STANDARD TREATMENT GUIDELINES

AND

ESSENTIAL MEDICINES LIST

FOR

SOUTH AFRICA

PRIMARY HEALTH CARE LEVEL

2014 EDITION

Copies may be obtained from:
The Directorate: Affordable Medicines
Private Bag X828
Pretoria
0001
OR
Department of Health Website: http://www.health.gov.za/edp.php

First printed 1996
Second edition 1998
Third edition 2003
Fourth edition 2008
Fifth edition 2014

ISBN: 978-1-920031-90-9

NOTE:
The information presented in these guidelines conforms to the current medical, nursing and pharmaceutical practice. Contributors and editors cannot be held responsible for errors, individual responses to drugs and other consequences.

Published by:
The National Department of Health, Pretoria, South Africa

FOREWORD

I am proud to present the fifth edition of the Primary Healthcare (PHC) Standard Treatment Guidelines (STGs) and Essential Medicines List (EML).

We are committed to the PHC approach as a strategy for working towards the goal of "developing a unified health system capable of delivering quality healthcare to all our citizens efficiently and in a caring environment." An integral component to the successful implementation of this strategy is equitable access to essential medicines.

These guidelines serve as a tool to facilitate health care access in South Africa, reducing the burden on secondary and tertiary services, and bringing health care closer to our communities.

We are indebted to all stakeholders who have enthusiastically participated in the external peer review process. The collaboration is heartening and has strengthened the EML review process.

Supporting the implementation of these guidelines will assist to attain a sustainable health system and universal access to essential medicines.

Let us work together towards a shared vision of a long and healthy life for all citizens.

DR A MOTSOALEDI, MP
MINISTER OF HEALTH
DATE

INTRODUCTION

Primary healthcare is the cornerstone of our health system and to essential health service delivery. The Primary Healthcare (PHC) Standard Treatment Guidelines (STGs) and Essential Medicines List (EML) 2014 edition provides a solid foundation, and standardised criteria guiding clinicians in the provision of essential universal PHC.

Evidence based medicine selection principles and consideration of practical implications were applied during this review. Tools summarising the evidence based changes in the PHC STGs and EML 2014 are available for use with the revised publication.

To promote transparency, in this fifth edition, revisions are accompanied by the level of evidence. All evidence based suggestions submitted through a national call for comment were deliberated. In addition, there was extensive collaboration with health experts, National Department of Health programmes and clinical societies.

In keeping with our National Drug Policy, it is the responsibility of every healthcare professional in our country to support the effective implementation of the revised guidelines. Therefore, I call on all stakeholders in the medicine management system including Provincial Departments of Health, Pharmaceutical and Therapeutics Committees, Health Care Managers, Supply Chain Managers, and every health care professional in South Africa to use and promote the implementation of these revised guidelines.

I congratulate the review committee and external stakeholders on a successful collaboration and revision, and I thank them for their continued commitment to healthcare provision in South Africa.

I encourage you to promote essential health service delivery at the PHC level in South Africa through implementation of the evidence based PHC STGs and EML 2014.

MS MP MATSOSO
DIRECTOR-GENERAL: HEALTH
DATE:

ACKNOWLEDGEMENTS

The quality of this edition reflects the passion, dedication, commitment and technical expertise of the members of the Primary Healthcare Level Expert Review Committee. We thank you for sacrificing the time.
We also thank the many stakeholders (dieticians, nurses, pharmacists, doctors, professional societies and other health care professionals) for their comments and contributions with appropriate evidence. The willingness to participate provided additional rigour to this peer review consultative process. We look forward to continuous constructive engagement.

NATIONAL ESSENTIAL DRUGS LIST COMMITTEE (2012)

Ms H Zeeman (Chairperson)
Dr F Benson
Prof GPG Boon
Mr V Dlamini
Prof B Hoek
Ms Y Johnson
Prof B Maharaj
Dr T Mbengashe
Ms M Ndwandwe
Prof AG Parrish
Dr T Pillay
Mr C Shabalala (retired)
Ms N Thipa
Prof L Bamford
Prof M Blockman
Prof H Brits
Prof M Freeman
Prof PM Jeena
Prof G Maartens
Ms HM Marais
Mr HT Mphaka
Ms MNM Ntshangase
Dr L Pein
Dr H Saeed
Mr GS Steel
Prof BW van de Wal

NATIONAL ESSENTIAL MEDICINES LIST COMMITTEE (2013–2015)

Ms GS Steel (Chairperson)
Prof L Bamford
Dr E Bera
Prof M Blockman
Dr C Clark
Mrs D du Plessis
Mr A Gray
Prof B Hoek
Ms Y Johnson
Dr N Khaole (retired)
Prof G Maartens
Dr P Mntla
Dr L Mvusi
Ms M Ndwande
Dr L Pein
Dr G Reubenson
Dr W Seaketso
Prof BW van de Wal
Ms H Zeeman (retired)
Dr F Benson
Prof GPG Boon (resigned)
Prof H Brits
Dr N Dlamini
Prof M Freeman
Dr G Grobler
Prof PM Jeena
Dr S Joubert
Dr J Lamprecht
Dr T Mbengashe (resigned)
Mr HT Mphaka
Ms MNM Ntshangase
Prof AG Parrish
Ms R Reddy
Dr C Scott
Ms N Thipa

PRIMARY HEALTHCARE EXPERT COMMITTEE

Dr E Bera (Chairperson)
Prof L Bamford
Prof H Brits
Dr MA Kwinda (resigned)
Ms C Mathosa
Dr J Munsamy
Dr L Pein
Prof BW van de Wal (Vice chairperson)
Prof GPG Boon
Dr R de Waal
Prof G Maartens
Dr N Mbilini
Ms MNM Ntshangase
Mr GS Steel

CONSULTANTS

Prof A Argent
Prof K Barnes
Prof M Blockman
Dr B Cheema
Dr T De Maayer
Prof GJ Hofmeyer
Dr M Marais
Prof J Moodley
Prof H Rees
Prof G Todd
Ms L Baker
Dr V Black
Prof L Blumberg
Dr AME du Plessis
Prof PM Jeena
Prof D Lewis
Prof B Mayosi
Prof AG Parrish
Dr G Reubenson

COMMENTS AND CONTRIBUTIONS

Dr SE Abizu
Ms E Appello
Dr E Augustine
Dr F Bassa
Ms AP Boraine
Ms A Burger
Dr Y Chothia
Dr R Cornick
Prof R Davids
Dr W de Lange
Prof L Denny
Dr J du Plessis
Ms N Fakir
Dr AE Fourie
Dr M Giaquinto
Dr T Gould
Dr GC Grobler
Dr T Hardcastle
Mr JJ Hattingh
Dr J Hiesegan
Dr JJ Janse van Rensburg
Prof J Joska
Dr S Kauchali
Dr L Koning
Dr A Laher
Dr A Amod
Dr E Armstrong
Dr K Balme
Dr D Blom
Ms L Botham
Prof D Cameron
Mr A Claassens
Ms M da Silva
Ms J Davids
Dr E de Vries
Dr N Dlamini
Dr I du Plessis
Prof J Farley
Dr R Freercks
Dr R Gihwala
Dr I Govender
Prof H Grundling
Ms Y Harding
Dr S Hawkridge
Dr N Horn
Prof PM Jeena
Dr S Joubert
Dr N Khan
Ms I Kotze
Dr R Lakier
Dr MI Anderson
Dr S Asmall
Dr C Bamford
Prof KD Boffard
Dr J Burger
Prof T Carmichael
Dr F Conradie
Dr N David
Dr P de Jongh
Dr EH Decloedt
Dr L Doussy
Dr J Dunlop
Prof S Fawcus
Prof J Gear
Dr LN Goldstein
Dr N Govender
Ms H Hamman
Dr A Hartwig
Dr M Hendricks
Ms Y Irwin
Ms Y Johnson
Prof M Kakaza
B Khowane
Dr P Kweza
Prof G Lamacraft

Dr J Lamprecht
Dr L Levine
Ms K Magakwa
Prof AD Marais
Ms L Moathlodi
Dr N Moran
Prof A Motala
Mr HT Mphaka
T Mungwe
Dr T Nana
Dr N Ngcobo
Prof M Ntsekha
Dr M Osman
Prof M Patel
Dr MP Pillay
S Ramlall
Ms R Reiff
Dr AKL Robinson
Dr T Rossouw
Prof CM Schutte
Dr D Solomon
Dr J Stanford
Dr J Thomas
Dr C Van De Venter
Dr R van Zyl
Dr WI Visser
Dr S Wasserman
Dr J Wilmhurst
Dr T Yates

Dr J Lawrenson
Prof D Levitt
Dr SK Maharaj
Ms E Marumo
Prof PC Modi
Dr M Moss
Dr F Motara
Dr R Muller
Prof SBA Mutambirwa
Ms A Naude
Dr JD Nortje
Dr J Nuttall
Dr G Paget
Dr N Patel
Ms R Pretorius
R Rautenbach
Prof G Richards
Prof J Rodda
Prof H Saloojee
Dr E Scriba
Dr A Solomon
Prof C Szabo
Dr IS Ukpe
Prof S van Dyk
Dr F Venter
Prof I van Biljon
Dr L Weich
Prof J Wing
Dr E Zöllner

Dr M Levin
Ms C Mabena
Dr J Maliakel
Ms D Mathibe
Dr M Moolla
Ms L Mostert
Dr T Motsohi
Dr S Mullins
Dr M Namane
Ms T Netshifhefhe
Dr P Nourse
Dr L Olivier
Dr P Parris
Dr S Picken
Mr W Ramkrishna
Ms R Reddy
Prof I Roberts
Ms L Roets
Ms L Schafer
Dr M Smith
Dr J Spicer
Prof GC Theron
Dr D Ungerer
Ms P van Heerden
Dr GC Verster
Ms Y Wang
Prof A Whitelaw
Ms W Wrench
Dr L Zuhlke

EDITORIAL

Ms T Leong
Dr J Munsamy
Dr R de Waal
Prof B Van de Wal
Ms K Jamaloodien

Assistance was provided by:

Dr J Riddin
Dr R Lancaster
Ms M Jones
Dr M Reddy
Mr P Msimanga
Dr S Berrada
Dr S Singh

SECRETARIAT

Ms T Leong
Ms K Jamaloodien
Dr J Munsamy

LOGISTICS

Mr M Molewa
Ms P Ngobese

Mr GS Steel
Cluster Manager: Sector Wide Procurement

TABLE OF CONTENTS

THE ESSENTIAL MEDICINES CONCEPT

The WHO describes Essential medicines as those that satisfy the priority health care needs of the population. Essential medicines are intended to be available within the context of functioning health systems at all times in adequate quantities, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford.

The concept of essential medicines is forward-looking. It incorporates the need to regularly update medicines selections to:

» reflect new therapeutic options and changing therapeutic needs;
» the need to ensure medicine quality; and
» the need for continued development of better medicines, medicines for emerging diseases, and medicines to meet changing resistance patterns.

Effective health care requires a judicious balance between preventive and curative services. A crucial and often deficient element in curative services is an adequate supply of appropriate medicines. In the health objectives of the National Drug Policy, the government of South Africa clearly outlines its commitment to ensuring availability and accessibility of medicines for all people. These are as follows:

» To ensure the availability and accessibility of essential medicines to all citizens.
» To ensure the safety, efficacy and quality of drugs.
» To ensure good prescribing and dispensing practices.
» To promote the rational use of drugs by prescribers, dispensers and patients through provision of the necessary training, education and information.
» To promote the concept of individual responsibility for health, preventive care and informed decision-making.

Achieving these objectives requires a comprehensive strategy that not only includes improved supply and distribution, but also appropriate and extensive human resource development. The implementation of an Essential Drugs Programme (EDP) forms an integral part of this strategy, with continued rationalisation of the variety of medicines available in the public sector as a first priority. The private sector is encouraged to use these guidelines and drug list wherever appropriate.

The criteria for the selection of essential drugs for Primary Health Care in South Africa were based on the WHO guidelines for drawing up a national EDL. Essential medicines are selected with due regard to disease prevalence, evidence on efficacy and safety, and comparative cost.

The implementation of the concept of essential medicines is intended to be flexible and adaptable to many different situations. It remains a national responsibility to determine which medicines are regarded as essential.

HOW TO USE THIS BOOK

Principles

The National Drug Policy makes provision for an Essential Drugs Programme (EDP) which is a key component in promoting rational medicines use.

The Primary Healthcare (PHC) Standard Treatment Guidelines (STGs) and Essential Medicines List (EML) should be used by healthcare workers providing care at clinics, community health centres and gateway clinics at hospitals to provide access to pharmaceuticals for the management of conditions commonly presenting at this level. It is the responsibility of the Pharmaceutical and Therapeutics Committees (PTCs) to ensure availability of medicines.

The medicines listed in the PHC EML should also be available at higher levels of care.

Provincial PTCs have the authority to facilitate and control access to additional medicines listed on the Adult and Paediatric hospital level EMLs at specific PHC facilities. In addition, provincial PTCs are authorised to reasonably adapt the STGs/EML according to local conditions and circumstances.

Provincial PTCs are also responsible for facilitating access of medicines using down referral from a higher to a lower level of care.

PHC treatment guidelines are designed to be a progression in care to the relevant Adult and Paediatric hospital level guidelines, with referral of patients with more complex and uncommon conditions to facilities with the skills and resources to provide further care. In addition, where a referral is recommended, the relevant medicines have either been reviewed and included in the Adult and Paediatric hospital level EMLs, or are in the process of being reviewed. Given that the STGs and EML for the various levels are reviewed at different times, there is a period when the STGs and EMLs are not always perfectly aligned.

All reasonable steps have been taken to align the STGs with Department of Health guidelines that were available at the time of review.
A medicine is included or removed from the list using an evidence based medicine review of safety and effectiveness, followed by consideration of cost and other relevant practice factors.

The EML has been developed down to generic or International Non-propriety Name (INN) level. It is anticipated that each Province will review the EML and prevailing tenders to compile a formulary which:

- » lists formulations and pack sizes that will facilitate care in alignment with the STGs and EML;
- » selects the preferred member of the therapeutic class based on cost;
- » implements formulary restrictions consistent with the local environment; and
- » provides information on medicine prices.

Therapeutic classes are designated in the “Medicine treatment” section of the STGs which provides a class of medicines followed by example such as, HMGCoA reductase inhibitors (statins) e.g. simvastatin. These therapeutic classes have been designated where none of the members of the class offer any significant benefit over the other registered members of the class. It is anticipated that by limiting the listing to a class there is increased competition and hence an improved chance of obtaining the best possible price in the tender process. In circumstances where you encounter such a class always consult the local formulary to identify the example that has been approved for use in your facility.

The perspective adopted is that of a competent prescriber practicing in a public sector facility. As such, the STGs serve as a standard for practice but do not replace sound clinical judgment.

Navigating the book

It is important that you become familiar with the contents and layout of the book in order to use the STGs effectively.

Where relevant this book is consistent with the Standard Treatment Guidelines for Hospital Level, Adults and Paediatrics, Integrated Management of Childhood Illness Strategy (IMCI) guidelines and other National Programme treatment guidelines.

The ICD-10 number, included with the conditions, refers to an international classification method used when describing certain diseases and conditions. A brief description and diagnostic criteria are included to assist the medical

officer to make a diagnosis. These guidelines also make provision for referral of patients with more complex and uncommon conditions to facilities with the resources for further investigation and management. The dosing regimens provide the recommended doses used in usual circumstances however the final dose should take into consideration capacity to eliminate the medicine, interactions and co-morbid states.

It is important to remember that the recommended treatments provided in this book are guidelines only and are based on the assumption that prescribers are competent to handle patients' health conditions presented at their facilities. Where the professional expertise of certain PHC centres exceeds that of an average clinic, PTCs are encouraged to tailor the availability of medicines at these centres. Adopting a more flexible approach promotes better utilisation of resources with healthcare provided that is more convenient for patients.

The STGs are arranged into chapters according to the organ systems of the body. Conditions and medicines are cross referenced in two separate indexes of the book. In some therapeutic areas that are not easily amenable to the development of a STG, the section is limited to a list of medicines.

This edition of the PHC STGs and EML provides medicine information services with contact numbers.

The section on Patient Education in Chronic Conditions aims to assist health workers to improve patient adherence and health.

Medicines Safety

Provincial and local PTCs should develop medicines safety systems to obtain information regarding medication errors, prevalence and importance of adverse medicine events, interactions and medication quality. These systems should not only support the regulatory pharmacovigilance plan but should also provide pharmacoepidemiology data that will be required to inform future essential medicines decisions as well as local interventions that may be required to improve safety.

In accordance with the Medicines Control Council's guidance on reporting adverse drug reactions in South Africa, the healthcare worker (with the support of the PTC) should report the relevant adverse reactions to the National

Adverse Drug Event Monitoring Centre (NADEMC). To facilitate reporting, a copy of the Adverse Drug Reaction form and guidance on its use has been provided at the back of the book.

Feedback

Comments that aim to improve these treatment guidelines will be appreciated. The submission form and guidelines for completing the form are included in the book. Motivations will only be accepted from the Provincial PTC.

Paediatric Dose Calculation

Paediatric doses are mostly provided in the form of weight-band dosing tables according to age. It is recommended that doses be calculated by weight, described as mg/kg. If this is not possible, choose a dose from the weight-band tables. Only use the dose according to age as a last resort. In particular, do not use age bands if the child appears small for his/her age or is malnourished.

Different conditions require different dosing of medication. In children most conditions can use standardised doses. These standardised paediatric weight-band dosing tables for specific conditions are contained in an appendix. Where a specific condition is not indicated in the appendix, refer to the STGs in the main text of the book for the dosing specific to that condition.

Prescription Writing

Medicines should be prescribed only when they are necessary for treatments following clear diagnosis. Not all patients or conditions need prescriptions for medication. In certain conditions simple advice and general and supportive measures may be more suitable.

In all cases carefully consider the expected benefit of a prescribed medication against potential risks. This is important during pregnancy where the risk to both mother and foetus must be considered.

All prescriptions should:

- » be written legibly in ink by the prescriber with the full name and address of the patient, and signed with the date on the prescription form;
- » specify the age and, in the case of children, weight of the patient;

» have contact details of the prescriber e.g. name and telephone number.

In all prescription writing the following should be noted:

» The name of the medicine or preparation should be written in full using the generic name.

» No abbreviations should be used due to the risk of misinterpretation. Avoid the Greek mu (μ): write mcg as an abbreviation for micrograms.

» Avoid unnecessary use of decimal points and only use where decimal points are unavoidable. A zero should be written in front of the decimal point where there is no other figure, e.g. 2 mg not 2.0 mg or 0.5 ml and not .5ml.

» Frequency. Avoid Greek and Roman frequency abbreviations that cause considerable confusion – qid, qod, tds, tid, etc. Instead either state the frequency in terms of hours (e.g. 8 hourly) or times per day in numerals (e.g. 3x/d).

» State the treatment regimen in full:
- medicine name and strength,
- dose or dosage,
- dose frequency,
- duration of treatment,
- e.g. amoxicillin 250 mg 8 hourly for 5 days.

» In the case of "as required", a minimum dose interval should be specified, e.g. every 4 hours as required.

» Most monthly outpatient scripts for chronic medication are for 28 days; check that the patient will be able to access a repeat before the 28 days are completed.

» After writing a script, check that the dose, dose units, route, frequency, and duration for each item is stated. Consider whether the number of items is too great to be practical for the patient, and check that there are no redundant items or potentially important drug interactions. Check that the script is dated and that the patient's name and identification number are on the prescription form. Only then should the prescriber sign the script, and as well as provide some other way for the pharmacy staff to identify the signature if there are problems (print your name, use a stamp, or use a prescriber number from your institution's pharmacy).

A GUIDE TO PATIENT ADHERENCE IN CHRONIC CONDITIONS

Achieving health goals for chronic conditions such as asthma, diabetes, HIV and AIDS, epilepsy, hypertension, mental health disorders and TB requires attention to:

» Adherence to long term pharmacotherapy – incomplete or non-adherence can lead to failure of an otherwise sound pharmacotherapeutic regimen.
» Organisation of health care services, which includes consideration of access to medicines and continuity of care.

Patient Adherence

Adherence is the extent to which a person's behaviour – taking medication, following a diet and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider.

Poor adherence results in less than optimal management and control of the illness and is often the primary reason for suboptimal clinical benefit. It can result in medical and psychosocial complications of disease, reduced quality of life of patients, and wasted health care resources.

Poor adherence can fall into one of the following patterns where the patient:

» takes the medication very rarely (once a week or once a month);
» alternates between long periods of taking and not taking their medication e.g. after a seizure or BP reading;
» skips entire days of medication;
» skips doses of the medication;
» skips one type of medication;
» takes the medication several hours late;
» does not stick to the eating or drinking requirements of the medication;
» adheres to a purposely modified regimen; and
» adheres to an unknowingly incorrect regimen.

Adherence should be assessed on a regular basis. Although there is no gold standard, the current consensus is that a multi method approach that includes self report be adopted such as that below. .

Barriers that contribute toward poor adherence

BARRIER	RECOMMENDED SUPPORT
Life style	
» It is often difficult to take multiple medications.	» Create a treatment plan with information on how and when to take the medications.
» A busy schedule makes it difficult to remember to take the medication.	» Use reminders such as cues that form part of the daily routine.

BARRIER	RECOMMENDED SUPPORT
Attitudes and beliefs	
» The condition is misunderstood or denied.	» Remind patients that they have a long term illness that requires their involvement.
» Treatment may not seem to be necessary.	» Use change techniques such as motivational interviewing.
» May have low expectations about treatment.	» Identify goals to demonstrate improvement/stabilisation.
Social and economic	
» May lack support at home or in the community	» Encourage participation in treatment support programs.
» May not have the economic resources to attend appointments.	» Consider down referral or reschedule appointment to fit in with other commitments.
Healthcare team related	
» Little or no time during the visit to provide information.	» Encourage patient to ask questions.
» Information maybe provided in a way that is not understood.	» Use patient literacy materials in the patient's language of choice.
» Relationship with the patient may not promote understanding and self management.	» Engage active listening.
Treatment related	
» Complex medication regimens (multiple medications and doses) can be hard to follow.	» If possible reduce treatment complexity
» May be discouraged if they don't feel better right away.	» Help the patient understand the condition and the role of their medication
» May be concerned about adverse effects.	» Discuss treatment goals in relation to potential adverse effects.

Although many of these recommendations require longer consultation time, this investment is rewarded many times over during the subsequent years of management.

For a patient to consistently adhere to long term pharmacotherapy requires integration of the regimen into his or her daily life style. The successful integration of the regimen is informed by the extent to which the regimen differs from his or her established daily routine. Where the pharmacological proprieties of the medication permits it, the pharmacotherapy dosing regimen should be adapted to the patient's daily routine. For example, a shift worker may need to take a sedating medicine in the morning when working night shifts, and at night, when working day shifts. If the intrusion into life style is too great alternative agents should be considered if they are available. This would include situations such as a lunchtime dose in a school-going child who remains at school for extramural activity and is unlikely to adhere to a three

times a regimen but may very well succeed with a twice daily regimen.

Towards concordance when prescribing

Establish the patient's:

» occupation,
» daily routine,
» recreational activities,
» past experiences with other medicines, and
» expectations of therapeutic outcome.

Balance these against the therapeutic alternatives identified based on clinical findings. Any clashes between the established routine and life style with the chosen therapy should be discussed with the patient in such a manner that the patient will be motivated to a change their lifestyle.

Note: Education that focuses on these identified problems is more likely to be successful than a generic approach toward the condition/medicine.

Education points to consider

» Focus on the positive aspects of therapy whilst being encouraging regarding the impact of the negative aspects and offer support to deal with them if they occur.
» Provide realistic expectations regarding:
– normal progression of the illness - especially important in those diseases where therapy merely controls the progression and those that are asymptomatic;
– the improvement that therapy and non-drug treatment can add to the quality of life.
» Establish therapeutic goals and discuss them openly with the patient.
» Any action to be taken with loss of control or when side effects develop.
» In conditions that are asymptomatic or where symptoms have been controlled, reassure the patient that this reflects therapeutic success, and not that the condition has resolved.
» Where a patient raises concern regarding anticipated side effects, attempt to place this in the correct context with respect to incidence, the risks vs. the benefits, and whether or not the side effects will disappear after continued use.

Note: Some patient's lifestyles make certain adverse responses acceptable which others may find intolerable. Sedation is unlikely to be acceptable to a student but an older patient with insomnia may welcome this side effect. This is where concordance plays a vital role.

Notes on prescribing in chronic conditions.

» Do not change doses without good reason.
» Never blame anyone or anything for non-adherence before fully investigating the cause.
» If the clinical outcome is unsatisfactory - investigate adherence (remember side effects may be a problem here).
» Always think about side effects and screen for them from time to time.
» When prescribing a new medicine for an additional health related problem

ask yourself whether or not this medicine is being used to manage a side effect.

» Adherence with a once daily dose is best. Twice daily regimens show agreeable adherence. However, once the interval is decreased to 3 times a day there is a sharp drop in adherence which deteriorates further on a 4 times a day regimens.

» Keep the total number of tablets to an absolute minimum as too many may lead to medication dosing errors and may influence adherence

Improving Continuity of Therapy

» Make clear and concise records.

» Involvement the patient in the care plan.

» Every patient on chronic therapy should know:
  - his/her diagnosis
  - the name of every medicine
  - the dose and interval of the regimen
  - his/her BP or other readings

  Note: The prescriber should reinforce this only once management of the condition has been established.

» When the patient seeks medical attention for any other complaints such as a cold or headache he/she must inform that person about any other condition/disease and its management.

» If a patient indicates that he/she is unable to comply with a prescribed regimen, consider an alternative - not to treat might be one option, but be aware of the consequences e.g. ethical.

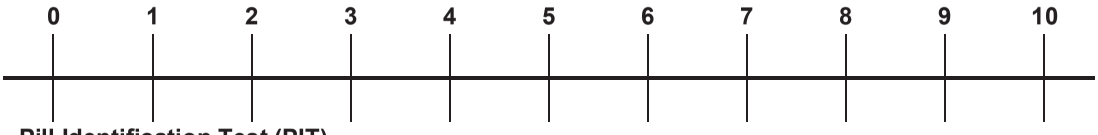
Patient Adherence Record

Folder No.	Date (dd/mm/yyyy) / /

Self-Reporting

Question	Yes	No
Do you sometimes find it difficult to remember to take your medicine?		
When you feel better, do you sometimes stop taking your medication?		
Thinking back over the past four days, have you missed any of your doses?		
Sometimes if you feel worse when you take the medicine, do you stop taking it?		

Visual Analogue Scale (VAS)



Score ____%

Pill Identification Test (PIT)

Medication	Knows the name (Y/N)	Knows the number of pills per dose (Y/N)	Time the medication is taken			Knows any additional instruction
			Morning (hour)	Evening (hour)	Considered Acceptable (Y/N)	

Pill Count

Did the client return the medication containers? Yes* No

***If yes,** check that the client only used medication from this container since the date of their last visit. If leftover medication had been used or an emergency prescription obtained, then the calculation will be invalid – skip to adherence assessment.

% Adherence = (**Dispensed** – **Returned**) / **Expected to be taken** **X 100 =** (☐ – ☐) / ☐ **X 100 =** ☐ **%**

Adherence Assessment

Self-reporting	Answered 'No' to all questions	Answered 'Yes' to 1 question	Answered 'Yes' to 2 or more questions
VAS	≥ 95%	75–94%	Less than 75%
PIT—Client knows the…	Dose, Time, and Instructions	Dose and Time	Dose only or confused
Pill count	≥ 95%	75–94%	Less than 75%
Overall Adherence	High	Moderate	Low

Chapter 1: Dental and oral conditions

1.1 ABSCESS AND CARIES, DENTAL

1.1.1 ABSCESS, DENTAL

K04.7

DESCRIPTION

Acute or chronic suppuration related to teeth, due to infection. It is characterised by:

» acute, severe, throbbing pain
» swelling adjacent to the tooth, or on the face
» pain worsened by tapping on affected teeth
» restriction in mouth opening or difficulty in chewing
» pus collection and drainage either intra-orally or on the face

MEDICINE TREATMENT

Initiate treatment before referral:

Children

- Amoxicillin, oral, 10–20 mg/kg 8 hourly for 5 days.

Weight kg	**Dose** mg	**Use one of the following:**				**Age** Months/years
		Susp		**Capsule**		
		125mg /5mL	250mg /5mL	250 mg	500 mg	
>11–25 kg	250 mg	10 mL	5 mL	1 cap	–	>8 months–7 years
>25 kg	500 mg	–	–	2 caps	1 cap	>7 years

Adults

- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

AND

Children

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. See dosing table, pg 22.6.

Adults

- Metronidazole, oral, 400 mg, 8 hourly for 5 days.

Penicillin allergy:

Children < 18 kg

- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children: 18-35 kg (able to take tablets)

- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL

All cases.

1.1.2 CARIES, DENTAL

K02

To be managed by a dentist.

For local anaesthesia for dental procedures:

- Lidocaine (Dentist only).
- Lidocaine with epinephrine (adrenaline) (Dentist only).

1.2 CANDIDIASIS, ORAL (THRUSH)

B37.0

DESCRIPTION

A candida infection of the mouth and sometimes of the pharynx.
Commonly presents as painful creamy white patches that can be scraped off the tongue and buccal mucosa.
Often occurs in healthy babies up to one month of age.

Risk factors for candida include:

» poor oral hygiene
» immunosuppression (may be responsible for severe cases of oral thrush)
» prolonged use of broad spectrum antibiotics or corticosteroids (including inhaled)
» certain chronic diseases, e.g. diabetes mellitus
» trauma e.g. from poorly fitting dentures or dentures worn whilst sleeping

GENERAL MEASURES

» Identify underlying causes, based on risk factors.
» Improve oral hygiene.
» Feed infants using cup instead of a bottle.
» Ensure proper fitting dentures.

MEDICINE TREATMENT

- Nystatin suspension, oral, 100 000 IU/mL, 1 mL 6 hourly after each meal/feed for 7 days.
  - Keep in contact with the affected area for as long as possible prior to swallowing.

- In older children, ask the child to swirl in the mouth, prior to swallowing.
- In infants, advise mothers to apply to front of the mouth and spread over the oral mucosa with a clean finger.
- Continue for 48 hours after cure.

Note: Oesophageal involvement in HIV infected patients with oral candidiasis who have pain or difficulty when swallowing requires fluconazole. See Section 11.3.3: Candida oesophagitis.

REFERRAL

» No improvement.
» Uncertain diagnosis.
» Pharyngeal or oesophageal involvement.

1.3 GINGIVITIS AND PERIODONTITIS

1.3.1 GINGIVITIS, UNCOMPLICATED

K05.1/K05.0

DESCRIPTION

An inflammation of the gum margin causing the gums to separate from the teeth. Pockets (recesses) form between the gums and the teeth.
Pus and bacteria can collect in these pockets, eventually causing periodontitis. See section 1.3.2: Periodontitis.

Characteristics of uncomplicated gingivitis:

» change in normal gum contour
» redness
» watery exudate/bleeding
» may be recurrent
» may be painful
» swollen gums
» gum recession may occur

PROPHYLAXIS AND GENERAL MEASURES

Oral hygiene is usually adequate to prevent superficial mouth and gum infection:

» Oral hygiene after each meal to remove plaque and food debris.
» Brush teeth twice daily.
» Floss teeth at least once daily.
» Rinse mouth with homemade salt mouthwash for one minute twice daily (i.e. ½ medicine measure of table salt in a glass of lukewarm water).

MEDICINE TREATMENT

Brush, floss, rinse mouth with water and then rinse with:

- Chlorhexidine 0.2%, 15 mL as a mouthwash, twice daily, after brushing teeth, for 5 days.
  - Do not swallow.

  Note: Do not eat or drink immediately after this.

LoE: III[i]

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

1.3.2 PERIODONTITIS

K05.3, K05.2

DESCRIPTION

Progressive gingivitis to the point where the underlying bone is eroded. It is characterised by loose teeth and is a cause of tooth loss in adults.

GENERAL MEASURES

» Provide advice on improving and maintaining oral hygiene.
» Brush teeth frequently, at least twice daily.

MEDICINE TREATMENT

Brush, floss, rinse mouth with water and then rinse with:

- Chlorhexidine 0.2%, 15 mL as a mouthwash, twice daily, for 5 days.
  - Do not swallow.

  Note: Do not eat or drink immediately after this.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL

All cases for dental treatment.

1.3.3 NECROTISING PERIODONTITIS

A69.1

DESCRIPTION

An acute, very painful infection of the gingival margin. It is characterised by:

» foul smelling breath
» necrosis and sloughing of the gum margin, especially of the interdental papillae
» loss of gingiva and supporting bone around teeth
» presence of underlying disease, e.g. HIV

May lead to disease of surrounding lips and cheeks if not adequately treated.

GENERAL MEASURES

» Relieve pain.
» Improve oral hygiene.

MEDICINE TREATMENT

Children

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. See dosing table, pg 22.6.

Adults

- Metronidazole, oral, 400 mg, 8 hourly for 5 days.

Brush, floss, rinse mouth with water and then rinse with:

- Chlorhexidine 0.2%, 15 mL as a mouthwash, twice daily, for 5 days.
  - Do not swallow.

  Note: Do not eat or drink immediately after this.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL

All cases for dental treatment.

1.4 HERPES SIMPLEX INFECTIONS OF THE MOUTH AND LIPS

B00.2

DESCRIPTION

Acute, painful vesicular eruptions of the lips or ulcerations of the lips and mouth caused by *Herpes simplex* virus and characterised by:

» shallow painful ulcers on the lips, gingiva and tongue
» pain exacerbated on eating

It is a self-limiting infection with symptoms subsiding within 10 days.

GENERAL MEASURES

» Rinse mouth with homemade salt mouthwash for one minute twice daily (i.e. ½ medicine measure of table salt in a glass of lukewarm water).
» Ensure adequate hydration.
» Fluid diet for children.
» Avoid acidic drinks, e.g. orange juice or soft drinks as they may cause pain.
» Cover lesions on the lips with petroleum jelly.

MEDICINE TREATMENT

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 227.

Adults
- Paracetamol, oral, 1 g 6 hourly when required.

Extensive oral herpes:
For children > 6 years and adults
- Tetracaine 0.5 %, oral, topical, applied every 6 hours.
  - Apply a thin layer on the affected areas only.

Note: Safety in children < 6 years of age has not been established.

LoE:III[ii]

The following patients should be treated with aciclovir:
» Children with extensive oral herpes **provided treatment can be started within 72 hours of onset of symptoms.**
» HIV infected patients with *Herpes simplex* of the lips or mouth.

Children < 15 years of age
- Aciclovir, oral, 250 mg/m^2/dose, 8 hourly for 7 days. See dosing table, pg 22.1.

Children > 15 years of age and adults
- Aciclovir, oral, 400 mg, 8 hourly for 7 days.

LoE:I[iii]

REFERRAL
» Severe condition.
» Dehydrated patients.
» No improvement after 1 week of treatment.

1.5 APHTHOUS ULCERS
K12.0

DESCRIPTION
Painful ulcers in the oropharynx. Minor ulcers (< 1 cm diameter) usually heal within 2 weeks. Major ulcers (> 1 cm diameter) are very painful, often very deep and persist. Major ulcers usually indicate advanced HIV infection.

MEDICINE TREATMENT
Minor aphthous ulcers:
Children < 6 years of age
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Children > 6 years of age and adults
- Tetracaine 0.5 %, oral, topical, applied every 6 hours.
  - Apply a thin layer on the affected areas only.

Note: Safety in children < 6 years of age has not been established.

REFERRAL
Major ulcers for further diagnostic evaluation.

1.6 TEETHING, INFANT

K00.7

DESCRIPTION

Teething is the appearance of teeth through the gums in the mouth of infants and young children.

Symptoms often associated with teething include:

- fretfulness
- biting or chewing on hard objects
- drooling, which may often begin before teething starts
- gum swelling and tenderness
- refusing food
- sleeping problems

Teething is not a cause of severe or systemic symptoms, such as high fever or diarrhoea. Exclude conditions other than teething in infants who are systemically unwell or in distress.

Advise caregivers to seek medical advice if the infant becomes systemically unwell.

GENERAL MEASURES

Teething is a normal physiological process, simple self-care measures are recommended.

- Gentle massage to the gum or biting on objects (such as teething rings) may produce relief by producing counter-pressure against the gums (beware of choking risks).
- Cold objects may help to ease symptoms.

Do not use local oral anaesthetic preparations in infants, as these have been associated with severe adverse events.

REFERRAL

All children with systemic symptoms (e.g. high fever or diarrhoea) that cannot be managed at primary health care level.

---

[i] Chlorhexidine.DRUGDEX® Drug Point, 2009.

[ii] Tetracaine hydrochloride.Sweetman SC, ed. Martindale: the complete drug reference. 37th ed. London, Pharmaceutical Press, 2011.

[iii] Aciclovir. Paz-Bailey G, Sternberg M, Puren AJ, Markowitz LE, Ballard R, Delany S, Hawkes S, Nwanyanwu O, Ryan C, Lewis DA. Improvement in healing and reduction in HIV shedding with episodic acyclovir therapy as part of syndromic management among men: a randomized, controlled trial. *J Infect Dis*. 2009 Oct 1;200(7):1039-49. http://www.ncbi.nlm.nih.gov/pubmed/19715417

Chapter 2: Gastro-intestinal conditions

2.1 ABDOMINAL PAIN

R10.4

DESCRIPTION

Abdominal pain is a common symptom, which may be non-specific. It is frequently benign, but may indicate a serious acute pathology. A thorough evaluation is necessary to exclude a surgical abdomen or other serious conditions.

The history should include:

» duration, location, type, radiation and severity of pain
» relieving or aggravating factors e.g. food, antacids, exertion
» associated symptoms e.g. fever or chills, weight loss or gain, nausea, vomiting, diarrhoea, cramps, fresh blood per rectum, melaena stools, jaundice, change in stool or urine colour, vaginal discharge
» past medical and surgical history
» medication history
» alcohol intake or intake of other recreational substances
» family history of bowel disorders
» menstrual and contraceptive history in women
» associated vaginal discharge in women with lower abdominal pain

Examination should emphasise detection of:

» tachycardia
» fever
» jaundice or pallor
» abdominal masses, distension, tenderness
» signs of peritonitis (rebound tenderness and guarding)
» features of possible associated diseases (e.g. HIV)

MEDICINE TREATMENT

Symptomatic treatment if no specific cause or indication for referral is found.

Urinary tract infection:
See Chapter 8: Kidney and urological disorders.

Dyspepsia:
See Section 2.2: Dyspepsia, heartburn and indigestion, in adults.

Pain relief (adults):
Analgesia as appropriate. See Section 20.1: Pain control.

Renal and biliary colic or acute surgical abdomen:

- Morphine, IM/IV, 10 mg as a single dose and refer (Doctor initiated).
  For IV morphine:
  - Dilute in 10 mL sodium chloride 0.9%.
  - Administer slowly over 5 minutes.

LoE:III[1]

Abdominal cramp-like pains:

- Hyoscine butylbromide, oral, 10 mg 6 hourly for a maximum of 3 days.

Cancer pain e.g. pancreatic, gastric cancer
See Section 20.3: Chronic cancer pain.

REFERRAL
» Severe pain that cannot be managed at primary health care level.
» Signs of acute abdomen.
» Associated bloody non-diarrhoeal stools.
» Associated abdominal mass.

2.2 DYSPEPSIA, HEARTBURN AND INDIGESTION, IN ADULTS
K30/R12

DESCRIPTION
Dyspepsia, heartburn and indigestion are common conditions. These conditions often present with epigastric discomfort and minimal change in bowel habits.
Intermittent indigestion, heartburn or dyspepsia may be associated with:
» use of NSAIDs e.g. aspirin, ibuprofen, pain powders
» spicy food, alcohol, carbonated drinks
» smoking
Note: Dyspeptic symptoms may possibly be due to acute coronary syndrome.

GENERAL MEASURES
» Stop smoking.
» Limit alcohol intake.
» Eat small frequent meals.
» Check haemoglobin.
» Stop the use of potential ulcerogenic medicines e.g. NSAIDs.

MEDICINE TREATMENT
Initiate medicine therapy with:
- Proton-pump inhibitor e.g.:
- Lansoprazole 30 mg, oral, daily for 14 days.
  - Also indicated for short-term use in pregnancy.
  - Refer if symptoms recur after 14 day course of therapy.

LoE:I[II]

REFERRAL
» Presence of warning signs:
  – weight loss
  – persistent vomiting
  – dysphagia
  – anaemia
  – haematemesis
  – palpable abdominal mass
» No response within 7 days of starting proton-pump therapytreatment.
» Recurrence of symptoms, especially:
  – > 50 years of age
  – family history of gastric carcinoma
  – previous gastric surgery

2.3 GASTRO-OESOPHAGEAL REFLUX/DISEASE IN INFANTS

K30/R12

DESCRIPTION

Gastro-oesophageal reflux (GOR) is the passive regurgitation of gastric content into the oesophagus. It is a normal physiological phenomenon in infants, children and adults. Gastro-oesophageal reflux disease (GORD) is when GOR results in abnormal or pathological complications.

Symptoms

Frequent positing/regurgitation of small amounts of milk/food.

GENERAL MEASURES

In the absence of referral criteria (features of GORD), no medicine treatment is required. Counselling and non-medicinal measures are suggested:

» Explain that GOR is common and resolves in the majority of children by the age of 12–18 months.
» Upright positioning after feeds.

REFERRAL

» Failure to thrive (growth faltering).
» Abnormal posturing with opisthotonus or torticollis (Sandifer's syndrome).
» Respiratory symptoms, i.e. recurrent wheeze or cough, chronic obstructive airway disease, recurrent aspiration/pneumonia, stridor, apnoea and apparent life-threatening events.

2.4 NAUSEA AND VOMITING, NON-SPECIFIC

R11.2

DESCRIPTION

There are many possible causes of nausea and vomiting.

Some important causes to **exclude** are:

» gastro-intestinal disease
» liver disease
» renal failure
» alcohol abuse
» early pregnancy
» medicines

Establish if the vomiting is associated with:

» abdominal pain
» diarrhoea
» headache
» constipation

GENERAL MEASURES

» Maintain adequate hydration with clear fluids. See Section 2.9: Diarrhoea.
» In children, do not stop feeds for more than 1 hour. Restart feeds in smaller and more frequent amounts.

MEDICINE TREATMENT

Children

Do not use anti-emetics. Give small volumes of fluids more frequently.

Adults

- Metoclopramide, IM/IV/oral, 10 mg 8 hourly.

REFERRAL

Urgent

» Severe dehydration.
» Shock.
» Diabetes.
» Severe pain.
» Wasting.
» Jaundice.
» Features of sepsis.
» Associated abdominal tenderness with guarding and rebound tenderness.
» Signs of intestinal obstruction i.e. no stool or flatus passed.
» Infants with projectile vomiting or vomiting everything.
» Vomiting with digested or fresh blood present.

2.5 ANAL CONDITIONS

2.5.1 ANAL FISSURES

K60.2

DESCRIPTION

Painful small cracks just inside the anal margin.
It is often seen together with a sentinel pile or external haemorrhoids.
May cause spasm of the anal sphincter.

GENERAL MEASURES

Dietary advice to promote soft stools.

MEDICINE TREATMENT

Children

- Lactulose, oral, 0.5 mL/kg/dose once daily. See dosing tables, pg 22.5.
  - If poor response, increase frequency to 12 hourly.

Adult

- Lactulose, oral, 10–20 mL once daily.
  - If poor response, increase frequency to 12 hourly.

- Bismuth subgallate compound, ointment, topical, applied 2–4 times daily.

OR

Lidocaine 2%, cream, topical, applied before and after each bowel action.

REFERRAL

» Severe pain.
» Recurrent episodes.
» Poor response to symptomatic treatment.

2.5.2 HAEMORRHOIDS

I84.9

DESCRIPTION

Varicose veins of the ano-rectal area.
Is usually accompanied by a history of constipation.
In older patients consider a diagnosis of underlying carcinoma.

GENERAL MEASURES

» High-fibre diet.
» Counsel against chronic use of laxatives.
» Avoid straining at stool.

MEDICINE TREATMENT

Symptomatic treatment for painful haemorrhoids:

- Bismuth subgallate compound, ointment, topical, applied 2–4 times daily.

OR

Bismuth subgallate compound suppositories, insert one into the rectum 3 times daily.

OR

Lidocaine 2%, cream, topical, applied before and after each bowel action.

Constipation

See Section 2.8: Constipation.

REFERRAL

» For surgical intervention if necessary:
  – if the haemorrhoid cannot be reduced
  – if the haemorrhoid is thrombosed
  – poor response to conservative treatment
» Children.

2.5.3 PERIANAL ABSCESSES

K61.0

An abscess forming adjacent to the anus.
Caused by organisms spreading through the wall of the anus into peri-anal soft tissues.
Treatment is by surgical drainage.

2.6 APPENDICITIS

K37

REFERRAL

» All patients with suspected appendicitis:
  – right iliac fossa tenderness
  – right iliac fossa rebound pain
  – severe persistent abdominal pain

2.7 CHOLERA

A00.9

Note: notifiable condition.

DESCRIPTION

Very acute severe watery diarrhoea due to infection with *Vibrio cholerae.*

Clinical features include:

» rice water appearance of stools:
  – no blood in stools
  – no pus in stools
  – no faecal odour
» possible vomiting
» rapid severe dehydration

Note: Prevent and treat dehydration.

GENERAL MEASURES

Rehydrate aggressively with oral rehydration solution (ORS).

MEDICINE TREATMENT

Treat dehydration

Children

Treat dehydration. See Section 2.9.1: Diarrhoea, acute in children.

In all children who are able to take oral medication

- Zinc (elemental), oral for 14 days:
  - If < 10 kg give 10 mg/day.
  - If > 10 kg give 20 mg/day.

LoE:III[III]

Adults

Oral treatment:

- ORS.

OR

Homemade sugar and salt solution. See Section 2.9: Diarrhoea.
The volume of fluid required for oral rehydration depends on the severity of the dehydration.

Oral rehydration is preferred. In stuporose patients administer ORS by nasogastric tube.

IV treatment:

- Sodium chloride 0.9%, IV.

Antibiotic treatment

Children

- Ciprofloxacin, oral, 20 mg/kg as a single dose immediately. (Ciprofloxacin is specifically used for this indication in children).

Weight kg	Dose mg	Use one of the following:			Age Months / years
		Susp 250 mg / 5 mL	Tablet		
			250 mg	500 mg	
>3.5–5 kg	75 mg	1.5 mL	–	–	>1–3 months
>5–7 kg	100 mg	2 mL	–	–	>3–6 months
>7–9 kg	150 mg	3 mL	–	–	>6–12 months
>9–11 kg	200 mg	4 mL	–	–	>12–18 months
>11–14 kg	250 mg	5 mL	1 tablet	–	>18 months–3 years
>14–7.5 kg	300 mg	6 mL	–	–	>3–5 years
>17.5–25 kg	400 mg	8 mL	–	–	>5–7 years
>25–35 kg	500 mg	10 mL	2 tablets	1 tablet	>7–11 years
>35–55 kg	750 mg		3 tablets	–	>11–15 years

Adults

- Ciprofloxacin, oral, 1 g as a single dose immediately.

LoE:II[iv]

REFERRAL

» Severely ill patients.
» According to provincial and local policy.

2.8 CONSTIPATION

K59.0

DESCRIPTION

A condition characterised by a change in usual bowel habits and dry, hard stools. There is a decreased frequency of bowel action. Patients should be assessed individually.

Constipation may have many causes, including:

» incorrect diet (insufficient fibre and fluid)
» pregnancy
» medicines, e.g. opiates and anticholinergics
» hypothyroidism
» lower bowel abnormalities
» chronic use of enemas and laxatives
» behavioural problems in children
» lack of exercise
» old age
» ignoring the urge
» neurogenic
» psychogenic disorders
» cancer of the bowel

CAUTION

In adults be especially suspicious of a change in bowel habits, as there may be a possibility of cancer of the large bowel.

GENERAL MEASURES

» Encourage exercise.
» Increase intake of fibre-rich food, e.g. vegetables, coarse maize meal, bran and cooked dried prunes.

» Ensure adequate hydration.
» Encourage regular bowel habits.
» Discourage continuous use of laxatives.

MEDICINE TREATMENT

Children > 12 months of age

- Lactulose, oral, 0.5 mL/kg/dose once daily. See dosing tables, pg 22.5.
  - If poor response, increase frequency to 12 hourly.

Adults and children > 15 years of age

- Sennosides A and B, oral, 7.5 mg, 2 tablets at night.
  - In resistant cases increase to 4 tablets.

OR

Lactulose 10–20 mL once or twice daily.

CAUTION

Prolonged severe constipation may present with overflow "diarrhoea". Rectal examination should be done in all adults.

REFERRAL

» Recent change in bowel habits.
» Faecal impaction.
» Poor response to treatment.
» Uncertain cause of constipation.

2.9 DIARRHOEA

A09

CAUTION

There is no place for antidiarrhoeal preparations in the treatment of acute diarrhoea in children or in dysentery.

2.9.1 DIARRHOEA, ACUTE IN CHILDREN

A09.0

DESCRIPTION

A sudden onset of increased frequency of stools that are looser than normal, with or without vomiting. Commonly caused by a virus, but may be caused by bacteria or parasites. The cause of acute diarrhoea cannot be diagnosed without laboratory investigation. It may be an epidemic if many patients are infected at the same time.

Special risk situations

Diarrhoea in:

» Infants < 4 weeks.
» Malnourished babies.
» Babies with other danger signs such as:

- convulsions
- altered level of consciousness
- persistent vomiting/vomiting everything
- respiratory distress
- persistent diarrhoea
- hypothermia
- surgical abdomen
- blood in stool in babies < 1 year of age

Note: Refer these babies urgently for treatment.

Before referral, begin management for dehydration (see below), and administer:

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose.** See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

LoE:III[V]

Special types of diarrhoea

» Bloody diarrhoea: consider dysentery. See Section 2.10: Dysentery.
» Diarrhoea with high fever or very ill: consider typhoid. See Section 2.13: Typhoid fever.
» Persistent diarrhoea, > 14 days: refer patient.
» Diarrhoea in children in the context of an adult epidemic: consider cholera. See Section 2.7: Cholera.

Treatment according to hydration classification			
Assess hydration and begin hydration (Plan A, B and C) based on this assessment →			
	Plan C **Severe dehydration**	**Plan B** **Some dehydration**	**Plan A** **No visible dehydration**
Classification	2 of the signs below: » lethargic or unconscious » eyes sunken » drinks poorly or not able to drink » severe decrease in skin turgor (skin pinch returning ≥ 2 seconds)	2 of the signs below, but not severe dehydration: » restless or irritable » eyes sunken » thirsty, drinks eagerly » moderate decrease in skin turgor - by slow skin pinch, returning in < 2 seconds	Only one or none of the signs of dehydration.
	Plan C **Severe dehydration**	**Plan B** **Some dehydration**	**Plan A** **No visible dehydration**
Treatment	Give rapidly: • Sodium chloride 0.9%, IV, 20 mL/kg. ○ If signs of acute severe malnutrition decrease the bolus to 10 mL/kg over 10 minutes. ○ Repeat up to twice if radial pulse is weak or undetectable. ○ Continue with 20 mL/kg every hour for the next 5 hours. **Then**: » Refer urgently for further management, continuing with 20 mL/kg every hour for the next 5	Give: • ORS, oral, 80 mL/kg over 4 hours, e.g. 5 mL/kg every 15 minutes. » Give more if the child wants more. » Show the caregiver how to give ORS with a cup and spoon using frequent small sips. » If child vomits wait 10 minutes and then continue more slowly. » Encourage the caregiver to continue feeding	» Show the caregiver how to give ORS with a cup and spoon using frequent small sips. » Encourage caregiver to give: • ORS, oral, 10 mL/kg after each diarrhoeal stool until diarrhoea stops. ○ child ≤2 years of age: 50–100 mL ○ child >2 years of age: 100–200 mL » Continue at home. » Encourage the caregiver to continue feeding the child, especially

Treatment	hours unless the child is reclassified as B: Some dehydration. » Reassess every 2 hours while awaiting transfer. » If hydration status does not improve, give IV fluids more rapidly. » As soon as the child can drink, usually after 3–4 hours in infants and 1–2 hours in children, also give: • ORS, oral, » 5 mL/kg/hour. » If IV administration is not possible, insert a nasogastric tube. While awaiting, and during urgent transfer, give: • ORS, NG, 20 mL/kg/hour over the next 6 hours. » If only oral administration is possible, or the condition is not improving, transfer the child urgently. While awaiting, and during urgent transfer, give: • ORS, oral, 20 mL/kg/hour » Reassess and reclassify the child every **4 hours.** If improves reclassify as B: Some dehydration and treat accordingly.	the child, especially breastfeeding. If after 4 hours there are: » No signs of dehydration – treat as A: No visible dehydration » Still some dehydration signs – continue as above. » Signs of severe dehydration – treat as C: Severe dehydration.	breastfeeding. » Instruct the caregiver how to make ORS/SSS at home and to continue treatment.

Child should return immediately if:

» condition does not improve
» condition deteriorates
» poor drinking or feeding
» blood in stool
» fever develops
» eyes sunken
» slow skin pinch

In all children who are able to take oral medication

- Zinc (elemental), oral for 14 days:
  - If < 10 kg give 10 mg/day.
  - If > 10 kg give 20 mg/day.

Homemade sugar and salt solution is recommended for home use and to prevent dehydration.

Homemade sugar and salt solution (SSS)
½ level medicine measure of table salt
plus
8 level medicine measures of sugar
dissolved in 1 litre of boiled (if possible) then cooled water
(1 level medicine measure = approximately 1 level 5 mL teaspoon)

REFERRAL

» Severe dehydration.
» Dysentery in children < 12 months of age.
» Malnourished children.
» Children with general danger signs, e.g.:
  – convulsions
  – altered level of consciousness
  – intractable vomiting
  – suspected acute surgical abdomen
  – inability to feed or drink

2.9.2 DIARRHOEA, PERSISTENT IN CHILDREN

A09.0

DESCRIPTION

Diarrhoea for 7–14 days.

GENERAL MEASURES

» Assess for possible HIV infection, and manage appropriately.
» Prevent dehydration using homemade sugar and salt solution.
» Counsel mother regarding feeding.
  – If breastfeeding, give more frequent, longer feeds.
  – If replacement feeding, replace milk with breast milk or with fermented milk products such as amasi (maas) or yoghurt, if available.
  – Continue with solids: give small, frequent meals at least 6 times a day.
» Follow up 5 days later. If diarrhoea persists, refer to doctor.

MEDICINE TREATMENT

Give an additional dose of Vitamin A:

- Vitamin A (retinol), oral.

Age range	Dose units	Capsule 100 000 u	Capsule 200 000 u
Infants 6–11 months old	100 000	1 capsule	–
Children 12 months to 5 years	200 000	2 capsules	1 capsule

Administration of a vitamin A capsule

- Cut the narrow end of the capsule with scissors.
- Open the child's mouth by gently squeezing the cheeks.
- Squeeze the drops from the capsule directly into the back of the child's mouth. If a child spits up most of the vitamin A liquid immediately, give one more dose.
- Do **NOT** give the capsule to the mother or the caregiver to take home.

- Zinc (elemental), oral for 14 days:
  - If < 10 kg give 10 mg/day.
  - If > 10 kg give 20 mg/day.

REFERRAL

» Child < 2 months of age.
» Signs of dehydration. See Section 2.9.1: Diarrhoea, acute in children.
» Malnutrition or weight loss.
» Diarrhoea that persists for > 5 days with treatment.
» Diarrhoea present for > 14 days.

2.9.3 DIARRHOEA, ACUTE, WITHOUT BLOOD, IN ADULTS

K52.9

DESCRIPTION

Acute diarrhoea is usually self-limiting and is managed by fluid replacement.

MEDICINE TREATMENT

Treat dehydration vigorously.

- Oral rehydration solution (ORS).

OR

Homemade sugar and salt solution (SSS).

Homemade sugar and salt solution (SSS)
½ level medicine measure of table salt
plus
8 level medicine measures of sugar
dissolved in 1 litre of boiled (if possible) then cooled water
(1 level medicine measure = approximately 1 level 5 mL teaspoon)

- Loperamide, oral, 4 mg immediately and 2 mg as required after each loose stool

up to 6 hourly.
- Not more than 12 mg daily.

REFERRAL
» Suspected acute surgical abdomen.
» Dehydration not corrected with rehydration.

2.9.4 DIARRHOEA, CHRONIC, IN ADULTS
K52.9

DESCRIPTION
Diarrhoea lasting > 2 weeks.
The majority of cases may be HIV related. Encourage HIV testing.
Send a stool sample for microscopy for ova, cysts and parasites.

Note: Do not request culture and sensitivity of the stool sample. Giardiasis is a common cause of chronic diarrhoea in adults, and may be difficult to diagnose on stools. Therefore empiric treatment for giardiasis is recommended before referring such patients.

MEDICINE TREATMENT
Giardiasis

- Metronidazole, oral, 2 g daily for 3 days.
  - Avoid alcohol.

LoE:III[VI]

Chronic diarrhoea in HIV/AIDS
See Section 11.3.6: Diarrhoea, HIV associated.

REFERRAL
All HIV negative cases with no pathogen identified and significant diarrhoea.

2.10 DYSENTERY
A06.0

Dysentery, or diarrhoeal stool with blood or mucus, is usually due to bacteria and should be treated as bacillary dysentery. If there is no clinical response within three days manage as amoebic dysentery or refer for formal assessment. Exclude surgical conditions, e.g. intussusception in children.
Commonly encountered infectious conditions include *Shigella, Salmonella, E. Coli, and Campylobacter.*

REFERRAL
» No response to treatment.
» Abdominal distension.
» Intussusception.

2.10.1 DYSENTERY, BACILLARY

A03.0/ A02.0

DESCRIPTION

Acute infection of the bowel usually caused by *Shigella, Salmonella* or *Campylobacter.*
There is sudden onset diarrhoea with:

» blood (not due to haemorrhoids or anal fissure) or mucous in the stools
» convulsions (in children)
» fever
» tenesmus

GENERAL MEASURES

» Prevent spread of micro-organism by:
  – good sanitation to prevent contamination of food and water
  – washing hands thoroughly before handling food
  – washing soiled garments and bed clothes

MEDICINE TREATMENT

Treat dehydration vigorously.

Children

Treat dehydration according to Section 2.9.1: Diarrhoea, acute in children.

Adults

Oral treatment:

- Oral rehydration solution (ORS).

OR

Homemade sugar and salt solution.

Homemade sugar and salt solution (SSS)
½ level medicine measure of table salt
plus
8 level medicine measures of sugar
dissolved in 1 litre of boiled (if possible) then cooled water
(1 level medicine measure = approximately 1 level 5 mL teaspoon)

Oral rehydration volume will depend on the severity of the dehydration.
IV treatment:

- Sodium chloride 0.9%, IV.

Antibiotic therapy

Indicated for:

» Children > 1 year of age and adults with blood in the stools.
» HIV-infected patients.
» Children < 12 months of age.

Children

- Ciprofloxacin, oral, 15 mg/kg/dose 12 hourly for 3 days. See dosing tables, pg 22.3.

Children < 12 months of age

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose.** See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

Adults

- Ciprofloxacin, oral, 500 mg 12 hourly for 3 days.

Note:

» Check for complications such as intestinal perforation or peritonitis.
» Ensure adequate urine output to exclude haemolytic uraemic syndrome.

REFERRAL

» Severe illness.
» Persistent blood in urine on dipstix or macroscopically.
» Acute abdominal signs (severe pain, acute tenderness, persistent or bilious vomiting).
» Bloody mucous passed in absence of diarrhoea.
» Failure to respond within 3 days.
» Malnutrition in children.
» Dehydration in children.
» Children < 12 months of age.

2.11 HELMINTHIC INFESTATION

B82.0

2.11.1 HELMINTHIC INFESTATION, TAPEWORM

B81.4

DESCRIPTION

Infestation with tapeworm occurs after eating infected, undercooked or raw meat like beef or pork.

Infestation may be caused by:

» beef tapeworm – *Taenia saginata*
» pork tapeworm – *Taenia solium*

Signs and symptoms include:
» vague abdominal pain
» diarrhoea
» flat white worm segments seen in the stool (blunt ended)
» weight loss
» anal (nocturnal) itch

GENERAL MEASURES
Health education about adequate preparation and cooking of meat.

MEDICINE TREATMENT
If the patient has diarrhoea, wait for it to settle.

- Albendazole, oral, daily for three days.
  - Children under 2 years: 200 mg
  - Children over 2 years and adults: 400 mg

REFERRAL
» Abdominal tenderness or pain.
» Abdominal masses.
» Vomiting.

2.11.2 HELMINTHIC INFESTATION, EXCLUDING TAPEWORM
B82.0

DESCRIPTION
Types of worm infestation and the characteristics are shown in the table below. Check for anaemia and failure to thrive (growth faltering). The infestations are often asymptomatic.

Type of worm	Description	Signs and symptoms
Common Roundworm ***Ascaris lumbricoides***	» Long pink/white worms with sharp ends. » Up to 25–30 cm long. » Often seen in the stools and vomitus.	» Cough. » If there is vomiting consider intestinal obstruction.
Pinworm ***Enterobius vermicularis***	» White and thread-like. » Up to 10 mm long. » Often seen in the stools. » Self-infection common.	» Anal itching – worse at night. » Sleeplessness.
Hookworm ***Necator americanus***	» Up to 8 mm long.	» No symptoms or pain. » Anaemia.
Whipworm ***Trichuris trichiura***	» Up to 5 cm long. » Anterior half thinner than posterior half.	» No symptoms. » Abdominal pain. » Diarrhoea. » Possible anaemia and rectal prolapse. » Abdominal discomfort. » Weight loss.

GENERAL MEASURES

» Patient counselling and education.
» Wash hands with soap and water, especially:
  – after passing stool(s)
  – before working with food or eating
» Keep fingernails short.
» Wash fruit and vegetables well before eating or cooking.
» Keep toilet seats clean.
» Teach children how to use toilets and wash hands.
» Do not pollute the soil with sewage or sludge.
» Dispose of faeces properly.

MEDICINE TREATMENT

- Mebendazole, oral, 12 hourly for three days.
  - Children 1–2 years: 100 mg 12 hourly for three days.
  - Children > 2 years and adults: 500 mg as a single dose.

Many children with worms who have pica may have iron deficiency (See Section 3.1.1 Anaemia, iron deficiency).

REFERRAL

» Signs of intestinal obstruction.
» Abdominal tenderness.
» Pain.
» Persistent vomiting.

2.12 IRRITABLE BOWEL SYNDROME (IBS)

K58.9

(Synonyms: spastic colon, irritable colon)

DESCRIPTION

» Irritable bowel syndrome consists of a triad of:
  1. abdominal distress following the colonic distribution of pain,
  2. variations in defaecatory habits from constipation to diarrhoea, and
  3. the passage of small stools at the time abdominal distress is at its worst.
» The diagnosis is suggested by a protracted and intermittent history of these symptoms which are frequently more pronounced when there is also stress.
» It is a functional disorder, most often seen in women 15–45 years old.

GENERAL MEASURES

<u>For patients with an established diagnosis:</u>

» Reassure patient that <u>there is no serious organic disorder.</u>
» High fibre/bran diets may be tried for patients with constipation.
  – warn about temporary increased flatus and abdominal distension.
  – High fibre/bran diets are not effective for Global IBS (i.e. all symptoms).
» Dietary advice by dietician.

MEDICINE TREATMENT

» Not specifically indicated.
» Based on patients predominant symptoms.
» Short-term symptomatic treatment for diarrhoea and/or constipation.

- Laxatives only for constipation-specific IBS. See Section 2.8: Constipation.
- Anti-diarrhoeals only for diarrhoea-specific IBS. See Section 2.9: Diarrhoea.

REFERRAL

» Blood or mucous in the stool.
» Weight loss.
» Age > 50 years of age.

2.13 TYPHOID FEVER

A01.0

Note: notifiable condition.

DESCRIPTION

A septicaemic illness with fever caused by the micro-organism *Salmonella typhi*. The cause of the fever is difficult to diagnose except in an epidemic.
It may present with:

» acute abdomen. See Section 2.1: Abdominal pain
» prolonged or high fever in a previously healthy individual
» fever with a slower pulse rate than expected
» headache and convulsions
» constipation during the first week
» diarrhoea may occur later in the illness and may be accompanied by frank bleeding
» diagnosis is confirmed only by stool culture or blood tests

MEDICINE TREATMENT

Treat dehydration if present and refer.

REFERRAL

Urgent

All cases or suspected cases.

---

[i] Morphine: SAMF 10th edition, 2012.

[ii] Proton pump inhibitor: Sigterman KE, van Pinxteren B, Bonis PA, Lau J, Numans ME. Short-term treatment with proton pump inhibitors, H2-receptor antagonists and prokinetics for gastro-oesophageal reflux disease-like symptoms and endoscopy negative reflux disease. *Cochrane Database Syst Rev.* 2013 May 31;5:CD002095. http://www.ncbi.nlm.nih.gov/pubmed/23728637

Proton pump inhibitor: Pasternak B, Hviid A. Use of PPIs in early pregnancy & the risk of birth defects. *N Engl J Med*. 2010 Nov 25;363(22):2114 -23. http://www.nejm.org/doi/full/10.1056/NEJMoa1002689

Proton pump inhibitor: SAMF 10th edition, 2012.

Proton pump inhibitor: Janarthanan S, Ditah I, Adler DG, Ehrinpreis MN. Clostridium difficile-associated diarrhea and proton pump inhibitor therapy: a meta-analysis. *Am J Gastroenterol.* 2012 Jul;107(7):1001-10. http://www.ncbi.nlm.nih.gov/pubmed/22710578

Proton pump inhibitor:Linsky A, Gupta K, Lawler EV, Fonda JR, Hermos JA. Proton pump inhibitors and risk for recurrent Clostridium difficile infection. *Arch Intern Med.* 2010 May 10;170(9):772-8. Erratum in: *Arch Intern Med.* 2010 Jul 12;170(13):1100. http://www.ncbi.nlm.nih.gov/pubmed/20458084

[iii] Zinc: Mayo-Wilson E, Junior JA, Imdad A, Dean S, Chan XH, Chan ES, Jaswal A, Bhutta ZA. Zinc supplementation for preventing mortality, morbidity, and growth failure in children aged 6 months to 12 years of age. *Cochrane Database Syst Rev.* 2014 May 15;5:CD009384. http://www.ncbi.nlm.nih.gov/pubmed/24826920

[iv] Ciprofloxacin: WHO. Guidelines for cholera control. 1993. [Online 1993] [Cited 2013] Available at: http://whqlibdoc.who.int/publications/1993/924154449X.pdf

Ciprofloxacin: Saha D, Karim MM, Khan WA, Ahmed S, Salam MA, Bennish ML. Single-dose azithromycin for the treatment of cholera in adults. *N Engl J Med.* 2006 Jun 8;354(23):2452-62. http://www.ncbi.nlm.nih.gov/pubmed/16760445

Ciprofloxacin: NICD. NICD.Group for Enteric, Respiratory and Meningeal disease Surveillance in South Africa.GERMS-SAAnnual Report 2008. [Online 2009] [Cited 2013] Available at: http://www.nicd.ac.za/?page=germs_annual_reports&id=196

Ciprofloxacin: NICD. NICD.Group for Enteric, Respiratory and Meningeal disease Surveillance in South Africa.GERMS-SAAnnual Report 2009. [Online 2010] [Cited 2013] Available at: http://www.nicd.ac.za/?page=germs_annual_reports&id=196

Ciprofloxacin: NICD. NICD.Group for Enteric, Respiratory and Meningeal disease Surveillance in South Africa.GERMS-SAAnnual Report 2010. [Online 2011] [Cited 2013] Available at: http://www.nicd.ac.za/?page=germs_annual_reports&id=196

Ciprofloxacin: NICD. NICD.Group for Enteric, Respiratory and Meningeal disease Surveillance in South Africa.GERMS-SAAnnual Report 2011. [Online 2012] [Cited 2013] Available at: http://www.nicd.ac.za/?page=germs_annual_reports&id=196

Ciprofloxacin: NICD. NICD.Group for Enteric, Respiratory and Meningeal disease Surveillance in South Africa.GERMS-SAAnnual Report 2012. [Online 2013] [Cited 2013] Available at: http://www.nicd.ac.za/?page=germs_annual_reports&id=196

Ciprofloxacin: NICD. NICD.Group for Enteric, Respiratory and Meningeal disease Surveillance in South Africa.GERMS-SAAnnual Report 2013. [Online 2014] [Cited 2014] Available at: http://www.nicd.ac.za/?page=germs_annual_reports&id=196

[v] Ceftriaxone: FDA safety alert: Ceftriaxone, 21 April 2009. [Online 2009] [Cited 2013] Available at: http://www.fda.gov/Drugs/DrugSafety/PostmarketDrugSafetyInformationforPatientsandProviders/DrugSafetyInformationforHeathcareProfessionals/ucm084263.htm

[vi] Metronidazole: Granados CE, Reveiz L, Uribe LG, Criollo CP. Drugs for treating giardiasis. *Cochrane Database Syst Rev* 2012 Dec 12;12:CD007787. http://www.ncbi.nlm.nih.gov/pubmed/23235648

Chapter 3: Blood and nutritional conditions

3.1 ANAEMIA

D50.9/D50-D53

DESCRIPTION

A condition characterised by low haemoglobin, clinically recognised by pallor.
It is commonly caused by:

» Nutritional deficiency of iron or folate.
» Chronic systemic diseases such as HIV, TB, malignancy.
» Blood loss (bleeding/haemorrhage) e.g. caused by parasites, ulcers, tumours, abnormal menstruation.

Other causes include:

» Vitamin B_{12} deficiency.
» Infiltration or replacement of the bone marrow.
» Abnormal Hb or red cells.
» Haemolysis.

DIAGNOSIS

	Hb less than:
» women	12 g/dL or 11 g/dL in pregnancy
» men	13 g/dL
» children 1–5 years of age	10 g/dL
» children > 5 years of age	11 g/dL

Children < 5 years of age

Anaemia is most often due to iron deficiency. See Section 3.1.1: Anaemia, iron deficiency.

Children > 5 years of age and adults

Request a full blood count.

» If MCV is normal (normocytic):
– then systemic disease is the most likely cause.
» If MCV is low (microcytic):
– then iron deficiency is the most likely cause.
» If MCV is high (macrocytic):
– then folate and/or vitamin B_{12} deficiency is the most likely cause.

Pregnant women

See Section 6.2.3: Anaemia in pregnancy.

REFERRAL

» Unknown cause.
» Symptomatic anaemia e.g. palpitations and shortness of breath.
» Evidence of cardiac failure.
» Signs of chronic disease (first investigate for HIV and TB).
» Anaemia associated with enlargement of the liver, spleen or lymph nodes.
» Evidence of acute blood loss or bleeding disorder.
» Menorrhagia or dysfunctional uterine bleeding.
» Blood in stool or melaena.

» Pregnant women > 34 weeks of gestation and Hb < 7 g/dL.
» Children with Hb ≤ 7 g/dL. (If Hb cannot be done, look for severe palmar pallor).
» Anaemia associated with other abnormalities on FBC or smear.
» No improvement despite correct treatment.

3.1.1 ANAEMIA, IRON DEFICIENCY

D50.9

DESCRIPTION

A common cause of anaemia in younger children and women of childbearing age.
A full blood count showing a low MCV suggests the diagnosis of iron deficiency anaemia. A full blood count is not required for children, unless referral criteria above are present.
Note: Iron deficiency anaemia in children > 5 years of age, adult males and non-menstruating women, is generally due to occult or overt blood loss. Refer all cases for investigation and treatment of the underlying cause.

GENERAL MEASURES

» Identify and treat the cause.
» Exclude other causes. See referral criteria in Section 3.1: Anaemia.
» Lifestyle and dietary adjustment.
» Dietary advice:
  – Avoid drinking tea/coffee with meals.
  – Increase vitamin C intake (e.g. citrus fruit, orange juice, broccoli, cauliflower, guavas, strawberries) with meals to maintain iron in its reduced state.
  – Increase dietary intake of iron. Foods rich in iron include: liver, kidney, beef, dried beans and peas, green leafy vegetables, fortified wholegrain breads and cereals, cheese.

MEDICINE TREATMENT

Treatment

Children < 5 years of age

- Iron, oral, 1–2 mg/kg/dose of elemental iron 8 hourly with meals.
  - Follow up Hb after 14 days. *LoE: I[i]*
    - » If Hb is lower than before, refer.
    - » If Hb is the same/higher, continue treatment and repeat after another 28 days.
    - » Continue treatment for 3 months after Hb normalises. *LoE: III*

Empiric treatment for worms (this will not treat tapeworm)

- Mebendazole, oral.
  - Children 1–2 years: 100 mg 12 hourly for 3 days.
  - Children > 2–5 years: 500 mg as a single dose.

Adults

- Ferrous sulphate compound BPC, oral, 170 mg (± 65 mg elemental iron) 8 hourly with food.

LoE: I[ii]

OR

Ferrous fumarate, oral, 200 mg (± 65 mg elemental iron) 8 hourly with food.

- Follow up at monthly intervals
- The expected response is an increase in Hb of ≥ 2 g/dL in 4 weeks.
- Continue for 3–6 months after the Hb normalises in order to replenish body iron stores.
- Do not take iron tablets within 4 hours of taking calcium tablets.

LoE:III[III]

Pregnant women

See Section 6.2.3: Anaemia in pregnancy.

Prophylaxis

Infants from 6 weeks:

If < 2.5 kg at birth:

- Ferrous lactate, oral, 0.3 mL daily until 6 months of age.

OR

Ferrous gluconate syrup, oral, 0.8 mL daily until 6 months of age.

CAUTION

Iron is extremely toxic in overdose, particularly in children.
Store all medication out of reach of children.

REFERRAL

» As in Section 3.1: Anaemia.
» Children > 5 years of age, men and non-menstruating women.
» No or inadequate response to treatment.

3.1.2 ANAEMIA, MACROCYTIC OR MEGALOBLASTIC

D52.0/D53.1

DESCRIPTION

Anaemia with large red blood cells is commonly due to folate or vitamin B_{12} deficiency. Folate deficiency is common in pregnant women and in the postpartum period. Macrocytic anaemia in these women can be assumed to be due to folate deficiency and does not require further investigation. See Section 6.2.3: Anaemia in pregnancy.
Vitamin B_{12} deficiency occurs mainly in middle-aged or older adults, and can cause neurological damage if not treated.
Macrocytic anaemia outside of pregnancy or the postpartum period requires further investigations to establish the cause.

INVESTIGATIONS

FBC will confirm macrocytic anaemia.
» MCV will be elevated.
» White cell count and/or platelet count may also be reduced.
» If there is a poor response to folate, a serum vitamin B_{12} should be done.

Note: Zidovudine and stavudine cause elevated MCV. Zidovudine often causes anaemia and/or decreased white cell count. It is not necessary to measure folate and B_{12} if the patient is not anaemic.

GENERAL MEASURES

» Dietary advice: Increase intake of folic acid rich foods such as:
  – Liver, eggs, fortified breakfast cereals, citrus fruit, spinach and other green vegetables, lentils, dry beans, peanuts.
  – Reduce alcohol intake.
» Vitamin B_{12} deficiency anaemia:
  – High protein diet is recommended (1.5 g/kg/day).
  – Increase intake of dietary vitamin B_{12} sources, including meat (especially liver), eggs and dairy products.

MEDICINE TREATMENT

Folic acid deficiency:

- Folic acid, oral, 5 mg daily until Hb is normal.
  - Check Hb monthly.

Folic acid given to patients with vitamin B_{12} deficiency can mask vitamin B_{12} deficiency and eventually leads to neurological damage, unless vitamin B_{12} is also given.

REFERRAL

» Patients with suspected vitamin B_{12} deficiency.
» Chronic diarrhoea.
» Poor response within a month of treatment.
» Macrocytic anaemia, of unknown cause.

3.2 CHILDHOOD MALNUTRITION, INCLUDING NOT GROWING WELL

E40–E46

In all children, check for malnutrition and anaemia:

» Plot the weight on the Road to Health chart/booklet.
» Look at the shape of the weight curve:
  - is the weight curve rising parallel to the reference lines?
  OR
  - is it flattening?
  OR
  - is there weight loss?
» Look for visible wasting.
» Look and feel for oedema of both feet.
» Look for palmar pallor.
» Check Hb if anaemia is suspected.

3.2.1 SEVERE ACUTE MALNUTRITION (SAM)

E40–E43

DESCRIPTION

Diagnostic criteria for SAM in children aged 6–60 months (any one of the following):

Indicator	Measure	Cut-off
Severe wasting	Weight-for-Height Z-score (WHZ)	< –3
	Mid Upper Arm Circumference (MUAC)	< 115 mm
Bilateral nutritional oedema	Clinical signs of nutritional oedema*	

Where a suitable measuring device is not available the following less sensitive findings would also indicate the need to manage as severe acute malnutrition:

» **Severe underweight**
  – WHZ < –3 (usually clinically reflective of marasmus) where no other explanation is present, and/or
  – clinically severe wasting (usually clinically reflective of marasmus – thin arms, thin legs, "old man" appearance, baggy pants folds around buttocks, wasted buttocks).

» **Nutritional oedema** *supported by findings of skin changes, fine pale sparse hair, enlarged smooth soft liver, moon face.

Exception

Babies who were premature and are growing parallel to or better than the Z-score lines, should not be classified as failure to thrive or not growing well.

3.2.1.1 COMPLICATED SAM

E40–E43

DESCRIPTION

Any child with SAM who has any **ONE** of the following features:

» < 6 months of age or weighs < 4 kg.
» Pitting oedema.
» Refusing feeds or is not eating well.
» Any of the danger signs listed below.

Danger Signs

– dehydration
– vomiting
– respiratory distress (including fast breathing)
– not able to feed
– lethargy (not alert)
– weeping skin lesions
– hypoglycaemia
– hypothermia
– convulsions
– shock
– jaundice
– bleeding

All children with complicated SAM are at risk of complications or death.
Refer urgently!
Stabilise before referral.

Initiate treatment while waiting for transport to hospital.

GENERAL MEASURES

» Keep the child warm.
» Test for and prevent hypoglycaemia in all children.

If the child is able to swallow:

– If breastfed: ask the mother to breastfeed the child, or give expressed breastmilk.
– If not breastfed**:** give a breastmilk substitute (F-75). Give 30–50 mL before the child is referred.
– If no breastmilk substitute is available, give 30–50 mL of sugar water. To make sugar water: Dissolve 4 level teaspoons of sugar (20 g) in a 200 mL cup of clean water.
– Repeat 2 hourly until the child reaches hospital.

If the child is not able to swallow:

– Insert a nasogastric tube and check the position of the tube.
– Give 50 mL of milk or sugar water by nasogastric tube (as above).

If blood sugar < 3 mmol/L treat with:

- 10% Glucose:
  - Nasogastric tube: 10 mL/kg.
  - Intravenous line: 2 mL/kg.

CAUTION

In malnutrition, if IV fluids are required for severe dehydration/shock, give sodium chloride 0.9%, 10 mL/kg/hour and monitor for volume overload. Once stable continue with ORS orally or by nasogastric tube.

MEDICINE TREATMENT

Note: Signs of infection such as fever are usually absent. Treat infection while awaiting transfer.

If there are no danger signs, give 1st dose while arranging referral to hospital:

- Amoxicillin, oral, 30 mg/kg as a single dose. See dosing table, pg 22.1.

If the child has any danger signs:

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose** and refer. See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

Give an additional dose of Vitamin A:

- Vitamin A (retinol), oral.

Age range	Dose units	Capsule 100 000 u	Capsule 200 000 u
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

3.2.1.2 UNCOMPLICATED SAM

E40–E43

DESCRIPTION

Children with SAM who meet the following criteria:

- The child is > 6 months of age and weight > 4 kg, and
- There is no pitting oedema, and
- The child is alert (not lethargic), and
- The child has a good appetite and is feeding well, and
- The child does not have any danger signs or severe classification.

All cases require careful assessment for possible TB or HIV.

GENERAL MEASURES

» Provide RTUF (regular nutritional supplements) and/or other nutritional supplements according to supplementation guidelines.
» Counsel according to IMCI guidelines.
» Regular follow-up to ensure that the child gains weight and remains well.
» Discharge with supplementation, once the following criteria are met:
  - WHZ (weight-for-height z-score) : > –2 WHZ for two consecutive visits at least one month apart and/or
  - MUAC: > 11.5 cm (preferable at 12 cm, if MUAC used alone).
» Follow patients for at least 6 months to ensure sustained growth.

MEDICINE TREATMENT

Do not repeat if child has received these during inpatient stay:

Give an additional dose of Vitamin A:

- Vitamin A (retinol), oral.

Age range	Dose units	Capsule 100 000 u	Capsule 200 000 u
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

- Multivitamin, oral, daily.

Empiric treatment for worms:

- Mebendazole, oral.
  - Children 1–2 years: 100 mg 12 hourly for 3 days.
  - Children > 2–5 years: 500 mg as a single dose.

LoE:III[IV]

REFERRAL

» When RUTF cannot be provided and follow-up on an ambulatory (outpatient) basis is not possible.
» The child develops pitting oedema or any of the danger signs (see above).
» Failure to gain weight despite provision of nutritional supplements.

3.2.2 NOT GROWING WELL (INCLUDING FAILURE TO THRIVE/ GROWTH FALTERING)

R62.8

DESCRIPTION

Children and infants who have either:

» Unsatisfactory weight gain (growth curve flattening or weight loss) on the Road to Health chart/ booklet.

OR

» Low weight for age, i.e. WHZ < –2 but > –3

Note: Babies who were premature and are growing parallel to or better than the Z-score line, should not be classified as having failure to thrive or not growing well.

Not growing well may be due to:

» Insufficient food intake due to anorexia and illness or poor availability of food.
» Insufficient uptake of nutrients, e.g. malabsorption.
» Insufficient use of nutrients for growth due to chronic disease.
» Increased demand for nutrients due to illness such as TB and HIV and AIDS.

Conduct a feeding and clinical assessment to determine the cause. Exclude anaemia.

GENERAL MEASURES

» Counselling on nutrition.
» Nutritional supplementation should be supplied unless there is a correctable cause.
» Assess the general condition of the child.
» Assess the child for possible HIV and TB, and manage appropriately.
» Assess for other long-term health conditions, and manage appropriately.
» Assess the child's feeding and recommend actions as outlined below.
» Provide supplements according to a child's age to meet specific nutritional needs.
» Provide adequate intake of micronutrients.
» Ensure that immunisations are up to date. Record the dose given on the RTHB.
» Follow up monthly. If responding review the child every two months.
» Refer for social assistance if needed.

Feeding recommendations for all children:

<u>0–6 months of age</u>

Breastfeed exclusively - feed at least 8 times in 24 hours.

If formula is medically indicated (refer below) or if the mother has chosen to formula-feed the child, discuss safe preparation and use with the mother.

<u>6–12 months of age</u>

Continue breastfeeding (breastfeed before giving foods).

Introduce complementary foods at six months of age. Start by giving 2–3 teaspoons

of iron-rich food such as mashed vegetables or cooked dried beans.
Children 6–8 months should be given two meals daily, gradually increasing the number of meals so that at 12 months the child is receiving 5 small meals.
For children who are not growing well, mix margarine, fat, or oil with their porridge.

12 months to 2 years of age
Continue breastfeeding. If the child is not breastfed, give 2 cups of full cream cow's milk every day. Make starchy foods the basis of the child's meal. Give locally available protein at least once a day, and fresh fruit or vegetables twice every day.

2–5 years of age
Give the child his/her own serving of family foods 3 times a day. In addition, give 2 nutritious snacks e.g. bread with peanut butter, full cream milk or fresh fruit between meals.

CONDITIONS WHICH JUSTIFY RECOMMENDING THAT MOTHERS DO NOT BREASTFEED
Infants with a small number of metabolic diseases qualify to receive specialised infant formula. These infants should be managed in tertiary centres.
Maternal medical condition that may justify temporary or permanent avoidance of breastfeeding:
» Severe illness that prevents a mother from caring for her infant, for example sepsis, renal failure.
» Herpes simplex virus type 1 (HSV-1): direct contact between lesions on the mother's breasts and the infant's mouth should be avoided until all active lesions have resolved.
» Maternal medications: sedating psychotherapeutic medicines, anti-epileptic medicines and opioids (may cause drowsiness and respiratory depression in the infant), radioactive iodine-131, excessive use of topical iodine or iodophors (especially on open wounds or mucous membranes), cytotoxic chemotherapy.

Infants who qualify to receive infant formula as part of the supplementation scheme
» The mother has died or infant has been abandoned.
» Other individual circumstances deemed necessary by a multidisciplinary team.

MEDICINE TREATMENT

- Multivitamin, oral, daily.

Empiric treatment for worms (this will not treat tapeworm):

- Mebendazole, oral.
  - Children 1–2 years: 100 mg 12 hourly for three days.
  - Children > 2–5 years: 500 mg as a single dose.

- Vitamin A (retinol), oral.

Age range	Dose units	Capsule 100 000 u	Capsule 200 000 u
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

Anaemia:
See Section 3.1: Anaemia.

REFERRAL
» No response to treatment.
» All children other than those with insufficient food intake.
» Severe malnutrition.

3.3 VITAMIN A DEFICIENCY
E50.9

DESCRIPTION
A condition predominantly affecting the skin, mucous membranes and the eyes.
It is most common in children of 1–5 years of age.
If associated with measles and diarrhoea there is an increased risk of illness and death.
If not identified and treated early, it can cause blindness.

Clinical features include:
» night blindness or inability to see in the dark
» white foamy patches on the eye (Bitot's spot) or conjunctival and corneal dryness
» keratomalacia or wrinkling and cloudiness of cornea
» corneal ulceration or the cornea becomes soft and bulges

GENERAL MEASURES
Dietary supplementation with vitamin A rich food including:
– fortified maize meal and/or bread, fortified margarine
– carrots, sweet potato, mangoes and pawpaw, broccoli, sprouts
– dark green leafy vegetables e.g. morogo/imifino and spinach
– apricots, melon, pumpkin
– liver, eggs, full cream milk and fish

MEDICINE TREATMENT
Prophylaxis
- Vitamin A (retinol), oral, every 6 months up to the age of 5 years.

Age range	Dose units	Capsule 100 000 u	Capsule 200 000 u
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

Treatment
Children 0–5 years of age, with:
» severe under nutrition/malnutrition
» persistent diarrheoa
» any of the clinical signs of vitamin A deficiency
» measles

- Vitamin A (retinol), oral, every 6 months up to the age of 5 years.

Age range	Dose Units (IU)	Capsule 100 000 IU	Capsule 200 000 IU
Infant < 6 months	50 000	½ capsule	–
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsule	1 capsule

Administration of a vitamin A capsule
- Cut the narrow end of the capsule with scissors.
- Open the child's mouth by gently squeezing the cheeks.
- Squeeze the drops from the capsule directly into the back of the child's mouth. If a child spits up most of the vitamin A liquid immediately, give one more dose.
- Do **NOT** give the capsule to the mother or the caretaker to take home.

Children > 5 years of age and adults with:
» any clinical signs of vitamin A deficiency
» measles

Note:
» Children who received a prophylactic dose within the previous month should not receive the treatment dose of vitamin A.
» If a child is scheduled to receive a routine prophylactic dose of vitamin A and has received a treatment dose within the past month, postpone the routine dose for approximately one month.
» Wait at least one month between doses.
» Children receiving routine multivitamin syrup can still receive vitamin A supplements.

REFERRAL
All complicated cases.

3.4 VITAMIN B DEFICIENCIES
E53.9

DESCRIPTION
A condition in which some of the B group vitamins are deficient.
This occurs commonly in malnutrition and alcoholism.

GENERAL MEASURES
» Lifestyle adjustment.
» Discourage alcohol abuse.

MEDICINE TREATMENT
For all forms of vitamin B deficiencies:
- Vitamin B complex, oral, 2 tablets 3 times daily for one week, then 1 tablet daily for 3 months.

LoE: III

3.4.1 VITAMIN B_3/NICOTINIC ACID DEFICIENCY (PELLAGRA)

E52

DESCRIPTION

Pellagra is a condition associated with nicotinic acid deficiency. It is usually accompanied by other vitamin deficiencies.

Clinical features include:

» diarrhoea
» dementia
» dermatitis with darkening of sun-exposed skin

GENERAL MEASURES

» Lifestyle adjustment including discouraging of alcohol abuse.
» Dietary advice. Increase intake of:
– liver, kidneys, other meats, poultry and fish
– peanuts
– milk
– marmite and Brewer's yeast
– pulses, whole meal wheat and bran

MEDICINE TREATMENT

For severe deficiency

Children

- Nicotinamide, oral, 50 mg 8 hourly for one week.

Adults

- Nicotinamide, oral, 100 mg 8 hourly for one week.

For mild deficiency

Children

- Nicotinamide, oral, 50 mg daily for one week.

Adults

- Nicotinamide, oral, 100 mg daily for one week.

LoE: III^{v}

REFERRAL

Failure to respond.

3.4.2 VITAMIN B_6/PYRIDOXINE DEFICIENCY

E53.1

DESCRIPTION

Commonly presents as signs of peripheral neuropathy including:

» tingling sensation
» burning pain or numbness of the feet

Pyridoxine deficiency is related to:

» malnutrition

» alcoholism
» isoniazid or combination TB therapy

GENERAL MEASURES

Dietary advice: Increase intake of pyridoxine rich foods such as:
» Liver, meat, fish and offal,
» Wholegrain cereals, fortified breakfast cereals,
» Peanuts, bananas, raw vegetables,
» Walnuts and seeds, avocados, dried fruits,
» Potatoes and baked beans.

MEDICINE TREATMENT

For deficiency

Children

- Pyridoxine, oral, 12.5 mg daily for 3 weeks.

Adults

- Pyridoxine, oral, 25 mg daily for 3 weeks.

For medicine-induced neuropathy

Children

- Pyridoxine, oral, 50 mg daily for 3 weeks.

Adults

- Pyridoxine, oral, 200 mg daily for 3 weeks.

Then follow with:

- Pyridoxine, oral, 25 mg daily as maintenance dose (for patients on TB therapy/ isoniazid).

LoE:III[VI]

REFERRAL

» Failure to respond.
» Children.

3.4.3 VITAMIN B_1/THIAMINE DEFICIENCY (WERNICKE ENCEPHALOPATHY AND BERIBERI)

E51.9/E51.1/E51.2

DESCRIPTION

Clinical features include:
» confusion
» short term memory loss
» paralysis of one or more of the ocular muscles or ophthalmoplegia
» nystagmus
» ataxia
» peripheral neuropathy
» cardiac failure

Alcoholics may present with Wernicke encephalopathy, neuropathies or cardiac failure associated with multiple vitamin deficiencies.

GENERAL MEASURES

» Lifestyle adjustment including discouraging of alcohol abuse.
» Dietary advice to increase intake of thiamine rich foods such as:
  – Wholewheat breads, oatmeal
  – Pulses, nuts, yeast
  – Fortified cereals
  – Pork, bacon and marmite
  – Potatoes and peas

MEDICINE TREATMENT

Peripheral neuropathy and cardiac failure

- Thiamine, oral, 100 mg daily.

In susceptible patients, administration of intravenous glucose precipitates Wernicke encephalopathy if administered before thiamine supplementation. Thiamine should be given first in all patients treated with intravenous glucose who are at risk of thiamine deficiency, e.g. alcoholics.

REFERRAL

All patients with encephalopathy, eye muscle paralysis or cardiac failure.

[i] Iron: Zlotkin S, Arthur P, Antwi KY, Yeung G. Randomized, controlled trial of single versus 3-times-daily ferrous sulfate drops for treatment of anemia. *Pediatrics* 2001 Sep;108(3):613-6. http://www.ncbi.nlm.nih.gov/pubmed/11533326
Iron: Gunadi D, Rosdiana N, Lubis B. Comparison of once a day and three times a day iron treatment in 9-12 year old elementary school children with iron deficiency anemia. *Paediatrica Indonesiana* March 2009;49(2):104-107. http://repository.usu.ac.id/bitstream/123456789/18173/1/pti-mar2009-49(2)%20104-107.pdf
Iron: SAMF 10th edition, 2012.
[ii] Ferrous sulphate: Fernández-Gaxiola AC, De-Regil LM. Intermittent iron supplementation for reducing anaemia and its associated impairments in menstruating women. Cochrane Database Syst Rev. 2011 Dec 7;(12):CD009218. http://www.ncbi.nlm.nih.gov/pubmed/22161448
[iii] Ferrous fumarate: Contract circular HP09-2014SSD. http://www.health.gov.za/
[iv] Vitamin A (retinol); multivitamin; mebendazole: Paediatric Hospital level STG, 2013. http://www.health.gov.za/
Vitamin A (retinol); multivitamin; mebendazole: National Department of Health. Integrated management of childhood illness guidelines, 2014. http://www.health.gov.za/
[v] Nicotinamide: SAMF 10th edition, 2012.
[vi] Pyridoxine: Snider DE Jr. Pyridoxine supplementation during isoniazid therapy.*Tubercle*.1980 Dec;61(4):191-6. http://www.ncbi.nlm.nih.gov/pubmed/6269259
Pyridoxine: Carlson HB, Anthony EM, Russell WF jr, MiddlebrookG. Prophylaxis of isoniazid neuropathy with pyridoxine. *N Engl J Med.* 1956 Jul 19;255(3):119-22. http://www.ncbi.nlm.nih.gov/pubmed/13334809
Pyridoxine: Zilber LA, Bajdakova ZL, Gardasjan AN, Konovalov NV, Bunina TL, Barabadze EM. The prevention and treatment of isoniazid toxicity in the therapy of pulmonary tuberculosis. 2. An assessment of the prophylactic effect of pyridoxine in low dosage. *Bull World Health Organ*. 1963;29:457-81. http://www.ncbi.nlm.nih.gov/pubmed/14099673
Pyridoxine: American Thoracic Society; CDC; Infectious Diseases Society of America.Treatment of tuberculosis. *MMWR Recomm Rep*. 2003 Jun 20;52(RR-11):1-77. Erratum in: *MMWR Recomm Rep.* 2005 Jan 7;53(51):1203. Dosage error in article text. http://www.ncbi.nlm.nih.gov/pubmed/12836625
Pyridoxine: World health organisation. Treatment of Tuberculosis guidelines, 4th edition, 2010. http://www.who.int/tb/publications/2010/9789241547833/en/
Pyridoxine: Center for Disease Control and Prevention. Latent Tuberculosis Infection: A guide for primary healthcare providers, 2013.[Online] [Cited November 2014] Available at: http://www.cdc.gov/TB/publications/LTBI/default.htm
Pyridoxine: SAMF 10th edition, 2012.

Chapter 4: Cardiovascular conditions

4.1 PREVENTION OF ISCHAEMIC HEART DISEASE AND ATHEROSCLEROSIS

I25.1

Major risk factors for ischaemic cardio- and cerebrovascular disease:

» diabetes mellitus
» hypertension
» central obesity: waist circumference ≥ 94 cm (men) and ≥ 80 cm (women)
» smoking
» dyslipidaemia (fasting levels):
  – total cholesterol > 5 mmol/L, or
  – LDL > 3 mmol/L, or
  – HDL < 1 mmol/L in men and < 1.2 mmol/L in women
» family history of early onset cardiovascular disease in male relatives < 55 years of age and in female relatives < 65 years of age
» age: men > 55 years of age, women > 65 years of age

GENERAL MEASURES

Lifestyle modification

All persons with risk factors for ischaemic heart disease should be encouraged to make the following lifestyle changes as appropriate:

» maintain ideal weight, i.e. BMI < 25 kg/m^2
» weight reduction in the overweight patient, i.e. BMI > 25 kg/m^2
» reduce alcohol intake to ≤ 2 standard drinks/day for men and ≤ 1 for women on no more than 5 out of 7 days per week (1 standard drink is equivalent to 25 mL of spirits, 125 mL of wine, 340 mL of beer or sorghum beer, or 60 mL of sherry)
» follow a prudent eating plan i.e. low fat, high fibre and unrefined carbohydrates, with adequate fresh fruit and vegetables
» regular moderate aerobic exercise, e.g. 30 minutes brisk walking 3–5 times/week (150 minutes/week)
» stop smoking

Calculation of risk of developing cardiovascular events over 10 years (in the absence of cardiovascular disease)

To derive the absolute risk as a percentage of patients who will have a cardiovascular event (i.e. death, myocardial infarction or stroke) over 10 years, add the points for each risk category (Section A). The risk associated with the total points is then derived from Section B.

SECTION A

Age (years)	**MEN**	**WOMEN**
30–34	0	0
35–39	2	2
40–44	5	4
45–49	6	5
50–54	8	7
55–59	10	8
60–64	11	9
65–69	12	10
70–74	14	11
75–79	15	12

Total cholesterol (mmol/L)	**MEN**	**WOMEN**
<4.1	0	0
4.1–5.19	1	1
5.2 – 6.19	2	3
6.2–7.2	3	4
>7.2	4	5

HDL cholesterol (mmol/L)	**MEN**	**WOMEN**
>1.5	–2	–2
1.3–1.49	–1	–1
1.2–1.29	0	0
0.9–1.119	1	1
<0.9	2	2

	MEN	**WOMEN**
Smoker	4	3
Diabetic*	3	4

*Type 2 diabetics > 40 years of age qualify for statin therapy irrespective of risk score.

	MEN		WOMEN	
Systolic BP (mmHg)	Untreated	Treated	Untreated	Treated
<120	–2	0	–3	–1
120–129	0	2	0	2
130–139	1	3	1	3
140–149	2	4	2	5
150–159	2	4	4	6
≥160	3	5	5	7

SECTION B

Total points

MEN	10-year risk %	WOMEN	10-year risk %
≤–3	<1	≤–2	<1
–2	1.1	–1	1.0
–1	1.4	0	1.2
0	1.6	1	1.5
1	1.9	2	1.7
2	2.3	3	2.0
3	2.8	4	2.4
4	3.3	5	2.8
5	3.9	6	3.3
6	4.7	7	3.9
7	5.6	8	4.5
8	6.7	9	5.3
9	7.9	10	6.3
10	9.4	11	7.3
11	11.2	12	8.6
12	13.2	13	10.0
13	15.6	14	11.7
14	18.4	15	13.7
15	21.6	16	15.9
16	25.3	17	18.5
17	29.4	18	21.5
≥18	>30	19	24.8

LoE: III[1]

MEDICINE TREATMENT

Indication for lipid lowering medicine therapy

» Established atherosclerotic disease:
  – ischaemic heart disease
  – peripheral vascular disease
  – atherothrombotic stroke

Note: Lipid lowering medicines should be administered in this setting even if the cholesterol is normal.

» Type 2 diabetics > 40 years of age, or diabetes for > 10 years, or have existing

cardiovascular disease, or chronic kidney disease (eGFR < 60 mL/min).

LoE: III[II]

Note: Lipid lowering medicines should be administered in this setting even if the cholesterol is normal.

» A risk of MI > 20% in 10 years (see table above).
» Such high-risk patients will benefit from lipid lowering (statin) therapy irrespective of their baseline LDL levels.

Note: When lipid-lowering medicines are used, this is ALWAYS in conjunction with ongoing lifestyle modification.

- HMGCoA reductase inhibitors (statins) that lower LDL by at least 25%, e.g.:
- Simvastatin, oral, 10 mg at night.

LoE:II[III]

Lipid lowering medicine therapy for patients taking protease inhibitors

» Certain antiretroviral medication, particularly protease inhibitors, can cause dyslipidaemia. Fasting lipid levels should be done 3 months after starting lopinavir/ritonavir. Lopinavir/ritonavir is associated with a higher risk of dyslipidaemia than atazanavir/ritonavir.
» Patients at high risk (> 20% risk of developing a CVS event in 10 years) should switch to atazanavir/ritonavir and repeat the fasting lipid profile in 3 months.
» Patients with persistent dyslipidaemia despite switching, qualify for lipid lowering therapy. Criteria for initiating lipid lowering therapy are the same as for HIV-uninfected patients. Many statins (including simvastatin) cannot be used with protease inhibitors, as protease inhibitors inhibit the metabolism of the statin resulting in extremely high blood levels.
» Patients who fail to respond to lifestyle modification and have dyslipidaemia treat with:

- Atorvastatin, oral, 10 mg once daily.

LoE:III[IV]

REFERRAL

» Random cholesterol > 7.5 mmol/L.
» Fasting (14 hours) triglycerides > 10 mmol/L.

4.2 ANGINA PECTORIS, STABLE

I20.9

DESCRIPTION

Characteristic chest pain due to myocardial ischaemia, usually occurring on exercise and relieved by rest.

GENERAL MEASURES

» Life style modification. See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

MEDICINE TREATMENT (Doctor initiated)

Long-term prophylaxis for thrombosis:

- Aspirin soluble, oral, 150 mg daily.

AND

- Nitrates, short acting e.g.:
- Isosorbide dinitrate, sublingual, 5 mg.
  - May be repeated if required at 5–10 minute intervals for 3 doses.

AND

Step 1

- Atenolol, oral, 50–100 mg daily.
  - Titrate to resting heart rate of approximately 60 beats/minute.

If ß-blocker cannot be tolerated or is contraindicated, consider long acting calcium channel blocker.

Step 2

ADD

- Long acting calcium channel blocker e.g.:
- Amlodipine, oral, 5 mg daily.

LoE:II[v]

Step 3

ADD

- Isosorbide mononitrate, oral, 10–20 mg twice daily.

OR

Isosorbide dinitrate, oral, 20–40 mg twice daily.

- At 8:00 and 14:00 hours for both medicines in order to provide a nitrate free period to prevent tolerance.
- Modify for night shift workers.

Angina is a high-risk condition for cardiovascular disease and is an indication for a statin for patients with proven lesions.

- HMGCoA reductase inhibitors, e.g.:
- Simvastatin, oral, 10 mg at night.

Therapy should be initiated with appropriate lifestyle modification and adherence support.

REFERRAL

» When diagnosis is in doubt.
» Failed medical therapy.

4.3 ANGINA PECTORIS, UNSTABLE / NON ST ELEVATION MYOCARDIAL INFARCTION (NSTEMI)

I20.0

DESCRIPTION

Unstable angina is a medical emergency and if untreated can progress to NSTEMI. Presents as chest pain or discomfort similar to stable angina but with the following additional characteristics:

» angina at rest or minimal effort
» angina occurring for the first time, particularly at rest
» prolonged angina > 10 minutes, not relieved by sublingual nitrates
» the pattern of angina accelerates and gets worse

DIAGNOSIS
» Made from good history.
» ECG may show ST segment depression or transient ST segment elevation.
» Abnormal ECG does not exclude the diagnosis.

MEDICINE TREATMENT
- Oxygen 40% via facemask, if saturation < 92% or if in distress.

LoE:III[VI]

- Aspirin soluble, oral, 300mg immediately, as a single dose.

ADD *LoE:III*[VII]

- Isosorbide dinitrate, sublingual, 5 mg immediately and then repeat once if necessary for pain relief.

ADD

- Morphine 10 mg diluted with 10 mL of water for injection or sodium chloride 0.9%, slow IV (Doctor initiated).
  - Start with 5 mg; thereafter slowly increase by 1 mg/minute up to 10mg.
  - Can be repeated after 4–6 hours if necessary, for pain relief.
  - Beware of hypotension.

LoE:III[VIII]

Unstable angina is a high-risk condition for cardiovascular disease and is an indication for a statin for patients with proven lesions.

- HMGCoA reductase inhibitors, e.g.:
- Simvastatin, oral, 10 mg, at night.

» This therapy requires good initial evaluation, ongoing support for patients and continuous evaluation to ensure compliance.
» Random cholesterol should be measured at baseline.
  – If < 7.5 mmol/L: initiate therapy.
  – If > 7.5 mmol/L: initiate therapy and refer for further assessment.
» Therapy should be initiated with lifestyle modification and adherence support.

REFERRAL
Urgent
All suspected or diagnosed cases.

4.4 MYOCARDIAL INFARCTION, ACUTE (AMI)/ ST ELEVATION MYOCARDIAL INFARCTION (STEMI)
I21.9

DESCRIPTION
AMI/STEMI is caused by the complete or partial occlusion of a coronary artery and requires prompt hospitalisation and intensive care management.

The major clinical feature is severe chest pain with the following characteristics:
» site: retrosternal or epigastric
» quality: crushing, constricting or burning pain or discomfort
» radiation: to the neck and/or down the inner part of the left arm
» duration: at least 20 minutes and often not responding to sublingual nitrates
» occurrence: at rest

May be associated with:
» pallor
» sweating
» arrhythmias
» pulmonary oedema
» a decrease in blood pressure

Note: Not all features have to be present.

EMERGENCY TREATMENT

Before transfer

» Cardio-pulmonary resuscitation if necessary (See Section 21.6: Cardiac arrest – cardiopulmonary resuscitation).

- Oxygen 40% via facemask, if saturation < 92% or if in distress.

AND

LoE:III[VI]

- Aspirin soluble, oral, 300 mg as a single dose (chewed or dissolved) as soon as possible.

AND

LoE:III[VII]

- Isosorbide dinitrate, sublingual, 5 mg, every 5–10 minutes as needed for relief of pain to a maximum of 3 tablets.

AND

- Morphine 10mg diluted with 10mL of water for injection or sodium chloride 0.9%, slow IV (Doctor initiated).
  - Start with 5 mg; thereafter slowly increase by 1 mg/minute up to 10mg.
  - Can be repeated after 4–6 hours if necessary, for pain relief.
  - Beware of hypotension.

AND

LoE:III[VIII]

- Streptokinase, IV, 1.5 million IU diluted in 100 mL dextrose 5% or sodium chloride 0.9% and given over 30–60 minutes (Doctor initiated).
  - Start as soon as possible, once diagnosed, preferably within the first 3 hours.

Indications	Contra-indications
<u>For acute myocardial infarction with ST elevation:</u> » if history of onset is < 6 hours, **or** » if on-going ischaemic pain, **or** » for new left bundle branch block.	<u>Absolute:</u> » streptokinase used within the last year, » previous allergy, » CVA within the last 3 months, » history of recent major trauma, » serious bleeding within the last month, » aneurysms, » brain or spinal surgery or head injury within the preceding month, or » active bleeding or known bleeding disorder.

	Relative: » refractory hypertension, » warfarin therapy, » recent retinal laser treatment, » subclavian central venous catheter, » pregnancy, » TIA in the preceding 6 months, or » traumatic resuscitation.

For the full list of contra-indications refer to the package insert for streptokinase.

LoE:III[ix]

CAUTION

Blood pressure may decrease and pulse rate may increase after administration of streptokinase.

Do not stop streptokinase when there is a decrease in blood pressure, but reduce the infusion rate.

However, discontinue streptokinase if patient shows manifestations of impending shock.

LoE:III[x]

Monitor the following, continuously and also during transfer:

» pulse
» blood pressure
» respiration depth and rate (count for a full minute)

Aftercare

This is a high-risk condition for cardiovascular disease and is an indication for a statin for patients with proven lesions.

- HMGCoA reductase inhibitors, e.g.:
- Simvastatin, oral, 10 mg at night.

» Statin therapy requires good initial evaluation, ongoing support for patients and continuous evaluation to ensure compliance.
» Random cholesterol should be measured at baseline.
  – If < 7.5 mmol/L: initiate therapy.
  – If > 7.5 mmol/L: initiate therapy and refer for further assessment.
» Therapy should be initiated with appropriate lifestyle modification and adherence support.

REFERRAL

Urgent

All suspected or diagnosed cases.

4.5 CARDIAC ARREST, CARDIO-PULMONARY RESUSCITATION

See Chapter 21: Trauma and emergencies.

4.6 CARDIAC FAILURE, CONGESTIVE (CCF)

4.6.1 CARDIAC FAILURE, CONGESTIVE (CCF), ADULTS

I50.0

DESCRIPTION

CCF is a clinical syndrome and has several causes. The cause and immediate precipitating factor(s) must be identified and treated to prevent further damage to the heart.

Signs and symptoms include:

- » dyspnoea (breathlessness)
- » fatigue
- » ankle swelling with pitting oedema
- » orthopnoea
- » tachycardia
- » tachypnoea
  - – breathing rate > 18 breaths/minute in men
  - – breathing rate > 20 breaths/minute in women
- » inspiratory basal crackles or wheezing on auscultation of the lungs
- » enlarged liver, often tender
- » raised jugular venous pressure

GENERAL MEASURES

- » Monitor body weight to assess changes in fluid balance.
- » Salt (sodium chloride) restriction to less than 2–3 g/day.
- » Regular exercise within limits of symptoms.

MEDICINE TREATMENT

All patients need to be assessed by a doctor for initiation or change of treatment.

- » Many of the medicines used can affect renal function and electrolytes.
- » Monitor sodium, potassium and serum creatinine.

S T E P 1 : Diuretic plus ACE-inhibitor

Mild volume overload (mild CCF) and normal renal function – thiazide diuretic

- Hydrochlorothiazide, oral, 25–50 mg daily.

Significant volume overload or abnormal renal function – loop diuretic

- Furosemide, oral, daily (Doctor initiated).
  - Initial dose: 40 mg.
  - If doses > 80 mg/day is required, change dose interval to 12 hourly.
  - Higher doses may be needed if co-morbid kidney failure is present.
  - Once CCF has improved, consider switching to hydrochlorothiazide.
  - Monitor electrolytes and creatinine.

Acute pulmonary oedema

- Furosemide, IV. See Section 21.16: Pulmonary oedema, acute.

Note:

- » Reduce diuretic dose when ACE-inhibitor is introduced.
- » Routine use of potassium supplements with diuretics is not recommended. They should only be used short term to correct documented low serum potassium level.

All patients with CCF, unless contraindicated or poorly tolerated

- ACE-inhibitor, e.g.:
- Enalapril, oral, 2.5 mg 12 hourly, up to maximum of 10 mg twice daily.
  - Titrate dosages gradually upwards until an optimal dose is achieved
  - Absolute contraindications include: (refer to package insert)
    - cardiogenic shock
    - bilateral renal artery stenosis, or stenosis of an artery to a dominant/single kidney
    - aortic valve stenosis and hypertrophic obstructive cardiomyopathy
    - pregnancy
    - history of angioedema associated with previous ACE-inhibitor or angiotensin receptor blocker therapy

LoE:III[xi]

- **S T E P 2 : After titration of ACE-inhibitor, add carvedilol (α-1 and non-selective ß-blocker) unless contra-indicated.** (Refer to package insert for full prescribing information).

- Carvedilol, oral (Doctor initiated).
  - Starting dose: 3.125 mg twice daily.
  - Increase dose at two-weekly intervals by doubling the daily dose until a maximum of 25 mg twice daily, if tolerated.
  - If not tolerated, i.e. worsening of cardiac failure manifestations, reduce the dose to the previously tolerated dose.
  - Up-titration can take several months.
  - Should treatment be discontinued for > 14 days, reinstate therapy as above.
  - Absolute contraindications include: (Refer to package insert)
    - cardiogenic shock, bradycardia, various forms of heart block
    - severe fluid overload
    - hypotension
    - asthma

Note: Do not use atenolol for cardiac failure.

LoE:III[xii]

OR

- Spironolactone, oral, 25mg daily (Doctor initiated).

LoE:III[xiii]

CAUTION

Spironolactone can cause severe hyperkalemia and should only be used when serum potassium can be monitored.

Do not use together with potassium supplements.

Do not use in kidney failure (Do not use if eGFR < 30 mL/min).

LoE:III[xiv]

S T E P 3 : Add spironolactone, if patient remains symptomatic despite optimal therapy AND if serum potassium can be monitored.

- Spironolactone, oral, 25mg daily (Doctor initiated). *LoE:III*[xv]

CAUTION
Spironolactone can cause severe hyperkalemia and should only be used when serum potassium can be monitored.
Do not use together with potassium supplements.
Do not use in kidney failure (Do not use if eGFR < 30 mL/min).

OR *LoE:III*[xvi]

- Carvedilol, oral (Doctor initiated).
  - Starting dose: 3.125 mg twice daily.
  - Increase dose at two-weekly intervals by doubling the daily dose until a maximum of 25 mg twice daily, if tolerated.
  - If not tolerated, i.e. worsening of cardiac failure manifestations, reduce the dose to the previously tolerated dose.
  - Up-titration can take several months.
  - Should treatment be discontinued for > 14 days, reinstate therapy as above.
  - Absolute contraindications include: (Refer to package insert)
    - cardiogenic shock, bradycardia, various forms of heart block
    - severe fluid overload
    - hypotension
    - asthma

S T E P 4 : *LoE:III*

Symptomatic CCF despite above-mentioned therapy
Refer to hospital for step up therapy with digoxin.

LoE:III[xvii]

CAUTION
Patients with CCF on diuretics may become hypokalaemic.
Digoxin therapy should not be initiated if the patient is hypokalaemic.

REFERRAL

Urgent

» Patients with prosthetic heart valve.
» Suspected infective endocarditis.
» Fainting spells.

Non urgent

» Initial assessment and initiation of treatment.
» Poor response to treatment.

4.6.2 CARDIAC FAILURE, CONGESTIVE (CCF), CHILDREN

I50.0

DESCRIPTION

The congestion of the systemic or pulmonary venous systems due to cardiac

dysfunction of various causes; including congenital heart disease and acquired cardiac and lung conditions (e.g. cor-pulmonale due to bronchiectasis in HIV-infected children).
Often mistaken for respiratory infection.

Signs and symptoms

Infants

» rapid breathing
» rapid heart rate
» cardiomegaly
» enlarged tender liver
» chest indrawing
» crackles or wheezing in lungs
» active cardiac impulse

Often presents primarily with shortness of breath, difficulty in feeding and sweating during feeds. Oedema is usually not an obvious feature.

Children

» rapid breathing
» rapid heart rate
» cardiomegaly
» enlarged tender liver
» chest indrawing
» crackles or wheezing in lungs
» active and displaced cardiac impulse
» oedema of the lower limbs or lower back

GENERAL MEASURES

While arranging transfer:

- Oxygen, using nasal cannula at 2–3 L per minute.

OR

Oxygen 40%, using face mask at 2–3 L per minute.

» Semi-Fowlers position.

Note: If hypertensive, consider glomerulonephritis in children.

MEDICINE TREATMENT

While arranging transfer:

If CCF is strongly suspected

- Furosemide, IV, 1 mg/kg, over 5 minutes. See dosing tables, pg 22.4.
  - Do not put up a drip or run in any IV fluids.

REFERRAL

All children with suspected congestive cardiac failure.

4.7 HYPERTENSION

4.7.1 HYPERTENSION IN ADULTS

I10

DESCRIPTION

A condition characterised by an elevated BP measured on 3 separate occasions, a minimum of 2 days apart.

However, when BP is severely elevated (refer to table below), a minimum of 3 BP readings must be taken at the 1st visit to confirm hypertension. Ensure that the

correct cuff size is used in obese patients.

» Systolic BP ≥ 140 mmHg
and/or
» Diastolic BP ≥ 90 mmHg.

LEVELS OF HYPERTENSION IN ADULTS

Level of hypertension	Systolic mmHg	Diastolic mmHg
mild	140–159	90–99
moderate	160–179	100–109
severe	≥180	≥110

Achieve and maintain target BP: Systolic < 140 mmHg and diastolic < 90 mmHg.

LoE:I[xviii]

GENERAL MEASURES

All patients with hypertension require lifestyle modification:

» weight loss if overweight
» stop smoking
» restrict salt intake
» regular physical exercise (150 minutes/week)
» avoid excessive alcohol intake
» restrict fat intake

MEDICINE TREATMENT

Initial medicine choices in patients qualifying for treatment are dependent on presence of compelling indications.

Medicine treatment choices without compelling indications

Mild hypertension

When there are no risk factors and there is poor response to lifestyle modification measures after 3 months, initiate medicine therapy.

Presence of risk factors

Medicine therapy as well as lifestyle modification should be initiated after confirmation of diagnosis (Step 2).

Moderate hypertension

Diagnosis must be confirmed within 2 weeks. Initiate treatment after confirmation of diagnosis (medicine and lifestyle modification) at Step 2.

Severe hypertension

Confirm diagnosis within 1 hour.

» In patients who are not symptomatic, initiate treatment (medicine and lifestyle modification) at Step 3.

Patients with symptoms of progressive target organ damage or associated clinical conditions: See hypertensive urgency and emergency, below.

Special cases

Pregnancy-induced hypertension:

See Section 6.2.2 Hypertensive disorders of pregnancy.

Asymptomatic severe hypertension

» These patients have severe hypertension, are asymptomatic and have no

evidence of progressive target organ damage.
» Observe the patient in the health care setting and repeat BP measurement after the patient has rested for 1 hour.
» If the second measurement is still elevated at the same level, start oral treatment with 2 agents (Step 3), one of which should be low dose hydrochlorothiazide and the second medicine is usually a calcium channel blocker, e.g. amlodipine.
» Patient should be followed up within a week.
» Refer to doctor if BP > 160/100 mmHg after 4 weeks.

LoE:III[xix]

Hypertensive urgency
» Most affected adults have a systolic BP > 220 mmHg and/or diastolic BP > 120 mmHg.
» Patients are symptomatic, usually with severe headache, shortness of breath and oedema.
» Treatment should be commenced with 2 oral agents (Step 3) with the aim to lower diastolic BP to 100 mmHg slowly, over 48–72 hours.
» Amlodipine and furosemide or hydrochlorothiazide should be used, if there is renal insufficiency or evidence of pulmonary congestion (See Section 4.6.1: Cardiac failure, congestive (CCF), adults).
» All patients with hypertensive urgency should be referred to a hospital.

Hypertensive emergency
» A markedly elevated BP: systolic BP > 180mmHg and/or a diastolic BP > 130 mmHg **associated with** ≥ 1 of the following:
  - unstable angina/chest pain
  - neurological signs, e.g. severe headache, visual disturbances, confusion, coma or seizures
  - pulmonary oedema
  - renal failure

MEDICINE TREATMENT
- Amlodipine, oral, 10 mg immediately as a single dose.

If pulmonary oedema:
- Furosemide, IV, 40 mg as a single dose (See Section 21.16: Pulmonary oedema, acute).

CAUTION
A hypertensive emergency needs immediate referral to hospital.

REFERRAL
Urgent
All patients.

Stroke
BP is often elevated in acute stroke and should only be treated if it persists > 2 days or is severely elevated. Diastolic BP > 120 mmHg. Reduce BP gradually.

Elderly

In patients without co-existing disease, initiate medicine treatment only when the BP > 160/90 mmHg.

Note:

» Check adherence to medication before escalating therapy.
» Monitor patients monthly and adjust therapy if necessary until the BP is stable.
» After target BP is achieved, patients may be seen at 3–6 monthly intervals.

CAUTION

Lower BP over a few days.
A sudden decrease in BP can be dangerous, especially in the elderly.

Stepwise treatment without compelling indications

STEP 1

Entry to Step 1	Treatment	Target
» Diastolic BP 90–99 mmHg and/or systolic BP 140–159 mmHg without any existing disease **AND** » No major risk factors.	» Lifestyle modification.	» BP control within 3 months to BP < 140/90 mmHg.

STEP 2

Entry to Step 2	Treatment	Target
» Diastolic BP 90–99 mmHg and systolic BP 140–159 mmHg without any existing disease **AND** » No major risk factors **AND** » Failure of lifestyle modification alone to reduce BP after 3 months **OR** Mild hypertension with major risk factors or existing disease **OR** Moderate hypertension at diagnosis.	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 12.5 mg daily.	» BP control within 1 month to BP < 140/90 mmHg.

STEP 3

Entry to Step 3	Treatment	Target
» Failure to achieve targets in Step 2 after 1 month despite adherence to therapy. **OR** Severe hypertension.	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 12.5 mg daily. **ADD** ▪ ACE-inhibitor, e.g.: • Enalapril, 10 mg daily **OR** Long acting calcium channel blocker, e.g.: amlodipine, oral 5 mg daily.	» BP control within 1 month to BP < 140/90 mmHg.

STEP 4

Entry to Step 4	Treatment	Target
» Failure of step 3 after 1 month of adherence.	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 12.5 mg daily **AND** ▪ ACE-inhibitor, e.g.: ▪ Enalapril, increase to 20 mg daily **AND** • Long acting calcium channel blocker, e.g.: amlodipine, oral, 5 mg daily.	» BP control within 1 month to BP < 140/90mmHg, with no adverse medicine reactions.

STEP 5

Entry to Step 5	Treatment	Target
» Failure of step 4 after 1 month of adherence.	» Lifestyle modification **AND** ▪ Hydrochlorothiazide, oral, increase to 25 mg daily. **AND** ▪ ACE-inhibitor, e.g.: • Enalapril, 20 mg daily. **AND** ▪ Long acting calcium	» BP control within 1month to BP < 140/90 mmHg, with no adverse medicine reactions.

	channel blocker, e.g. amlodipine, oral 10 mg daily. **AND ADD** • Atenolol, oral, 50 mg daily.	

If not controlled on step 5 – Refer

Compelling indications for specific medicines	**Medicine/therapeutic class**
Angina	• ß-blocker **OR** Long acting calcium channel blocker
Prior myocardial infarction	• ß-blocker **AND** • ACE-inhibitor
Heart failure	• ACE-inhibitor **AND** • Carvedilol. **OR** Spironolactone <u>For significant volume overload:</u> • Loop diuretic
Left ventricular hypertrophy(confirmed by ECG)	• ACE-inhibitor
Stroke: secondary prevention	• Hydrochlorothiazide **AND** • ACE-inhibitor
Diabetes type 1 and 2 with or without evidence of microalbuminuria or proteinuria	• ACE-inhibitor, usually in combination with diuretic
Chronic kidney disease	• ACE-inhibitor, usually in combination with diuretic
Isolated systolic hypertension	• Hydrochlorothiazide **OR** Long acting calcium channel blocker
Pregnancy	• Methyldopa

Contraindications to individual medicines

<u>Hydrochlorothiazide</u>

» gout
» pregnancy
» severe liver failure
» kidney failure

Beta-adrenergic blocking agent e.g. atenolol
Absolute:
» asthma
» chronic obstructive airways disease
Relative:
» heart failure (not carvedilol)
» diabetes mellitus
» peripheral vascular disease
» bradycardia: pulse rate < 50 beats/minute

ACE-inhibitors
» pregnancy
» bilateral renal artery stenosis or stenosis of an artery to a dominant/single kidney
» aortic valve stenosis
» history of angioedema
» hyperkalemia

CAUTION
Advise all patients receiving ACE-inhibitors about the symptoms of angioedema.

Calcium channel blockers, long acting
» heart failure

REFERRAL
» Young adults (< 30 years of age).
» BP not controlled by 4 medicines and where there is no doctor available.
» Pregnancy.
» Signs of target organ damage e.g. oedema, dyspnoea, proteinuria, angina etc.
» If severe adverse drug reactions develop.
» Hypertensive urgency and hypertensive emergency.

4.7.2 HYPERTENSION IN CHILDREN
I10

DESCRIPTION
Hypertension is defined as systolic and/or diastolic blood pressure ≥ the 95th percentile for gender, age and height percentile on at least 3 consecutive occasions. Refer to table below.

The choice of appropriate cuff size is important. Too small a cuff for the arm leads to false high BP. The cuff bladder must encircle at least 80% of the upper arm and should cover at least 75% of the distance between the acromion and the olecranon. It is better to use a cuff that is slightly too large than one that is too small. Large cuffs, if covered with linen-like material, can be folded to the appropriate size in smaller infants as long as the bladder encompasses the arm.

Infants and preschool-aged children are almost never diagnosed with essential hypertension and are most likely to have secondary forms of hypertension.

With age, the prevalence of essential hypertension increases, and after 10 years of age, it becomes the leading cause of elevated BP. Obesity currently is emerging as a common comorbidity of essential hypertension in paediatric patients, often manifesting during early childhood.

DIAGNOSIS

Age years	95th BP percentiles for boys mmHg	95th BP percentiles for girls mmHg
1	103/56	104/58
3	109/65	107/67
5	112/72	110/72
6	114/74	111/74
8	116/78	115/76
9	118/79	117/77
10	119/80	119/78
11	121/80	121/79
12	123/81	123/80

Adapted from U.S Department of Health and Human Services.National Institutes of Health (National Heart, Lung, and Blood Institute): The 4th report on the diagnosis, evaluation, and treatment of high blood pressure in children and adolescents, May 2005 (using the 50th height percentile).

LoE:III[xx]

REFERRAL

All cases with BP above the 95th percentile.

4.8 PULMONARY OEDEMA, ACUTE

See Section 21.16: Pulmonary oedema, acute.

4.9 RHEUMATIC FEVER, ACUTE

I01.9

Note: notifiable condition.

DESCRIPTION

A condition in which the body develops antibodies against its own tissues, following a streptococcal throat infection. Effective treatment of streptococcal pharyngitis can markedly reduce the occurrence of this disease.

Commonly occurs in children, 3–15 years of age.

Recurrences are frequent.

Clinical signs and symptoms include:

» arthralgia or arthritis that may shift from one joint to another
» carditis including cardiac failure
» heart murmurs
» subcutaneous nodules
» erythema marginatum
» chorea (involuntary movements of limbs or face)
» other complaints indicating a systemic illness e.g. fever

MEDICINE TREATMENT

Eradication of streptococci in throat:

- Benzathine benzylpenicillin, IM, single dose. *LoE:I*[XXI]
  - Children < 30 kg: 600 000 IU.
  - Children ≥ 30 kg and adults: 1.2 MU.
  - For benzathine benzylpenicillin, IM injection, dissolve benzathine benzylpenicillin 1.2 MU in 3.2 mL lidocaine 1% without epinephrine (adrenaline) or 3 mL water for injection. *LoE:III*[XXII]

OR

Phenoxymethylpenicillin, oral, 12 hourly for 10 days.

- Children < 30 kg: 250 mg
- Children ≥ 30 kg and adults: 500 mg

LoE:I[XXIII]

Penicillin allergy:

Children ≤ 18 kg

- Macrolide, e.g.:
- Erythromycin, oral, 125 mg, 6 hourly before meals for 10 days. See dosing table, pg 22.4.

Children > 18–35 kg (able to take tablets)

- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

LoE:I[XXIV]

Prophylaxis for rheumatic fever:

All patients with confirmed rheumatic fever and no persistent rheumatic valvular disease:

» Treat for 10 years or until the age of 21 years, whichever is longer.

LoE:III[XXV]

All patients with confirmed rheumatic fever and persistent rheumatic valvular disease:

» Treat lifelong.

LoE:III[XXIII]

- Benzathine benzylpenicillin, IM, every 21–28 days (3–4 weeks).
  - Children < 30 kg: 600 000 IU
  - Children ≥ 30 kg and adults: 1.2 MU
  - For benzathine benzylpenicillin, IM injection, dissolve benzathine benzylpenicillin 1.2 MU in 3.2 mL lidocaine 1% without epinephrine (adrenaline).

LoE:II[XXVI]

CAUTION

IM injections must be avoided if patients are on warfarin

OR

Phenoxymethylpenicillin, oral, 12 hourly. LoE:II[xxvii]
- Children: 125 mg
- Adults: 250 mg

Penicillin allergy:

Children ≤ 11 years of age
- Macrolide, e.g.:
- Erythromycin, oral, 125 mg, 12 hourly before meals.

Children > 11 years of age and adults
- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily.

LoE:III[xxviii]

REFERRAL

All patients for diagnosis and management.

4.10 VALVULAR HEART DISEASE AND CONGENITAL STRUCTURAL HEART DISEASE

I09.9

DESCRIPTION

Damage to heart valves, chamber or vessel wall anomalies caused by rheumatic fever or other causes, e.g. congenital heart defects and ischaemic heart disease.
May be complicated by:
- » heart failure
- » infective endocarditis
- » atrial fibrillation
- » systemic embolism

GENERAL MEASURES

- » Advise **all** patients with a heart murmur regarding the need for prophylaxis treatment prior to undergoing certain medical and dental procedures.
- » Advise patients to inform health care providers of the presence of the heart murmur when reporting for medical or dental treatment.

MEDICINE TREATMENT

Prophylaxis antibiotic treatment for infective endocarditis:

- » Should be given prior to certain invasive diagnostic and therapeutic procedures e.g. tooth extraction, to prevent infective endocarditis.
- » Is essential for all children with congenital or rheumatic heart lesions needing dental extraction.

Dental extraction if no anaesthetic is required:

- Amoxicillin, oral, 50 mg/kg (maximum dose: 2 g), 1 hour before the procedure.
  - Repeat dose 6 hours later.

Age	Dose
< 5 years of age:	750 mg
5–10 years of age:	1 500 mg
≥ 10 years of age:	2 g

LoE:III[xxix]

Penicillin allergy:
Refer.

If anaesthetic is required:
Refer.

Prophylaxis for rheumatic fever:
See Section 4.9: Rheumatic fever, acute.

REFERRAL

» All patients with pathological heart murmurs for assessment.
» All patients with heart murmurs not on a chronic management plan.
» Development of cardiac signs and symptoms.
» Worsening of clinical signs and symptoms of heart disease.
» Any newly developing medical condition, e.g. fever.
» All patients with valvular heart disease for advice on prophylactic antibiotic treatment prior to any invasive diagnostic or therapeutic procedure.

---

[i] Framingham tables: Klug E; South African Heart Association (S A Heart); Lipid and Atherosclerosis Society of Southern Africa (LASSA). South African dyslipidaemia guideline consensus statement. *SAMJ* 2012 Feb 23;102(3 Pt 2):178-87 http://www.ncbi.nlm.nih.gov/pubmed/922380916

Framingham tables: SAHA. Update on changes to South African Dyslipidaemia Guidelines, 2012. [Online, 2012][Cited 2014] Available at: http://www.saheart.org/uploads/files/Algorithm2.pdf

Framingham tables: Wilson PW, D'Agostino RB, Levy D, Belanger AM, Silbershatz H, Kannel WB. Prediction of coronary heart disease using risk factor categories. *Circulation.1998 May 12;97(18):1837-47.* http://www.ncbi.nlm.nih.gov/pubmed/9603539

[ii] Indications for lipid lowering medicine: Klug E; South African Heart Association (S A Heart); Lipid and Atherosclerosis Society of Southern Africa (LASSA). South African dyslipidaemia guideline consensus statement. *SAMJ* 2012 Feb 23;102(3 Pt 2):178-87 http://www.ncbi.nlm.nih.gov/pubmed/922380916

Indications for lipid lowering medicine: SAHA. Update on changes to South African Dyslipidaemia Guidelines, 2012.[Online, 2012][Cited, 2014] Available at: http://www.saheart.org/uploads/files/Algorithm2.pdf

Indications for lipid lowering medicine: Adult Hospital level STG, 2012. http://www.health.gov.za/

[iii] Simvastatin: Verschuren WM, Jacobs DR, Bloemberg BP, Kromhout D, Menotti A, Aravanis C, Blackburn H, Buzina R, Dontas AS, Fidanza F, et al. Serum total cholesterol and long-term coronary heart disease mortality in different cultures. Twenty-five-year follow-up of the seven countries study. *JAMA.* 1995 Jul 12;274(2):131-6. http://www.ncbi.nlm.nih.gov/pubmed/7596000

Simvastatin: Padwal R, Straus SE, McAlister FA. Cardiovascular risk factors and their impact on the decision to treat hypertension: an evidence-based review. *BMJ.*2001;322:977–80. http://www.bmj.com/content/322/7292/977.1

Simvastatin: Baigent C, Keech A, Kearney PM, Blackwell L, Buck G, Pollicino C, Kirby A,Sourjina T, Peto R, Collins R, Simes R; Cholesterol Treatment Trialists' (CTT) Collaborators. Efficacy and safety of cholesterol-lowering treatment: prospective meta-analysis of data from 90,056 participants in 14 randomised trials of statins. *Lancet.* 2005 Oct 8;366(9493):1267-78. http://www.ncbi.nlm.nih.gov/pubmed/16214597

Simvastatin: Delahoy PJ, Magliano DJ, Webb K, Grobler M, Liew D. The relationship between reduction in low-density lipoprotein cholesterol by statins and reduction in risk of cardiovascular outcomes: an updated meta-analysis. *ClinTher*. 2009 Feb;31(2):236-44. http://www.ncbi.nlm.nih.gov/pubmed/19302897

Simvastatin: Takagi H, Umemoto T; for the ALICE (All-Literature Investigation of Cardiovascular Evidence) Group. Limit to Benefits of Large Reductions in Low-Density Lipoprotein Cholesterol Levels: Use of Fractional Polynomials to Assess the Effect of Low-Density Lipoprotein Cholesterol Level Reduction in Metaregression of Large Statin Randomized Trials. *JAMA Intern Med.* 2013 Apr 29:1-2. http://www.ncbi.nlm.nih.gov/pubmed/23700132

Simvastatin: Cochrane centre: E-mail correspondence of 21January2014.

Simvastatin: National Department of Health: Affordable Medicines, EDP-PHC. Medicine Review: Statin dose, June 2013. http://www.health.gov.za/

Simvastatin: Naci H, Brugts JJ, Fleurence R, Ades A. Dose-comparative effects of different statins on serum lipid levels: a network meta-analysis of 256,827 individuals in 181 randomized controlled trials. *Eur J PrevCardiol*. 2013 Mar 25. [Epub ahead of print] PubMed PMID: 23529608. http://www.ncbi.nlm.nih.gov/pubmed/23529608

Simvastatin: Law MR, Wald NJ, Rudnicka AR. Quantifying effect of statins on low density lipoprotein cholesterol, ischaemic heart disease, and stroke: systematic review and meta-analysis. *BMJ.* 2003 Jun 28;326(7404):1423. http://www.ncbi.nlm.nih.gov/pubmed/12829554

Simvastatin: Saito Y, Yoshida S, Nakaya N, Hata Y, Goto Y. Comparison between morning and evening doses of simvastatin in hyperlipidemic subjects. A double-blind comparative study. *ArterioscIerThromb.* 1991 Jul-Aug;11(4):816-26. http://www.ncbi.nlm.nih.gov/pubmed/2065035

Simvastatin: Wallace A, Chinn D, Rubin G. Taking simvastatin in the morning compared with in the evening: randomised controlled trial. *BMJ.* 2003 Oct 4;327(7418):788. http://www.ncbi.nlm.nih.gov/pubmed/14525878

Simvastatin: Saremi A, Bahn G, Reaven PD; VADT Investigators. Progression of vascular calcification is increased with statin use in the Veterans Affairs Diabetes Trial (VADT). *Diabetes Care.* 2012 Nov;35(11):2390-2. http://www.ncbi.nlm.nih.gov/pubmed/22875226

Simvastatin: Reaven PD, Sacks J; Investigators for the Veterans Affairs Cooperative Study of Glycemic Control and Complications in Diabetes Mellitus Type 2. Reduced coronary artery and abdominal aortic calcification in Hispanics with type 2 diabetes. *Diabetes Care.* 2004 May;27(5):1115-20. http://www.ncbi.nlm.nih.gov/pubmed/15111530

[iv] Atorvastatin: Adult Hospital level STG, 2012. http://www.health.gov.za

[v] Amlodipine: Ellis JS, Seymour RA, Steele JG, Robertson P, Butler TJ, Thomason JM. Prevalence of gingival overgrowth induced by calcium channel blockers: a community-based study. *J Periodontol.*1999 Jan;70(1):63-7. http://www.ncbi.nlm.nih.gov/pubmed/10052772

[vi] Oxygen: Cabello JB, Burls A, Emparanza JI, Bayliss S, Quinn T. Oxygen therapy for acute myocardial infarction. Cochrane Database Syst Rev. 2013 Aug 21;8:CD007160.. http://www.ncbi.nlm.nih.gov/pubmed/23963794

Oxygen: Adult Hospital level STG, 2012. http://www.health.gov.za/

[vii] Aspirin: Adult Hospital level STG, 2012. http://www.health.gov.za/

[viii] Morphine: Adult Hospital level STG, 2012. http://www.health.gov.za/

[ix] Streptokinase: CSL Bering. MCC registered package insert: Streptase® 1,500,000 i.u. injection, 1998.

Streptokinase: Adult Hospital level STG, 2012. http://www.health.gov.za/

[x] Streptokinase: BNF Guidelines, 2009.

[xi] Enalapril: Adult Hospital level STG, 2012. http://www.health.gov.za/

[xii] Carvedilol: The Cardiac Insufficiency Bisoprolol Study II (CIBIS-II): a randomised trial. *Lancet* 1999;353:9–13. http://www.ncbi.nlm.nih.gov/pubmed/10023943

Carvedilol: Effect of metoprolol CR/XL in chronic heart failure: Metoprolol CR/XL Randomised Intervention Trial in Congestive Heart Failure (MERIT-HF). *Lancet* 1999; 353:2001-2007. http://www.ncbi.nlm.nih.gov/pubmed/10376614

Carvedilol: Hjalmarson A, Goldstein S, Fagerberg B, Wedel H, Waagstein F, Kjekshus J, Wikstrand J, El Allaf D, Vitovec J, Aldershvile J, Halinen M, Dietz R, Neuhaus KL, Janosi A, Thorgeirsson G, Dunselman PH, Gullestad L, Kuch J, Herlitz J, Rickenbacher P, Ball S, Gottlieb S, Deedwania P. Effects of controlled-release metoprolol on total mortality, hospitalizations, and well-being in patients with heart failure: the Metoprolol CR/XL Randomized Intervention Trial in congestive heart failure (MERIT-HF). MERIT-HF Study Group. *JAMA* 2000;283:1295–1302. http://www.ncbi.nlm.nih.gov/pubmed/10714728

Carvedilol: Packer M, Coats AJ, Fowler MB, Katus HA, Krum H, Mohacsi P, Rouleau JL, Tendera M, Castaigne A, Roecker EB, Schultz MK, DeMets DL. Effect of carvedilol on survival in severe chronic heart failure. *N Engl J Med* 2001;344: 1651–1658. http://www.ncbi.nlm.nih.gov/pubmed/11386263

Carvedilol: Packer M, Fowler MB, Roecker EB, Coats AJ, Katus HA, Krum H, Mohacsi P, Rouleau JL, Tendera M, Staiger C, Holcslaw TL, Amann-Zalan I, DeMets DL. Effect of carvedilol on the morbidity of patients with severe chronic heart failure: results of the carvedilol prospective randomized cumulative survival (COPERNICUS) study. *Circulation* 2002;106:2194–2199. http://www.ncbi.nlm.nih.gov/pubmed/12390947

Carvedilol: SAMF, 2012 edition. http://www.health.gov.za/

[xiii] Spirinolactone: Pitt B, Zannad F, Remme WJ, Cody R, Castaigne A, Perez A, Palensky J, Wittes J. The effect of spironolactone on morbidity and mortality in patients with severe heart failure. Randomized Aldactone Evaluation Study Investigators. *N Engl J Med* 1999;341:709–717 http://www.ncbi.nlm.nih.gov/pubmed/10471456

[xiv] Spirinolactone: SAMF, 2012 edition

[xv] Spirinolactone: NICE clinical guideline CG108, Cardiac heart failure, 2010. https://www.nice.org.uk/guidance/cg108

[xvi] Spirinolactone: SAMF, 2012 edition

[xvii] Digoxin: Opie LH. Dilated cardiomyopathy and potentially deadly digoxin.*SAMJ* 2011 May 25;101(6):388, 390. http://www.ncbi.nlm.nih.gov/pubmed/21920082

[xviii] Target BP in diabetes mellitus: Arguedas JA, Leiva V, Wright JM. Blood pressure targets for hypertension in people with diabetes mellitus. Cochrane Database Syst Rev. 2013 Oct 30;10:CD008277. http://www.ncbi.nlm.nih.gov/pubmed/24170669

Target BP in diabetes mellitus: Lopez-Jaramillo P, Sanchez R, Diaz M, Cobos L, Bryce A, Parra-Carrillo JZ, Lizcano F, Lanas F, Sinay I, Sierra IV, Penaherrera E, Bendersky M, Schmid H, Botero R, Urina M, Lara J, Foss MC, Matquez G, Harrap S, Ramorez AJ, Zanchetti A, on behalf of the Latin America expert Group: Latin American consensus on hypertension in patients with diabetes type 2 and metabolic syndrome. *J Hypertens* 2013, 31:223–238. http://www.ncbi.nlm.nih.gov/pubmed/23282894

Target BP in diabetes mellitus: Mancia G, Fagard R, Narkiewicz K, Redon J, Zanchetti A, Bohm M, Christiaens T, Cifkvra R, De Backer G, Dominiczak A, Galdereisi M, Grobbeee DE, Jaarsma T, Kirchhof P, Kjeldsen SE, Laurent S, Manolis AJ, Nilsson PM, Ruilope LM, Schmieder RE, Sirnes PA, Sleight P, Viigimaa M, Waeber B, Zannad F: ESH/ESC Guidelines for the management of arterial hypertension; The Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). *J Hypertens* 2013, 2013 (31):1281–1357. http://www.ncbi.nlm.nih.gov/pubmed/23817082

Target BP in diabetes mellitus: Lopez-Jaramillo P, Lopez-Lopez J, Lopez-Lopez C, Rodriguez-Alvarez MI. The goal of blood pressure in the hypertensive patient with diabetes is defined: now the challenge is go from recommendations to practice. *DiabetolMetabSyndr.*2014 Mar 4;6(1):31. http://www.ncbi.nlm.nih.gov/pubmed/24594121

[xix] Asymptomatic severe hypertension: Adult Hospital level STG, 2012. http://www.health.gov.za/

Asymptomatic severe hypertension: Seedat YK, Rayner BL; Southern African Hypertension Society. South African hypertension guideline 2011. *SAMJ*. 2011 Dec 14;102(1 Pt 2):57-83. Erratum in: *SAMJ*. 2012 Feb;102(2):94. http://www.ncbi.nlm.nih.gov/pubmed/22273141

[xx] Blood pressure levels for boys and girls by age and height percentile: U.S Department of Health and Human Services. National Institutes of Health (National Heart, Lung, and Blood Institute).The 4th report on the diagnosis, evaluation, and treatment of high blood pressure in children and adolescents, May 2005.

[xxi] Benzathine benzylpenicillin:van Driel ML, De Sutter AI, Keber N, Habraken H, Christiaens T. Different antibiotic treatments for group A streptococcal pharyngitis. *Cochrane Database Syst Rev*. 2013 Apr 30;4:CD004406. http://www.ncbi.nlm.nih.gov/pubmed/23633318

[xxii] Lidocaine 1%: Amir J, Ginat S, Cohen YH, Marcus TE, Keller N, Varsano I. Lidocaine as a diluent for administration of benzathine penicillin G. *Pediatr Infect Dis J*. 1998 Oct;17(10):890-3. http://www.ncbi.nlm.nih.gov/pubmed/9802630

[xxiii] Phenoxymethylpenicillin: van Driel ML, De Sutter AI, Keber N, Habraken H, Christiaens T. Different antibiotic treatments for group A streptococcal pharyngitis. *Cochrane Database Syst Rev*. 2013 Apr 30;4:CD004406. http://www.ncbi.nlm.nih.gov/pubmed/23633318

Phenoxymethylpenicillin: Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[xxiv] Azithromycin: van Driel ML, De Sutter AI, Keber N, Habraken H, Christiaens T. Different antibiotic treatments for group A streptococcal pharyngitis. *Cochrane Database Syst Rev*. 2013 Apr 30;4:CD004406. http://www.ncbi.nlm.nih.gov/pubmed/23633318

Azithromycin: SAMF, 2012 edition.

Azithromycin: Guo D, Cai Y, Chai D, Liang B, Bai N, Wang R. The cardiotoxicity of macrolides: a systematic review. *Pharmazie.* 2010 Sep;65(9):631-40. Review. http://www.ncbi.nlm.nih.gov/pubmed/21038838

Azithromycin: Contract circular HP02-2013AI, to 31July2015. http://www.health.gov.za/

[xxv] Period of antibiotic prophylaxis therapy:Begs S, Petrson G, Thompson A. Report for the 2nd meeting of the World Health Organization's subcommittee of the Expert Committee of the selection and use of essential medicines: Antibiotic use for the prevention and treatment of rheumatic fever and treatment of rheumatic fever and rheumatic heart disease in children. 30 June 2008. http://www.who.int/selection_medicines/committees/subcommittee/2/RheumaticFever_review.pdf

Period of antibiotic prophylaxis therapy: Gerber MA, Baltimore RS, Eaton CB, Gewitz M, Rowley AH, Shulman ST, Taubert KA. Prevention of rheumatic fever and diagnosis and treatment of acute Streptococcal pharyngitis: a scientific statement from the American Heart Association Rheumatic Fever, Endocarditis, and Kawasaki Disease Committee of the Council on Cardiovascular Disease in the Young, the Interdisciplinary Council on Functional Genomics and Translational Biology, and the Interdisciplinary Council on Quality of Care and Outcomes Research: endorsed by the American Academy of Pediatrics. *Circulation.* 2009 Mar 24;119(11):1541-51. http://www.ncbi.nlm.nih.gov/pubmed/19246689

[xxvi] Benzathine benzylpenicillin: Manyemba J, Mayosi BM. Penicillin for secondary prevention of rheumatic fever. *Cochrane Database Syst Rev.*2002;(3):CD002227. http://www.ncbi.nlm.nih.gov/pubmed/12137650

Benzathine benzylpenicillin: Gerber MA, Baltimore RS, Eaton CB, Gewitz M, Rowley AH, Shulman ST, Taubert KA. Prevention of rheumatic fever and diagnosis and treatment of acute Streptococcal pharyngitis: a scientific statement from the American Heart Association Rheumatic Fever, Endocarditis, and Kawasaki Disease Committee of the Council on Cardiovascular Disease in the Young, the Interdisciplinary Council on Functional Genomics and Translational Biology, and the Interdisciplinary Council on Quality of Care and Outcomes Research: endorsed by the American Academy of Pediatrics. *Circulation.* 2009 Mar 24;119(11):1541-51. http://www.ncbi.nlm.nih.gov/pubmed/19246689

[xxvii] Phenoxymethylpenicillin: Manyemba J, Mayosi BM. Penicillin for secondary prevention of rheumatic fever. *Cochrane Database Syst Rev.*2002;(3):CD002227. http://www.ncbi.nlm.nih.gov/pubmed/12137650

Phenoxymethylpenicillin: Gerber MA, Baltimore RS, Eaton CB, Gewitz M, Rowley AH, Shulman ST, Taubert KA. Prevention of rheumatic fever and diagnosis and treatment of acute Streptococcal pharyngitis: a scientific statement from the American Heart Association Rheumatic Fever, Endocarditis, and Kawasaki Disease Committee of the Council on Cardiovascular Disease in the Young, the Interdisciplinary Council on Functional Genomics and Translational Biology, and the Interdisciplinary Council on Quality of Care and Outcomes Research: endorsed by the American Academy of Pediatrics. *Circulation.* 2009 Mar 24;119(11):1541-51. http://www.ncbi.nlm.nih.gov/pubmed/19246689

[xxviii] Azithromycin: Albert RK, Connett J, Bailey WC, Casaburi R, Cooper JA Jr, Criner GJ, Curtis JL, Dransfield MT, Han MK, Lazarus SC, Make B, Marchetti N, Martinez FJ, Madinger NE, McEvoy C, Niewoehner DE, Porsasz J, Price CS, Reilly J, Scanlon PD, Sciurba FC, Scharf SM, Washko GR, Woodruff PG, Anthonisen NR; COPD Clinical Research Network. Azithromycin for prevention of exacerbations of COPD. *NEMJ*. 2011 Aug 25;365(8):689-98. doi: 10.1056/NEJMoa1104623. Erratum in: *NEMJ*. 2012 Apr 5;366(14):1356. http://www.ncbi.nlm.nih.gov/pubmed/21864166

Azithromycin: Altenburg J, de Graaff CS, Stienstra Y, Sloos JH, van Haren EH, Koppers RJ, van der Werf TS, Boersma WG. Effect of azithromycin maintenance treatment on infectious exacerbations among patients with non-cystic fibrosis bronchiectasis: the BAT randomized controlled trial. *JAMA.* 2013 Mar 27;309(12):1251-9. http://www.ncbi.nlm.nih.gov/pubmed/23532241

[xxix] Amoxicillin: Glenny AM, Oliver R, Roberts GJ, Hooper L, Worthington HV. Antibiotics for the prophylaxis of bacterial endocarditis in dentistry.*Cochrane Database Syst Rev*. 2013 Oct 9;10:CD003813. http://www.ncbi.nlm.nih.gov/pubmed/24108511

Amoxicillin: Duval X, Leport C. Prophylaxis of infective endocarditis: current tendencies, continuing controversies. *Lancet Infect Dis. 2008* Apr;8(4):225-32. http://www.ncbi.nlm.nih.gov/pubmed/18353264

Amoxicillin: Adult Hospital level STG, 2012. http://www.health.gov.za/

Amoxicillin: Paediatric Hospital level STG, 2013. http://www.health.gov.za/

Chapter 5: Skin Conditions

5.1 DRY SKIN

L85.3

DESCRIPTION

The skin is dry and rough, together with varying degrees of scaling.
Severe forms are mainly inherited, e.g. ichthyosis.
Milder forms (xeroderma), seen as dryness with only slight scaling are common in the elderly and some chronic conditions, e.g. HIV disease, malignancies and atopic eczema.

MEDICINE TREATMENT

- Avoid soap, use soap substitutes e.g.
- Aqueous cream (UEA).
  - Rub on skin, before rinsing off completely.
  - Aqueous cream should not be used as an emollient.
- Emollient, e.g.:
- Emulsifying ointment (UE).

LoE: III[i]

5.2 ITCHING (PRURITUS)

L29.9

DESCRIPTION

Itching may be:
» localised or generalised
» accompanied by obvious skin lesions or skin conditions e.g. eczema
» accompanied by many systemic diseases, e.g. hepatitis
» caused by scabies and insect bites

GENERAL MEASURES

» Trim fingernails.
» Avoid scratching.

MEDICINE TREATMENT

Diagnose and treat the underlying condition.

- Calamine lotion, apply when needed.

LoE: III[ii]

For pruritis associated with dry skin:

- Emollient, e.g.:
- Emulsifying ointment (UE).

Severe pruritus:

For short term use:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

Note: Chlorphenamine is sedating and in mild cases may be used only at night.

For long term use e.g. for chronic pruritus:

Children: 2–6 years of age

- Cetirizine, oral, 5 mg once daily. See dosing table, pg 22.2.

Children > 6 years of age and adults

- Cetirizine, oral, 10 mg once daily.

CAUTION
Do not give an antihistamine to children < 2 years of age.

LoE:III[III]

REFERRAL

» No improvement after 2 weeks.
» Underlying malignancy or systemic disease suspected.

5.3 ACNE VULGARIS

L70.0

DESCRIPTION

Acne is an inflammatory condition of the hair follicle.
It is caused by hormones and sebum gland keratinisation,leading to follicular plugging producing comedomes and proliferation of *Propionibacterium acnes*.
Occurs more commonly in adolescence, but may also occur in adulthood.
Distributed on face, chest and back.
Ranges in severity from mild, with a few blackheads, to severe with nodules and cysts.
Severe forms may be seen in HIV disease and itching may be a feature.
May also occur as a result of the inappropriate use of topical steroids or as a side effect of medicine e.g. INH therapy.

GENERAL MEASURES

» Do not squeeze lesions.
» Avoid greasy or oily cosmetics and hair grooming products that block the hair follicle openings.
» Avoid excessive facial washing.

MEDICINE TREATMENT

Many pustules

- Benzoyl peroxide 5%, gel, apply at night to affected areas as tolerated.
  - Wash off in the morning.
  - If ineffective and tolerated, increase application to 12 hourly.
  - Avoid contact with eyes, mouth, angles of the nose and mucous membranes.

CAUTION
Limit exposure to sunlight.

- Doxycycline, oral, 100 mg daily for 3 months.

Poor response to benzoyl peroxide:

- Topical retinoids, e.g.:
- Tretinoin 0.05% cream, topical, apply once daily at bedtime until substantial improvement, for at least 6 weeks. (Doctor initiated)
  - Apply sparingly.

CAUTION
Do not use if pregnant or planning pregnancy.
Limit exposure to sunlight.

LoE:III[IV]

5.4 BACTERIAL INFECTIONS OF THE SKIN

5.4.1 BOIL, ABSCESS

L02.9

DESCRIPTION

Localised bacterial skin infection of hair follicles or dermis, usually with *S. aureus*. The surrounding skin becomes:

» swollen
» red
» hot
» tender to touch

Note:

» Check blood glucose level if diabetes suspected or if the boils are recurrent. Boils in diabetic or immunocompromised patients require careful management.
» Axillary abscesses and pustules (See Section 5.17: Hidradenitis suppurativa).

GENERAL MEASURES

» Encourage general hygiene.
» Drainage of abscess is the treatment of choice.
» Perform surgical incision only when the lesion is fluctuant.

MEDICINE TREATMENT

Systemic antibiotics are seldom necessary, except if there are:

» swollen lymph nodes in the area
» fever
» extensive surrounding cellulitis
» boils on the face

Antibiotics are also indicated in immunocompromised, diabetic patients and neonates:

Children ≤ 7 years of age

- Cephalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.2.

OR

Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 7 years of age and adults

LoE:III[V]

- Cephalexin, oral, 500 mg 6 hourly for 5 days.

OR

Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Penicillin allergy:

Children ≤ 18 kg

- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 18–35 kg (able to take tablets)

- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

REFERRAL

» Poor response to treatment.
» Abscesses of the palm of the hand and pulp space abscess of the fingers.
» Features of severe sepsis requiring intravenous antibiotics.
» Deep abscess e.g. ischiorectal and breast abscess.

5.4.2 IMPETIGO

L01.0

DESCRIPTION

A common contagious skin infection caused by streptococci or staphylococci.
Predominantly occurs in children.
Often secondary to scabies, insect bite, eczemaortineacapitis.
Clinical features:

» starts as blisters containing pus
» subsequently becomes eroded producing honey-coloured crusts
» commonly starts on the face or buttocks
» spreading to neck, hands, arms and legs

Note:

» Post-streptococcal glomerulonephritis is a potential complication.
» Check urine for blood if the sores have been present for more than a week.

GENERAL MEASURES

» Good personal and household hygiene to avoid spread of the infection and to reduce carriage of organisms.
» Trim finger nails.
» Wash and soak sores in soapy water to soften and remove crusts.
» Continue with general measures until the sores are completely healed.

MEDICINE TREATMENT

- Povidone iodine 5%, cream or 10% ointment, apply 8 hourly.

LoE:III

AND

Children ≤ 7 years of age

- Cephalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.2.

OR

Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 7 years of age and adults

- Cephalexin, oral, 500 mg 6 hourly for 5 days.

OR

Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

LoE:I[IV]

Penicillin allergy:

Children ≤ 18 kg

- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 18–35 kg (able to take tablets)

- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

If impetigo has improved, but has not completely cured, give a 2nd 5-day course of antibiotics.

REFERRAL

» No improvement after second course of antibiotics.
» Presence of blood on urine test strip for longer than 5–7 days.
» Clinical features of glomerulonephritis. See Section 8.3.1: Nephritic syndrome.

5.4.3 CELLULITIS

L03.9

DESCRIPTION

A diffuse, spreading, acute infection within skin and soft tissues, commonly caused by streptococci and staphylococci.

Characterised by:

» oedema
» redness
» increased local temperature
» no suppuration

Frequently associated with lymphangitis and regional lymph node involvement.
Commonly occurs on the lower legs, but may occur elsewhere.
May follow minor trauma.

There may be significant systemic manifestations of infection:

» fever
» chills
» tachycardia
» delirium/altered mental state
» hypotension

May present as an acute fulminant or chronic condition.

GENERAL MEASURES

Elevate the affected limb to reduce swelling and discomfort.

MEDICINE TREATMENT

Children ≤ 7 years of age

- Cephalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.2.

OR

Flucloxacillin, oral, 12–25mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 7 years of age and adults

- Cephalexin, oral, 500 mg 6 hourly for 5 days.

OR

Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Penicillin allergy:

Children ≤ 18 kg

- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 18–35 kg (able to take tablets)

- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

Severe cases:

Refer for parenteral antibiotics.

REFERRAL

Urgent

» Children who have significant pain, swelling or loss of function (to exclude osteomyelitis).
» Necrosis.
» Extensive cellulitis.
» Recurrent cellulitis associated with underlying conditions, e.g. lymphoedema.
» Cellulitis with systemic manifestations, e.g. confusion, hypotension.
» Poorly controlled diabetic patients.
» Involvement of the hand, face and scalp.

Non-urgent

» Inadequate response to initial antibiotic treatment.

5.4.4 CHRONIC LOWER LIMB ULCERS

L97.8

DESCRIPTION

A chronic relapsing disorder of the lower limbs.
Associated with vascular insufficiency (predominantly venous insufficiency) and patient immobility.
Commonly associated with neuropathy, infections, neoplasia, trauma or other rare conditions.

GENERAL MEASURES

» If the ulcer is oedema- or stasis-related, rest the leg in an elevated position.
» In venous insufficiency, compression (bandages or stockings) are essential to achieve and maintain healing, provided the arterial supply is normal.
» In patients with arterial insufficiency, avoid pressure on bony prominences and the toes.
» In patients with neuropathy, relieve pressure from the area.
» Exclude diabetes with finger prick blood glucose test.
» Avoid topical application of home remedies.
» Stress meticulous foot care and avoidance of minor trauma. Encourage patients with neuropathy not to walk barefoot, check their shoes for foreign objects, examine their feet daily for trauma and to test bath water before bathing to prevent getting burnt.
» Avoid excessive local heat.
» Walking and exercises are recommended.

MEDICINE TREATMENT

Refer for assessment and initiation of treatment.

Local wound care:

Use bland, non-toxic products to clean the ulcer and surrounding skin.

- Sodium chloride 0.9%.

LoE:III

For venous ulcers:

- Paraffin gauze dressing.

LoE:III[VII]

REFERRAL

» No improvement after 1 month.
» All foot ulcers.
» Ulcers with atypical appearance.
» Venous ulcers that are persistently infected.

5.5 FUNGAL INFECTIONS OF THE SKIN

5.5.1 CANDIDIASIS, SKIN

B37.2

Vaginal candidiasis: See Section 12.1: Vaginal discharge syndrome (VDS).

DESCRIPTION

A skin infection caused by *C. albicans*.
Most common sites for infection are skin folds such as:

» under the breasts
» natal cleft
» axillae
» groins
» nail folds
» neck folds, peri-anal, perineum and groins in infants

The skin lesions or sores:

» Are red raw-looking patches.
» Appear moist (weeping).
» Have peripheral outlying white pustules, red scaly lesions which become confluent.

GENERAL MEASURES

Exclude diabetes.

MEDICINE TREATMENT

- Imidazole, e.g.:
- Clotrimazole 2% cream, apply three times daily for 14 days.

5.5.2 RINGWORM AND OTHER TINEAS

B35.9

Fungal infections affecting the skin (tinea corporis; tinea versicolor), feet (tinea pedis), scalp (tinea capitis) and nails (tinea unguium). These infections may be contagious.

5.5.2.1 RINGWORM – *TINEA CORPORIS*

B35.4

DESCRIPTION

Clinical features include:

» itchy ring-like patches
» raised borders
» patches slowly grow bigger

As the patch extends a clear area develops in the center which may become hyper-pigmented in dark skin.
Extensive disease is common in HIV, often with no evidence of the patches developing clear centres.

GENERAL MEASURES

» Prevent spreading the infection to others.
» Do not share:
  – clothes
  – towels
  – toiletries, especially combs and hair brushes

» Wash skin well and dry before applying medicine treatment.

MEDICINE TREATMENT

Treat any secondary skin infection with antibiotics. See Section 5.4.2: Impetigo.

- Imidazole, e.g.:
- Clotrimazole 2% cream, topical, apply 3 times daily.
  - Continue using cream for at least 2 weeks after lesions have cleared.

REFERRAL

Extensive disease.

5.5.2.2 ATHLETE'S FOOT – *TINEA PEDIS*

B35.3

DESCRIPTION

A common contagious fungal infection of the foot, characterised by itching, burning and stinging between the toes or the sole.

The skin between the toes is moist and white (maceration) and may become fissured. There is also associated erythema, scaling and peeling.

Secondary eczema of the hands may be an associated condition. See Section 5.8.1:Eczema, atopic.

Vesicles may occur in inflammatory cases.

Pain and tenderness in the web spaces may indicate secondary bacterial infection.

Re-infection is common.

GENERAL MEASURES

» Discourage the use of shared bathing or swimming areas, whilst infected.

» Keep feet dry:

- wear open sandals
- do not wear socks of synthetic material
- dry between toes after washing the feet or walking in water
- wash and dry feet twice daily before applying medicine treatment

MEDICINE TREATMENT

- Imidazole cream, e.g.:
- Clotrimazole 2%, apply twice daily for 4 weeks.

REFERRAL

No improvement after 4 weeks.

5.5.2.3 SCALP INFECTIONS – *TINEA CAPITIS*

B35.0

DESCRIPTION

Round or patchy bald areas with scales and stumps of broken off hair.

GENERAL MEASURES
Avoid shaving head in children.
Do not share toiletries such as combs and hair brushes.

MEDICINE TREATMENT
For scalp infections:
Children
- Fluconazole, oral, 6 mg/kg once daily, for 28 days. See dosing table, pg 22.4.

LoE:III[viii]

Adults
- Fluconazole, oral, 200 mg once daily, for 28 days.

LoE:III[ix]

Note: Do not give to women of child-bearing age unless they are using an effective contraceptive.

5.5.2.4 PITYRIASIS VERSICOLOR – *TINEA VERSICOLOR*
B36.0

DESCRIPTION
Mostly found on the upper chest and back and less commonly on the neck, face, abdomen and upper limbs. Round macules which are usually lighter than normal skin (but may be darker). On the chest and back the more central macules join together and the condition spreads with the formation of new macules on the periphery. The pigmentation may take months to return to normal.
Recurrences are common especially in hot weather.

GENERAL MEASURES
Avoid wearing heavy clothing in hot weather to reduce perspiration.

MEDICINE TREATMENT
Oral antifungal therapy is not indicated.
- Selenium sulphide, 2.5% suspension, apply daily for 7 days.
  - Lather shampoo on affected parts.
  - Leave on for 30 minutes, then wash off.

LoE:III

5.5.2.5 NAIL INFECTIONS – *TINEA UNGUIUM*
See Section 5.6.3 Nail infections – tinea unguium.

5.6 NAIL AND NAILFOLD INFECTIONS
B37.2

5.6.1 PARONYCHIA, CHRONIC
B37.2

DESCRIPTION
» Chronic, red, swollen nailfold, lifted off the nail plate with whitish pus.

» Commonly caused by working in water and contact with household detergents.

GENERAL MEASURES
» Avoid hand contact with household detergents, washing powders and softeners.
» Patients to wear rubber gloves when washing clothes, linen and kitchen utensils.

MEDICINE TREATMENT
- Imidazole, e.g.:
- Clotrimazole 2% cream, topical, apply 4–6 hourly until lesions have cleared.
  - After washing hands, massage cream into the nailfold.

LoE:III

If secondary infection is present, indicated by pain and tenderness in the nail fold, treat with antibiotics. See Section 5.4.2: Impetigo

REFERRAL
No response to treatment.

5.6.2 PARONYCHIA, ACUTE
B37.2

DESCRIPTION
Small subcutaneous collection of pus under the nailfold.
Often associated with cutting nails too short, or nail biting.

GENERAL MEASURES
» Avoid cutting finger nails too short.
» Avoid nail biting.

MEDICINE TREATMENT
Drain abscess by puncture or incision.
Adults
- Flucloxacillin 500 mg 6 hourly for 5 days.

LoE:III

5.6.3 NAIL INFECTIONS – *TINEA UNGUIUM*
B35.1

DESCRIPTION
Nails are lifted, distorted, crumbling and discoloured. One or more nails may be affected.

GENERAL MEASURES
Topical treatment is generally ineffective for fungal nail infections.
Systemic treatment is often unsuccessful and recurrent infections are common if repeat exposure is not prevented.

REFERRAL
Only patients that are distressed by cosmetic appearance.

5.7 PARASITIC INFESTATIONS OF THE SKIN
B85.0

5.7.1 LICE (PEDICULOSIS)
B85.2

DESCRIPTION
An infestation of the body with parasitic lice.
Clinical features include:
» itching
» bite marks
» presence of secondary eczema and secondary infection

CAUTION
Do not use commercial insect sprays as they are toxic.
Lotions used for the treatment of lice are toxic when swallowed.

Treat secondary infection with antibiotics.See Section 5.4.2: Impetigo.

5.7.1.1 HEAD LICE
B85.0

DESCRIPTION
Head lice are common in children. The eggs (nits) appear as fixed white specks on the hair.

GENERAL MEASURES
» Use a fine comb to comb out the nits after washing hair.
» Shaving of the head may expedite treatment, where socially acceptable.
» Prevent spread by treating other contacts.
» Remove nits from eyelashes by applications of white soft paraffin.

MEDICINE TREATMENT
- Permethrin 5% lotion.
  - Apply permethrin 5% lotion to towel-dried or dry hair. Comb into hair repeatedly with a normal comb until scalp is covered completely.
  - Remove lice and nymphs with fine lice comb, by dividing scalp into sections and combing away from scalp.
  - Rinse lice comb in a white bowl filled with hot water between hair strokes to identify removed lice, or detach on white tissue paper. Paralysed and dead lice will present as dark spots (like ground pepper).
  - Take note of the physical size of removed lice and nymphs, as the size should get smaller with consecutive treatments.
  - Keep on combing with fine lice comb, rinsing or wiping comb frequently.
  - Permethrin 5% lotion is safe and can be left in the hair for up to one hour.
  - After combing, rinse hair with lukewarm water and wash permethrin 5% lotion out with normal shampoo (more than one foaming might be needed).

- Repeat this procedure every 5 days for 3 weeks.
- Thereafter, carry out frequent inspections to detect new infestations early.

Note:

- **Do not** apply to broken skin or sores.
- **Avoid** contact with eyes.

LoE:III[x]

5.7.1.2 BODY LICE

B85.1

Body lice live in the seams of clothing and only come to the skin to feed.
Note: Body lice may carry typhus fever.

GENERAL MEASURES

Regularly wash bed linen and underclothes in hot water and expose to sunlight.

MEDICINE TREATMENT

Adults and adolescent children:

- Benzyl benzoate 25% lotion, undiluted, applied over the whole body.
  - Leave on overnight and wash off the next day.
  - Repeat once a week for up to 3 weeks.

  Note:
  - **Do not** apply to neck and face.
  - Avoid contact with eyes and broken skin or sores.
  - The lotion is toxic if swallowed.
  - Do not continue if a rash or swelling develops.
  - Itching may continue for 2–3 weeks after treatment.

LoE:II[xi]

5.7.1.3 PUBIC LICE

B85.3

Pubic lice are acquired as STIs and nits are found on pubic hair and eyelashes.

GENERAL MEASURES

Prevent spread by treating other contacts.

MEDICINE TREATMENT

Adults and adolescent children:

- Benzyl benzoate 25% lotion, undiluted, applied over the whole body.
  - Leave on overnight and wash off the next day.
  - Repeat once a week for up to 3 weeks.

  Note:
  - **Do not** apply to neck and face.
  - Avoid contact with eyes and broken skin or sores.
  - The lotion is toxic if swallowed.
  - Do not continue if a rash or swelling develops.
  - Itching may continue for 2–3 weeks after treatment.

See Section 12.12: Pubic lice.

REFERRAL
Lice infestation of eyelashes in children to exclude suspected sexual abuse.

5.7.2 SCABIES
B86

DESCRIPTION
An infestation with the parasite *Sarcoptes scabei.*
Commonly occurs in the skin folds. The infestation spreads easily, usually affecting more than one person in the household.
Clinical features include:
» intense itching, which is more severe at night
» small burrows between fingers, toes, elbow areas and buttocks where the parasite has burrowed under the skin
» secondary infection which may occur due to scratching with dirty nails
» in small babies, there are often vesicles and pustules on the palms and soles and sometimes on the scalp

GENERAL MEASURES
All close contacts must be treated simultaneously even if they are not itchy – see medicinal treatment below.
» Cut finger nails and keep them clean.
» Wash all linen and underclothes in hot water.
» Expose all bedding to direct sunlight.
» Put on clean, washed clothes after medicine treatment.

MEDICINE TREATMENT
Adults and children > 6 years of age
- Benzyl benzoate 25% lotion, applied undiluted to the whole body from neck to feet on 2 consecutive days.
  - Leave on overnight and wash off the next day.

LoE: III

If benzyl benzoate is unsuccessful:
- Permethrin 5% lotion, applied undiluted to the whole body from neck to feet.
  - Leave on overnight (8–12hours) and wash off the following morning.

LoE:I[xii]

Children < 6 years of age
- Permethrin 5% lotion, applied undiluted to the whole body from neck to feet.
  - Leave on overnight (8–12 hours) and wash off the following morning.

LoE:III[xiii]

Note:
- Benzyl benzoate and permethrin are toxic if swallowed.
- Avoid contact with eyes and broken skin or sores.
- Do not continue if rash or swelling develops.
- Itching may continue for 2–3 weeks after treatment.

Treatment may need to be repeated after one week.

Treat secondary infection with antibiotics. See Section 5.4.2: Impetigo.

5.7.3 SANDWORM

B76.0

DESCRIPTION

Creeping eruption (cutaneous larva migrans) caused by *Ancylostoma braziliense*, a hookworm of dog or cat. Larvae of ova in soil penetrate skin commonly through the feet, legs, buttocks or back and cause a winding thread-like trail of inflammation with itching, scratching dermatitis and bacterial infection.

MEDICINE TREATMENT

- Albendazole, oral, daily for 3 days.
  - Children ≤ 2 years of age: 200 mg
  - Children >2 years of age and adults: 400 mg

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

Note: Chlorphenamine is sedating and in mild cases may be used only at night.

CAUTION
Do not give an antihistamine to children < 2 years of age.

5.8 ECZEMA AND DERMATITIS

L20.9/B00.0

5.8.1 ECZEMA, ATOPIC

L20.9

DESCRIPTION

An allergic disorder with an itchy red rash or dry rough skin.
In babies it appears at approximately 3 months.
Family history of asthma, hay fever or atopic dermatitis is common.
Clinical features:

» occurs on the inner (flexural) surfaces of elbows and knees, the face and neck
» can become chronic with thickened scaly skin (lichenification)
» secondary bacterial infection may occur with impetigo or pustules
» can be extensive in infants
» very itchy at night

Eczema is usually a chronic condition and requires long term care.
Sufferers of atopic eczema are particularly susceptible to herpes simplex and may present with large areas of involvement with numerous vesicles and crusting surrounded by erythema (eczema herpeticum). See Section 5.13: Herpes simplex.

GENERAL MEASURES

» Avoid direct skin contact with woollen or rough clothes.
» Avoid overheating by blankets at night.
» Trim finger nails to prevent scratching.
» Good personal hygiene with regular washing to remove crusts and accretions and to avoid secondary infection.
» Diet modification may have no role in atopic eczema treatment.
» Avoid soap on affected areas.

MEDICINE TREATMENT

STEP 1

- Avoid soap, use soap substitutes such as aqueous cream (UEA).
  - Rub on skin, before rinsing off completely.
  - Aqueous cream should not be used as an emollient.
- Emollient, e.g.:
- Emulsifying ointment (UE).

LoE: III[i]

STEP 2

If no response within seven days; or more severe eczema:

- Hydrocortisone 1% cream, applied twice daily for 7 days.
  - Apply sparingly to the face.
  - **Do not** apply around the eyes.

If there is a response:
Reduce the use of the hydrocortisone cream over a few days and maintain treatment with:

- Aqueous cream (UEA) as a soap.

AND

- Emollient, e.g.:
- Emulsifying ointment (UE).

LoE: III[i]

STEP 3

If no response within seven days, or more severe eczema:

- More potent topical corticosteroids, e.g. betamethasone 0.1% ointment applied twice daily for 7 days (Doctor initiated).
  - **Do not** apply to face, neck and flexures.

If there is a response:
Reduce use of corticosteroid cream over a few days and maintain treatment with:

- Aqueous cream (UEA) as a soap.

AND

- Emollient, e.g.:
- Emulsifying ointment (UE).

LoE: III[i]

For itching not controlled with topical treatment:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

Adults
- Chlorphenamine, oral, 4 mg, 6–8 hourly.

Note: Chlorphenamine is sedating and in mild cases may be used only at night.

For long term use in adults and school going children:

Children: 2–6 years of age
- Cetirizine, oral, 5 mg once daily. See dosing table, pg 22.2.

Children > 6 years of age and adults
- Cetirizine, oral, 10 mg once daily.

CAUTION
Do not give an antihistamine to children < 2 years of age.

REFERRAL
» No improvement in 2 weeks.
» Infants requiring more than 1% hydrocortisone cream.
» Extensive involvement.
» Eczema herpeticum.

5.8.2 ECZEMA, ACUTE, MOIST OR WEEPING
L21.9

DESCRIPTION
A form of eczema with microscopic or large vesicles, associated with oozing and eventual crusting and scaling. Yellow pustules which crust indicate sepsis.

GENERAL MEASURES
» Sodium chloride 0.9% dressings, applied daily or twice daily.
» Avoid use of soap on affected areas.

MEDICINE TREATMENT
Topical steroids, e.g.:
- Hydrocortisone 1% cream, applied 12 hourly, until improved.
  - Topical steroids should be applied to both moist and dry inflamed areas.

LoE: III

Antibiotic treatment if secondary infection is present:

Children ≤ 7 years of age
- Cephalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.2.

OR

Flucloxacillin, oral, 12–25mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 7 years of age and adults
- Cephalexin, oral, 500 mg 6 hourly for 5 days.

OR

Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Penicillin allergy:

Children ≤ 18 kg
- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 18–35 kg (able to take tablets)
- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

Children > 35 kg and adults
- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

For itching:

Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

Adults
- Chlorphenamine, oral, 4 mg, 6–8 hourly.

Note: Chlorphenamine is sedating and in mild cases may be used only at night.

CAUTION
Do not give an antihistamine to children < 2 years of age.

For itching in children < 2 years of age:
- Calamine lotion, applied on the skin.

LoE:III[ii]

REFERRAL
» No improvement after a week.
» Severe acute moist or weeping eczema.

5.8.3 DERMATITIS, SEBORRHOEIC
L21.9

DESCRIPTION
Dandruff is an uninflamed form of seborrhoeic dermatitis.
Pruritus may or may not be present in seborrhoeic dermatitis.
The scalp, face, ears and skin folds e.g. axillae, groins, under the breasts are commonly affected.
May become very extensive, particularly in infants and HIV infected patients.

GENERAL MEASURES
» Trim nails.
» Avoid scratching.
» Avoid perfumed soap.

MEDICINE TREATMENT
- Hydrocortisone 1% cream, apply twice daily until improved.
  - Then apply once or twice weekly for maintenance as needed.

For severe dermatitis:

- Betamethasone 0.1% ointment, applied twice daily for 5–7 days. (Doctor initiated).
  - **Do not** apply to face neck and flexures.

For itching scalp, scaling and dandruff:

- Selenium sulphide, 2.5% suspension, apply weekly.
  - Lather on the scalp.
  - Rinse off after 10 minutes.
  - Apply weekly, until improved and every second week to maintain control.

LoE: III[xiv]

5.9 NAPPY RASH

L22

DESCRIPTION

A diffuse reddish eruption in the nappy area, usually caused by irritation from:

» persistent moisture and irregular cleaning and drying of the nappy area,
» diarrhoeal stools,
» underlying skin conditions in some cases, or
» improper rinsing of nappies to remove urine and stool breakdown products.

Rash is predominantly on areas in contact with the nappy, and spares the flexures.

GENERAL MEASURES

» Prompt changing of soiled nappy.
» Avoid waterproof pants. Expose nappy area to air if possible especially with severe nappy dermatitis.
» Educate caregiver on:
  – washing, rinsing and drying of the nappy when soiled.

MEDICINE TREATMENT

- Zinc and castor oil ointment, applied after each nappy change.

If no improvement within 3 days or if rash involves the flexures, suspect candida:

- Imidazole, e.g.:
- Clotrimazole 2% cream followed by zinc and castor oil ointment applied after each nappy change.

REFERRAL

No improvement after 3 days of clotrimazole treatment.

5.10 ALLERGIES

5.10.1 URTICARIA

L50.9

DESCRIPTION

Urticaria is a skin disorder characterised by itchy wheals (hives). There are many

causes, including allergic, toxic or physical. Allergic urticaria may be caused by drugs, plant pollen, insect bites or food stuffs, e.g. fish, eggs, fruit, milk and meat.
Note: Commonly caused by medicines e.g. aspirin, NSAIDs and codeine.

GENERAL MEASURES
» Take detailed history to determine trigger factors.
» Lifestyle adjustment.

MEDICINE TREATMENT
Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

Adults
- Chlorphenamine, oral, 4 mg, 6–8 hourly.

CAUTION
Do not give an antihistamine to children < 2 years of age.

- Calamine lotion, applied on the skin.
  - The use of oral corticosteroids should be avoided.

LoE: III[II]

REFERRAL
No improvement or response after 24 hours.

5.10.2 ANGIOEDEMA
T78.3

DESCRIPTION
Localised oedema of the subcutaneous tissue affecting particular parts of the face i.e. lips, eyes and tongue. May also affect the larynx, causing life threatening airway obstruction and anaphylaxis.
The use of ACE-inhibitors is most commonly associated with angioedema in adults. Other causes include other medicines and allergies.

GENERAL MEASURES
» Stop all suspected agents e.g. ACE-inhibitor.
» In the case of airway obstruction, a definitive airway must be established if oedema is extensive or progressing.

MEDICINE TREATMENT
In severe cases where airway obstruction is present:
Adults
- Epinephrine (adrenaline), 1:1000 solution, 0.5 mL into the lateral thigh, administered immediately and repeated every 5 to 15 minutes as needed.

LoE:III[XV]

Children
- Epinephrine (adrenaline), IM, 0.01 mL/kg of 1:1000 solution, administered immediately.

- Maximum dose of 0.3 mL.

LoE:III[xvi]

In all cases:

- Hydrocortisone, IV, 100 mg as a single dose.

AND

LoE:III[xvii]

If the angioedema is not due to an ACE inhibitor

- Chlorphenamine, oral, 4 mg immediately.

OR

Promethazine, IM, 25–50 mg immediately.

CAUTION
Do not give an antihistamine to children < 2 years of age.

Observe all cases until resolution.

LoE:III[xviii]

REFERRAL

» Failure to respond.
» No obvious cause found.

5.10.3 FIXED DRUG ERUPTIONS

L27.1

DESCRIPTION

Dark coloured round macules that can occur anywhere on the body following the ingestion of a medicine to which the patient has become allergic.
They recur on the same spot and increase in number with each successive attack.
In the acute stage they are itchy, red around the edge or even bullous.

GENERAL MEASURES

Stop the offending medicine.

MEDICINE TREATMENT

- Hydrocortisone 1%, topical, apply daily for 5 days.

LoE:III

REFERRAL

Widespread eruptions.

5.10.4 PAPULAR URTICARIA

L50.9

DESCRIPTION

Hypersensitivity response to insect bites.
Initial lesion is a red papule, which may blister, become excoriated, and then heal with hyperpigmentation. Usually occur in crops over several months.
Common and often severe in HIV infections (Papular pruritic eruption, PPE).

GENERAL MEASURES

Reduce exposure to insects by treating pets, using mosquito nets and fumigating houses regularly. Use of insect repellents may be helpful.

MEDICINE TREATMENT

New, inflamed lesions:

- Hydrocortisone 1%, topical, apply daily for 5 days.

LoE:III[xix]

For relief of itch:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

Note: Chlorphenamine is sedating and in mild cases may be used only at night.

LoE:III[xx]

For long term use in adults and school going children:

Children: 2–6 years of age

- Cetirizine, oral, 5 mg once daily. See dosing table, pg 22.2.

Children > 6 years of age and adults

- Cetirizine, oral, 10 mg once daily.

LoE:III

CAUTION

Do not give an antihistamine to children < 2 years of age.

REFERRAL

Non-responsive and chronic cases.

5.10.5 ERYTHEMA MULTIFORME

L51.9

DESCRIPTION

A self-limiting and commonly recurrent inflammatory eruption of the skin. Sometimes involves mucous membrane (but not more than one surface) and without systemic symptoms. Usually lasts for 10–14 days before complete recovery occurs.

Symmetrically distributed crops of target lesions (dark centre, an inner, pale ring surrounded by an outer red ring) occur on the extremities and in particular on the backs of the hands and forearms, palms and soles. This condition is usually due to an infection, commonly herpes simplex or mycoplasma.

REFERRAL

All patients, except those with erythema multiforme rash limited to the skin without systemic symptoms or mucosal involvement.

5.10.6 SEVERE CUTANEOUS ADVERSE DRUG REACTIONS

5.10.6.1 STEVENS-JOHNSON SYNDROME (SJS)/TOXIC EPIDERMAL NECROLYSIS (TEN)

L51.1/ L51.2

DESCRIPTION

An acute, systemic condition with vesico-bullous lesions involving the skin and mucous membranes (≥ 2 mucosal surfaces), but occasionally only the mucous membranes.

The eruption may start as widespread red irregular macules and patches. There may be a vesicle or bulla in the central area of the lesion. The blisters rupture leaving denuded areas of skin. Mucous membrane erosions often with slough covering the surface are frequently seen.

Toxic epidermal necrolysis (TEN) is a more severe form of the condition and is suggested if the skin lesions cover > 30% of the body surface area.The mucous membranes such as the mouth, eyes and vagina are also more severely affected.

The condition is usually caused by medicines e.g. sulphonamides, anti-retrovirals (nevirapine), anti-epileptics (phenytoin, phenobarbitone, carbamazepine, lamotrigine).

Systemic involvement with multi-organ dysfunction is common.

GENERAL MEASURES

Immediate withdrawal of offending medicine.

Patients usually require care in a high or intensive care unit with dedicated nursing.

REFERRAL

All patients.

5.10.6.2 DRUG REACTION WITH EOSINOPHILIA AND SYSTEMIC SYMPTOMS (DRESS)

L27.0

DESCRIPTION

Severe hypersensitivity reaction to a medicine.

Typically occurs within 3 months of starting the offending medicine.

Clinical symptoms include:

» maculopapular rash
» fever > 38^{o} C
» lymphadenopathy
» hepatitis or other organ involvement
» blood count abnormalities especially eosinophilia

Medicines that commonly induce the DRESS syndrome include phenobarbital, carbamazepine, phenytoin, lamotrigine, allopurinol, sulphonamides, abacavir and nevirapine.

REFERRAL

All patients.

5.11 PITYRIASIS ROSEA

L42

DESCRIPTION

A common disease of unknown cause, probably due to a viral infection as it occurs in minor epidemics. Most common in young adults but any age may be affected. The rash involves the trunk, neck and mainly proximal parts of the limbs.

Presents as pink papules and macules. The macules are oval, and have a thin collar of scale towards, but not at the periphery of the lesions. The eruption is usually preceded by a few days by one larger, oval, slightly scaly area ("herald patch"), commonly found in the scapular area or abdomen. The macules on the thorax characteristically lie parallel to the long axis of the ribs ("Christmas tree" distribution).

The itch is usually mild and there are few or no constitutional symptoms. It is self-limiting within about 6–8 weeks.

GENERAL MEASURES

Explain about the benign but prolonged nature of the condition.

MEDICINE TREATMENT

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

Note: Chlorphenamine is sedating and in mild cases may be used only at night.

CAUTION

Do not give an antihistamine to children < 2 years of age.

- Aqueous cream, applied 3 times daily.

5.12 MOLLUSCUM CONTAGIOSUM

B08.1

DESCRIPTION

Infectious disease caused by a poxvirus. Presents with dome-shaped papules with a central depression (umbilication). Varies from occasional lesions to large crops of lesions particularly in immunocompromised or HIV-infected patients.

Papules are commonly seen on the face in children, but may be found at any skin site, except on the palms and soles. They may also occur on the genitalia as an STI.

Most infections resolve spontaneously except in the immunocompromised patient.

GENERAL MEASURES

In non- genital molluscum contagiosum:

» Allow lesions to heal spontaneously if the lesions are few in number and the patient not immunocompromised.

» In adults, contents can be expressed manually remembering it is contagious.

In genital molluscum contagiosum:
» Counsel on risk reduction for transmission of STIs.
» Notify that the partner(s) must be examined and treated.

MEDICINE TREATMENT
- Tincture of iodine BP, applied to core of individual lesions using an applicator.

CAUTION
Beware of hypersensitivity to iodine.

REFERRAL
» Extensive disease.
» Those failing to respond to simple measures.
» Peri-ocular lesions to an ophthalmologist.
» HIV infected patients with extensive lesions may have to be started on ART.

5.13 HERPES SIMPLEX
B00.0

DESCRIPTION
Infection caused by herpes simplex virus type 1or 2.
Primary herpes infection involving gingivostomatitis (usually type 1) or the genital area (usually type 2) may be extensive, but may occur at other sites, e.g. the face.
It is characterised by grouped crusted vesicles surrounded by erythema. The vesicles rupture soon producing discrete ulcers.

Recurrences are usually mild and last a few days, except in immunosuppressed patients. Recurrences of oral herpes may be triggered by other respiratory tract infections or exposure to ultraviolet light.

Sufferers of atopic eczema are particularly susceptible to the virus and may present with large areas of involvement with numerous vesicles and crusting surrounded by erythema (eczema herpeticum).

Herpes simplex mucocutaneous ulceration that persists for > 1 month is an AIDS–defining illness. See Section 11.3.11: Herpes simplex ulcers, chronic. Herpes simplex infection may be the precipitating event in many cases of erythema multiforme.

GENERAL MEASURES
Keep the skin lesions clean and dry.

MEDICINE TREATMENT
Extensive herpes, eczema herpeticum or chronic mucocutaneous ulcerations:
- Aciclovir, oral, 8 hourly for 10 days.
  - Children dose: 250 mg/m^2/dose. See dosing table, pg 22.1.

5.14 HERPES ZOSTER

See Section 11.3.12: Herpes zoster (Shingles).

5.15 WARTS

B07

DESCRIPTION

A common, infectious, self-limiting condition of the skin or mucous membrane caused by papilloma virus.

5.15.1 COMMON WARTS

B07.9

DESCRIPTION

Seen most often on the hands and fingers, but can be found anywhere on the body.
Raised nodules with a rough 'warty' surface.

GENERAL MEASURES

In most cases they should be left alone, as they will spontaneously resolve.

MEDICINE TREATMENT

- Salicylic acid, 15 to 30% topical liquid application.
  - Protect surrounding skin with petroleum jelly.
  - Apply daily to wart and allow to dry.
  - Occlude for 24 hours.
  - Soften lesions by soaking in warm water and remove loosened keratin by light abrasion.
  - Wash wash well, dry, reapply the wart paint and occlude.
  - Repeat process daily until the wart disappears.

LoE:III[xxi]

REFERRAL

Extensive warts.

5.15.2 PLANE WARTS

B07.8

DESCRIPTION

Very small warts that are just slightly raised.
Present as smooth, flat, skin-coloured or slightly pigmented surface.
They occur particularly on the face, back of the hands and knees.
Commonly seen in the immunocompromised.

MEDICINE TREATMENT

These warts are notoriously difficult to treat with a poor response.

- Salicylic acid, 2%, topical.

LoE:III[xxii]

REFERRAL
» Failure to respond.
» Extensive cases involving the face.

5.15.3 PLANTAR WARTS
A44.1

DESCRIPTION
Appear commonly on the pressure-bearing areas of the soles and can be painful and interfere with walking. Because pressure forces them deep into the dermis they are flat, almost circular lesions, with a rough surface and are often thick and hard due to increased keratin formation. Plantar warts are contagious and walking barefoot in communal areas should be discouraged.

MEDICINE TREATMENT
- Salicylic acid, 15 to 30% topical liquid application.
  - Protect surrounding skin with petroleum jelly.
  - Apply daily to wart and allow to dry.
  - Occlude for 24 hours.
  - Soften lesions by soaking in warm water and remove loosened keratin by light abrasion.
  - Wash well, dry, reapply the wart paint and occlude.
  - Repeat process daily until the wart disappears.

LoE:III[xxiii]

REFERRAL
» No response to treatment.
» Diabetic patients.

5.15.4 GENITAL WARTS: CONDYLOMATA ACCUMINATA
A63.0
See Section 12.11: Genital warts (GW): *condylomata accuminata.*

5.16 PSORIASIS
L40.9

DESCRIPTION
Inflammatory condition of the skin and joints of unknown aetiology.
Scaly itchy plaques occur especially on the extensor surfaces of the knees, elbows, sacrum and scalp.
Psoriasis may spread to involve any other sites, although the face is usually spared. The nails and skin folds are often involved.
Multiple co-morbidities are recognised, particularly the metabolic syndrome. Check for other markers of the metabolic syndrome e.g. central obesity, hypertension, dyslipidaemia.
Often aggravated by stress and may be provoked by HIV disease.

GENERAL MEASURES
» Counselling regarding precipitating factors and chronicity.
» HIV test, if acute onset and risk factors present.
» Encourage sun exposure as tolerated.

MEDICINE TREATMENT
For flares (if delay experienced in obtaining a dermatological consultation):
- Coal tar (Liquor picis carbonis (LPC) B.P.) 5%, topical.

LoE:III[xxiv]

- Betamethasone 0.1%, topical, apply 12 hourly (Doctor initiated).
  - Decrease according to severity, reduce to hydrocortisone 1%, topical, and then stop.

LoE:III[xxv]

REFERRAL
All patients.

5.17 HIDRADENITIS SUPPURATIVA
L73.2

DESCRIPTION
A chronic disorder of the apocrine glands involving the formation of abscesses and cysts, often accompanied by scarring and sinus tract formation.
Commonly found in axillae, groin, between the thighs, perianal and perineal areas.
Flare-ups may be triggered by perspiration, hormonal changes (such as menstrual cycles), humidity and heat, and friction from clothing.

GENERAL MEASURES
Avoid tight clothing and clothing made of heavy non-breathable material.

REFERRAL
Refer all patients with abscesses, infected cysts or sinuses and suspicion of the diagnoses.

---

[i] Aqueous cream and emollients: Tsang M, Guy RH. Effect of aqueous cream BP on human stratum corneum in vivo. *Br J Dermatol*2010; 163:954–8.http://www.ncbi.nlm.nih.gov/pubmed/20649794
Aqueous cream and emollients: Mohammed D, Matts PJ, Hadgraft J, Lane ME. Influence of aqueous cream BP on corneocyte size, maturity, skin protease activity, protein content and transepidermal water loss. *Br J Dermatol* 2011; 164:1304–10.http://www.ncbi.nlm.nih.gov/pubmed/21443526
Aqueous cream and emollients: Danby S, Cork MJ. A new understanding of atopic dermatitis: the role of epidermal barrier dysfunction and subclinical inflammation. *J ClinDermatol* 2010; 1:33–46.
Aqueous cream and emollients: Hoare C, Li Wan Po A,Williams H. Systematic review of treatments of atopic eczema. *Health Technol Assess* 2000;4(37).http://www.ncbi.nlm.nih.gov/pubmed/11134919
Aqueous cream and emollients: Lewis-Jones S, Cork MJ, Clark C et al. Atopic Eczema in Children – Guideline Consultation: A Systematic Review of the Treatments for Atopic Eczema and Guideline for its Management. London: National Institute for Clinical Excellence (NICE), 2007.https://www.nice.org.uk/guidance/cg57
[ii] Calamine lotion: BNF for children, 2011-2012.
[iii] Antihistamines, oral: SAMF 10th edition, 2012.
[iv]Retinoids, topical: Adult Hospital level STG, 2012. http://www.health.gov.za/
[v] Cephalexin, Flucloxacillin: Adult Hospital level STG, 2012; Paediatric Hospital level STG, 2014; Contract circular HP02-2013AI. http://www.health.gov.za/

[vi] Cephalexin, Flucloxacillin: Koning S, van der Sande R, Verhagen AP, van Suijlekom-Smit LWA, Morris AD, Butler CC, Berger M, van der Wouden JC. Interventions for impetigo.*Cochrane Database of Systematic Reviews* 2012, Issue 1. Art. No.: CD003261.http://www.ncbi.nlm.nih.gov/pubmed/22258953

[vii] Paraffin gauze dressings: Briggs M, Nelson EA, Martyn-St James M. Topical agents or dressings for pain in venous leg ulcers.*Cochrane Database Syst Rev*. 2012 Nov 14;11:CD001177. http://www.ncbi.nlm.nih.gov/pubmed/23152206

Paraffin gauze dressings: Nelson EA, Bradley MD.Dressings and topical agents for arterial leg ulcers.*Cochrane Database Syst Rev.* 2007 Jan 24;(1):CD001836.http://www.ncbi.nlm.nih.gov/pubmed/17253465

Paraffin gauze dressings: O'Meara S, Al-Kurdi D, Ologun Y, Ovington LG, Martyn-St James M, Richardson R. Antibiotics and antiseptics for venous leg ulcers.*Cochrane Database Syst Rev*. 2014 Jan 10;1:CD003557. http://www.ncbi.nlm.nih.gov/pubmed/24408354

Paraffin gauze dressings:Bradley M, Cullum N, Nelson EA, Petticrew M, Sheldon T, Torgerson D. Systematic reviews of wound care management: (2) Dressings and topical agents used in the healing of chronic wounds. *Health Technol Assess* 1999;3(17 Pt 2). http://www.ncbi.nlm.nih.gov/pubmed/10683589

[viii] Fluconazole: BNF 2011-2012 edition.

[ix] Fluconazole: Adult Hospital level STG, 2012. http://www.health.gov.za/

[x] Permethrin 5% lotion:Meinking TL, Vicaria M, Eyerdam DH, Villar ME, Reyna S, Suarez G. Efficacy of a reduced application time of Ovide lotion (0.5% malathion) compared to Nix crème rinse (1% permethrin) for the treatment of head lice. *PediatrDermatol.* 2004 Nov-Dec;21(6):670-4.http://www.ncbi.nlm.nih.gov/pubmed/15575855

Permethrin 5% lotion:Frankowski BL, Bocchini Jr. JA and Council on School Health and Committee on Infectious Diseases. Head lice.*Pediatrics*2010;126:392-403.http://www.ncbi.nlm.nih.gov/pubmed/20660553

Permethrin 5% lotion:MarkLebwohl, Lily Clark and Jacob Levitt. Therapy for Head Lice Based on Life Cycle, Resistance, and Safety Considerations. *Pediatrics*2007;119(5):965-974. http://www.ncbi.nlm.nih.gov/pubmed/17473098

Permethrin 5% lotion:Nova Scotia District health authority public health services and the department of health promotion and protection. Guidelines for treatment of pediculosiscapitis (head lice). August 2008. [Online 2008][Cited 2013] Available at: www.gov.ns.ca/hpp

Permethrin 5% lotion:Roberts RJ. Head lice.*N Engl J Med* 2002;346(21):1645-1650.

Permethrin 5% lotion:MCC registered package insert for Skabi-rid®.

Permethrin 5% lotion: Diamantis SA, Morrell DS, Burkhart CN.Treatment of head lice**.***Dermatologic Therapy* 2009;22:273–278.http://www.ncbi.nlm.nih.gov/pubmed/19580574

Permethrin 5% lotion:Jones KN, English III JC. Review of Common Therapeutic Options in the United States for the Treatment of Pediculosis Capitis.*Clinical Infectious Diseases* 2003; 36:1355–61. http://www.ncbi.nlm.nih.gov/pubmed/12766828

Permethrin 5% lotion:Madke B, Khopkar U. Pediculosis capitis: An update. *Indian J DermatolVenereolLeprol*2012;78:429-38.

Permethrin 5% lotion:BNF for children 2011-2012. http://www.ncbi.nlm.nih.gov/pubmed/22772612

[xi] Benzyl benzoate lotion: Bachewar NP, Thawani VR, Mali SN, Gharpure KJ, Shingade VP, Dakhale GN. Comparison of safety, efficacy, and cost effectiveness of benzyl benzoate, permethrin, and ivermectin in patients of scabies.*Indian J Pharmacol.* 2009 Feb;41(1):9-14.http://www.ncbi.nlm.nih.gov/pubmed/20177574

Benzyl benzoate lotion: Strong M, Johnstone P. Interventions for treating scabies. *Cochrane Database Syst Rev.* 2007 Jul 18;(3):CD000320.http://www.ncbi.nlm.nih.gov/pubmed/17636630

[xii] Permethrin 5% lotion: Strong M, Johnstone P. Interventions for treating scabies. *Cochrane Database Syst Rev.* 2007 Jul 18;(3):CD000320.http://www.ncbi.nlm.nih.gov/pubmed/17636630

[xiii] Permethrin 5% lotion: BNF for children 2011-2012.

[xiv] Selenium sulphide 2.5% suspension: MCC registered package insert for Selsun shampoo 2.5%®.

[xv] Epinephrine, IM: Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[xvi] Epinephrine, IM: Pawankar RP, Canonica GW, Holgate ST, Lockey RF. WAO White Book on Allergy. Wisconsin: World Allergy Organization; 2011

[xvii] Hydrocortisone, IV: Adult Hospital level STG, 2012 and Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[xviii] Chlorphenamine, Promethazine: Adult Hospital level STG, 2012 and Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[xix] Hydrocortisone 1%, topical: Adult Hospital level STG, 2012 and Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[xx] Chlorphenamine: Adult Hospital level STG, 2012 and Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[xxi] Salicylic acid, 15 to 30% topical liquid application: Kwok CS, Gibbs S, Bennett C, Holland R, Abbott R. Topical treatments for cutaneous warts. *Cochrane Database Syst Rev.* 2012 Sep 12;9:CD001781. http://www.ncbi.nlm.nih.gov/pubmed/22972052

[xxii] Salicylic acid, 2%, topical: Kwok CS, Gibbs S, Bennett C, Holland R, Abbott R. Topical treatments for cutaneous warts. *Cochrane Database Syst Rev.* 2012 Sep 12;9:CD001781.http://www.ncbi.nlm.nih.gov/pubmed/22972052

Salicylic acid, 2%, topical: Dall'oglio F, D'Amico V, Nasca MR, Micali G. Treatment of cutaneous warts: an evidence-based review. *Am J ClinDermatol.* 2012 Apr 1;13(2):73-96.http://www.ncbi.nlm.nih.gov/pubmed/22292461

Salicylic acid, 2%, topical: Sterling JC, Handfield-Jones S, Hudson PM; British Association of Dermatologists. Guidelines for the management of cutaneous warts.*Br J Dermatol.* 2001 Jan;144(1):4-11.http://www.ncbi.nlm.nih.gov/pubmed/11167676

[xxiii] Salicylic acid, 15 to 30% topical liquid application: Kwok CS, Gibbs S, Bennett C, Holland R, Abbott R. Topical treatments for cutaneous warts. *Cochrane Database Syst Rev.* 2012 Sep 12;9:CD001781. http://www.ncbi.nlm.nih.gov/pubmed/22972052

[xxiv] Coal tar 5%, topical: Adult Hospital level STG, 2012. http://www.health.gov.za/

[xxv] Betamethasone 0.1%, topical: Adult Hospital level STG, 2012. http://www.health.gov.za/

Chapter 6: Obstetrics & gynaecology

Obstetrics

Gynaecology

OBSTETRICS

6.1 BLEEDING IN PREGNANCY

O20.9

6.1.1 MISCARRIAGE

O08-O09

DESCRIPTION

Bleeding from the genital tract prior to 22 weeks gestation, which may or may not be associated with lower abdominal pain (LAP), and is classified as follows:

» Threatened miscarriage:
  – mild vaginal bleeding, usually no associated LAP
  – cervix closed on digital examination
» Inevitable miscarriage:
  – moderate vaginal bleeding with associated LAP
  – cervical dilatation is usually present
» Incomplete miscarriage:
  – vaginal bleeding with clots
  – passage of products of conception
» Complete miscarriage:
  – complete passage of all products of conception
  – usually still requires referral for confirmation
» Unsafe (septic) miscarriage:
  – any miscarriage with history of interference, pyrexia, tachycardia and/or offensive products of conception

For perinatal mortality audit and statistics (DHIS or PPIP), all fetuses ≥ 500g are included.

GENERAL MEASURES

» Monitor vital parameters, e.g. Haemoglobin (Hb), pulse, BP, temperature.
» Treat for shock if indicated.
» Counselling and support.

MEDICINE TREATMENT

- Oxytocin 20 units, IV, diluted in 1 000 mL sodium chloride 0.9% and infused at 125 mL/hour in all cases, **except where threatened miscarriage** is suspected.

<u>If septic miscarriage is suspected, before referral</u>

- Ceftriaxone, IV, 1 g.

CAUTION: USE OF CEFTRIAXONE
Do not administer calcium containing fluids, e.g. Ringer-Lactate, concurrently with ceftriaxone.

LOE:III

AND

- Metronidazole, oral, 400 mg

In Rh-negative, non-sensitised women

- Anti-D immunoglobulin, IM, 50–100 mcg preferably within 72 hours but may be given up to 7 days following management of miscarriage.

LOE:III[II]

REFERRAL

Urgent

All patients with unsafe miscarriage.

Note: For patients with safe miscarriage the need for referral is determined by skills and facilities at the primary health care level. A local referral policy should be in place. Ideally midwife obstetric units and community health centres should be able to manage safe miscarriage using manual vacuum aspiration.

6.1.2 MANAGEMENT OF INCOMPLETE MISCARRIAGE IN THE 1ST TRIMESTER, AT PRIMARY HEALTH CARE LEVEL

O02.1

Both Manual Vacuum Aspiration (MVA) and medical evacuation are equally effective for miscarriage.

GENERAL MEASURES

» Counselling.
» Evacuation of the uterus after ripening the cervix.

MEDICINE TREATMENT

Before MVA, to ripen the cervix:

- Misoprostol, oral/vaginal, 400 mcg as a single dose.

Medical evacuation:

- Misoprostol, oral/vaginal, 600 mcg as a single dose.
  - Repeat after 24 hours if necessary.

Follow up after one week to ensure that bleeding has stopped. *LOE:III[III]*

REFERRAL

» Unsafe miscarriage.
» Miscarriage > 12 weeks gestation.
» Anaemia.
» Haemodynamic instability.
» Failed medical evacuation.

6.1.3 ANTEPARTUM HAEMORRHAGE

O46.9

DESCRIPTION

Vaginal bleeding in pregnancy after 22 weeks gestation.
Important causes include the following:

» abruptio placentae,
» placenta praevia, and

» uterine rupture (particularly when misoprostol was used).

MEDICINE TREATMENT

- Sodium chloride 0.9%, IV.

» Treat for shock if necessary.
» Avoid vaginal examination, unless placenta praevia excluded.

LOE:III

REFERRAL

Urgent
All patients.

6.2 ANTENATAL CARE

Z35.9

6.2.1 CARE OF HIV-INFECTED PREGNANT WOMEN

O98.7

DESCRIPTION

HIV is currently the most common cause of maternal deaths in South Africa. Transmission of HIV from mother to infant may occur during pregnancy, delivery and/or breastfeeding.
Without intervention, 25–40% of infants born to HIV-infected women may become infected. With appropriate interventions, maternal mortality as well as perinatal transmission of HIV can be substantially reduced.
For comprehensive information on the care of HIV-infected pregnant women refer to the current National prevention of mother-to-child transmission of HIV (PMTCT) Guidelines.

GENERAL MEASURES

» Provide routine counselling and voluntary HIV testing to all pregnant women at their very first antenatal visit, in addition to Hb, Rh and syphilis test.
» Provide counselling on the benefits of PMTCT to all HIV-infected women.
» Offer repeat testing from 32 weeks' gestation onwards to all women who test HIV negative.
» On diagnosis, HIV-infected pregnant women should be clinically staged, assessed for TB and have a blood sample taken for CD4 cell count and creatinine, on the same day. The results must be obtained within a week.
» Those with symptoms of TB must be investigated before antiretroviral therapy (ART) initiation. If TB treatment commences, ART should be deferred for 2 weeks.
» Fast-track all HIV-infected pregnant women for ART regardless of CD4 count.
» Provide counselling to all asymptomatic well women and commence ART on the same day.
» Decisions about postpartum contraceptive use should be made in the antenatal period.
» Women with unwanted pregnancies < 20 weeks' gestation should be assisted with access to termination of pregnancy (TOP) services.

» Perform a viral load (VL) at booking for all HIV-infected women who have been on ART for at least 6 months, unless a recent result (within the last 6 months) is available. If they are not suppressed refer for expert advice.

MEDICINE TREATMENT

Opportunistic infection prophylaxis for HIV-infected pregnant women

See Section 11.2.2: Isoniazid preventive therapy (IPT).

Women on ART with no symptoms of TB:

- Isoniazid, oral, 300 mg daily for 12 months.

AND

- Pyridoxine, oral, 25 mg daily for 12 months.

LOE:II[IV]

Women with CD4 ≤ 200 or WHO clinical stage 2, 3 or 4:

- Cotrimoxazole, oral, 160/800 mg daily, until CD4 > 200.

LOE:III[V]

Women with CD4 < 100, do a serum cryptococcal antigen (CrAg) test.

» If CrAg-positive and asymptomatic:

- Start fluconazole, oral, 800 mg daily for 2 weeks, then 400 mg daily for 8 weeks, then 200 mg daily until CD4 > 200.

» If CrAg-positive and symptomatic (e.g. headache, vomiting, confusion, fever), refer immediately for lumbar puncture.

LOE:III[VI]

Antiretroviral therapy

- Tenofovir 300 mg oral, daily.

AND

- Emtricitabine 200 mg, oral daily (**OR** lamivudine 300 mg, oral, daily).

AND

- Efavirenz 600 mg, oral at night.

LOE:III[VII]

If active psychiatric conditions present (in consultation with doctor):

CD4 ≤ 250

- Replace efavirenz with nevirapine, oral 200 mg daily for 2 weeks, then 200 mg 12 hourly.
  - Do an ALT test before starting nevirapine. Nevirapine should not be used in women with elevated ALT.
  - If ALT elevated, replace efavirenz with lopinavir/ritonavir, oral, 400/100 mg 12 hourly.

CD4 > 250

- Replace efavirenz with lopinavir/ritonavir, oral, 400/100 mg 12 hourly.

LOE:III[VIII]

If renal dysfunction i.e. serum creatinine > 85 micromol/L (in consultation with doctor):

» Replace tenofovir+emtricitabine with abacavir+lamivudine.

- Abacavir, oral, 600 mg daily.

- Lamivudine, oral, 150 mg 12 hourly.

LOE:III

Note: Monitor response to ART within 6 months of initiation with a plasma VL. If VL is not suppressed refer for expert advice.

For unbooked women diagnosed in labour

- Nevirapine, oral, 200 mg single dose as early as possible in labour.

AND

- Zidovudine, oral, 300 mg intrapartum, every 3 hours until delivery.

AND

- Tenofovir 300 mg and emtricitabine 200 mg, oral, as a single dose.

LOE:III[ix]

Breastfeeding

The mother should start ART within 24 hours of delivery to protect the baby during breastfeeding (See Antiretroviral therapy, above).

LOE:III[x]

Baby

See Section 11.4.1: The HIV-exposed infant.

REFERRAL

» Refer mothers suspected of non-adherence early.
» Creatinine > 85 mmol/L**.**
» ALT > 100 IU/L.

6.2.2 HYPERTENSIVE DISORDERS OF PREGNANCY

O13/O14

DESCRIPTION

Hypertension in pregnancy, pre-eclampsia and eclampsia may have very serious and fatal consequences for both the mother and the baby.

Hypertension occurring for the first time at ≥ 20 weeks' gestation (gestational hypertension) is characterised by:

» BP ≥ 140/90 mmHg measured on 2 occasions 4 hours apart.

OR

» BP > 160/110 mmHg measured on a single occasion.

(Always measure BP in the left lateral, and not supine, position).

Hypertensive disorders of pregnancy can be classified as:

» Gestational hypertension:
  – Hypertension without proteinuria, detected > 20 weeks of pregnancy.
» Pre-eclampsia:
  – Hypertension with proteinuria > 20 weeks of pregnancy (risk factors include chronic hypertension, pre-existing kidney disease, diabetes, pre-eclampsia in a previous pregnancy, etc).
» Eclampsia:
  – Generalised tonic-clonic seizures in women with pre-eclampsia.
» Chronic hypertension:

- Hypertension without proteinuria diagnosed before pregnancy or < 20 weeks of pregnancy.

» Chronic kidney disease:
- proteinuria with/without hypertension < 20 weeks of pregnancy.

LEVELS OF SEVERITY OF HYPERTENSION

Level of hypertension	BP Level mmHg		
	Systolic		Diastolic
mild	140–149	or	90–99
moderate	150–159	or	100–109
severe	≥160	or	≥110

REFERRAL
» Severe hypertension.
» Pre-eclampsia (all levels of severity).
» Chronic kidney disease.

MILD TO MODERATE HYPERTENSION
O13

DESCRIPTION
Hypertension occurring for the first time at ≥ 20 weeks' gestation with no proteinuria. Characterised by:
» BP ≥ 140/90 mmHg measured on 2 occasions 4 hours apart.
OR
» BP >160/110 mmHg measured on a single occasion.
(Always measure BP in the left lateral and not supine, position).

GENERAL MEASURES
» May be managed without admission before 38 weeks of gestation, provided no proteinuria.
» Review the following on a weekly basis:
- BP
- weight
- urine analysis
- height of fundus
- fetal heart rate and movements

» Educate on signs requiring urgent follow-up (headache, epigastric pain, vaginal bleeding etc).
» Refer to hospital if proteinuria develops,or at 38 weeks for delivery.

MEDICINE TREATMENT
- Methyldopa, oral, 250 mg 8 hourly.
  - Titrate to a maximum dose: 750 mg 8 hourly.
  - When using iron together with methyldopa, ensure that iron and methyldopa are taken at least 4 hours apart from one another.

LOE:III[xi]

REFERRAL
» Severe hypertension.
» Pre-eclampsia (all levels of severity).

» Poor control of hypertension.

SEVERE HYPERTENSION

O13

DESCRIPTION

BP ≥ 160/110 mmHg, with no proteinuria. (Always measure BP in the left lateral and not supine position).

MEDICINE TREATMENT

Aim to reduce BP to 140/100 mmHg.
Preload with:

- Sodium chloride 0.9%, IV, 200 mL unless in cardiac failure.

AND

- Nifedipine, oral, 10 mg (not sublingual) as a single dose.
  - May be repeated after an hour if diastolic BP remains > 110 mmHg.

LOE:III[XII]

REFERRAL

All cases.

CHRONIC HYPERTENSION

O10.9

Stop ACE-inhibitors when pregnancy is planned or as soon as pregnancy isestablished.

MEDICINE TREATMENT

Prevention of pre-eclampsia

From 14 weeks gestation onwards:

- Calcium, oral.
  - For high-risk patients: Calcium carbonate, oral, 500 mg 12 hourly (equivalent to 1 g elemental calcium daily).
  - Although the benefit is greatest in high-risk women, consider use of this agent in all pregnant women.

  Note: Calcium reduces iron absorption from the gastro-intestinal tract. These supplements should be taken 4 hours apart from one another.
- Aspirin, oral, 75–100 mg daily with food (Doctor initiated).
  - Recommended dose is 100 mg, and in the absence of appropriate formulation use 150 mg.

Treatment

LOE:III[XIII]

- Methyldopa, oral, 250 mg 8 hourly.
  - Maximum dose: 750 mg 8 hourly.

LOE:III[XIV]

REFERRAL

» Poor control of hypertension.
» Chronic hypertension with superimposed pre-eclampsia.
» All women with pre-eclampsia.

E C L A M P S I A

O15

GENERAL MEASURES

» Ensure safe airway.
» Turn woman onto left lateral position.
» Administer oxygen.
» Stabilise prior to urgent referral.
» Insert a Foley's catheter.

MEDICINE TREATMENT

- Magnesium sulphate, IV, 4 g as a loading dose diluted with 200 mL sodium chloride 0.9% and infused over 20 minutes.

AND

- Magnesium sulphate, IM, 10 g given as 5 g in each buttock
  - Then IM, 5 g every 4 hours in alternate buttocks.

LOE:III

REFERRAL

Urgent

» Severe eclampsia and pre-eclampsia:
  – stabilise the patient,
  – initiate magnesium sulphate loading dose before referral,
  – monitor vital signs while awaiting transport.
» Severe hypertension.

Non urgent

All women with pre-eclampsia.

6.2.3 ANAEMIA IN PREGNANCY

O99.0

DESCRIPTION

Anaemia in pregnancy is Hb < 11 g/dL, mostly due to either iron deficiency, folic acid deficiency or a combination of both.
Women with iron deficiency often have 'pica', e.g. eating substances such as soil, charcoal, ice, etc.

GENERAL MEASURES

» A balanced diet to prevent nutritional deficiency.
» Reduce intake of tea.
» Do not drink tea within 2 hours of taking iron tablets.

MEDICINE TREATMENT

Prevention:

» All pregnant women: routine iron and folic acid supplementation.
» Continue with iron and folic acid supplementation during lactation.

- Ferrous sulphate compound BPC, oral, 170 mg once daily with food.

OR

Ferrous fumarate, oral, 200 mg once daily with food.
- Do not take iron tablets within 4 hours of taking calcium tablets.

AND
- Folic acid, oral, 5 mg daily.

Established anaemia with Hb < 11 g/dL:
- Ferrous sulphate compound BPC, oral, 170 mg 8 hourly with food.

OR

Ferrous fumarate, oral, 200 mg 8 hourly with food.
- Continue for 3 months after the Hb normalises in order to replenish body iron stores.
- Do not take iron tablets within 4 hours of taking calcium tablets.

AND
- Folic acid, oral, 5 mg daily.

LOE:III

REFERRAL

Urgent
» Symptomatic anaemia (tachycardia > 100 heartbeats/minute, dizziness, shortness of breath).
» Signs or symptoms of acute or chronic blood loss.
» Evidence of cardiac failure.

Non urgent
» Hb < 7 g/dL in women who have not responded to oral therapy, after a month.
» Women > 34 weeks gestation with Hb < 7 g/dL.
» Any low Hb with an obstetric complication.
» Pallor (anaemia) plus signs of chronic disease, e.g. suspicion of TB, or the presence of hepatosplenomegaly.
» Anaemia of sudden onset.

6.2.4 SYPHILIS IN PREGNANCY

O98.1

DESCRIPTION

A sexually transmitted infection with many manifestations that may be asymptomatic in pregnant women. It is caused by the spirochaete, *T pallidum*. Vertical transmission to the foetus occurs in up to 40% of cases in untreated mothers. Untreated maternal syphilis may lead to miscarriage, stillbirth, non-immune hydrops fetalis, or congenital syphilis in the newborn.

Diagnosis is made by positive serology, preferably with on-site rapid testing.

The Rapid Plasmin Reagin (RPR) is one of the serological tests that measure disease activity, but is not specific for syphilis. False RPR positive reactions may occur, notably in patients with connective tissue disorders (false positive reactions are usually low titre < 1:8). For this reason, positive RPR results should be confirmed as due to syphilis by further testing of the serum with a specific treponemal test (if available), e.g.:
» *Treponema pallidum* haemagglutination assay (TPHA).

» *Treponema pallidum* particle agglutination assay (TPPA).
» *Treponema pallidum antibody* (TPAB).
» Fluorescent Treponemal Antibody (FTA) test.
» *Treponema pallidum* ELISA.
» Rapid treponemal antibody test.

Once positive, specific treponemal tests generally remain positive for life.

The RPR can be used:
» to determine if the patient's syphilis disease is active or not,
» to measure a successful response to therapy (at least a fourfold reduction in titre, e.g. 1:256 improving to 1:64), or
» to determine a new re-infection.

Some patients, even with successful treatment for syphilis, may retain life-long positive RPR results at low titres (≤ 1:8), which does not change by more than one dilution difference over time (so-called serofast patients).

All pregnant women should have a syphilis serology test at the first visit.
Women who booked in the first trimester and tested negative should have a repeat test done at 32 weeks gestation.

GENERAL MEASURES

» Encourage partner notification and treatment.
» Provide counselling and promote HIV testing.
» Educate on treatment adherence.
» Promote condom use.

MEDICINE TREATMENT

Pregnant woman

- Benzathine benzylpenicillin, IM, 2.4 MU weekly for 3 weeks.
  - Reconstitute with 6 mL of lidocaine1% without epinephrine (adrenaline).
  - Follow up at 3 months after the last injection to confirm a fourfold (i.e. 2 dilution) reduction in RPR titres, provided the initial titre was ≥ 1:8. If initial titre < 1:8, further reductions may not occur (serofast reaction).

LOE:III[XV]

Penicillin allergy
Refer for penicillin desensitisation.

LOE:III[XVI]

Newborn baby

» Refer all symptomatic babies.
  – Hepatosplenomegaly.
  – Snuffles.
  – Jaundice.
  – Purpura.
  – Pseudoparesis.
  – Oedema.
  – Anaemia.
  – Desquamative rash (especially involving palms and soles).

» Asymptomatic, well baby:
  – Mother was not treated, or
  – If the mother has received < 3 doses of benzathine benzylpenicillin, or
  – If the mother delivers within 4 weeks of commencing treatment.

- Benzathine benzylpenicillin (depot formulation), IM, 50 000 units/kg as a single dose into the lateral thigh.

LOE:III[xvii]

CAUTION

Benzathine benzylpenicillin (depot formulation) must never be given intravenously.

REFERRAL

» Symptomatic babies of mothers with syphilis.
» Penicillin allergy in the pregnant woman.

6.3 PRETERM LABOUR (PTL) AND PRETERM PRELABOUR RUPTURE OF MEMBRANES (PPROM)

O60/ 042.9

6.3.1 PRETERM LABOUR (PTL)

O60

DESCRIPTION

Regular painful contractions: 3 per 10 minutes, occurring < 37 weeks of gestation.

GENERAL MEASURES

< 26 weeks

» Refer without tocolysis (medicines to inhibit uterine contractions).

26–34 weeks of gestation:

» Refer with initial tocolysis and corticosteroids.

>34 weeks gestation:

» Allow labour to continue at midwife obstetric unit.

MEDICINE TREATMENT

26–34 weeks gestation

- Betamethasone, IM, 12 mg two doses 24 hours apart.

Tocolysis:
Preload with:

- Sodium chloride 0.9%, IV, 200 mL.

THEN

- Nifedipine, oral, 20 mg as a single dose.
  - Follow with 10 mg after 30 minutes, if contractions persist.
  - Then 10 mg every 4 hours until patient is transferred.
  - Maximum duration: 24 hours.

LOE:III[xviii]

REFERRAL

All cases before 34 weeks.

6.3.2 PRETERM PRELABOUR RUPTURE OF MEMBRANES (PPROM)

042.9

DESCRIPTION

Rupture of the membranes before 37 weeks of gestation.
Confirmed with a sterile speculum examination demonstrating leakage of amniotic fluid.
If there is clinical uncertainty test for pH – liquor is alkaline.
Avoid digital vaginal examination.

MEDICINE TREATMENT

26–34 weeks gestation

- Betamethasone, IM, 12 mg two doses 24 hours apart.

REFERRAL

All cases.

6.4 PRELABOUR RUPTURE OF MEMBRANES AT TERM (PROM)

O75.9

DESCRIPTION

Rupture of membranes before the onset of labour at term (> 37 weeks).
A sterile speculum examination is required to visually confirm amniotic fluid draining through the cervical os.

GENERAL MEASURES

If PROM is followed by uterine contractions at > 34 weeks' gestation, allow labour to proceed.
If the woman does not develop uterine contractions within 12 hours of PROM, commence antibiotics and transfer for induction of labour.

MEDICINE TREATMENT

- Ampicillin IV, 1 g as a single dose.

AND

- Metronidazole oral, 400 mg as a single dose.

LOE:III[xix]

REFERRAL

» Suspected chorio-amnionitis (refer after starting antibiotics).
» Prolonged rupture of membranes (> 12 hours).

6.5 INTRAPARTUM CARE

O80.9

For the comprehensive management of women in labour refer to the most recent National Maternity Care Guidelines.

DESCRIPTION

Labour is divided into 4 stages:

» **First stage**
  – onset of regular uterine contractions at term to full dilatation of cervix.
» Second stage
  – full dilatation to delivery of the baby.
» Third stage
  – delivery of the baby to delivery of the placenta.
» Fourth stage
  – 1 hour post delivery of the placenta.

GENERAL MEASURES

» Encourage companion support.
» Ensure that the mother is adequately hydrated (can be done orally).
» Monitor progress of labour on partogram.

MEDICINE TREATMENT

First stage with cervical dilatation < 10 cm:

Analgesia:

- Pethidine, IM, 100 mg 4 hourly.

OR

Morphine, IM, 10 mg, 4 hourly (Doctor initiated).

OR *LOE:III*

Especially in advanced first stage of labour:

Nitrous oxide 50% mixed with oxygen 50%, given by mask.

AND

For nausea and sedation, if needed:

- Promethazine, IM, 25 mg 4 hourly.

Second stage

If episiotomy is needed, local anaesthetic:

- Lidocaine 1%.
  - Do not exceed 20 mL.

Fetal distress during labour

» Place the woman in the left lateral position.
- Salbutamol 0.5 mg/mL, IV, 250 mcg administered slowly over 2 minutes and refer.
» Reconstitute the tocolytic as follows:
  - Salbutamol 1 mL (0.5 mg/mL) added to 9 mL of water for injection, to make a 50 mcg/mL solution. Monitor pulse.
  - Inject 5 mL (250 mcg) over at least 2 minutes. Monitor pulse.
  - If pulse increases to more than 120 beats/minute, discontinue the injection.
  - Do not administer if mother has cardiac disease.

Prevention of post-partum haemorrhage (PPH):

» Check for twins.
- Oxytocin, IM, 10 units.
» Early cord clamping and cutting (wait one minute before clamping).

» Controlled cord traction of the placenta.

Treatment of PPH (blood loss > 500 mL within 24 hours of birth):

» The most common cause is an atonic uterus
» Bimanually compress the uterus to expel clots from vagina.
» Empty the bladder.
» Two intravenous lines (wide bore if possible).

- Oxytocin, IV, 20 units in 1 000 mL sodium chloride 0.9% infused at 250 mL/hour in one line.

LOE:III[xx]

As fluid replacement:

- Sodium chloride 0.9%, IV, infused as fast as possible in the 2nd line.

LOE:III[xxi]

If no response:

- Ergometrine, IM, 0.5 mg.

OR

Oxytocin/ergometrine, IM, 5 units/0.5 mg, 1 mL.

- Avoid ergometrine in hypertensive women and those with heart disease, unless haemorrhage is life threatening.
- Repeat after 10–15 minutes if no response to 1st dose, while arranging referral.

LOE:III[xxii]

Only in settings where oxytocin is not available:

- Misoprostol, sublingual, or rectal, 600 mcg as a single dose.

LOE:III[xxiii]

Rh-negative mother

Administer to Rh-negative mother, if baby is Rh-positive or baby's Rh group is unknown:

- Anti-D immunoglobulin, IM, 100 mcg, preferably within 72 hours but can be given up to 7 days after delivery.

Baby

See Section 6.5: Care of the neonate. Observe mother and neonate for 1–2 hours before transfer to the postnatal ward.

REFERRAL

» Prolonged labour according to charting on partogram.
» Post-partum haemorrhage.
» Retained placenta.
» Other complications of mother or baby.

6.6 CARE OF THE NEONATE

P39

6.6.1 ROUTINE CARE OF THE NEONATE

P39

GENERAL MEASURES

Immediately after birth:

» Check if the baby needs resuscitation:
Is the baby breathing?

Is the heart rate > 100?
Is the baby centrally pink?
If NO to any question, resuscitate immediately. See Section 6.6.3 Neonatal resuscitation.

Then
» Dry the baby with a warm towel immediately.
» If there are excess secretions, turn the baby onto the side. Avoid suctioning.
» Check and record the Apgar score:

Apgar score	0	1	2
Heart rate	Absent	< 100/min	> 100/min
Respiration	Absent	Slow or irregular	Good, crying
Muscle tone	Limp	Slight flexion	Active, moves
Response to stimulation	No response	Grimace	Vigorous cry
Colour	Blue or pale	Body pink, limbs blue	Pink all over

» Clamp the cord after the first few cries.
» Replace forceps with disposable clamp or sterile cord tie 3–4 cm from the abdomen.

Refer to a neonatal unit if the baby required resuscitation or if the Apgar score at 5 minutes is ≤ 7.

Check risk factors
» Membranes ruptured for > 18 hours.
» Mother diabetic.
» Smelly liquor or baby.
  – If any of the above, refer to a neonatal unit for observation and care.
» Mother HIV-infected.
  – Check the feeding choice. See Section 11.5: The HIV exposed infant.

Check baby from head totoe and the back
» Check the weight.
» Check the head circumference.
» Check for:
  – Central cyanosis.
  – Grunting.
  – Fast breathing.
  – Chest indrawing.
  – Floppy.
  – Less than normal movements.
  – Major congenital abnormality.
  – Weight (> 4 kg or < 2 kg)

If any of the above present, assess need for urgent care and refer to a neonatal unit.

Initiate bonding and feeding
» Place the baby on the mother's chest.
» Initiate breastfeeding.

Identify and record
» Formally identify the baby with the mother.
» Place a label with the mother's name and folder number, baby's sex, time and date of birth on the baby's wrist and ankle.
» After giving vitamin K and chloramphenicol eye ointment, give the baby back to the mother, unless there is a reason for the baby to be transferred to a neonatal unit.

MEDICINE TREATMENT

Bleeding prophylaxis

- Vitamin K, IM, 1 mg immediately after birth routinely.
  - Administer in the anterolateral aspect of the mid-thigh.

Neonatal conjunctivitis prophylaxis

- Chloramphenicol ophthalmic ointment 1%, applied routinely to each eye after birth.

Routine EPI immunisation:

- BCG vaccination, intradermal, once neonate is stable.
- Polio vaccine, oral, once neonate is stable.

No baby must be sent home without immunisation.

LOE:III[xxiv]

6.6.2 SICK NEONATE AND NEONATAL EMERGENCIES

P59

DESCRIPTION

Neonates can become ill very rapidly and signs of disease are often not readily appreciated unless specifically looked for. All of these conditions in neonates should be referred urgently.

The most common serious conditions are:

» septicaemia or infections
» respiratory conditions
» congenital abnormalities
» late effects of asphyxia

Possible serious bacterial infection or other severe abnormalities must be suspected when any of the following are found:

» convulsions
» fast breathing (> 60 breaths/minute)
» severe chest indrawing
» nasal flaring or grunting respiration
» bulging fontanelle
» umbilical redness extending to the skin and draining pus
» low or high temperature
» many or severe skin pustules
» swollen eyes with pus draining from eye
» lethargic or unconscious or less than normal movements
» shallow or slow breathing
» poor feeding
» diarrhoea (obvious)
» vomiting everything or bile-stained vomitus
» abdominal distension or passing blood per rectum
» pallor
» jaundice within the first 24 hours of life

GENERAL MEASURES

Keep the neonate warm, the axillary temperature should be 36.5–37^{o}C.

» This is best done by "Kangaroo Care" where the neonate is kept naked against the mother's skin between her breasts inside her clothing.
» Alternatively, use an incubator or heated cloths. Monitor temperature of baby once the temperature is normal.

MEDICINE TREATMENT

If baby's tongue and lips are blue:

- Oxygen, using nasal catheter at 2 L/minute.

If infection is suspected and jaundice has been excluded:

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose.**
  - Administer into the lateral thigh.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

Monitor blood glucose and exclude hypoglycaemia. If < 2.6 mmol/L and baby able to suckle or take orally:

» Breastfeed.

OR

- Dextrose 10%, oral.

If unable to take orally consider nasogastric tube feeding or IV infusion.

REFERRAL

Urgent

» All cases.
» All neonates with jaundice on the first day of life, with pallor or with poor feeding.
» All other neonates with increasing, deep or persistent (> 10 days) jaundice should be referred as soon as possible.

If possible, always send mother with the neonate as well as any clinical notes.

6.6.3 NEONATAL RESUSCITATION

P21.9

Be prepared
Be at the delivery
Check the equipment and emergency medicines

Ask 3 questions to evaluate the infant:

1. Is the baby breathing adequately and not just gasping?
2. Is the baby's heart rate (HR) > 100 beats/minute?
3. Is the baby centrally pink, i.e. no central cyanosis?

» If the answer to **all** 3 questions is **"yes**": The baby does not need resuscitation.
» If the answer to **any** of the questions is **"no**": The baby needs resuscitation.

Assess the baby using the above 3 questions every 30 seconds during resuscitation.
» If the baby is improving, then the interventions, e.g. bagging, can be stopped.
» Only if the baby is not responding or getting worse, is further intervention needed e.g. chest compressions (see algorithm).

Check that each step has been effectively applied before proceeding to the next step. The algorithm follows the assumption that the previous step was unsuccessful and the baby is deteriorating.

Use the lowest inspiratory oxygen concentration that alleviates central cyanosis. Obtain target pulse oximetry readings, if pulse oximeter is available, and restore a heart rate > 100 beats/minute. (There is evidence that routine resuscitation with 100% oxygen is potentially harmful to the baby).

An unsatisfactory response to resuscitation includes:
» A sustained slow heart rate, usually ≤ 60 beats/minute or a progressive decrease in heart rate until cardiac arrest occurs.
» Episodes of cardiac arrest, with a progressively weaker response to chest compressions, positive pressure ventilation and medicines.
» A decreasing blood pressure, increasing acidosis, severe hypotonia with central cyanosis or intense pallor.
» Apnoea or weak, irregular and inefficient respiratory efforts.

If the baby's response to resuscitation is inadequate once the ventilation and circulation are adequately supported, then the following steps should be carried out:

<u>If the mother is known or suspected to have had narcotic pain relief and the baby has normal heart rate and colour response to bag-mask ventilation, but has not initiated sustained regular respiratory effort:</u>

- Naloxone, IV, 0.1 mg/kg.

Check the blood glucose of the baby.
<u>If hypoglycaemia is present:</u>

- Glucose (dextrose) 10%, IV, 2.5–5 mL/kg.

If no adequate response has occurred by this stage, a person skilled in neonatal resuscitation should be consulted and the baby transferred with ongoing resuscitation to a higher level of care:

Discontinue resuscitation if the unsatisfactory response to resuscitation persists for > 20 minutes and underlying conditions e.g. pneumothorax, diaphragmatic hernia has been excluded or > 10 minutes of unresponsive cardiac arrest (asystole) and/or > 20 minutes of unsustained respiration.

Babies requiring minimal resuscitation with prompt and complete response may be watched with their mothers. Babies with a favourable response to resuscitation should be referred to a neonatal high or intensive care unit, if available, for post resuscitation care. Babies, who, after resuscitation, are not completely normal, should be referred to a higher level for care using transport with necessary support, e.g. oxygen and temperature control.

Medicines used during neonatal resuscitation

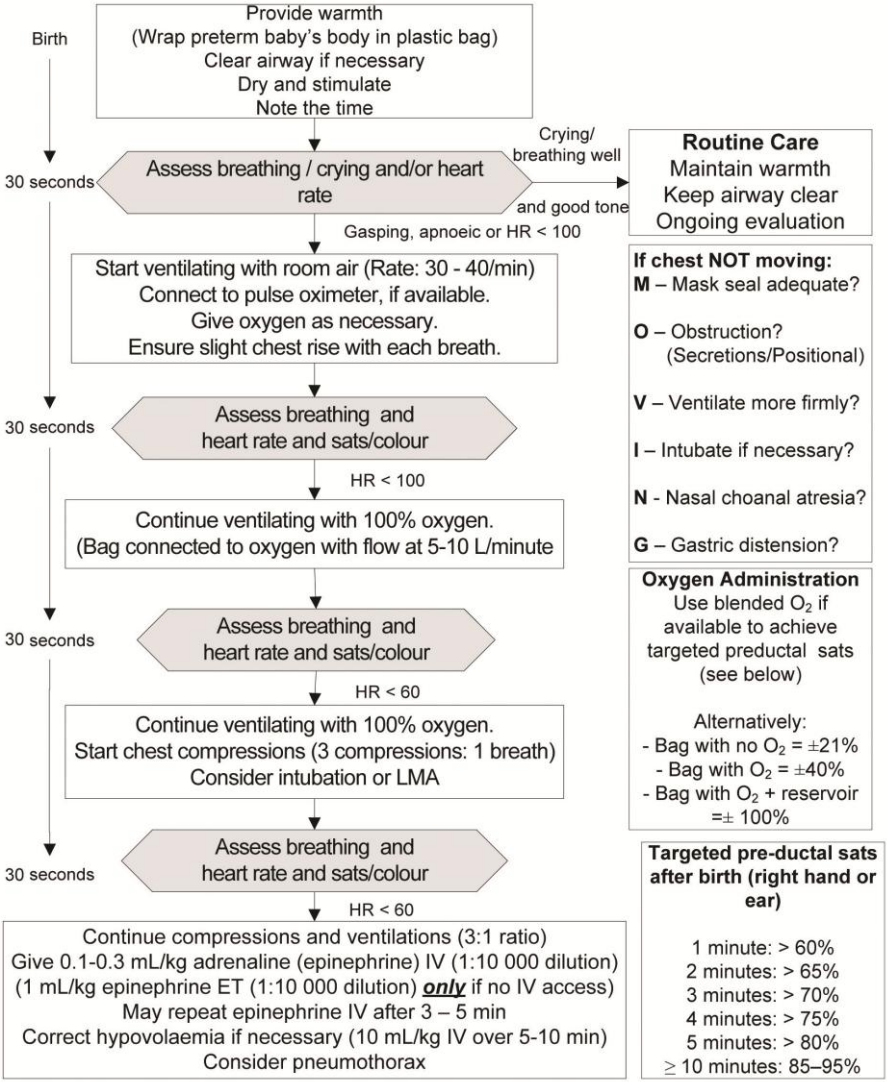
Medicine and dose	Indications	Effect
• Epinephrine (Adrenaline). ○ 0.1 mL/kg of a 1:10 000 dilutionIV, (0.01 mg/kg/dose). ○ *ET, up to 1 mL/kg of a 1:10 000 dilution (0.1 mg/kg/dose).	» Asystole. » Heart rate <60/minute.	» ↑Heart rate. » ↑Myocardial contractility. » ↑Arterial pressure.
• Naloxone ○ IV/IM, 0.1 mg/kg ○ May need repeating after 2 hours.	» Maternal administration of opiates with apnoeic infant.	» Corrects apnoea and/or hypoventilation.
• Dextrose. ○ IV, 2.5–5 mL/kg of 10% dextrose water (250–500 mg/kg) ○ 10% solution: draw up 4 mL of 50% dextrose water into a 20 mL syringe then draw up 16 mL water for injection – mix by agitating the syringe.	» Hypoglycaemia (usually only occurs after acute resuscitation).	» Corrects hypoglycaemia.
• Fluid for volume expansion. • IV, sodium chloride 0.9%, 10–20mL/kg, slow IV (5–10 minutes).	» Hypovolaemia (usually history of blood loss, child pale shocked with poor pulses and perfusion).	» ↑Blood Pressure and improve tissue perfusion.

*ET = Endotracheal tube

LOE:III[xxv]

Newborn Resuscitation Algorithm

The algorithm follows the assumption that the previous step was unsuccessful and the newborn is deteriorating)



Published with kind permission from the Resuscitation Council of Southern Africa.
www.reuscitationcouncil.co.za

6.6.4 CARE OF THE HIV-EXPOSED INFANT

098.7

See Section 11.4: The HIV exposed infant.

6.7 POST PARTUM CARE

Z39.2

6.7.1 CRACKED NIPPLES DURING BREASTFEEDING

O92.1

DESCRIPTION

The areola and nipple are protected by the secretion of a lubricant from Montgomery's glands. Cracked nipples may lead to infection and mastitis.

Causes of cracked nipples include:

» poor positioning of the baby and incorrect attachment to the breast
» removing the baby from the breast before suction is broken

The four signs of good attachment are:

» chin touching breast (or very close)
» mouth wide open
» lower lip turned outward
» more areola visible above than below the mouth

GENERAL MEASURES

» Apply expressed breast milk to the nipples between feeds and air dry.
» If too painful, express the milk and nurse the baby on the other breast until improvement.
» Keep areola and nipple clean and dry.
» Avoid use of soap, creams and lotions on the nipples.

MEDICINE TREATMENT

- Zinc and castor oil ointment
  - Apply between feeds.

LOE:III

If oral thrush is present, treat neonate with:

- Nystatin solution. See Section 1.2: Candidiasis, oral (thrush).

LOE:III[xxvi]

REFERRAL

No improvement after 2 days.

6.7.2 MASTITIS

O91.23

DESCRIPTION

Inflammation of the breast tissue surrounding the milk ducts.
Retrograde infection from a fissured nipple and milk stasis are known risk factors.

Commonly isolated pathogens include *S. aureus* and *S. epidermidis*. Presentation includes painful breast(s), fever, erythema and malaise.

GENERAL MEASURES

Compresses.
Regular expressing of breast milk.
Do not stop breastfeeding, unless a breast abscess has developed.
If breast abscess present, refer for incision and drainage.

MEDICINE TREATMENT

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Penicillin allergy
- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

Pain:
- Paracetamol, oral, 1 g 6 hourly when required.

LOE:III

REFERRAL

Breast abscess.
No improvement after 2 days.

GYNAECOLOGY

6.8 PREGNANCY, ECTOPIC

O00.9

DESCRIPTION

Pregnancy outside the uterus, usually presenting with the combination of:
» amenorrhoea (missed menstrual period)
» sudden lower abdominal pain
» dizziness
» shock
» anaemia
» urine pregnancy test usually positive
» shoulder tip pain

Note: Consider ectopic pregnancy in young women, complaining of lower abdominal pain.

REFERRAL

» All suspected cases of ectopic pregnancy.
» Treat shock if indicated.

6.9 VAGINAL BLEEDING

N93.9

Note: Women should receive regular screening for cervical cancer after the age of 30 years. Any opportunity to perform screening should be taken; this includes taking pap smears during pregnancy.

6.9.1 ABNORMAL VAGINAL BLEEDING DURING FERTILE YEARS

N92.0

DESCRIPTION

Increased vaginal blood flow either in volume, duration and/or frequency, including menorrhagia or dysfunctional uterine bleeding.

GENERAL MEASURES

» Assess current contraceptives used.
» Exclude pregnancy complication or organic disease e.g. cervical cancer, fibroids.

MEDICINE TREATMENT

- Combined oral contraceptive pill (ethinylestradiol/levonorgestrel) for 3–6 months.
- Ibuprofen, oral, 400 mg 8 hourly with or after food as needed for 2–3 days.
  - Ibuprofen may reduce blood loss in menorrhagia associated with intrauterine device (IUD) or chronic salpingitis (See Chapter 12: Sexually transmitted infections).

If blood loss has been severe or there are signs of anaemia: *LOE:III*[xxvii]

- Ferrous sulphate compound BPC, oral, 170 mg 8 hourly with food.

OR

Ferrous fumarate, oral, 200 mg 8 hourly with food.

- Continue for 3 months after the Hb normalises in order to replenish body iron stores.
- Do not take iron tablets within 4 hours of taking calcium tablets.

REFERRAL

» No improvement.
» Girls < 12 years of age with vaginal bleeding before the development of their secondary sexual characteristics.
» For investigation of other causes such as:
  – sexual abuse
  – foreign bodies
  – tumours of the genital tract
» Severe anaemia.

6.9.2 BLEEDING, POST-MENOPAUSAL

N95.0

DESCRIPTION

Vaginal bleeding 6 months following the complete cessation of menstruation.
Note: If bleeding is profuse, stabilise before referral.

REFERRAL

All cases, to exclude underlying malignancy and other pathology.

6.10 DYSMENORRHOEA

N94.6

DESCRIPTION

Pain associated with menstrual cycles. In primary dysmenorrhoea there is no known cause. Secondary dysmenorrhoea usually has an organic cause.

GENERAL MEASURES

» Advise and reassure women with primary dysmenorrhoea about the nature of the condition.
» Encourage patient to carry on with normal everyday activities.

MEDICINE TREATMENT

- Ibuprofen, oral, 400 mg 8 hourly with or after food as needed for 2–3 days.

ADD

- Combined oral contraceptive pill, if symptoms still problematic, and if pregnancy is not planned.

Treat for pelvic infection when present.

REFERRAL

» Poor response to treatment.
» If an organic cause is suspected, e.g. fibroids.

6.11 HORMONE THERAPY (HT)

Z79.89

Indications:

Short term symptomatic relief for severe menopausal symptoms.
For menopausal women, treatment should be ≤ 5 years.

A risk-benefit assessment should be individualised in all patients.

Contra-indications include:

» endometrial cancer
» breast cancer
» thrombo-embolism
» porphyria cutaneatarda
» coronary heart disease
» women ≥ 60 years of age
» acute liver disease

MEDICINE TREATMENT (Doctor initiated)

Uterus present (no hysterectomy)

HT can be offered as sequentially opposed or continuous combined preparations. Continuous combined preparations are often preferred if the woman had her last menstrual period (menopause) over a year ago, as they will not usually cause bleeding then. For women who are still menstruating or have recently stopped, sequentially opposed preparations are preferred and will result in regular menstrual periods, whereas continuous combined may result in irregular bleeding.

Sequentially opposed therapy:

- Estradiol valerate, oral, 1–2 mg daily for 21 days.

ADD

- Cyproterone acetate, oral, 1 mg daily from day 12–21.

or

- Norethisterone acetate, oral, 1 mg daily from day 12–21.

or

- Medroxyprogesterone acetate, oral, 10 mg daily from day 12–21.
  - Followed by no therapy from day 22–28.

OR

- Conjugated equine estrogens, oral, 0.3–0.625 mg daily for 21 days.

ADD

- Medroxyprogesteroneacetate, oral, 5–10 mg daily from day 12–21.
  - Followed by no therapy from day 22–28.

Continuous combined therapy, e.g.:

- Conjugated equine estrogens, oral, 0.3–0.625 mg plus medroxyprogesterone acetate, oral, 2.5–5mg daily.

OR

Estradiol valerate, oral, 0.5–1 mg plus norethisterone acetate, oral, 0.5–1 mg daily.

Note: Start at the lowest possible dose to alleviate symptoms. The need to continue HT should be reviewed annually. A mammogram should be done at commencement of HT, and then once a year, if available. Abnormal vaginal bleeding requires specialist referral.

Women with no uterus (post-hysterectomy)

HT is given as estrogen only.

- Estradiol valerate, oral, 1–2 mg daily.

OR

Conjugated equine estrogens, oral, 0.3 mg daily up to a maximum of 1.25 mg daily.

LOE:III[xxviii]

REFERRAL

Annually, for re-evaluation.

6.12 ULCERS, VAGINAL

A60.9

See Chapter 12: Sexually transmitted infections.

6.13 VAGINAL DISCHARGE/LOWER ABDOMINAL PAIN IN WOMEN

A54.9/ N73.9

See Chapter 12: Sexually transmitted infections.

---

[i] Ceftriaxone: FDA safety alert: Ceftriaxone, 21 April 2009. Available at: http://www.fda.gov/Drugs/DrugSafety/PostmarketDrugSafetyInformationforPatientsandProviders/DrugSafetyInformationforHeathcareProfessionals/ucm084263.htm

[ii] Anti-D immunoglobulin: Adult Hospital level STG, 2012. http://www.health.gov.za/

[iii] Misoprostol: Adult Hospital level STG, 2012. http://www.health.gov.za/

[iv] Isoniazid: Rangaka MX, Boulle A, Wilkinson RJ *et al.* Randomized controlled trial of isoniazid preventive therapy in HIV-infected persons on antiretroviral therapy. THLBB03 - Oral Abstract Session.XIX International AIDS Conference, 2012. Available at: http://pag.aids2012.org/Abstracts.aspx?AID=21471

Isoniazid: National Department of Health, Antiretroviral Guidelines. http://www.health.gov.za/

Pyridoxine: National Department of Health, Antiretroviral Guidelines. http://www.health.gov.za/

Pyridoxine: Snider DE Jr. Pyridoxine supplementation during isoniazid therapy.*Tubercle.*1980 Dec;61(4):1916. http://www.ncbi.nlm.nih.gov/pubmed/6269259

Pyridoxine: Carlson HB, Anthony EM, Russell WF jr, MiddlebrookG. Prophylaxis of isoniazid neuropathy with pyridoxine.*N Engl J Med*. 1956 Jul 19;255(3):119-22.http://www.ncbi.nlm.nih.gov/pubmed/13334809

Pyridoxine: Zilber LA, Bajdakova ZL, Gardasjan AN, Konovalov NV, Bunina TL, Barabadze EM. The prevention and treatment of isoniazid toxicity in the therapy of pulmonary tuberculosis. 2. An assessment of the prophylactic effect of pyridoxine in low dosage. Bull World Health Organ. 1963;29:457-81.http://www.ncbi.nlm.nih.gov/pubmed/14099673

[v] Cotrimoxazole: National Department of Health, Antiretroviral Guidelines. http://www.health.gov.za/

[vi] Fluconazole: Lopez-Rangel E, Van Allen MI. Prenatal exposure to fluconazole: an identifiable dysmorphic phenotype. *Birth Defects Res A ClinMolTeratol*. 2005;73:919-23. http://www.ncbi.nlm.nih.gov/pubmed/16265639

Fluconazole: Pursley TJ, Blomquist IK, Abraham J, Andersen HF, Bartley JA. Fluconazole-induced congenital anomalies in three infants.*Clin Infect Dis*. 1996;22:336-40.http://www.ncbi.nlm.nih.gov/pubmed/8838193

Fluconazole: Lee BE, Feinberg M, Abraham JJ, Murthy AR. Congenital malformations in an infant born to a woman treated with fluconazole. *Pediatr Infect Dis J*. 1992;11:1062-4.http://www.ncbi.nlm.nih.gov/pubmed/1461702

Fluconzaole: Aleck KA, Bartley DL. Multiple malformation syndrome following fluconazole use in pregnancy: report of an additional patient. *Am J Med Genet*. 1997;72:253-6.http://www.ncbi.nlm.nih.gov/pubmed/9332650

Fluconazole: Mølgaard-Nielsen D, Pasternak B, Hviid A. Oral fluconazole during pregnancy and risk of birth defects. *N Engl J Med*. 2013 Nov 21;369(21):2061-2.http://www.ncbi.nlm.nih.gov/pubmed/24256388

Fluconazole: National Department of Health, Antiretroviral Guidelines. http://www.health.gov.za/

[vii] Tenofovir: National Department of Health, Antiretroviral Guidelines. http://www.health.gov.za/

Emtricitabine: National Department of Health, Antiretroviral Guidelines. http://www.health.gov.za/

Efavirenaz: National Department of Health, Antiretroviral Guidelines. http://www.health.gov.za/

[viii] Efavirenz: National Department of Health, Antiretroviral Guidelines. http://www.health.gov.za/

Lopinavir/ ritonavir: National Department of Health, Antiretroviral Guidelines. http://www.health.gov.za/

[ix] Nevirapine: National Department of Health, Antiretroviral Guidelines. http://www.health.gov.za/

Zidovudine: National Department of Health, Antiretroviral Guidelines. http://www.health.gov.za/

Tenofovir and Emtricitabine: National Department of Health, Antiretroviral Guidelines. http://www.health.gov.za/

[x] Breastfeeding: National Department of Health, Antiretroviral Guidelines. http://www.health.gov.za/

[xi] Methyldopa: SAMF, 10th edition, 2012.

Methyldopa:National Department of Health, Republic of South Africa. 2014. Guidelines for Maternity care in South Africa, 4th edition. http://www.health.gov.za/

[xii] Nifedipine: Adult Hospital level STG, 2012. http://www.health.gov.za/

[xiii] Calcium: Adult Hospital level STG, 2012. http://www.health.gov.za/

Calcium: Hofmeyr GJ, Lawrie TA, Atallah AN, Duley L, Torloni MR. Calcium supplementation during pregnancy for preventing hypertensive disorders and related problems. *Cochrane Database Syst Rev*. 2014 Jun 24;6:CD001059.http://www.ncbi.nlm.nih.gov/pubmed/24960615

Calcium: WHO. WHO recommendations for prevention and treatment of pre-eclampsia and eclampsia, 2011. http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/9789241548335/en/

Aspirin: Adult Hospital level STG, 2012. http://www.health.gov.za/

Aspirin: Coomarasamy A, Honest H, Papaioannou S, Gee H, Khan KS. Aspirin for prevention of preeclampsia in women with historical risk factors: a systematic review. Obstet Gynecol. 2003 Jun;101(6):1319-32. http://www.ncbi.nlm.nih.gov/pubmed/12798543

[xiv] Methyldopa: Adult Hospital level STG, 2012. http://www.health.gov.za/
Methyldopa:National Department of Health, Republic of South Africa. 2014. Guidelines for Maternity care in South Africa, 4th edition. http://www.health.gov.za/
[xv]Benzathine benzylpenicillin: Section 4.9 Rheumatic fever, acute. PHC STG, 2014.
Lidocaine 1%: Section 4.9 Rheumatic fever, acute. PHC STG, 2014.
[xvi]Penicillin desensitisation:Adult Hospital level STG, 2012. http://www.health.gov.za/
[xvii]Benzathine benzylpenicillin: CDC Sexually transmitted infections guidelines, 2010. http://www.cdc.gov/std/treatment/2010/
Benzathine benzylpenicillin: Berman. Maternal syphilis: pathophysiology and treatment. *Bulletin of the World Health Organization*, 2004;82:433-438. http://www.who.int/bulletin/volumes/82/6/433.pdf
Benzathine benzylpenicillin: Centers for Disease Control and Prevention. Sexually Transmitted Diseases Treatment Guidelines, 2010. MMWR 2010;59(RR-12):1-110. http://www.cdc.gov/std/treatment/2010/std-treatment-2010-rr5912.pdf
[xviii] Nifedipine: Adult Hospital level STG, 2012. http://www.health.gov.za/
[xix] Ampicillin: Adult Hospital level STG, 2012. http://www.health.gov.za/
Metronidazole: Adult Hospital level STG, 2012. http://www.health.gov.za/
[xx] Oxytocin: Adult Hospital level STG, 2012. http://www.health.gov.za/
Oxytocin:Tunçalp Ö, Hofmeyr GJ, Gülmezoglu AM. Prostaglandins for preventing postpartum haemorrhage.*Cochrane Database of Systematic Reviews* 2012, Issue 8. Art. No.: CD000494.http://www.ncbi.nlm.nih.gov/pubmed/22895917
[xxi]Sodium chloride 0.9%: Essential Steps in Managing Obstetric Emergencies (ESMOE), facilitator's guide.
[xxii]Ergometrine: Adult Hospital level STG, 2012. http://www.health.gov.za/
[xxiii]Misoprostol: Essential Steps in Managing Obstetric Emergencies (ESMOE), facilitator's guide.
Misoprostol: Hofmeyr GJ et al. Misoprostol to prevent and treat postpartum haemorrhage: a systematic review and meta-analysis of maternal deaths and dose-related effects. *Bulletin of the World Health Organization* 2009;87:666-677. http://www.ncbi.nlm.nih.gov/pubmed/19784446
Misoprostol: Department of Health, Republic of South Africa. 2014. Guidelines for Maternity care in South Africa, 4th edition.. http://www.health.gov.za/
Misoprostol: International Federation Of Gynecology And Obstetrics. Treatment of postpartum hemorrhage with misoprostol. Int J Gynaecol Obstet. 2012 Dec;119(3):215-6. http://www.ncbi.nlm.nih.gov/pubmed/23036964
[xxiv]Routine care of the neonate: Updated South African Handbook of Resuscitation of the Newborn under the auspices of the South African Paediatric Association.
[xxv]Neonatal resuscitation: Updated South African Handbook of Resuscitation of the Newborn under the auspices of the South African Paediatric Association.
Neonatal resuscitation: Resuscitation Council: Algorithm for newborn resuscitation, 2012. http://www.resuscitationcouncil.co.za/newborn-resuscitation-algorithm
[xxvi]Nystatin: Section 1.2: Candidiasis, oral (thrush). PHC STG, 2014.
[xxvii]Ibuprofen:Adult Hospital level STG, 2012. http://www.health.gov.za/
[xxviii]Estradiol valerate: Adult Hospital level STG, 2012. http://www.health.gov.za/
Conjugated equine estrogens: Adult Hospital level STG, 2012. http://www.health.gov.za/

Chapter 7: Family planning

INTRODUCTION TO CONTRACEPTION

Consult the most recent National Contraception Clinical Guidelines.
The appropriate choice of family planning method should be decided on by the woman in consultation with the health care professional taking into consideration safety, efficacy, acceptability and access. A complete medical and sexual history must be obtained and an appropriate physical examination performed to identify potential risks to the individual's health.
Exclude pregnancy before commencing contraception.

Contraceptive methods

CAUTION

Hormonal contraception and IUDs do not prevent sexually transmitted infections (STIs), including HIV. Dual contraception use i.e. the use of a condom in combination with another contraceptive method is recommended to reduce the risk of STIs, including HIV. IUDs are the preferred primary contraceptive method.

Contraceptive method	Advantages	Disadvantages
Copper IUD (see Section 7.1)	» Can be used in most women, including nulliparous women. » Provides long-term protection i.e. 10 years. » Convenient, does not require regular follow up. » Works immediately on insertion. » Fertility returns on removal of IUD in women of child-bearing age. » Medicine interactions do not lower contraceptive effect.	» Pain during and following insertion of IUD. » IUD must be inserted or removed by a trained health care professional. » Not indicated in women with dysmenorrhea and abnormal uterine bleeding.
Hormonal subdermal: progestin-only implant (see Section 7.2.1)	» Provides long-term protection i.e. 3 years (etonogestrel) or 5 years (levonorgestrel). » Convenient, does not require regular follow up. » Fertility returns on removal of implant in women of child-bearing age. » Can be used in women >35 years who are obese, who smoke, have diabetes, hypertension, or a history of	» Frequent bleeding irregularities. » Ovarian cysts » Implant must be inserted or removed by a trained health care professional under aseptic conditions to prevent infection. » An incision is required to insert the implant under the skin in the woman’s upper arm.

	venous thromboembolism.	This may result in complications such as pain and bruising.
Hormonal injectable: progestin-only (see Section 7.2.2)	» Daily patient adherence is not required. » Long-acting i.e. given every 12 weeks. » Interactions with other medicines do not lower contraceptive effect. » Can be used postpartum. » Can be used in women >35 years who are obese, who smoke, have diabetes, hypertension, or a history of venous thromboembolism.	» Delayed return of fertility, of up to ≥ 9 months, after last injection. » Weight gain in some women. » Headaches.
Hormonal oral: progestin-only (see Section 7.2.3)	» Fertility returns 1-3 months on discontinuing the pill. » Can be used postpartum. » Can be used in women >35 years who are obese, who smoke, have diabetes, hypertension, or a history of venous thromboembolism.	» Daily adherence is required. » Interactions with other medicines can lower contraceptive effect. » Lower efficacy compared with COC. » Frequent bleeding irregularities. » Ovarian cysts.
Hormonal oral: combined oral contraceptive (COC) (see Section 7.2.3)	» Non-contraceptive benefits, e.g.: alleviation of dysmenorrhoea, premenstrual syndrome and menorrhagia. » Fertility returns 1–3 months of discontinuing COC. » Long-term use protects against ovarian, endometrial cancer and improves bone mineral density.	» Daily patient adherence is required. » Interactions with other medicines can lower contraceptive effect. » Cannot be used in women with heart disease, stroke and a history of active venous thromboembolism.
Barrier: male and female condoms (see Section 7.3)	» Protects against STIs, including HIV.	» Possibility of breakage or slipping off. » Possible allergic reaction to latex.

(Refer to the package inserts for detailed information). *LoE:III*[i]

Effectiveness of family planning methods

Rates of unintended pregnancies per 100 women:

Contraceptive method	**Failure rate in 1st year (%)**	
	Consistent and correct use	As commonly used
Copper IUD	0.6	0.8
Progestin-only subdermal implant	0.05	0.05
Progestin-only injectable	0.3	3
Progestin-only oral pill	0.3	8
Combined oral contraceptive (COC) pill	0.3	3
Barrier: female condoms	5	21
Barrier: male condoms	2	15
No method	85	85

Key: 0-0.9: very effective 10-25: moderately effective
1-9: effective 26-32: less effective

Patient counselling *LoE:III*[II]

» Women may experience abnormal bleeding including:
  - Breakthrough bleeding or spotting between menstrual cycles.
  - Painful, heavy or prolonged bleeding during the menstrual cycle.
  - Amenorrhoea.
» Hormonal oral pills must be taken at the same time every day without interruption.
» Taking the hormonal oral pill with food or at bedtime may alleviate nausea.
» If the patient is not using the dual contraception method with hormonal oral contraceptives and vomits within 2 hours or has severe diarrhoea within 12 hours of taking the hormonal oral pill, repeat the dose as soon as possible. Recommend the use of condoms.
» Women who have persistent vomiting or severe diarrhoea resulting in two or more missed pills follow instructions for missed pills. Recommend the use of condoms.
» Discourage smoking with the use of the combined oral contraceptive.
» Encourage increased physical activity and healthy eating if there is weight gain.

Breastfeeding

» Women who are intending to breastfeed should delay initiation of COCs until cessation of breastfeeding or at 6 months postpartum, whichever occurs earlier.

LoE:III[III]

7.1 INTRAUTERINE DEVICE/CONTRACEPTION (IUD)

Z30.1

Dual contraception with barrier methods, are preferred to reduce the risk of STIs. The IUD is an effective, safe, reversible long-term contraceptive method requiring minimal patient involvement, but is however under-utilised.

HIV infection is NOT a contra-indication to the use of IUD and may be the most suitable contraceptive for women on ARVs.

- **Copper IUD,** e.g.:
- Cu T380A, 380mm² copper device.

Devices with lower copper surface area are not recommended.

LoE:I[IV]

The IUD can be inserted any time during the menstrual cycle once pregnancy or the possibility of pregnancy has been excluded. Insertion at menstruation may be easier for the patient resulting in less discomfort and spotting.

Copper IUD is not recommended for women with menorrhagia, active pelvic inflammatory disease (PID) or uterine abnormalities.

LoE:III[V]

For pain after insertion:

- Ibuprofen, oral, 400 mg 8 hourly as needed for up to 5 days.

LoE:III

REFERRAL

» Excessive bleeding after insertion.
» Abnormal bleeding for > 3 months.

7.2 CONTRACEPTION, HORMONAL

7.2.1 SUBDERMAL IMPLANT

Z30.9

Dual contraception with barrier methods, are preferred to reduce the risk of STIs.
The subdermal implant is an effective, safe, reversible and convenient long-term contraceptive method requiring minimal patient involvement and no regular follow-up.

Progestin-only subdermal implant contraceptive, e.g.:

- Etonogestrel, subdermal, 68 mg, single-rod implant.

OR

Levonorgestrel, subdermal, 150 mg, two-rod implant.

LoE:I[VI]

The progestin-only subdermal implant can be inserted any time during the menstrual cycle, once pregnancy has been excluded. If the implant is inserted within 7 days of the onset of the menstrual cycle the contraceptive effect is achieved on the day of insertion.
Progestin-only hormonal contraceptives are contraindicated in certain conditions e.g. unexplained vaginal bleeding, active liver disease, and progestin-dependant tumours. Consult the package insert in this regard.

CAUTION

Do not use progestin-only subdermal implants in women on long term medicines that induce the metabolism of progestins, which could reduce contraceptive efficacy.

These medicines include efavirenz, nevirapine, rifampicin, phenytoin, carbamazepine and phenobarbital.

Women with implants on these medicines should be counseled to use additional contraceptive methods.

LoE:III[VII]

Insertion and removal procedures

» Participation in a training session is strongly recommended to become familiar with the use of the subdermal implants and techniques for insertion and removal.

» Only health care professionals familiar with these procedures should insert and remove subdermal implants under aseptic conditions.
» Insert the implant subdermally just under the skin.
» Refer to the package inserts, for detailed information.

Insertion of etonogestrel:
» Insertion should only be performed with the preloaded applicator.
» Clean the insertion site with an antiseptic solution.
» Anaesthetise the insertion area.
» Mark the insertion site with a marker.
» Insert subdermally at inner side of the non-dominant upper arm about 8–10 cm above the medial epicondyle of the humerus.
» Remove the transparent protection cap by sliding it horizontally in the direction of the arrow away from the needle.
» Puncture the skin with the tip of the needle angled about 30°.
» Lower the applicator to a horizontal position. While lifting the skin with the tip of the needle, slide the needle to its full length.
» While keeping the applicator in the same position and the needle inserted to its full length, unlock the purple slider by pushing it slightly down. Move the slider fully back until it stops.
» The implant is now in its final subdermal position. Remove the applicator.
» Always verify the presence of the implant in the patients arm immediately after insertion by palpation.
» Apply sterile gauze with a pressure bandage to minimise bruising. The patient may remove the pressure bandage in 24 hours and the small bandage over the insertion site after 3–5 days.

Insertion of levonorgestrel:
» Clean the insertion site with an antiseptic solution.
» Anaesthetise the insertion area.
» Mark the insertion site with a marker.
» Make an incision of 3 mm in the skin with the scalpel that is attached to the body protecting the inserter.
» Insert subdermally in the inner aspect of the upper left arm in right-handed women and in the right arm in left-handed women, approximately 8 cm above the fold in the elbow.
» Place the implants with the inserter subdermally, in the shape of a V opening towards the shoulder.
» After inserting the second implant, the edges of the incision are pressed together, closed with a skin closure and dressed.
» Advise the patient to keep the insertion area dry for 3 days.
» The gauze and the bandage may be removed as soon as the incision has healed, usually after 3–5 days.

For pain after insertion:
- Ibuprofen, oral, 400 mg 8 hourly as needed for up to 5 days.

LoE:III

Removal of progestin-only subdermal implants:
Remove etonogestrel implants at the end of 3 years and levonorgestrel implants at the end of 5 years.

» Locate the implant by palpation.
» Clean the removal site with an antiseptic solution.
» Anaesthetise the removal area.
» Make a 2–4 mm incision with the scalpel close to the end of the implant.
» Remove the implant very gently, using a small forceps.
» Close the incision and bandage.
» Advise the patient to keep the arm dry for a few days.
» Confirm that the entire implant has been removed by measuring its length.

REFERRAL

» Heavy or prolonged bleeding, despite treatment with COCs
» Infection at insertion site, inadequately responding to initial antibiotic treatment.

7.2.2 INJECTABLE

Z30.9

Dual contraception with barrier methods, are preferred to reduce the risk of STIs.

- **Progestin-only injectable contraceptive**, e.g.:
- Medroxyprogesterone acetate (long-acting), IM, 150 mg, 12 weekly.

LoE:I[VIII]

Progestin-only hormonal contraceptives are contraindicated in certain conditions e.g. unexplained vaginal bleeding. Consult the package insert in this regard.

When to start the injection

» The injection can be started anytime within the menstrual cycle but it is advisable to start during menses.
» If the first injection is given within 5 days of the onset of the menstrual cycle the contraceptive effect is achieved on the day of the first injection.
» Recommend dual contraceptive method i.e. condom in combination with the injection, irrespective of when the injection is started within the cycle.

Note: It is not necessary to shorten the dose interval when using rifampicin or any other enzyme inducing medicine.

Late injection

» If it has been < 2 weeks since the missed injection, the next injection can be given without loss of protection. Continue with dual contraceptive method i.e. condom in combination with the injection.
» If it has been > 2 weeks since the missed injection:
  - Exclude pregnancy.
  - If the patient is not pregnant, the next injection can be given. Recommend dual contraceptive method i.e. condom in combination with the injection.
  - If unable to exclude pregnancy consider emergency contraception if indicated. The next injection can be given. Recommend dual contraceptive method i.e. condom in combination with the injection.

For heavy or prolonged bleeding

- Give COCs for 3–6 months, thereafter refer.

LoE:III[ix]

For pain

- Ibuprofen, oral, 400 mg 8 hourly as needed for up to 5 days.

LoE:III[x]

REFERRAL

Heavy or prolonged bleeding despite treatment with combined oral contraceptives.

7.2.3 ORAL

Y42.4

Dual contraception with barrier methods, are preferred to reduce the risk of STIs.

Monophasic: progestin only pills

- Levonorgestrel, oral, 30 mcg daily.

Combination of estrogen and progestin in each pill

Monophasic preparations: combination of estrogen and progestin in each pill, e.g.:

- Ethinyloestradiol/ levonorgestrel, oral, 30 mcg/150 mcg:
  - 21 tablets ethinyloestradiol/levonorgestrel, 30 mcg/150 mcg and
  - 7 tablets placebo.

Triphasic preparations: combination of estrogen and progestin, e.g.:

- Ethinyloestradiol/levonorgestrel, oral:
  - 6 tablets ethinyloestradiol/levonorgestrel,30 mcg/50 mcg
  - 5 tablets ethinyloestradiol/levonorgestrel, 40 mcg/75 mcg and
  - 10 tablets ethinyloestradiol/levonorgestrel,30 mcg/125 mcg and
  - 7 tablets placebo.

	Progestin only	Combined estrogen/progestin
Contraindications	Progestin only preparations are contraindicated in certain conditions. (Consult the package insert in this regard). Contraindications include: » Abnormal uterine bleeding of unknown cause » Myocardial infarction or stroke » Liver disease » Cancer of the breast or genital tract » Known or suspected pregnancy	Combination preparations contraindicated in certain conditions. (Consult the package insert in this regard). Contraindications include: » Women >35 years of age who smoke ≥ 15 cigarettes a day or have risk factors for cardiovascular disease: - heart disease - liver disease - thromboembolism - certain cancers
When to start the pill	» Start anytime within the menstrual cycle, but it is advisable to start during menses.	

	» If the first pill is given between days 1 and 5 of the menstrual cycle the contraceptive effect is achieved immediately. » Dual contraception use is recommended irrespective of when the pill is started in the menstrual cycle.

Medicine interactions *LoE:III*[xi]

Enzyme-inducing medicines interacting with oral contraceptives		**Contraceptive effect (%)**	**Recommendation**
Therapeutic class	**Examples**		
Anti-tuberculosis	Rifampicin	Lowering of contraceptive effect expected. May reduce ethinyloestradiol (EE) by 66%.	Use dual contraception i.e. condoms in combination with COCs or, alternatively use IUD.
Anti-epileptics	Phenobarbital	Lowering of contraceptive effect expected. May reduce EE by 50%.	Use IUD or alternatively condoms in combination with oral contraceptives.
	Phenytoin	Lowering of contraceptive effect expected. May reduce EE by 50%.	Same as above.
	Carbamazepine	Lowering of contraceptive effect expected. May reduce EE by 66%.	Same as above.
Antiretrovirals	Nevirapine	Lowering of contraceptive effect expected. May reduce EE by 20%.	Use dual contraception i.e. condoms in combination with IUD or, alternatively use condoms in combination with COCs.
	Lopinavir/ ritonavir	Lowering of contraceptive effect expected. May reduce EE by 42%.	

<u>Non-liver enzyme inducing medicines</u> *LoE:III*[xii]

Lamotrigine:

» Lowering of contraceptive effect not expected.

» Oral contraceptives may reduce lamotrigine concentration by 50%, increasing the risk of seizures. Consider alternate dual contraception method.

Antibiotics: *LoE:III*[xiii]

» Possible lowering of contraceptive effect. For the duration of the current menstrual cycle, use a condom as well.

LoE:III[xiv]

REFERRAL
Abnormal bleeding for > 3 months.

7.2.4 MISSED PILLS

Progestin only pills
Efficacy is rapidly lost if one pill is forgotten or taken > 3 hours late. Recommend dual contraception for all scenarios.

Scenario	Action
One pill forgotten or if pill taken >3 hours late and unprotected sexual intercourse has not occurred in the past 5 days.	Take pill as soon as remembered and continue taking one pill daily at the same hour.
One pill forgotten or if taken > 3 hours late and unprotected sexual intercourse has occurred in the past 5 days.	Give emergency contraception (see Section 7.4). Take one pill the next day and continue taking one pill daily at the same hour.

LoE:III[xv]

Combination of progestin and estrogen in each pill
Missing active pills and extending hormone free interval leads to decreased contraceptive efficacy. Recommend dual contraception for all scenarios.

Scenario	Action
One active pill forgotten.	Take pill as soon as remembered and take next one at usual time.
≥ Two pills forgotten in the last 7 active pills of the pack.	Omit the inactive pill and immediately start the first active pill of the next pack.
≥ Two pills forgotten during the 1st 7 active pills of the pack and sexual intercourse has occurred.	Give emergency contraception (see Section 7.4). Restart active pills 12 hours later.

LoE:III[xvi]

7.3 CONTRACEPTION, BARRIER METHODS
Z30.9

Barrier methods are the optimum means to prevent STI and HIV transmission. Barrier methods are recommended in all individuals not in a long-term monogamous relationship or where either of the partners is known to have a STI, including HIV.

- Condoms, male and female in combination with IUD (see Section 7.1: Intrauterine contraception).

7.4 CONTRACEPTION, EMERGENCY
Z30.9

Emergency contraception is indicated for patients not using contraception or dual contraception with IUDs to prevent pregnancy after unprotected intercourse e.g.

forgotten tablets, slipped or broken condom, progestin-only injectable contraceptive given > 2 weeks late.

- **Progestin-only tablets**, e.g.:
- Levonorgestrel 1.5 mg, oral, as a single dose as soon as possible after unprotected intercourse.

CAUTION

Tablets must be taken as soon as possible, preferably within 72 hours of unprotected intercourse and not more than 5 days later.

OR

- Copper IUD, e.g.:
- Cu T 380A, within 5 days of unprotected intercourse.

LoE:I[xvii]

[i] NDoH, National Contraception Clinical Guidelines, 2012. Available at: http://www.health.gov.za/

[ii] Effectiveness of family planning methods:WHO. Family Planning: A Global Handbook for Providers. [Online: 2007][Cited: 2014].Available at: https://www.fphandbook.org/.

Effectiveness of family planning methods:Trussell J. Contraceptive efficacy. In: Hatcher R et al., editors. Contraceptive technology. 19th revised ed. 2007.

Effectiveness of family planning methods: Trussell J. Contraceptive failure in the United States. *Contraception*. 2004;70(2): 89–96. Available at: http://www.ncbi.nlm.nih.gov/pubmed/21477680

Effectiveness of family planning methods: Korver T, Klipping C, Heger-Mahn D, Duijkers I, van Osta G, Dieben T. Maintenance of ovulation inhibition with the 75-microg desogestrel-only contraceptive pill (Cerazette) after scheduled 12-h delays in tablet intake. *Contraception*. 2005 Jan;71(1):8-13. Available at: http://www.ncbi.nlm.nih.gov/pubmed/15639065

Effectiveness of family planning methods: Black A, Francoeur D, Rowe T, Collins J, Miller D, Brown T, David M, Dunn S, Fisher WA, Fleming N, Fortin CA, Guilbert E, Hanvey L, Lalonde A, Miller R, Morris M, O'Grady T, Pymar H, Smith T, Henneberg E; Society of Obstetrics and Gynaecology of Canada. Canadian contraception consensus. *J Obstet Gynaecol Can. 2004* Apr;26(4):347-87, 389-436. Available at: http://www.ncbi.nlm.nih.gov/pubmed/15115624

[iii] Breastfeeding: National Contraception Clinical Guidelines, 2012. Available at: Available at: http://www.health.gov.za/

Breastfeeding:Korver T, Klipping C, Heger-Mahn D, Duijkers I, van Osta G, Dieben T. Maintenance of ovulation inhibition with the 75-microg desogestrel-only contraceptive pill (Cerazette) after scheduled 12-h delays in tablet intake. *Contraception*. 2005 Jan;71(1):8-13. Available at: http://www.ncbi.nlm.nih.gov/pubmed/15639065

Breastfeeding: Simpson EL, Lawrenson RA, Nightingale AL, Farmer RD. Venous thromboembolism in pregnancy and the puerperium: incidence and additional risk factors from a London perinatal database. *BJOG*. 2001 Jan;108(1):56-60. Available at: http://www.ncbi.nlm.nih.gov/pubmed/11213005

[iv] Cu T380A: O'Brien PA, Kulier R, Helmerhorst FM, Usher-Patel M, d'Arcangues C. Copper-containing, framed intrauterine devices for contraception: a systematic review of randomized controlled trials. *Contraception*. 2008 May;77(5):318-27. Available at: http://www.ncbi.nlm.nih.gov/pubmed/18402846

[v] Cu T380A: SAMF 10th edition, 2012.

Cu T380A: Black A, Francoeur D, Rowe T, Collins J, Miller D, Brown T, David M, Dunn S, Fisher WA, Fleming N, Fortin CA, Guilbert E, Hanvey L, Lalonde A, Miller R, Morris M, O'Grady T, Pymar H, Smith T, Henneberg E; Society of Obstetrics and Gynaecology of Canada. Canadian contraception consensus. *J Obstet Gynaecol Can*. 2004 Apr;26(4):347-87, 389-436. http://www.ncbi.nlm.nih.gov/pubmed/15115624

Cu T380A: SMB corporation of India. Copper T 380A® package insert, 2003.

[vi] Subdermal implant: Power J, French R, Cowan F. Subdermal implantable contraceptives versus other forms of reversible contraceptives or other implants as effective methods of preventing pregnancy. *Cochrane Database Syst Rev*. 2007 Jul 18;(3):CD001326. http://www.ncbi.nlm.nih.gov/pubmed/17636668

[vii] Subdermal implant: Landolt NK, Phanuphak N, Ubolyam S, Pinyakorn S, Kerr S, Ahluwalia J, Thongpaeng P, Thammajaruk N, Cremers S, Thomas T, Chaithongwongwatthana S, Lange JM, Ananworanich J. Significant decrease of ethinylestradiol with nevirapine, and of etonogestrel with efavirenz in HIV-positive women. *J Acquir Immune DeficSyndr.* 2014 Jun 1;66(2):e50-2. http://www.ncbi.nlm.nih.gov/pubmed/24608892

Subdermal implant: Perry SH, Swamy P, Preidis GA, Mwanyumba A, Motsa N, Sarero HN. Implementing the Jadelle implant for women living with HIV in a resource-limited setting: concerns for drug interactions leading to unintended pregnancies. *AIDS*. 2014 Mar 13;28(5):791-3. http://www.ncbi.nlm.nih.gov/pubmed/24401645

[viii] Progestin-only injectables: Draper BH, Morroni C, Hoffman M, Smit J, Beksinska M, Hapgood J, Van der Merwe L. Depot medroxyprogesterone versus norethisterone oenanthate for long-acting progestogenic contraception. *Cochrane Database Syst Rev*. 2006 Jul 19;(3):CD005214. http://www.ncbi.nlm.nih.gov/pubmed/16856087

Progestin-only injectables: Smit J, Gray A, McFadyen L, Zuma K. Counting the costs: comparing depot medroxyprogesterone acetate and norethisterone oenanthate utilisation patterns in South Africa. *BMC Health Serv Res.* 2001;1:4. Epub 2001 Jun 4. http://www.ncbi.nlm.nih.gov/pubmed/11401729

Progestin-only injectables: WHO Medical Eligibility Criteria fourth edition 2009. http://www.who.int/reproductivehealth/publications/family_planning/9789241563888/en/

Morrison CS, Chen PL, Kwok C, Richardson BA, Chipato T, Mugerwa R, Byamugisha J, Padian N, Celentano DD, Salata RA. Hormonal contraception and HIV acquisition: reanalysis using marginal structural modeling. *AIDS*. 2010 Jul 17;24(11):1778-81. http://www.ncbi.nlm.nih.gov/pubmed/20588106

Progestin-only injectables: Baeten JM, Lavreys L, Overbaugh J. The influence of hormonal contraceptive use on HIV-1 transmission and disease progression. *Clin Infect Dis. 2007* Aug 1;45(3):360-9. http://www.ncbi.nlm.nih.gov/pubmed/17599316

Progestin-only injectables: Heffron R, Donnell D, Rees H, Celum C, Mugo N, Were E, de Bruyn G, Nakku-Joloba E, Ngure K, Kiarie J, Coombs RW, Baeten JM; Partners in Prevention HSV/HIV Transmission Study Team. Use of hormonal contraceptives and risk of HIV-1 transmission: a prospective cohort study. *Lancet Infect Dis*. 2012 Jan;12(1):19-26.. Erratum in: *Lancet Infect Dis*. 2012 Feb;12(2):98.: http://www.ncbi.nlm.nih.gov/pubmed/21975269

[ix] Progestin-only injectables, COCs: Adult Hospital level STG, 2012. Available at: http://www.health.gov.za/

Progestin-only injectables, COCs: Black A, Francoeur D, Rowe T, Collins J, Miller D, Brown T, David M, Dunn S, Fisher WA, Fleming N, Fortin CA, Guilbert E, Hanvey L, Lalonde A, Miller R, Morris M, O'Grady T, Pymar H, Smith T, Henneberg E; Society of Obstetrics and Gynaecology of Canada. Canadian contraception consensus. *J Obstet Gynaecol Can*. 2004 Apr;26(4):347-87, 389-436. http://www.ncbi.nlm.nih.gov/pubmed/15115624

[x] Progestin-only injectables, Ibuprofen: Adult Hospital level STG, 2012. Available at: http://www.health.gov.za/

Progestin-only injectables, Ibuprofen:Black A, Francoeur D, Rowe T, Collins J, Miller D, Brown T, David M, Dunn S, Fisher WA, Fleming N, Fortin CA, Guilbert E, Hanvey L, Lalonde A, Miller R, Morris M, O'Grady T, Pymar H, Smith T, Henneberg E; Society of Obstetrics and Gynaecology of Canada. Canadian contraception consensus. *J Obstet Gynaecol Can.* 2004 Apr;26(4):347-87, 389-436. http://www.ncbi.nlm.nih.gov/pubmed/15115624

[xi] Oral contraceptives:Black A, Francoeur D, Rowe T, Collins J, Miller D, Brown T, David M, Dunn S, Fisher WA, Fleming N, Fortin CA, Guilbert E, Hanvey L, Lalonde A, Miller R, Morris M, O'Grady T, Pymar H, Smith T, Henneberg E; Society of Obstetrics and Gynaecology of Canada. Canadian contraception consensus. *J Obstet Gynaecol Can.* 2004 Apr;26(4):347-87, 389-436. http://www.ncbi.nlm.nih.gov/pubmed/15115624

Oral contraceptives: SAMF 10th edition, 2012.

Oral contraceptives: WHO Medical Eligibility Criteria fourth edition 2009. Available at: http://www.who.int/reproductivehealth/publications/family_planning/9789241563888/en/

[xii] Oral contraceptives– medicine interactions: Faculty of Family Planning and Reproductive Health Care Clinical Effectiveness Unit. FFPRHC Guidance (April 2005). Drug interactions with hormonal contraception. *J Fam Plann Reprod Health Care*.2005 Apr;31(2):139-51. http://www.ncbi.nlm.nih.gov/pubmed/159215584

Oral contraceptives – medicine interactions: WHO Medical Eligibility Criteria fourth edition 2009. http://www.who.int/reproductivehealth/publications/family_planning/9789241563888/en/

Oral contraceptives – medicine interactions: SAMF 10th edition, 2012.

[xiii] Oral contraceptives– lamotrigine interaction: Faculty of Family Planning and Reproductive Health Care Clinical Effectiveness Unit. FFPRHC Guidance (April 2005). Drug interactions with hormonal contraception. *J Fam Plann Reprod Health Care*.2005 Apr;31(2):139-51. http://www.ncbi.nlm.nih.gov/pubmed/159215584

Oral contraceptives – lamotrigine interaction: WHO Medical Eligibility Criteria fourth edition 2009. Available at: http://www.who.int/reproductivehealth/publications/family_planning/9789241563888/en/

Oral contraceptives lamotrigine interaction: Sabers A, Buchholt JM, Uldall P, Hansen EL. Lamotrigine plasma levels reduced by oral contraceptives. *Epilepsy Res* 2001; 47: 151–154. http://www.ncbi.nlm.nih.gov/pubmed/11673029

[xiv] Oral contraceptives – antibiotic interaction: Black A, Francoeur D, Rowe T, Collins J, Miller D, Brown T, David M, Dunn S, Fisher WA, Fleming N, Fortin CA, Guilbert E, Hanvey L, Lalonde A, Miller R, Morris M, O'Grady T, Pymar H, Smith T, Henneberg E; Society of Obstetrics and Gynaecology of Canada. Canadian contraception consensus. *J Obstet Gynaecol Can.* 2004 Apr;26(4):347-87, 389-436. http://www.ncbi.nlm.nih.gov/pubmed/15115624

Oral contraceptives – antibiotic interaction: SAMF 10th edition, 2012.

Oral contraceptives – antibiotic interaction: WHO Medical Eligibility Criteria fourth edition 2009. http://www.who.int/reproductivehealth/publications/family_planning/9789241563888/en/

Oral contraceptives – antibiotic interaction:Neely JL, Abate M, Swinker M, D'Angio R. The effect of doxycycline on serum levels of ethinylestradiol, norethindrone, and endogenous progesterone. *Obstet Gynecol*. 1991 Mar;77(3):416-20. http://www.ncbi.nlm.nih.gov/pubmed/1992409

Oral contraceptives – antibiotic interaction :Faculty of Family Planning and Reproductive Health Care Clinical Effectiveness Unit. FFPRHC Guidance (April 2005). Drug interactions with hormonal contraception. *J Fam Plann Reprod Health Care*.2005 Apr;31(2):139-51. http://www.ncbi.nlm.nih.gov/pubmed/159215584

[xv] Missed pills – progestin only pills: Guilbert E, Black A, Dunn S, Senikas V, Bérubé J, Charbonneau L, Guilbert E, Leboeuf M, McConnery C, Gilbert A, Risi C, Roy G, Steben M, Wagner MS, Aggarwal A, Burnett M, Davis VJ, Fisher WA, Lamont JA, Levinsky E, MacKinnon K, McLeod NL, Pellizzari R, Wells T. Missed hormonal contraceptives: new recommendations. *J ObstetGynaecol Can.* 2008 Nov;30(11):1050-62, 1063-77. http://www.ncbi.nlm.nih.gov/pubmed/19126288

Missed pills – progestin only pills: SAMF 10th edition, 2012.

[xvi] Missed pills – oestrogen/progestin combination pills: Guilbert E, Black A, Dunn S, Senikas V, Bérubé J, Charbonneau L, Guilbert E, Leboeuf M, McConnery C, Gilbert A, Risi C, Roy G, Steben M, Wagner MS, Aggarwal A, Burnett M, Davis VJ, Fisher WA, Lamont JA, Levinsky E, MacKinnon K, McLeod NL, Pellizzari R, Wells T. Missed hormonal contraceptives: new recommendations. *J Obstet Gynaecol Can.* 2008 Nov;30(11):1050-62, 1063-77.: http://www.ncbi.nlm.nih.gov/pubmed/19126288

Missed pills – oestrogen/progestin combination pills: SAMF 10th edition, 2012.

[xvii] Emergency contraception: Levonorgestrel: Cheng L, Che Y, Gülmezoglu AM. Interventions for emergency contraception. Cochrane Database Syst Rev. 2012 Aug 15;8:CD001324. http://www.ncbi.nlm.nih.gov/pubmed/22895920

Emergency contraception: Copper IUD: Cheng L, Che Y, Gülmezoglu AM. Interventions for emergency contraception. Cochrane Database Syst Rev. 2012 Aug 15;8:CD001324. http://www.ncbi.nlm.nih.gov/pubmed/22895920

Chapter 8: Kidney and urological disorders

Kidney section

Urology section

KIDNEY SECTION

8.1 CHRONIC KIDNEY DISEASE (CKD)

N18.9

DESCRIPTION

Structural or functional kidney damage present for > 3 months, with or without a decreased glomerular filtration rate (eGFR).

Markers of kidney damage include:

» abnormalities in urine e.g. proteinuria or haematuria
» abnormalities in blood e.g. serum creatinine or low eGFR
» abnormalities in imaging tests e.g. small kidneys on ultrasound
» abnormalities on pathological specimens e.g. glomerular disease on renal biopsy

Common causes of chronic kidney disease include:

» hypertension
» diabetes mellitus
» glomerular diseases
» polycystic kidney disease
» HIV/AIDS

Chronic kidney disease can be entirely asymptomatic, BUT early detection and management can improve the outcome of this condition.

Treatment and prevention strategies according to stages

Estimation of the degree of kidney damage and staging is important to guide management and further prevent adverse outcomes of chronic kidney disease.

Note:

» Adults with early CKD i.e. stages 0–3 can all be managed at primary care level **once** the cause and plan for care has been established.
» All children should be referred for investigation and initial management.

Staging of kidney disease is essential for adequate management of CKD

CKD Stage. Glomerular filtration rate (mL/minute/1.73m^2)	**Description**	**Action** Includes actions from preceding stages
Stage 0 or eGFR > 90	At increased risk for CKD, e.g.: » diabetes mellitus » hypertension » glomerular disease » and HIV	» Screening for CKD and CVD disease » CKD risk reduction i.e. treat hypertension, diabetes and HIV
Stage 1 or eGFR > 90	Kidney damage with normal eGFR.	» Diagnose and treat comorbid conditions. » Slow progression. » CVD risk reduction. (Watch for stage 2).

Stage 2 or eGFR 60–89	Kidney damage with mild ↓ eGFR.	» Refer to determine cause and develop care plan. » While on the care plan, monitor the eGFR in these patients and ensure kidney function is not worsening rapidly. (Watch for stage 3).
Stage 3 or eGFR 30–59	Moderate ↓ eGFR.	Refer.
Stage 4 or eGFR 15–29	Severe ↓ eGFR.	Refer.
Stage 5 or eGFR < 15	Kidney failure requiring renal replacement therapy. End stage renal disease.	Refer.

Send blood annually for measurement of creatinine in all patients at increased risk. (eGFR will be calculated by the laboratory, based on the serum creatinine).

GENERAL MEASURES

» Reduce salt intake.
» Low protein diet is indicated in the presence of CKD stage 4 and 5.
» Reduce cardiovascular disease risk factors. See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.
» Avoid nephrotoxic medicines e.g. NSAIDs.
» Screen for proteinuria.
  – If urine dipstick 1+ or greater, repeat on a properly collected midstream urine specimen on another occasion. If proteinuria persists quantify protein with a spot urine protein creatinine ratio. Significant proteinuria = spot urine protein creatinine ratio of > 0.1 g/mmol.
  – **Note**: Proteinuria is screened for differently in diabetics. See Section 9.4.3: Diabetic nephropathy.

MEDICINE TREATMENT

Treat underlying conditions.

Proteinuria

Measure serum potassium at baseline.

Adults

- ACE-inhibitor, e.g.:
- Enalapril, oral, start with 5 mg 12 hourly.
  - Titrate up to 20 mg 12 hourly, if tolerated.
  - Start with low dosage of ACE-inhibitor and titrate up to the maximum dose or until the proteinuria disappears – whichever comes first. Ensure BP remains in normal range and no side effects are present.
  - Monitor creatinine and potassium:

  - 1–2 weeks after treatment initiation, if eGFR < 60 mL/min and after 4 weeks, if eGFR > 60 mL/min.
  - If creatinine increases by > 20% from the baseline, stop ACE-inhibitor and refer.
  - If stable, monitor thereafter at regular clinic visits.

» ACE-inhibitors are contraindicated in, amongst others: *LoE:III*[I]
  - hyperkalaemia
  - known hypersensitivity to an ACE-inhibitor or an ARB
  - bilateral renal artery stenosis
  - pregnancy
  - severe renal impairment (eGFR < 30 mL/min)

Hyperlipidaemia *LoE:III*[II]

If hyperlipidaemia is a co-existent risk factor, manage according to Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

Diabetes mellitus

» In diabetics, optimise control according to Section 9.2.2: Type 2 Diabetes mellitus, in adults.

» Replace oral sulphonylureas with insulin when eGFR < 60 mL/min, because of an increased risk of hypoglycaemia.

» Stop metformin when eGFR < 30 ml/min, because of the potential risk of lactic acidosis. *LoE:III*[III]

» Insulin is preferred to control blood glucose in patients with eGFR < 30 mL/min.

Hypertension

Treat if present. See Section 4.7: Hypertension.

Fluid overload

Treat fluid overload if present and refer.

Adults

- Furosemide, slow IV or oral, 40–80 mg, 12 hourly.
  - If poor response, repeat after 1 hour.
  - Do not give IV fluids – use heparin lock or similar IV access.

Children

- Furosemide, IV, 1 mg/kg, over 5 minutes. See doing table, pg 22.4
  - Do not put up a drip or run in any IV fluids.

Note: Exclude heart failure in patients with persistent pedal oedema.

REFERRAL

» All cases of suspected chronic kidney disease stages 3–5 for assessment and planning.

» All children.

» All cases of CKD with:
  - haematuria,
  - significant proteinuria with urine protein creatinine ratio of > 0.1 g/mmol

  - eGFR < 60 mL/min for initial assessment and planning
  - eGFR < 30 mL/min
» Uncontrolled hypertension/fluid overload.
» CKD associated with hyperlipidaemia.
» No resolution of proteinuria with ACE-inhibitor therapy.
» If ACE-inhibitor is contra-indicated.
» If ACE-inhibitor is not tolerated.

Patients who might qualify for dialysis and transplantation or who have complications should be referred early to ensure improved outcome and survival on dialysis, i.e. as soon as eGFR drops < 30 mL/min, or as soon as diagnosis is made/suspected.

8.2 ACUTE KIDNEY INJURY

N17.9

DESCRIPTION

This is (potentially) reversible kidney failure, commonly as a result of:

» hypovolaemia and fluid loss
» medicines/toxins
» urinary tract obstruction
» acute tubular necrosis
» acute glomerulonephritis

It is often recognised by:

» fluid overload (e.g. pulmonary oedema)
» decreased or no urine output
» abnormalities of serum urea, creatinine and/or electrolytes
» convulsions in children

GENERAL MEASURES

» Give oxygen, and nurse in semi-Fowlers' position if patient has respiratory distress. Early referral is essential.
» If fluid overloaded:
  - stop all IV fluids
» If dehydrated or shocked:
  - treat immediately as in shock section.
» Avoid any nephrotoxic medicines e.g. NSAIDs, aminoglycosides.

MEDICINE TREATMENT

Children

<6 years of age:	>120 mmHg systolic BP **or** >90 mmHg diastolic BP
6–15 years:	>130 mmHg systolic BP **or** >95 mmHg diastolic BP

- Nifedipine, oral, 0.25–0.5 mg/kg squirted into mouth.
  - Withdraw contents of 5 mg capsule with a 1 mL syringe:

10–25 kg:	2.5 mg
25–50 kg	5 mg
> 50 kg:	10 mg

If there is respiratory distress (rapid respiration, chest indrawing):

- Furosemide, IV, 1 mg/kg, over 5 minutes. See doing table, pg 22.4.
  - Do not put up a drip or run in any IV fluids.

Adults

If diastolic blood pressure > 110 mmHg or systolic blood pressure > 180 mmHg:

- Amlodipine, oral, 5 mg as a single dose

AND

- Hydrochlorothiazide, oral, 25 mg (if eGFR ≥ 30 mL/min)

OR

Furosemide, oral, 40–80 mg (if eGFR < 30 mL/min)

If there is respiratory distress (rapid respiration, orthopnoea):

- Furosemide, as an IV bolus, 80 mg.
  - Do not put up a drip **and do not** give a fluid infusion.

REFERRAL

All cases.

Where adequate laboratory and clinical resources exists, management according to the hospital level guidelines may be instituted.

8.3 GLOMERULAR DISEASES (GN)

N00–N08

DESCRIPTION

Glomerular disease may be a result of a primary condition of the kidney, or may be secondary to a systemic disorder. Can present with any, or a combination of the following:

» proteinuria
» reduced eGFR(and its effects)
» haematuria
» hypertension and oedema

Approach to care is outlined under the syndromes which follow.

Diabetic nephropathy

See Section 9.4.3 Diabetic nephropathy.

REFERRAL

» Unexplained haematuria on two to three consecutive visits.
» Proteinuria > 1 g/24 hours or PCR > 0.1 g/mmol.
» Nephritic syndrome.
» Nephrotic syndrome.
» Chronic Kidney Disease.

Note: Where facilities are available, investigation should be done e.g. urea, creatinine and electrolytes to calculate the eGFR or PCR.

8.3.1 NEPHRITIC SYNDROME

N00/N01/N03/N05

DESCRIPTION

Presents with a varied combination of:

» painless macroscopic turbid, bloody or brownish urine
» peripheral and periorbital oedema
» pulmonary oedema (circulatory overload)
» hypertension or hypertensive encephalopathy with impaired level of consciousness or convulsions
» little or no urine excretion

In children, this is commonly due to acute post streptococcal glomerulonephritis.

GENERAL MEASURES

» Give oxygen, and nurse in semi-Fowlers position if patient has respiratory distress.
» Early referral essential, especially if patient had a hypertensive episode or fluid overload.
» If dehydrated or shocked: Treat immediately. (See Section 21.17 Shock).

MEDICINE TREATMENT

Children

Fluid overload (rapid respiration, chest indrawing)

- Furosemide, IV, 1 mg/kg, over 5 minutes. See doing table, pg 22.4.
  - Do not put up a drip or run in any IV fluids.

If hypertension present:

<6 years of age:	> 120 mmHg systolic BP **or** > 90 mmHg diastolic BP
6–15 years:	> 130 mmHg systolic BP **or** > 95 mmHg diastolic BP

- Nifedipine, oral, 0.25–0.5 mg/kg squirted into mouth.
  - Withdraw contents of 5 mg capsule with a 1 mL syringe:

10–25 kg:	2.5 mg
25–50 kg:	5 mg
>50 kg:	10 mg

Adults

Fluid overload

- Furosemide, as an IV bolus, 80 mg.
  - Do not put up a drip **and do not** give a fluid infusion.

If hypertension present:

Diastolic BP > 100 mmHg or systolic BP is > 150 mmHg:

- Amlodipine, oral, 5 mg as a single dose.

AND

- Hydrochlorothiazide, oral, 25mg (if eGFR ≥ 30 mL/min).

OR

Furosemide, oral, 40–80mg (if eGFR < 30 mL/min).

REFERRAL

All cases.

The definitive treatment of nephritis depends on the cause – an assumption of acute post streptococcal nephritis or any other disease cannot be made without specific investigation which may include renal biopsy.

8.3.2 NEPHROTIC SYNDROME

N04

DESCRIPTION

Glomerular disease characterised by:

» severe proteinuria defined as:
  – children: ≥ 3 + proteinuria on dipstick test, or urine protein: creatinine ratio (PCR) ≥ 0.2 g/mmol on spot urine sample
  – adults: ≥ 2.5 g/day, as determined by a spot urine protein measurement, i.e. PCR > 0.25 g/mmol
» and resultant 'classic' clinical picture (not always present) which includes:
  – oedema and
  – hypoalbuminaemia and
  – hyperlipidaemia.

Accurate diagnosis requires a renal biopsy.

MEDICINE TREATMENT

The management of glomerular disease depends on the type/cause of the disease and is individualized, guided by a specialist according to the biopsy result.

REFERRAL

All cases.

8.4 URINARY TRACT INFECTION (UTI)

N39.0

DESCRIPTION

Urinary tract infections may involve the upper or lower urinary tract. Infections may be complicated or uncomplicated. Uncomplicated cystitis is a lower UTI in a non-pregnant woman of reproductive age and who has a normal urinary tract. All other UTIs should be regarded as complicated.

Differentiation of upper from lower urinary tract infection in young children is not possible on clinical grounds.

Upper UTI is a more serious condition and requires longer and sometimes intravenous treatment.

Features of upper UTI (pyelonephritis) that may be detected in adults and adolescents include:

» flank pain/tenderness
» temperature 38^{o}C or higher
» other features of sepsis, i.e.:
  – tachypnoea
  – tachycardia
  – confusion
  – hypotension

» vomiting

In complicated, recurrent or upper UTIs, urine should be sent for microscopy, culture and sensitivity.

Features of urinary tract infections in children

Signs and symptoms are related to the age of the child and are often non-specific.

Uncomplicated urinary tract infections may cause very few signs and symptoms.

Complicated infections may present with a wide range of signs and symptoms.

Neonates may present with:

» fever
» poor feeding
» vomiting
» failure to thrive
» hypothermia
» sepsis
» prolonged jaundice
» renal failure

Infants and children may present with:

» failure to thrive
» persisting fever
» abdominal pain
» diarrhoea
» frequency
» dysuria
» enuresis or urgency

In any child with fever of unknown origin, the urine must be examined, to assess whether a urinary tract infection is present.

If a bag specimen reveals the following, a urine specimen must be collected aseptically for culture and sensitivity:

» positive leukocytes or nitrites on dipsticks in freshly passed urine
» motile bacilli and increased leukocytes or leukocyte casts on urine microscopy

Urine dipstix should be performed on a fresh urine specimen.

» If leucocytes and nitrites are not present, a urinary tract infection is unlikely.
» If leucocytes are present on a second specimen, a urinary tract infection must be suspected.

GENERAL MEASURES

» Women with recurrent UTIs should be advised to:
  - void bladder after intercourse and before retiring at night
  - not postpone voiding when urge to micturate occurs
  - change from use of diaphragm to an alternative type of contraception

MEDICINE TREATMENT

Empirical treatment is indicated only if:

» positive leucocytes and nitrites on freshly passed urine, or
» leucocytes or nitrites with symptoms of UTI, or
» systemic signs and symptoms.

Alkalinising agents are not advised.

Uncomplicated cystitis

Adults

- Ciprofloxacin, oral, 500 mg 12 hourly for 3 days.

LoE:I^{IV}

Complicated cystitis

Adults

- Ciprofloxacin, oral, 500 mg 12 hourly for 7 days.

For pregnant women and adolescents:

- Amoxicillin/clavulanic acid 875/125 mg, oral, 1 tablet 12 hourly for 7 days.

LoE:III^{V}

Children ≤ 35 kg who do not meet criteria for urgent referral:

- Amoxicillin/clavulanic acid oral, 15–25 mg/kg/dose of amoxicillin component, 8 hourly for 7 days.

Weight kg	**Dose** mg (amoxicillin component)	**Use one of the following**			**Age** months/years
		Susp 125/31.5 mg/5 mL	Susp 250/62.5 mg/5 mL	Tablet 250/61.5 mg/tab	
>5–7 kg	100 mg	4 mL	2mL	–	>3–6 months
>7–9 kg	150 mg	6 mL	3 mL	–	>6–12 months
>9–11 kg	200 mg	8 mL	4 mL	–	>12–18 months
>11–14 kg	250 mg	10 mL	5 mL	1 tablet	>18 months–3 years
>14–17.5 kg	300 mg	12 mL	6 mL	–	>3–5 years
>17.5–25	375 mg	15 mL	7.5 mL	–	>5–7 years
>25–35 kg	500 mg	20 mL	10 mL	2 tablets	>7–11 years

LoE:III^{VI}

Children > 35 kg and adults who do not meet criteria for urgent referral:

- Amoxicillin clavulanic acid, oral, 875/125 mg, oral, 1 tablet 12 hourly for 5 days.

Acute pyelonephritis

Outpatient therapy is only indicated for women of reproductive age, who do not have any of the manifestations requiring referral (see referral criteria below). All other patients should be referred.

- Ciprofloxacin, oral, 500 mg 12 hourly for 7–10 days.
  - It is essential to give at least a 7 day course of therapy.

REFERRAL

Urgent

» Acute pyelonephritis with:
  - vomiting
  - sepsis
  - diabetes mellitus

» Acute pyelonephritis in:
  - pregnant women
  - women beyond reproductive age
  - men

» Children > 3 months of age who appear ill.
» Children < 3 months of age with any UTI.
» Pregnant women and adolescents allergic to penicillin.

Ill patients awaiting transfer

» Ensure adequate hydration with intravenous fluids.
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose.** See dosing tables, pg 22.2.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

Non-urgent

» All children for urinary tract investigations after completion of treatment.
» No response to treatment.
» UTI > 3 times within a one-year period in women, and > 1 time in men.
» Recurrent UTI in children for assessment and consideration of prophylaxis.

8.5 PROSTATITIS

N41.0

DESCRIPTION

Infection of the prostate caused by urinary or STI pathogens.
Clinical features include:

» perineal, sacral or suprapubic pain
» dysuria and frequency
» varying degrees of obstructive symptoms which may lead to urinary retention
» sometimes fever
» acutely tender prostate on rectal examination

The condition may be chronic, bacterial or non-bacterial, the latter usually being assessed when there is failure to respond to antibiotics.

MEDICINE TREATMENT

Acute bacterial prostatitis

In men ≤ 35 years of age or if there are features of associated urethritis (STI regimen):

- Ceftriaxone, IM, 250 mg as a single dose.

AND

- Macrolide, e.g.:
- Azithromycin, oral, 1 g as a single dose.

In men > 35 years of age or if there is associated cystitis:

- Ciprofloxacin, oral, 500 mg 12 hourly for 14 days.

REFERRAL

» No response to treatment.
» Urinary retention.
» High fever.
» Chronic/relapsing prostatitis.

UROLOGY SECTION

8.6 HAEMATURIA

R31

DESCRIPTION

Bleeding from the urinary tract, which can be from the kidneys, collecting system, bladder, prostate and urethra.
Glomerular disease is suggested if proteinuria, red blood cell casts and/or dysmorphic red blood cells are present on microscopy.
Exclude schistosomiasis (bilharzia), a common cause of haematuria.
When haematuria is accompanied by colicky pain a kidney stone should be excluded.
Note: The presence of blood on the urine test strips does not indicate infection and should be investigated as above.

MEDICINE TREATMENT

If evidence of schistosomiasis, treat as in Section 10.13: Schistosomiasis.
If symptoms of UTI; leucocytes and/or nitrite test positive in urine, treat as UTI.
If haematuria does not resolve rapidly after treatment referral for formal investigation will be required, i.e. next 48 hours.

REFERRAL

» All cases not associated with schistosomiasis or UTI.
» All cases not responding to specific medicine treatment.
» When glomerular disease is suspected.

8.7 BENIGN PROSTATIC HYPERPLASIA (BPH)

N40

DESCRIPTION

BPH is a noncancerous (benign) growth of the prostate gland.
May be associated with both obstructive (weak, intermittent stream and urinary hesitancy) and irritative (frequency, nocturia and urgency) voiding symptoms.
Digital rectal examination reveals a uniform enlargement of the prostate.
Urinary retention with a distended bladder may be present in the absence of severe symptoms, therefore it is important to palpate for an enlarged bladder during examination.

GENERAL MEASURES

Annual follow-up with digital rectal examination.
For patients presenting with urinary retention, insert a urethral catheter as a temporary measure while patient is transferred to hospital.
Remove medicines that prevent urinary outflow e.g. tricyclic antidepressants, neuroleptics.

REFERRAL

All patients with suspected BPH.

8.8 PROSTATE CANCER

D07.5

DESCRIPTION

Usually occurs in men > 50 years of age and is most often asymptomatic.
Systemic symptoms, i.e. weight loss, bone pain, etc. occurs in 20% of patients.
Obstructive voiding symptoms and urinary retention are uncommon.
The prostate gland is hard and may be nodular on digital rectal examination.
As the axial skeleton is the most common site of metastases, patients may present with back pain or pathological spinal fractures.
Lymph node metastases can lead to lower limb lymphoedema.

Serum prostate specific antigen (PSA) is generally elevated and may be markedly so in metastatic disease.

REFERRAL

All patients with suspected cancer.

8.9 ENURESIS

F98.0

DESCRIPTION

Enuresis is bedwetting that occurs in children > 5 years of age.
It is a benign condition which mostly resolves spontaneously.
It is important, however, to differentiate between nocturnal enuresis and daytime wetting with associated bladder dysfunction.
Secondary causes of enuresis include:

» diabetes mellitus
» urinary tract infection
» physical or emotional trauma

Note:

» Clinical evaluation should attempt to exclude the above conditions.
» Urine examination should be done on all patients.

GENERAL MEASURES

» Motivate, counsel and reassure child and parents.

» Advise against punishment and scolding.
» Spread fluid intake throughout the day.
» Diapers are not advised, as this will lower the child's self-esteem.

REFERRAL
» Suspected underlying systemic illness or chronic kidney disease.
» Persistent enuresis in a child > 8 years of age.
» Diurnal enuresis.

8.10 IMPOTENCE/ERECTILE DYSFUNCTION
N48.4/F52.2

DESCRIPTION
The inability to attain and maintain an erect penis with sufficient rigidity for penetration. Organic causes include neurogenic, vasculogenic, endocrinological (e.g. diabetes mellitus) as well as many systemic diseases and medications.

GENERAL MEASURES
» Thorough medical and psychosexual history.
» Physical examination should rule out gynaecomastia, testicular atrophy or penile abnormalities.
» Consider the removal of medicines that may be associated with the problem.
» A change in lifestyle or medications may resolve the problem, e.g. advise cessation of smoking and alcohol abuse.

TREATMENT
Treat the underlying condition.

8.11 RENAL CALCULI
N20.2

DESCRIPTION
This is a kidney stone or calculus which has formed in the renal tract i.e. pelvis, ureters or bladder as a result of urine which is supersaturated with respect to a stone-forming salt.
Clinical features of obstructing urinary stones may include:
» sudden onset of acute colic, localized to the flank, causing the patient to move constantly,
» nausea and vomiting,
» referred pain to the scrotum or labium on the same side as the stone moves down the ureter.
Urinalysis usually reveals microscopic or macroscopic haematuria.

GENERAL MEASURES
Ensure adequate hydration.

MEDICINE TREATMENT

Adults:

Analgesia for pain, if needed:

- Morphine 10 mg diluted with 10 mL of water for injection or sodium chloride 0.9%, slow IV (Doctor initiated).
  - Start with 5 mg; thereafter slowly increase by 1 mg/minute up to 10mg.
  - Can be repeated after 4–6 hours if necessary, for pain relief.
  - Beware of hypotension.

REFERRAL

All patients.

---

[i] ACE-inhibitor: Adult Hospital level STG, 2012. http://www.health.gov.za/

[ii] ACE-inhibitor: Adult Hospital level STG, 2012. http://www.health.gov.za/

[iii] Sulphonylureas: Primary healthcare level STG, 2014/5: Chapter 9 Endocrine conditions. http://www.health.gov.za/

[iv] Ciprofloxacin-uncomplicated cystitis: Zalmanovici Trestioreanu A, Green H, Paul M, Yaphe J, Leibovici L. Antimicrobial agents for treating uncomplicated urinary tract infection in women. *Cochrane Database Syst Rev.* 2010 Oct 6;(10):CD007182. http://www.ncbi.nlm.nih.gov/pubmed/20927755

[v] Amoxicillin/clavulanic acid – pregnant women and adolescents: Lewis DA, Gumede LY, van der Hoven LA, de Gita GN, de Kock EJ, de Lange T, Maseko V, Kekana V, Smuts FP, Perovic O. Antimicrobial susceptibility of organisms causing community-acquired urinary tract infections in Gauteng Province, South Africa. *S Afr Med J*. 2013 Mar 15;103(6):377-81. http://www.ncbi.nlm.nih.gov/pubmed/23725955

[vi] Amoxicillin/clavulanic acid – Children ≤ 35 kg: Bosch FJ, van Vuuren C, Joubert G. Antimicrobial resistance patterns in outpatient urinary tract infections--the constant need to revise prescribing habits. *S Afr Med J.* 2011 May;101(5):328-31. http://www.ncbi.nlm.nih.gov/pubmed/21837876

Amoxicillin/clavulanic acid – Children ≤ 35 kg: Zorc JJ, Kiddoo DA, Shaw KN. Diagnosis and management of pediatric urinary tract infections. *Clin Microbiol Rev.* 2005 Apr;18(2):417-22. http://www.ncbi.nlm.nih.gov/pubmed/15831830

Amoxicillin/clavulanic acid – Children ≤ 35 kg: Bamford C, Bonorchis K, Ryan A, Hoffmann R, Naicker P, Maloba M, Nana T, Zietsman I, Govind C. Antimicrobial susceptibility patterns of Escherichia coli strains isolated from urine samples in South Africa from 2007-2011. *South Afr J Epidemiol Infect* 2012;27(2):46-52. http://www.sajei.co.za/index.php/SAJEI/article/view/483

Amoxicillin/clavulanic acid – Children ≤ 35 kg: Lewis DA, Gumede LY, van der Hoven LA, de Gita GN, de Kock EJ, de Lange T, Maseko V, Kekana V, Smuts FP, Perovic O. Antimicrobial susceptibility of organisms causing community-acquired urinary tract infections in Gauteng Province, South Africa. *S Afr Med J*. 2013 Mar 15;103(6):377-81. http://www.ncbi.nlm.nih.gov/pubmed/23725955

Amoxicillin/clavulanic acid – Children ≤ 35 kg: Fitzgerald A, Mori R, Lakhanpaul M, Tullus K. Antibiotics for treating lower urinary tract infection in children. *Cochrane Database Syst Rev.* 2012 Aug 15;8:CD006857. http://www.ncbi.nlm.nih.gov/pubmed/22895956

Amoxicillin/clavulanic acid – Children ≤ 35 kg: Keren R, Chan E. A meta-analysis of randomized, controlled trials comparing short- and long-course antibiotic therapy for urinary tract infections in children. *Pediatrics.* 2002 May;109(5):E70-0. http://www.ncbi.nlm.nih.gov/pubmed/11986476

Amoxicillin/clavulanic acid – Children ≤ 35 kg: Downs SM. Technical report: urinary tract infections in febrile infants and young children. The Urinary Tract Subcommittee of the American Academy of Pediatrics Committee on Quality Improvement. *Pediatrics.* 1999 Apr;103(4):e54. http://www.ncbi.nlm.nih.gov/pubmed/10103346

Amoxicillin/clavulanic acid – Children ≤ 35 kg: American Academy of Pediatrics. Committee on Quality Improvement. Subcommittee on Urinary Tract Infection. *Pediatrics*. 1999 Apr;103(4 Pt 1):843-52. Erratum in: *Pediatrics* 1999 May;103(5 Pt 1):1052, 1999 Jul;104(1 Pt 1):118. 2000 Jan;105(1 Pt 1):141. http://www.ncbi.nlm.nih.gov/pubmed/10103321

Amoxicillin/clavulanic acid – Children ≤ 35 kg: Kennedy KM, Glynn LG, Dineen B. A survey of the management of urinary tract infection in children in primary care and comparison with the NICE guidelines. *BMC Fam Pract.* 2010 Jan 26;11:6. http://www.ncbi.nlm.nih.gov/pubmed/20102638

Amoxicillin/clavulanic acid – Children ≤ 35 kg: Shann F. Drug doses, 15th edition, 2010. Intensive Care Unit, Royal Children's Hospital, Parkville, Victoria 3052, Australia.

Amoxicillin/clavulanic acid – Children ≤ 35 kg: Triomed, RSA. Package insert for Augmaxcil®S, SF (Powder for suspension, suspension forte). 1997.

Amoxicillin/clavulanic acid – Children ≤ 35 kg: Montini G, Toffolo A, Zucchetta P, Dall'Amico R, Gobber D, Calderan A, Maschio F, Pavanello L, Molinari PP, Scorrano D, Zanchetta S, Cassar W, Brisotto P, Corsini A, Sartori S, Da Dalt L, Murer L, Zacchello G. Antibiotic treatment for pyelonephritis in children: multicentre randomised controlled non-inferiority trial. *BMJ.* 2007 Aug 25;335(7616):386. http://www.ncbi.nlm.nih.gov/pubmed/17611232

Chapter 9: Endocrine conditions

9.1 TYPE 1 DIABETES MELLITUS

E10.9

DESCRIPTION

Type 1 diabetes mellitus, previously known as juvenile onset diabetes mellitus and as insulin-dependent diabetes mellitus (IDDM) occurs because of a lack of insulin. The result is an increase in blood glucose concentration.

CLINICAL PRESENTATION

- » hunger
- » polyuria
- » ketoacidosis
- » thirst
- » unexplained weight loss
- » tiredness

DIAGNOSIS

Type 1 diabetes mellitus is diagnosed when the classic symptoms of polyuria and polydipsia are associated with hyperglycaemia:

- » Random plasma glucose $\geq$ 11.1 mmol/L
- » Random is defined as any time of day without regard to time since last meal

OR

- » Fasting plasma glucose $\geq$ 7.0 mmol/L
- » Fasting is defined as no caloric intake for ≥ 8 hours

GENERAL MEASURES

- » Lifestyle modification, including self-care practices.
- » Education regarding diabetes and its complications.
- » Even and regular meal consumption.
- » Dietary emphasis should be on regulating carbohydrate, fibre and fat intake (See Section 9.2.2 Type 2 Diabetes mellitus, in adults for recommended diet plan).
- » Increased physical activity, aim for 30 minutes 5 times a week.
- » Appropriate weight loss if weight exceeds ideal weight.
- » Education about foot care.
- » Monitor for development of depression.
- » All patients should wear a notification bracelet.

REFERRAL

All patients.

9.1.1 TYPE 1 DIABETES MELLITUS, IN CHILDREN AND ADOLESCENTS

E10.9

MEDICINE TREATMENT

Oral anti-diabetic medicines should not be used to treat children with type 1 diabetes mellitus.

REFERRAL

All children with confirmed or suspected type 1 diabetes mellitus should be referred to a

hospital immediately for management.

9.1.2 TYPE 1 DIABETES MELLITUS, IN ADULTS

E10.9

Type 1 diabetes mellitus is a rare condition and should be diagnosed and monitored at hospital level. Only stable patients may be down referred for chronic medicines.

MONITORING FOLLOWING DOWN REFERRAL

At every visit:

» Finger-prick blood glucose.
» Weight.
» Blood pressure.

Annually:

» HbA1c, one month before next hospital appointment.

Treatment targets

Parameter	Optimal	Acceptable	Additional action suggested
Finger-prick blood glucose values:			
– fasting (mmol/L)	4–7	<8	>8
– 2-hour post-prandial (mmol/L)	5–8	8–10	>10
Glycosylated haemoglobin (HbA1c) (%)	<7	7–8	>8
Blood pressure Systolic	<140 mmHg		
Diastolic	<90 mmHg		
			LoE:I

The increased risk of hypoglycaemia must always be weighed against the potential benefit of reducing microvascular and macrovascular complications.

MEDICINE TREATMENT

As type 1 diabetes mellitus usually presents with diabetic ketoacidosis, treatment is usually initiated with insulin and the patient is stabilised at hospital level. Oral anti-diabetic medicines should not be used to treat type 1 diabetics.

Insulin dose requirements will decrease as kidney disease progresses.

Types of insulin

- Insulin, short acting, SC, three times daily, 30 minutes before meals.
  - Regular human insulin.
  - Onset of action: 30 minutes.
  - Peak action: 2–5 hours.
  - Duration of action: 5–8 hours.
- Insulin, intermediate acting, SC, once or twice daily usually at night at bedtime, approximately 8 hours before breakfast.
  - Neutral Protamine Hagedorn (NPH) insulin.
  - Onset of action: 1–3 hours.

  - Peak action: 6–12 hours.
  - Duration of action: 16–24 hours.

- Insulin, biphasic, SC, once or twice daily.
  - Mixtures of regular human insulin and NPH insulin in different proportions, e.g. 30/70 (30% regular insulin and 70% NPH insulin).
  - Onset of action: 30 minutes.
  - Peak action: 2–12 hours.
  - Duration of action: 16–24 hours.

Insulin regimens

Basal bolus regimen

All type 1 diabetics should preferentially be managed with the "basal bolus regimen" i.e. combined intermediate-acting (basal) and short-acting insulin (bolus). This consists of pre-meal, short-acting insulin and bedtime intermediate-acting insulin not later than 22h00.

The initial total daily insulin dose:
  - 0.6 units/kg body weight.

The total dose is divided into:
  - 40–50% basal insulin
  - The rest as bolus insulin, split equally before each meal.

Adjust dose on an individual basis.

Pre-mixed insulin

Twice daily pre-mixed insulin, i.e. a mixture of intermediate- or short- acting insulin provides adequate control, when used with at least daily blood glucose monitoring. It is a practical option for patients who cannot monitor blood glucose frequently.

LoE:III[II]

Education related to insulin therapy

» Types of insulin.
» Injection technique and sites of injection.
» Insulin storage.
» Recognition and treatment of acute complications, e.g. hypoglycaemia and hyperglycaemia.
» Diet:
  – Meal frequency, as this varies according to the type and frequency of insulin, e.g. patients may need a snack at night, about 3–4 hours after the evening meal.
  – Consistent carbohydrate intake for patient receiving fixed mealtime doses of insulin.
» Self-monitoring of blood glucose and how to self-adjust insulin doses.

Drawing up insulin from vials

» Clean the top of the insulin bottle with an antiseptic swab.
» Draw air into the syringe to the number of marks of insulin required and inject this into the bottle; then draw the required dose of insulin into the syringe.

» Before withdrawing the needle from the insulin bottle, expel the air bubble if one has formed.

Injection technique
» The skin need not be specially cleaned.
» Repeated application of antiseptics hardens the skin.
» Stretching the skin at the injection site is the best way to obtain a painless injection. In thin people it may be necessary to pinch the skin between thumb and forefinger of one hand.
» The needle should be inserted briskly at almost 90 ° to the skin to almost its whole length (needles are usually 0.6–1.2 cm long).
» Inject the insulin.
» To avoid insulin leakage, wait 5–10 seconds before withdrawing the needle.
» Injection sites must be rotated to avoid lipohypertrophy.

Prefilled pens and cartridges
In visually impaired patients and arthritic patients, prefilled pens and cartridges may be used.

LoE:III

Home blood glucose monitoring
Patients on basal/bolus insulin should initially measure glucose at least twice daily. Once patient is stable, reduce the frequency of monitoring.

LoE:III[III]

REFERRAL
All type 1 diabetic patients.

9.2 TYPE 2 DIABETES MELLITUS

9.2.1 TYPE 2 DIABETES MELLITUS, IN ADOLESCENTS
E11.9

DESCRIPTION
The majority of adolescent diabetics are of type 1**.** However, an increasing number of adolescents are being diagnosed with type 2 diabetes mellitus.

Criteria for screening for diabetes in children
» Body mass index > 85th percentile for age and sex.
» Family history of type 2 diabetes mellitus.
» Presence of hyperlipidaemia, hypertension or polycystic ovarian syndrome.
AND
» Physical signs of puberty **or** age > 10 years of age.

DIAGNOSIS
» Symptoms of diabetes plus a random blood glucose ≥ 11.1 mmol/L.
  – Random is defined as any time of day without regard to time since last meal.
  - The classic symptoms of diabetes mellitus include polyphagia, polyuria and polydipsia.

» Fasting plasma glucose ≥ 7.0 mmol/L.
  – Fasting is defined as no caloric intake for ≥ 8 hours.

It is difficult to distinguish type 2 from type 1 diabetes mellitus, as many type 1 diabetics may be overweight, or have a family history of type 2 diabetes mellitus, given the increasing prevalence of both obesity and type 2 diabetes mellitus. The diagnosis of type 2 diabetes mellitus in adolescents should be made in consultation with a specialist.

REFERRAL
All.

9.2.2 TYPE 2 DIABETES MELLITUS, ADULTS
E11.9

DESCRIPTION
Type 2 diabetes mellitus is a chronic debilitating metabolic disease characterised by hyperglycaemia with serious acute and chronic complications. It is an important component of the metabolic syndrome (see Section 9.5.1: Obesity in diabetes).
Most adults with type 2 diabetes mellitus are overweight with a high waist to hip ratio.
In adults the condition might be diagnosed only when presenting with complications, e.g.:

» ischaemic heart disease
» peripheral artery disease
» stroke
» deteriorating eyesight
» foot ulcers
» erectile dysfunction

CLINICAL PRESENTATION
Symptoms of hyperglycaemia are:
» thirst, especially noticed at night
» polyuria
» tiredness
» periodic changes in vision due to fluctuations in blood glucose concentration
» susceptibility to infections, especially of the urinary tract, respiratory tract and skin

Note: It is important to distinguish type 2 diabetes mellitus from type 1 diabetes mellitus. Suspect type 1 diabetes mellitus among younger patients with excessive weight loss and/or ketoacidosis.

DIAGNOSIS
» Symptoms of diabetes plus a random plasma glucose ≥ 11.1 mmol/L.
  – Random is defined as any time of day without regard to time since last meal.
» Fasting plasma glucose ≥ 7.0 mmol/L.
  – Fasting is defined as no caloric intake for ≥ 8 hours.

MONITORING
<u>At every visit:</u>
» Finger-prick blood glucose.
» Weight.

» Blood pressure.

Baseline:

» Serum creatinine concentration (and calculate estimated glomerular filtration rate (eGFR)).
» Serum potassium concentration, if on ACE-inhibitor or eGFR < 30 mL/min.
» Urine protein by dipstix.
  – If dipstix negative, send urine to laboratory for albumin: creatinine ratio, unless already on an ACE-inhibitor. (See Section 9.4.3: Diabetic nephropathy).
  – If dipstix positive, see Section 9.4.3: Diabetic nephropathy.
» Blood lipids (fasting total cholesterol, triglycerides, HDL and LDL cholesterol).
» Foot examination.
» Eye examination to look for retinopathy.
» Abdominal circumference.

Annually:

» Serum creatinine concentration (and calculate eGFR).
» Serum potassium concentration, if on ACE-inhibitor or eGFR < 30 mL/min.
» Urine protein by dipstix.
  – If dipstix negative, send urine to laboratory for albumin: creatinine ratio, unless already on an ACE-inhibitor. (See Section 9.4.3: Diabetic nephropathy.)

LoE: III[IV]

» HbA1c, in patients who meet treatment goals (3–6 monthly in patients whose therapy has changed, until stable).
» Eye examination to look for retinopathy.
» Foot examination.

Treatment targets

Parameter	Optimal	Acceptable	Additional action suggested
Finger prick blood glucose values:			
– fasting (mmol/L)	4–7	<8	> 8
– 2-hour post-prandial (mmol/L)	5–8	8–10	> 10
Glycosylated haemoglobin (HbA1c) (%)	< 7	7–8	> 8
Blood pressure Systolic	< 140 mmHg		
Diastolic	< 90 mmHg		

» In the elderly, the increased risk of hypoglycaemia must be weighed against the potential benefit of reducing microvascular and macrovascular complications.
» Prevent acute complications, e.g. hyperglycaemic and hypoglycaemic coma.
» Management of type 2 diabetes mellitus includes:
  – Treatment of hyperglycaemia.
  – Management of chronic conditions associated with diabetes. For treatment of hypertension and dyslipidaemia after risk-assessment, see Section 4.7: Hypertension and Section 4.1: Prevention of Ischaemic heart disease and

atherosclerosis.
- Prevention and treatment of microvascular complications. See Section 9.4: Microvascular complications of diabetes.
- Prevention and treatment of macrovascular complications. See Section 9.5: Cardiovascular risk in diabetes.

GENERAL MEASURES

» Lifestyle modification, including self-care practices.
» Education about diabetes and its complications.
» Increased physical activity, aim for 30 minutes 5 times a week.
» Appropriate weight loss if weight exceeds ideal weight.
» Discourage smoking.
» Moderate or no alcohol intake (≤ 2 standard drinks per day for males and ≤ 1 for females).
» Education about foot care.
» All patients should wear a notification bracelet.

Diet

» Consider the following for a person-centred approach to diet therapy:
  - Weight.
  - Lifestyle and physical activity.
  - Cultural, social and economic issues.
» Dietary emphasis for improved glycaemic control should be on:
  - Even and regular meal consumption.
  - Low-glycaemic and high fibre foods. These foods are digested slowly resulting in a slow and steady rise in blood glucose concentrations.
  - Reduced amounts of fat, sweets, sugary foods and sugar-containing beverages.

Fruit and vegetables

» Eat a variety of fruit and vegetables – 4 to 5 portions on a daily basis.
  - One portion of which is a good source of vitamin C, e.g. tomato, cabbage family, citrus fruit and guavas.
  - One portion, a dark green vegetable e.g. broccoli, green beans, spinach and baby marrow.
  - One dark yellow/orange vegetable, e.g. carrots, pumpkin and butternut prepared without butter.
» Eat only one fruit (fresh) at a time.
  - Fruit must preferably be eaten with a meal or as a snack.
  - When eating dried fruit, limit the portion to the equivalent of a fresh fruit, e.g. 2 dried pear halves = 1 pear.

Carbohydrate

» Make starchy foods the basis of most meals.
» At least half of the grain intake should be from wholegrain products e.g. whole wheat, brown or rye bread, oats, whole wheat cereals, brown rice, whole wheat pasta.

Fat and cholesterol

» Reduce total intake of fat, saturated and transfat.
  - Unhealthy fats include: animal fat, hard margarine, butter, cheese, and any type of oil heated to a high temperature.
  - Use healthy types of fat, e.g. avocado pear, nuts, canola oil, canola margarine, olive oil and olives.
  - Soft low fat margarine (in the tub) should preferably be used instead of butter or hard margarine.
  - Never use 2 “fats” on bread e.g. when using a spread containing fat, do not use margarine as well.
  - Use low fat dairy products e.g. low fat/fat free milk, low fat cheese.
  - Limit the intake of cheese to a 30 g portion (a matchbox size or a third cup grated cheese) three times per week.
  - Grilled or steamed fish/chicken (without the skin) should be eaten in preference to red meat.
  - Eat at least 2 servings of fish per week.
  - Small amounts of red meat (lean portions) ≤ three times per week.
  - Protein source alternatives include legumes, e.g. peas and beans, lentils and soya products.
» Restrict food high in cholesterol, e.g. egg yolks, tripe, liver, processed meat (sausages), cheese, butter, fast food (fried chicken, hamburgers).

Salt

» Salt restriction may help to control blood pressure.
» Remove the salt from the table.
» Gradually reduce added salt in food preparation.
» Avoid processed foods.

MEDICINE TREATMENT

Oral blood glucose lowering agents

Stepwise approach:

» Add metformin to the combination of dietary modifications and physical activity/exercise.
» Combination therapy with metformin plus a sulphonylurea is indicated if therapy with metformin alone (together with dietary modifications and physical activity/exercise) has not achieved the HbA1c target.
» For persisting HbA1c above acceptable levels and despite adequate adherence to oral hypoglycaemic agents: add insulin and withdraw sulphonylurea.
» Ensure patient is adherent at each step.
» Oral agents should not be used in type 1 diabetes mellitus, renal impairment or clinical liver failure.

STEP 1
Lifestyle modification plus metformin

Entry to Step 1	Treatment and duration	Target
» Typical symptoms - thirst, tiredness, polyuria. **AND** » Random plasma glucose >11.1mmol/L. **OR** » Fasting plasma glucose ≥ 7 mmol/L.	» Lifestyle modification for life. » Appropriate diet. » Weight loss until at ideal weight. Initiate therapy with: • Metformin. » Assess monthly.	» 2-hour post-prandial finger-prick blood glucose: 8–10 mmol/L. **OR** fasting finger-prick blood glucose: 6–8 mmol/L. **AND/OR** » HbA1c:7–8%.

- Metformin, oral, 500 mg daily with meals.
  - Titrate dose slowly depending on HbA1c and/or fasting blood glucose concentrations to a maximum dose of 850 mg 8 hourly.
  - Contraindicated in:
  - uncontrolled congestive cardiac failure
  - severe liver disease
  - patients with significant respiratory compromise

In patients with renal impairment, adjust dose according to table:

eGFR	Action
>30–60 mL/minute	» Continue use » **50% of dose (maximum 500 mg 12 hourly)** » Increase frequency of renal function monitoring (3–6 monthly)
<30 mL/minute	Stop metformin

LoE:III[v]

STEP 2
Add sulphonylurea:

Entry to Step 2	Treatment and duration	Target
» Failed step 1: HbA1c > 8 % or fasting finger-prick blood glucose > 8 mmol/L despite adherence to treatment plan in step 1 and maximal dose of metformin for 2–3 months. **OR** » 2-hour post-prandial finger-prick blood	» Lifestyle modification. **AND** » Combination oral hypoglycaemic agents, i.e.: • Metformin. **AND** • Sulphonylurea.	» 2-hour post-prandial finger prick blood glucose <8–10 mmol/L. **OR** » fasting finger prick blood glucose: 6–8 mmol/L. **AND/OR** » HbA1c:7–8%.

glucose > 10 mmol/L despite adherence to treatment plan in step 1 and maximal dose of metformin for 2–3 months.		

- **Sulphonylurea derivatives: glimepiride or glibenclamide.**

- Glimepiride, oral with or before breakfast.
  - Initially 1 mg daily, adjusted according to response in 1 mg increments at 1 to 2 week intervals.
  - Maximum dose of 4 mg daily.
  - Preferred in the elderly.

OR *LoE:III[VI]*

Glibenclamide, oral, 2.5 mg daily 30 minutes before breakfast.
- Titrate dose slowly depending on HbA1c and/or fasting blood glucose levels to a maximum of 15 mg daily.
- When ≥ 7.5 mg per day is needed, give $^{2}/_{3}$ of the total dose in the morning and $^{1}/_{3}$ at night.
- **Avoid in the elderly and patients with renal impairment**

LoE:III[VII]

Both glimepiride and glibenclamide should be avoided in patients with renal impairment i.e. eGFR< 60 mL/minute.

LoE:III[VIII]

Sulphonylureas are contraindicated in:
» severe hepatic impairment
» pregnancy

Missing meals while taking sulphonylureas may lead to hypoglycaemia.

STEP 3
Insulin therapy: See Section 9.1.2: Type 1 diabetes mellitus, in adults.
» Insulin is indicated when oral combination therapy fails.
» Continue lifestyle modification.
» Insulin therapy must be initiated and titrated by a doctor, until stabilised.
» Stop sulphonylurea once insulin therapy is initiated but continue metformin.

LoE: III

Education for patients on insulin therapy:
» Types of insulin.
» Injection technique and sites of injection.
» Insulin storage.
» Self-monitoring of blood glucose and how to self-adjust insulin doses.
» Diet:
  – Meal frequency, this varies according to the type and frequency of insulin, e.g. patients may need a snack at night about 3–4 hours after the evening meal.
  – Consistent carbohydrate intake for patients receiving fixed mealtime doses of insulin.

» Recognition and treatment of acute complications, e.g. hypoglycaemia and hyperglycaemia.

Insulin type	Starting dose	Increment
Add on therapy: • Intermediate to long-acting	10 units in the evening before bedtime, but not after 22h00.	If 10 units not effective: increase gradually to 20 units (2–4 units increase each week).
Substitution therapy: • Biphasic	Twice daily. Total daily dose: 15 units divided as follows: ○ $^{2}/_{3}$ of total daily dose, i.e. 10 units, 30 minutes before breakfast. ○ $^{1}/_{3}$ of total daily dose, i.e. 5 units, 30 minutes before supper.	4 units weekly. First increment is added to dose before breakfast. Second increment is added to dose before supper.

LoE: III[IX]

REFERRAL

Urgent (same day)

» Acidotic breathing.
» Dehydration and hypotension.
» Nausea, vomiting and abdominal pain.
» Ketonuria (more than 1+).
» Hyperglycaemia > 25 mmol/L .
» Gangrene.
» Sudden deterioration of vision.
» Serious infections.

Note: Consider IV infusion with sodium chloride 0.9%, before transferring very ill patients.

Non-urgent

» Pregnancy.
» Failure of step 3 to control diabetes.
» eGFR < 30 mL/minute.
» Ischaemic heart disease.
» Cerebrovascular disease.
» Refractory hypertension.
» Progressive loss of vision.

9.3 DIABETIC EMERGENCIES

DESCRIPTION

Diabetics may present with a decreased level of consciousness owing to:

» hyperglycaemia diabetic ketoacidosis (DKA) or hyperosmolar hyperglycaemic state(HHS), or
» hypoglycaemia.

DIAGNOSIS

Check blood glucose concentration and test urine for ketones, immediately.

	Hyperglycaemia		Hypoglycaemia
	DKA	HHS	
Blood glucose	≥ 11.1 mmol/L		≤ 4mmol/L
Urine test for ketones	Usually positive and > 1+	Negative/ positive	usually negative

If a diagnosis cannot be made, treat as hypoglycaemia and refer urgently.
Low blood glucose presents the most immediate danger to life.

9.3.1 HYPOGLYCAEMIA IN DIABETICS

E10.0/E11.0

DESCRIPTION

Diabetic patients on therapy may experience hypoglycaemia for reasons such as intercurrent illness (e.g. diarrhoea); missed meals; inadvertent intramuscular injections of insulin or miscalculated doses of insulin or progressive renal failure leading to decreased insulin clearance; alcohol ingestion; and exercise without appropriate dietary preparation.
Risk factors include age < 6 years of age, low HbA1c and longer duration of diabetes.

Hypoglycaemia in diabetic patients can be graded according to the table below:

Mild/moderate hypoglycaemia	Severe hypoglycaemia
» Capable of self-treatment*.	» Semi-conscious **or** Unconscious/comatose.
» Conscious, but requires help from someone else.	» Requires medical help.

*Except children < 6 years of age.

Autonomic symptoms/signs	Neurological symptoms/signs
» Tremors » Palpitations » Sweating » Hunger » Fatigue » Pallor	» Headache » Mood changes » Low attentiveness » Slurred speech » Dizziness » Unsteady gait » Depressed level of consciousness/ convulsions

***Note:**

» Children, particularly < 6 years of age, generally are not capable of self-management and are reliant on supervision from an adult.
» Patients may fail to recognise that they are hypoglycaemic when neuroglycopenia (impaired thinking, mood changes, irritability, dizziness, tiredness) occurs before autonomic activation.

DIAGNOSIS

» Blood glucose < 4 mmol/L with symptoms in a known diabetic patient.
» Blood glucose concentrations should be measured with a glucometer to confirm hypoglycaemia.

Hypoglycaemia must be managed as an emergency.
If a diabetic patient presents with an altered level of consciousness and a glucometer is not available, treat as hypoglycaemia.

EMERGENCY TREATMENT

» Measure blood glucose concentration with glucometer/testing strip, immediately.

Conscious patient, able to feed

Breastfeeding child

– give breast milk

Older children

– A formula feed of 5 mL/kg

OR

– oral sugar solution
  - Dissolve 3 teaspoons of sugar (15 g) in a 200 mL cup of water – administer 5 mL/kg

OR

– sweets, sugar, glucose by mouth

Adults

– sweets, sugar, glucose by mouth

OR

– oral sugar solution
  - Dissolve 3 teaspoons of sugar (15 g) in a 200 mL cup of water.

Conscious patient, not able to feed without danger of aspiration

Administer via nasogastric tube:

- Dextrose 10%, 5 mL/kg
  - Add 1 part 50% dextrose water to 4 parts water to make a 10% solution.

OR

– milk

OR

– sugar solution
  - Dissolve 3 teaspoons of sugar (15 g) in a 200 mL cup of water – administer 5 mL/kg.

Unconscious patient

Children

- Dextrose 10%, IV, 2–5 mL/kg.
  - 10% solution e.g. add 1 part 50% dextrose water to 4 parts water for injection to make 10% solution.

IV administration of dextrose in children with hypoglycaemia:

» Establish an IV line. Do not give excessive volumes of fluid: usually can keep line open with 2mL/kg/hour.
» Take a blood sample for emergency investigations and blood glucose.
» Check blood glucose.
  – **If low, i.e. < 2.5 mmol/L or if testing strips are not available, administer 2–5 mL/kg of 10% dextrose solution IV rapidly.**
    In the majority of cases an immediate clinical response can be expected.
» Recheck the blood glucose after infusion.
  – If still low, repeat 2 mL/kg of 10% dextrose solution.
» After recovery, maintain with 5–10% dextrose solution until blood glucose is stabilised.
» Feed the child as soon as conscious.

Adults

LoE: III[x]

- Dextrose 50%, IV, 50 mL immediately and reassess.
  - If there is no clinical response, give a second 50% dextrose bolus.
  - Followed with dextrose 10% solution.
  - In the majority of cases an immediate clinical response can be expected.
  - Maintain with 5% dextrose solution after recovery until blood glucose is stabilised.

LoE: III[xi]

Alcoholics

- Thiamine, IV/IM, 100mg immediately.

CAUTION

Thiamine should preferably be administered prior to intravenous glucose to prevent permanent neurological damage.
Do not delay the dextrose administration in a hypoglycaemic patient.

REFERRAL

Urgent

» All hypoglycaemic patients on oral hypoglycaemic agents.
» Hypoglycaemic patients who do not recover completely after treatment.
» All children with documented hypoglycaemia unless the cause is clearly identified and safe management instituted to prevent recurrence.

9.3.2 DIABETIC KETOACIDOSIS (DKA)

E10.1/E11.1

DESCRIPTION

Clinical features of DKA include:

» dehydration
» abdominal pain
» vomiting
» deep sighing respiration
» drowsiness, confusion, coma
» acetone/fruity smelling breath
» elevated blood glucose

MEDICINE TREATMENT

Adults

Average deficit 6 L, and may be as much as 12 L.
Be cautious in renal and cardiac disease.
In the absence of renal or cardiac compromise:

- Sodium chloride 0.9%, IV, 15–20 mL/kg in the first hour
  - Subsequent infusion rate: 10 mL/kg/hour with 20 mL/kg boluses if shocked.
  - Do not exceed 50 mL/kg in the first 4 hours.
  - Correct estimated deficits over 24 hours.

LoE: III[xii]

Refer urgently with drip in place and running at planned rate.
When referral will take more than 2 hours and a diagnosis of diabetes with hyperglycaemia is confirmed:

- Insulin, short acting, IM, 0.1 unit/kg.
  - When giving insulin IM, do not use insulin needle.

CAUTION
Do not administer IV short-acting insulin if the serum electrolyte status, especially potassium is not known.
Continue with IV fluids but delay giving insulin in these cases in consultation with referral facility as this delay should not negatively affect the patient, but hypokalaemia with resultant cardiac dysrhythmias definitely will.
See Section 21.10: Hyperglycaemia and ketoacidosis

Children

If in shock:

- Sodium chloride 0.9%, IV, 20 mL/kg as a bolus.

» If shock not corrected, repeat the bolus.
» If a 3rd bolus is required, consult with paediatrician.

If no shock or aftershock is corrected

- Sodium chloride 0.9%, IV.

Fluid rates of sodium chloride 0.9%, IV (if no shock) in children awaiting transfer.		**Check regularly for shock or increasing dehydration**
Weight range kg		**Rate** (mL/hr) (2–10 kg: 6 mL/kg/hr) (>10-–20 kg: 5 mL/kg/hr) (>20–40 kg: 4 mL/kg/hr)
4	<6	25
6	<10	40
10	<15	60
15	<20	85
20	<30	100
30	<45	150
45	<80	200

Refer urgently with drip in place and running at planned rate.

LoE: III[xiii]

When referral will take > 2 hours and a diagnosis of diabetes with hyperglycaemia is confirmed and provided glucose is monitored hourly:

- Insulin, short acting, IM, 0.1 units/kg after 1st hour of infusion of saline
  - When giving insulin IM, do not use insulin needle.

9.4 MICROVASCULAR COMPLICATIONS OF DIABETES

9.4.1 DIABETIC NEUROPATHY

E10.2/E11.2/N08.3

DESCRIPTION

Neuropathies are a common complication of diabetes. They play an important role in the morbidity and mortality suffered by people with diabetes.
There are three major categories:

» peripheral neuropathy
» autonomic neuropathy
» acute onset neuropathies

GENERAL MEASURES

» Educate patient regarding appropriate footwear and good foot care.
» Patients with neuropathy should have their feet examined at every visit.

MEDICINE TREATMENT

Ensure appropriate glycaemic control.
Exclude or treat other contributory factors e.g.:

» alcohol excess
» vitamin B_{12} deficiency, if suspected,
» uraemia, and
» HIV infection.

Pain:

- Amitriptyline, oral, 10–25 mg at night increasing to 100 mg, if necessary.

LoE: III[xiv]

AND/OR

- Paracetamol, oral, 1 g 6 hourly as needed.

Gastroparesis:

- Metoclopramide, oral, 10 mg 8 hourly before meals.

LoE: III[xv]

REFERRAL

For further treatment if the above measures do not control symptoms adequately.

9.4.2 DIABETIC FOOT ULCERS

E10.5/E11.5

DESCRIPTION

Ulcers develop at the tips of the toes and on the plantar surfaces of the metatarsal heads and are often preceded by callus formation.

If the callus is not removed then haemorrhage and tissue necrosis occurs below the plaque of callus which leads to ulceration. Ulcers can be secondarily infected by staphylococci, streptococci, coliforms, and anaerobic bacteria which can lead to cellulitis, abscess formation, and osteomyelitis.

DIAGNOSIS

The three main factors that lead to tissue necrosis in the diabetic foot are:

» neuropathy,
» infection, and
» ischaemia.

GENERAL MEASURES

» Metabolic control.
» Treat underlying comorbidity.
» Relieve pressure: non-weight bearing is essential.
» Smoking cessation is essential.
» Frequent (e.g. weekly) removal of excess keratin by a chiropodist with a scalpel blade to expose the floor of the ulcer and allow efficient drainage of the lesion.
» Cleanse with sodium chloride 0.9% solution daily and apply non-adherent dressing.

MEDICINE TREATMENT

- Amoxicillin/clavulanic acid 875/125 mg oral 12 hourly for 10 days.

LoE: III[XVI]

REFERRAL

Urgent

Threatened limb, i.e. if the ulcer is associated with:

» cellulitis,
» abscess,
» discolouration of surrounding skin, or
» crepitus.

Non-urgent

» Claudication.
» Ulcers not responding to adequate treatment.

9.4.3 DIABETIC NEPHROPATHY

E10.2/E11.2/N08.9

DESCRIPTION

Screening

» Check annually for proteinuria using dipstix.
» A diagnosis of nephropathy can be made on either a positive dipstix or, if dipstix negative, send urine to laboratory for albumin:creatinine ratio. If ratio > 3 mg/mmol, diagnose nephropathy.
» Measure serum creatinine annually, and estimate eGFR.

LoE: III[XVII]

Diet and lifestyle

» Limit protein intake < 0.8 g/kg daily, if proteinuric.

» Advise smoking cessation.

MEDICINE TREATMENT

» Start treatment with an ACE-inhibitor and increase gradually to maximal dose if tolerated.

- ACE-inhibitor, e.g.:
- Enalapril, oral, initiate with 5mg 12 hourly.
  - Increase to 20 mg 12 hourly, as tolerated.
  - Monitor potassium, at baseline, within 1 month, and annually.

LoE: I[xviii]

Persistent proteinuria

See Chapter 9: Kidney and urological disorders.

Hypertension

Target BP: < 140/90 mmHg. See Section 4.7: Hypertension.

Diabetes mellitus

Target HbA1c < 7.5%.

- Intensify other renal and cardiovascular protection measures (not smoking, aspirin therapy, lipid lowering therapy).

REFERRAL

To specialist: When eGFR < 30 mL/minute or earlier if symptomatic.

9.5 CARDIOVASCULAR RISK IN DIABETES

E10.69/ E11.69

DESCRIPTION

The metabolic syndrome is a cluster of risk factors:

» impaired glucose metabolism
» central obesity
» dyslipidaemia
» hypertension

DIAGNOSIS

There is still some controversy as to whether the metabolic syndrome is a true syndrome or a cluster of risk factors. There are also varying diagnostic criteria around the world. The more components of the syndrome, the higher the risk.

MEDICINE TREATMENT

Aspirin therapy (Doctor initiated).

» Use aspirin therapy in adult Type 1 and Type 2 diabetic patients with a history of cardiovascular disease i.e.
  - ischaemic heart disease
  - peripheral vascular disease
  - previous thrombotic stroke

- Aspirin, orally, 150 mg (½ tablet) daily.

9.5.1 OBESITY IN DIABETES

E66.9

» Abdominal obesity, i.e. waist circumference > 94 cm in men, and > 80 cm in women.
» BMI: determined by weight in kg/height in m^2.

BMI (kg/m^2)	
18.5–24.9	normal
25.0–29.9	overweight
30.0–34.9	mildly obese
35.0–39.9	moderately obese
>40	extremely obese

GENERAL MEASURES

A decrease in food intake together with an increase in physical activity is crucial to losing weight.

MEDICINE TREATMENT

Treat the metabolic risk factors, i.e. dyslipidaemia, hypertension, and hyperglycaemia.

9.5.2 DYSLIPIDAEMIA IN DIABETES

E78.5

DESCRIPTION

Dyslipidaemia in type 2 diabetes is usually characterised by increased fasting plasma triglycerides (> 1.7 mmol/L), decreased HDL cholesterol (< 1.0 mmol/L in men and < 1.30 mmol/L in women) and to a lesser extent, increased LDL cholesterol. In those with type 1 diabetes, triglycerides, and to a lesser extent cholesterol concentrations, are usually increased.

MONITORING

See Section 9.2.2: Type 2 diabetes mellitus, in adults.

MEDICINE TREATMENT

Dyslipidaemia may successfully be treated through lifestyle modifications alone.

- HMGCoA reductase inhibitor (statin) therapy should be added to lifestyle modifications, regardless of baseline lipid concentrations, for all type 2 diabetic patients, who:
  - are > 40 years of age
  - have had diabetes for > 10 years
  - have existing cardiovascular disease
  - have chronic kidney disease (eGFR < 60 mL/minute)
- e.g. Simvastatin, oral, 10 mg at night.

In patients < 40 years of age, risk assess as for dyslipidaemia. See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

LoE: III[xix]

REFERRAL
» Random cholesterol > 7.5 mmol/L.
» Fasting (14 hours) triglycerides > 10 mmol/L.

9.5.3 HYPERTENSION IN DIABETES
I15.2

BP lowering in hypertensive patients reduces cardiovascular risk. The diagnosis of hypertension is confirmed if the blood pressure remains > 140/90 mmHg on 2 separate days. See Section 4.7: Hypertension.

9.5.4 HYPERGLYCAEMIA
R73.9
See Sections 9.1.2: Type 1 diabetes mellitus, in adults and 9.2.2: Type 2 diabetes mellitus, in adults.

9.6 HYPOTHYROIDISM

9.6.1 HYPOTHYROIDISM IN NEONATES
E03.9

DESCRIPTION
Congenital deficiency of thyroid hormone due to aplasia/hypoplasia of the thyroid gland, defects in thyroid hormone biosynthesis or intrauterine exposure to antithyroid medicines. Congenital hypothyroidism is one of the common treatable causes of preventable mental retardation in children. Congenital hypothyroidism must be treated as early as possible to avoid intellectual impairment.

DIAGNOSIS
Clinical
» prolonged jaundice
» feeding difficulties
» lethargy
» constipation
» swollen hands, feet and genitals
» decreased muscle tone
» delayed achievement of milestones
» enlarged tongue

REFERRAL
All patients for investigation and initiation of therapy.

9.6.2 HYPOTHYROIDISM IN CHILDREN AND ADOLESCENTS
E03.9

DESCRIPTION
Hypothyroidism in children causes decreased growth, lethargy, cold intolerance and dry skin. Physical signs may include goitre, short stature, bradycardia and delayed deep tendon reflexes.
Congenital hypothyroidism may present in childhood. Acquired hypothyroidism in children and adolescents may be caused by:

» chronic lymphocytic thyroiditis
» iodine deficiency
» surgery
» radioactive iodine
» infiltrations

DIAGNOSIS
Elevated TSH and low T4 concentrations.

MEDICINE TREATMENT
- Levothyroxine, oral, 100 mcg/m^2 once daily, preferably on an empty stomach (Doctor initiated).

LoE: III[xx]

REFERRAL
All cases for investigation and initiation of therapy.

9.6.3 HYPOTHYROIDISM IN ADULTS
E03.9

DESCRIPTION
Hypothyroidism causes general slowing of metabolism, which results in symptoms that include fatigue, slow movement and speech, hoarse voice, weight gain, constipation, cold intolerance, depression and impaired memory. Physical signs may include bradycardia, dry, coarse skin, hair loss and delayed relaxation of deep tendon reflexes.
Common causes of primary hypothyroidism are:
» thyroiditis
» amiodarone
» post surgery
» radio-active iodine
Secondary hypothyroidism (< 1% of cases) may be due to any cause of anterior hypopituitarism.

DIAGNOSIS
» Check TSH concentration. If elevated, check T4 concentration.
» If TSH is elevated, and T4 is low, diagnose hypothyroidism.

MEDICINE TREATMENT
- Levothyroxine, oral, 100 mcg daily, preferably on an empty stomach.
  - If there is a risk of ischaemic heart disease, start at 25 mcg daily and increase by 25 mcg every 4 weeks.
  - In the elderly, start at 50 mcg daily, increased by 25 mcg at 4 week intervals, according to response.
  - Check TSH and T4 after 2–3 months and adjust dose if required.
  - Once stable, check TSH andT4 annually.

LoE: III[xxi]

REFERRAL
» Suspected hypopituitarism.
» Hypothyroidism in pregnancy.

9.7 HYPERTHYROIDISM

9.7.1 HYPERTHYROIDISM IN CHILDREN AND ADOLESCENTS

E05.9

DESCRIPTION

Hyperthyroidism is a pathological syndrome in which tissue is exposed to excessive amounts of circulating thyroid hormones. The most common cause is Grave's disease, although thyroiditis may also present with thyrotoxicosis.

DIAGNOSIS

Clinical

- » fatigue
- » nervousness or anxiety
- » weight loss
- » palpitations
- » heat insensitivity
- » tachycardia
- » warm moist hands
- » thyromegaly
- » tremor

REFERRAL

Urgent

All patients.

9.7.2 HYPERTHYROIDISM IN ADULTS

E05.9

DESCRIPTION

Most common cause of hyperthyroidism is Graves' disease, which is an autoimmune condition resulting from the presence of thyroid stimulating autoantibodies. Other common causes are toxic single or multinodular goitre and sub-acute thyroiditis.

DIAGNOSIS

Suppressed TSH and elevated T4

Note: T4 may be normal in hyperthyroidism.

REFERRAL

Urgent

All patients.

---

[i] Blood pressure target: Lopez-Jaramillo P, Sanchez R, Diaz M, Cobos L, Bryce A, Parra-Carrillo JZ, Lizcano F, Lanas F, Sinay I, Sierra IV, Penaherrera E, Bendersky M, Schmid H, Botero R, Urina M, Lara J, Foss MC, Matquez G, Harrap S, Ramorez AJ, Zanchetti A, on behalf of the Latin America expert Group: Latin American consensus on hypertension in patients with diabetes type 2 and metabolic syndrome. *J Hypertens* 2013, 31:223–238. http://www.ncbi.nlm.nih.gov/pubmed/23282894

Blood pressure target: Mancia G, Fagard R, Narkiewicz K, Redon J, Zanchetti A, *et al*. : ESH/ESC Guidelines for the management of arterial hypertension; The Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC*). J Hypertens* 2013, 2013 (31):1281–1357. http://www.ncbi.nlm.nih.gov/pubmed/23817082

Blood pressure target: Lopez-Jaramillo P, Lopez-Lopez J, Lopez-Lopez C, Rodriguez-Alvarez MI. The goal of blood pressure in the hypertensive patient with diabetes is defined: now the challenge is go from recommendations to practice. *Diabetol Metab Syndr.*2014 Mar 4;6(1):31. http://www.ncbi.nlm.nih.gov/pubmed/24594121

[ii] Insulin: Adult Hospital level STG, 2012. http://www.health.gov.za/

[iii] Home blood glucose monitoring: Starostina EG, Antsiferov M, Galstyan GR, Trautner C, Jörgens V, BottU,Mühlhauser I, Berger M, Dedov II. Effectiveness and cost-benefit analysis of intensive treatment and teaching programmes for type 1 (insulin-dependent) diabetes mellitus in Moscow-blood glucose versus urine glucose self-monitoring. *Diabetologia.* 1994 Feb;37(2):170-6. http://www.ncbi.nlm.nih.gov/pubmed/8163051

Home blood glucose monitoring: American Diabetes Association. Standards of medical care in diabetes-2013. *Diabetes Care*. 2013 Jan;36 Suppl 1:S11-66. http://www.ncbi.nlm.nih.gov/pubmed/23264422

Home blood glucose monitoring: Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. *Can J Diabetes* 2013;37(suppl 1):S1-S212. http://www.ncbi.nlm.nih.gov/pubmed/24070961

Home blood glucose monitoring: Adult Hospital Level STG, 2012. http://www.health.gov.za/

[iv] Screening for microalbuminuria: Amod A, Ascott-Evans BH, Berg GI, Blom DJ, Brown SL, Carrihill MM, Dave JA, Distiller LA, Ganie YN, Grobler N, Heilbrunn AG, Huddle KRL, Janse van Rensburg G, Jivan D, Joshi P, Khutsoane DT, Levitt NS, May WM, Mollentze WF, Motala AA, Paruk IM, Pirie FJ, Raal FJ, Rauff S, Raubenheimer PJ, Randeree HAR, Rheeder P, Tudhope L, Van Zyl DJ, Young M; Guideline Committee. The 2012 SEMDSA Guideline for the Management of Type 2 Diabetes (Revised) *JEMDSA* 2012;17(2)(Supplement 1): S1-S95. http://www.semdsa.org.za/images/2012_SEMDSA_Guideline_July_FINAL.pdf

Screening for microalbuminuria: Ballard DJ, Humphrey LL, Melton LJ 3rd, Frohnert PP, Chu PC, O'Fallon WM, Palumbo PJ. Epidemiology of persistent proteinuria in type II diabetes mellitus. Population-based study in Rochester, Minnesota. *Diabetes.* 1988 Apr;37(4):405-12. http://www.ncbi.nlm.nih.gov/pubmed/3378684

[v] Metformin: Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. *Can J Diabetes* 2013;37(suppl 1):S1-S212. http://www.ncbi.nlm.nih.gov/pubmed/24070961

Metformin: NICE Clinical Guideline 87: Type 2 diabetes - The management of type 2 diabetes, 2009, 2014. [Online][Accessed 2014] Available at: www.nice.org.uk/Guidance/CG87

Metformin: South African package insert, Glucophage® 500mg, 850 mg tablets.

Metformin: South African package insert, Bigsens® 500, 850, 1000 mg tablets.

Metformin: South African package insert, Diabetmin retard® 850 mg tablets.

Metformin: Aronoff, Bennett *et al.* Drug Prescribing in Renal Failure: Dosing Guidelines for Adults and Children, 5th Edition. *American College of Physicians.*United States of America, 2007.

Metformin: Lipska KJ, Bailey CJ, Inzucchi SE. Use of metformin in the setting of mild-to-moderate renal insufficiency. *Diabetes Care.* 2011 Jun;34(6):1431-7. http://www.ncbi.nlm.nih.gov/pubmed/21617112

[vi] Glimepiride: Tsumura K-i. Clinical evaluation of glimepiride (HOE490) in NIDDM, including a double blind comparative study versus gliclazide.Diabetes *Diabetes Res Clin Pract.*. 1995; 28: S147-S9. http://www.ncbi.nlm.nih.gov/pubmed/8529507

Glimepiride: Inukai K, Watanabe M, Nakashima Y, Sawa T, Takata N, Tanaka M, et al. Efficacy of glimepiride in Japanese type 2 diabetic subjects. *Diabetes Res Clin Pract.*. 2005; 68(3): 250-7. http://www.ncbi.nlm.nih.gov/pubmed/15936468

Glimepiride: Li Y, Xu L, Shen J, Ran J, Zhang Y, Wang M, et al. Effects of short-term therapy with different insulin secretagogues on glucose metabolism, lipid parameters and oxidative stress in newly diagnosed Type 2 Diabetes Mellitus. *Diabetes Res Clin Pract.* 2010; 88(1): 42-7. http://www.ncbi.nlm.nih.gov/pubmed/20060192

Glimepiride: Schernthaner G, Grimaldi A, Di Mario U, Drzewoski J, Kempler P, Kvapil M, et al. Blackwell Publishing, Ltd. GUIDE study: double-blind comparison of once-daily gliclazide MR and glimepiride in type 2 diabetic patients. *Eur J clin Invest.* 2004; 34(8): 535-42. http://www.ncbi.nlm.nih.gov/pubmed/15305887

Glimepiride: SAMF 10th edition, 2012.

Glimepiride: Contract circular HP09-2014SD. http://www.health.gov.za/

Glimepiride: NDoH: Affordable Medicines, EMP-PHC. Medicine Review: Glimepiride *vs*. gliclazide, January2014.

[vii] Glibenclamide: Contract HP09-2014SD. http://www.health.gov.za/

Glibenclamide: Canadian Agency for Drugs and Technologies in Health. Second-line pharmacotherapy for type 2 diabetes, Update. Ottawa: The Agency; 2013. (CADTH optimal use report; vol.3, no. 1a).

Glibenclamide: SAMF 10th edition, 2012.

Glibenclamide: Tessier, D., Dawson, K., Tétrault, J.P., Bravo, G. and Meneilly, G.S. Glibenclamide vs Gliclazide in Type 2 Diabetes of the Elderly. *Diabetic Medicine*.1994; 11: 974–980. http://www.ncbi.nlm.nih.gov/pubmed/7895463

Glibenclamide: NDoH: Affordable Medicines, EMP- PHC. Medicine Review: Glimepiride *vs*. glibenclamide, October 2013.

[viii] Sulphonylurea renal caution: Screening for microalbuminuria: Amod A, Ascott-Evans BH, Berg GI, Blom DJ, Brown SL, Carrihill MM, Dave JA, Distiller LA, Ganie YN, Grobler N, Heilbrunn AG, Huddle KRL, Janse van Rensburg G, Jivan D, Joshi P, Khutsoane DT, Levitt NS, May WM, Mollentze WF, Motala AA, Paruk IM, Pirie FJ, Raal FJ, Rauff S, Raubenheimer PJ, Randeree HAR, Rheeder P, Tudhope L, Van Zyl DJ, Young M; Guideline Committee. The 2012 SEMDSA Guideline for the Management of Type 2 Diabetes (Revised) *JEMDSA* 2012;17(2)(Supplement 1): S1-S95. http://www.semdsa.org.za/images/2012_SEMDSA_Guideline_July_FINAL.pdf

Sulphonylurea renal caution: SAMF 10th edition, 2012.

Sulphonylurea renal caution: South African package insert, Glycron® 5 mg tablets.

Sulphonylurea renal caution: Aronoff, Bennett *et al.* Drug Prescribing in Renal Failure: Dosing Guidelines for Adults and Children, 5th Edition. *American College of Physicians.* United States of America, 2007.

Sulphonylurea renal caution: Adult Hospital level STG, 2012. http://www.health.gov.za/

[ix] Education on insulin therapy: NDoH. Primary care 101 Guidelines, 2013/2014.

[x] Dextrose 10%: Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[xi] Dextrose 50%: Adult Hospital level STG, 2012. http://www.health.gov.za/

[xii] Sodium chloride 0.9%: Craig ME, Twigg SM, Donaghue KC, Cheung NW, Cameron FJ, Conn J, Jenkins AJ, Silink M, for the

Australian Type 1 Diabetes Guidelines Expert Advisory Group. National evidence-based clinical care guidelines for type 1 diabetes in children, adolescents and adults, Australian Government Department of Health and Ageing, Canberra 2011.

[xiii] Sodium chloride 0.9%:Craig ME, Twigg SM, Donaghue KC, Cheung NW, Cameron FJ, Conn J, Jenkins AJ, Silink M, for the Australian Type 1 Diabetes Guidelines Expert Advisory Group. National evidence-based clinical care guidelines for type 1 diabetes in children, adolescents and adults, Australian Government Department of Health and Ageing, Canberra 2011. https://diabetessociety.com.au/downloads/Type1guidelines(7Feb11).pdf

[xiv] Amitriptyline: Adult Hospital level STG, 2012. http://www.health.gov.za/

Paracetamol: Adult Hospital level STG, 2012. http://www.health.gov.za/

[xv] Metocloperamide: Adult Hospital level STG, 2012. http://www.health.gov.za/

[xvi] Amoxicillin/clavulanic acid: Adult Hospital level STG, 2012. http://www.health.gov.za/

[xvii] Screening for microalbuminuria: Seedat YK, Rayner BL. South African Hypertension Guideline 2011. *S Afr Med J* 2012;102:57-84. http://www.ncbi.nlm.nih.gov/pubmed/22273141

Screening for microalbuminuria: Screening for microalbuminuria: Amod A, Ascott-Evans BH, Berg GI, Blom DJ, Brown SL, Carrihill MM, Dave JA, Distiller LA, Ganie YN, Grobler N, Heilbrunn AG, Huddle KRL, Janse van Rensburg G, Jivan D, Joshi P, Khutsoane DT, Levitt NS, May WM, Mollentze WF, Motala AA, Paruk IM, Pirie FJ, Raal FJ, Rauff S, Raubenheimer PJ, Randeree HAR, Rheeder P, Tudhope L, Van Zyl DJ, Young M; Guideline Committee. The 2012 SEMDSA Guideline for the Management of Type 2 Diabetes (Revised) *JEMDSA* 2012;17(2)(Supplement 1): S1-S95. http://www.semdsa.org.za/images/2012_SEMDSA_Guideline_July_FINAL.pdf

Screening for microalbuminuria: American Diabetes Association. Standards of medical care in diabetes-2013. *Diabetes Care*. 2013 Jan;36 Suppl 1:S11-66. http://www.ncbi.nlm.nih.gov/pubmed/23264422

Screening for microalbuminuria: Craig ME, Twigg SM, Donaghue KC, Cheung NW, Cameron FJ, Conn J, Jenkins AJ, Silink M, for the Australian Type 1 Diabetes Guidelines Expert Advisory Group. National evidence-based clinical care guidelines for type 1 diabetes in children, adolescents and adults, Australian Government Department of Health and Ageing, Canberra 2011. https://diabetessociety.com.au/downloads/Type1guidelines(7Feb11).pdf

Screening for microalbuminuria: Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. *Can J Diabetes* 2013;37(suppl 1):S1-S212. http://www.ncbi.nlm.nih.gov/pubmed/24070961

Screening for microalbuminuria: Warram JH, Gearin G, Laffel L, Krolewski AS. Effect of duration of type I diabetes on the prevalence of stages of diabetic nephropathy defined by urinary albumin/creatinine ratio. *J Am Soc Nephrol.* 1996 Jun;7(6):930-7. http://www.ncbi.nlm.nih.gov/pubmed/8793803

[xviii] ACE inhibitor: ACEI (ACE Inhibitors in Diabetic Nephropathy Trialist Group) (2001). Should all patients with type 1 diabetes mellitus and microalbuminuria receive angiotensin converting enzyme inhibitors? A meta-analysis of individual patient data, *Annals of Internal Medicine,* 134(5): 370–379. http://www.ncbi.nlm.nih.gov/pubmed/11242497

ACE inhibitor: Amod A, Ascott-Evans BH, Berg GI, Blom DJ, Brown SL, Carrihill MM, Dave JA, Distiller LA, Ganie YN, Grobler N, Heilbrunn AG, Huddle KRL, Janse van Rensburg G, Jivan D, Joshi P, Khutsoane DT, Levitt NS, May WM, Mollentze WF, Motala AA, Paruk IM, Pirie FJ, Raal FJ, Rauff S, Raubenheimer PJ, Randeree HAR, Rheeder P, Tudhope L, Van Zyl DJ, Young M; Guideline Committee. The 2012 SEMDSA Guideline for the Management of Type 2 Diabetes (Revised) *JEMDSA* 2012;17(2)(Supplement 1): S1-S95. http://www.semdsa.org.za/images/2012_SEMDSA_Guideline_July_FINAL.pdf

ACE inhibitor: Craig ME, Twigg SM, Donaghue KC, Cheung NW, Cameron FJ, Conn J, Jenkins AJ, Silink M, for the Australian Type 1 Diabetes Guidelines Expert Advisory Group. National evidence-based clinical care guidelines for type 1 diabetes in children, adolescents and adults, Australian Government Department of Health and Ageing, Canberra 2011. https://diabetessociety.com.au/downloads/Type1guidelines(7Feb11).pdf

ACE inhibitor: Adult Hospital level STG, 2012. http://www.health.gov.za/

[xix] Simvastatin: Adult Hospital level STGs, 2012. http://www.health.gov.za/

[xx] Levothyroxine: Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[xxi] Levothyroxine: Adult Hospital level STG, 2012. http://www.health.gov.za/

Chapter 10: Infections and related conditions

10.1 FEVER

R50.9

DESCRIPTION

Fever, i.e. temperature ≥ 38°C, is a natural and sometimes useful response to infection, inflammation or infarction.
Fever alone is not a diagnosis.
Fever may be associated with convulsions in children < 6 years of age, but is not a cause of the convulsions.

Note:

» Temperature > 40°C needs urgent lowering, in children.
» Fluid losses are increased with fever.
» Malaria must be considered in anyone with fever who lives in a malaria endemic area, or who has visited a malaria area in the past 12 weeks.

GENERAL MEASURES

Children

» Caregivers should offer the child regular fluids (where a baby or child is breastfed the most appropriate fluid is breast milk).
» Dress child appropriately for the weather.
» Following contact with a healthcare professional, parents and carers who are looking after their feverish child at home should seek further advice if:
  – the child has a convulsion
  – the child develops a non-blanching rash
  – the parent or carer feels that the child is less well than when they previously sought advice
  – the parent or carer is more concerned than when they previously sought advice
  – the fever lasts > 2 days
  – the parent or carer is distressed, or concerned that they are unable to look after their child

Note: Tepid sponging and evaporative cooling are not recommended.

LoE: III[i]

Adults

Maintain hydration.

MEDICINE TREATMENT

Only febrile children who appear distressed should be treated with paracetamol.
Consider treatment with paracetamol in adults with associated tachycardia, possibility of worsening cardiac conditions, or who are in distress.

Antipyretic agents are not indicated with the sole aim of reducing body temperature in children and adults with fever.

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

LoE: III[ii]

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

CAUTION

Do not treat undiagnosed fever with antibiotics, except in children < 2 months of age who are classified as having
POSSIBLE SERIOUS BACTERIAL INFECTION.
Do not give aspirin to children with fever.

LoE:III[III]

Children < 2 months of age, fulfilling any criterion of possible serious bacterial infection (see referral criteria):

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose.** See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

LoE:III[IV]

REFERRAL

» All children < 2 months of age with any one of the following criteria of possible serious bacterial infection:
  – axillary temperature > 37.5°C
  – bulging fontanelle, decreased movement/only moves when stimulated, convulsions with current illness, decreased level of consciousness
  – breathing difficulties, i.e. respiratory rate > 60, nasal flaring, chest indrawing or apnoea
  – pus forming conditions, i.e. umbilical redness extending to the skin or draining pus, many or severe skin pustules, pus draining from eye
» All children in whom a definite and easily managed cause is not found.
» Fever that lasts > 2 days without finding a treatable cause.
» Fever that recurs.
» Fever combined with:
  – signs of meningitis
  – toxic-looking patient
  – convulsion
  – coma or confusion
  – jaundice
  – failure to feed

10.2 ANTISEPTICS AND DISINFECTANTS

DESCRIPTION

Disinfectants are used to kill micro-organisms on working surfaces and instruments, but cannot be relied on to destroy all micro-organisms.
Antiseptics are used for reducing bacterial load on skin and mucous membranes.

Disinfecting surfaces

Guidelines for the use of disinfectants

» Cleansing (removal of visible soiling) is the first and most important step in chemical disinfection.
» The disinfection fluid must entirely cover the object and penetrate all crevices.
» Use the recommended strengths for specific purposes.
» Disinfectants cannot sterilise surgical instruments.
» No chemical agent acts immediately;note the recommended exposure time.
» Equipment must be rinsed with sterile water after immersion in a chemical disinfectant e.g. chlorhexidine solution, 0.5% in 70% alcohol.
» Avoid recontamination at this stage.
» Make sure that the rinsing water and all other apparatus are sterile.
» Equipment must not be stored in chemical disinfectants.
» The best disinfectant for killing HIV and other pathogens is a chlorinated solution such as bleach or hypochlorite:
  – Solutions must be freshly prepared.
  – Discarded after 24 hours to disinfect properly.
  – Do not use on the skin.

Intact skin

» Use alcohol swabs before injections.
» Use antiseptics like povidone iodine or chlorhexidinefor surgical scrubbing.

Wounds and mucous membranes

- Use chlorhexidine 0.05% aqueous solution to clean dirty wounds.
- Use sodium chloride 0.9% and sterile water on clean wounds.

Disinfectant	Indications	Directions for application
• Chlorhexidine solution: ○ 0.05% aqueous solution ○ 0.5% in 70% alcohol	» Cleaning dirty wounds. » Skin disinfection before surgery.	» Remove all dirt, pus and blood before use. » Clean dirty wounds with 0.05% aqueous solution. » Do not use for normal cleaning. » Use the correct concentration for a specific purpose.
• Povidone iodine: ○ solution 10% ○ ointment 10% ○ cream 5%	» Skin and wound infections **Contraindication**: iodine allergy	» Use ointment for skin infection. » Use solution for cleaning skin and wounds. » **Avoid** using on large wounds because of danger of iodine absorption

Articles and instruments
Adhere to the appropriate cleansing and disinfection policy.

10.3 CHICKEN POX

B01.9

DESCRIPTION

A mild viral infection that presents 2–3 weeks after exposure, with:
» mild fever preceding the rash
» lesions beginning on the trunk and face, later spreading to the arms and legs
» small, red, itchy spots that turn into blisters and burst to form scabs. These stages may all be present at the same time.

Chickenpox is infective from the start of the fever until 6 days after the lesions have appeared or until all the lesions have crusted.
The infection is self-limiting, with a duration of about 1 week.
Complications such as secondary bacterial infection, encephalitis, meningitis and pneumonia may occur (more common in adults and immunocompromised patients).

GENERAL MEASURES

» Isolate from immunocompromised people and pregnant women until all lesions have crusted.
» Ensure adequate hydration.
» Cut fingernails short and discourage scratching.

MEDICINE TREATMENT

CAUTION
Avoid the use of aspirin in children and adolescents < 16 years of age because of risk of Reye's syndrome.

For itch:
- Calamine lotion, applied as needed.

In severe cases
Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

CAUTION
Do not give an antihistamine to children < 2 years of age.

Adults
- Chlorphenamine, oral, 4 mg, 6–8 hourly.

For fever with distress:
Children *LoE: III[v]*
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

If skin infection is present due to scratching, treat as for bacterial skin infection. See Section 5.4: Bacterial infections of the skin.

Treatments with antiviral agents are recommended for:

» Immunocompromised patients.
» All patients with severe chickenpox (irrespective of duration of rash).
  – Extensive rash.
  – Visceral involvement.
  – Haemorrhagic rash.
  – Presence of complications.
» Adults and adolescents presenting within 48 hours of the onset of the rash.

LoE:II[VI]

Children

- Aciclovir, oral, 20 mg/kg/dose 6 hourly for 7 days (Doctor initiated).

Weight kg	**Dose** mg	**Use one of the following:**			**Age** months/years
		Susp 200 mg /5 mL	**Tablet** 200 mg	**Tablet** 400 mg	
>3.5–5 kg	100 mg	2.5 mL	–	–	>1–3 months
>5–7 kg	140 mg	3.5 mL	–	–	>3–6 months
>7–9 kg	160 mg	4 mL	–	–	>6–12 months
>9–11 kg	200 mg	5 mL	1 tablet	½ tablet	>12–18 months
>11–14 kg	240 mg	6 mL	–	–	>18 months–3 years
>14–25 kg	300 mg	7.5 mL	1½ tablet	–	>3–5 years
>25–35 kg	500 mg	15 mL	2 ½ tablets	–	>7–11 years
>35–55 kg	700 mg	–	3 ½ tablets	–	>11–15 years

Adults

- Aciclovir, oral, 800 mg 6 hourly for 7 days (Doctor initiated).

LoE:I[VII]

REFERRAL

» Complications such as:
  – meningoencephalitis
  – pneumonia
» Severely ill patients.
» Pregnant women.
» Asymptomatic neonates whose mothers had chicken pox 7 days before or 7 days after delivery.
» Neonates with clinical chicken pox.

LoE:III[VIII]

10.4 CHOLERA

See Chapter 2: Gastrointestinal conditions.

10.5 DYSENTERY, AMOEBIC

See Chapter 2: Gastrointestinal conditions.

10.6 DYSENTERY, BACILLARY

See Chapter 2: Gastrointestinal conditions.

10.7 GIARDIASIS

See Chapter 2: Gastrointestinal conditions.

10.8 MALARIA

B54

Note: notifiable condition.

Refer to the most recent Malaria Treatment Guidelines from the Department of Health for the most suitable management in the various endemic areas.

DESCRIPTION

Malaria is an infection of red blood cells by a parasite micro-organism called *Plasmodium*. Four species of *Plasmodium* are known to cause malaria in humans in Africa. The four species are:

» *Plasmodium falciparum (P. falciparum)*
» *Plasmodium vivax (P. vivax)*
» *Plasmodium ovale (P. ovale)*
» *Plasmodium malariae (P. malariae)*.

The parasites are usually transmitted to humans by the bite of a vector mosquito. In South Africa, *P. falciparum* is the most common and the most dangerous of the malaria species. Malaria caused by *P. falciparum* is an acute febrile illness that may progress rapidly to severe disease if not diagnosed early and treated adequately.
Symptoms and signs of malaria are non-specific.
The most important element in the diagnosis of malaria is a high index of suspicion in both endemic and non-endemic areas. Any person resident in or returning from a malaria area **and** who presents with fever (usually within 3 months of possible exposure to vector mosquito bites) should be tested for malaria. The progression of *P. falciparum* malaria to severe disease is rapid and early diagnosis and effective treatment is crucial. **Pregnant women, young children ≤ 5 years of age and people living with HIV/AIDS are at particularly high risk of developing severe malaria.**

Symptoms and signs of malaria may include:

» severe headache
» fever > 38°C
» muscle and joint pains
» shivering episodes
» nausea and vomiting
» flu-like symptoms

Severe disease may present with one or more of the following additional clinical features:

» prostration (severe general body weakness)
» sleepiness, unconsciousness or coma, convulsions
» respiratory distress and/or cyanosis
» renal failure
» shock
» jaundice
» repeated vomiting
» hypoglycaemia

» severe anaemia (Hb < 7 g/dL)
» haemoglobinuria/black urine
» abnormal bleeding

DIAGNOSIS

Microscopic examination of thick and thin blood smears. Thick films are more sensitive than thin films in the detection of malaria parasites.
Where rapid diagnostic tests, e.g. HRP2 antigen dipsticks are available, these can be used to diagnose malaria within 10–15 minutes.

Note: One negative malaria test does not exclude the diagnosis of malaria. Request a 2nd test.

GENERAL MEASURES

» Provide supportive and symptomatic relief.
» Monitor for complications.
» Ensure adequate hydration.
» Carefully observe all patients with *P. falciparum* malaria for the 1st 24 hours for features of severe malaria.

MEDICINE TREATMENT

All first doses of antimalarial medicines must be given under supervision and patients must be observed for at least an hour as vomiting is common in patients with malaria. Treatment must be repeated if the patient vomits within the first hour. Vomiting oral treatment is one of the commonest reasons for treatment failure.

In areas with high incidence of malaria (whether locally transmitted or imported) it should be definitively diagnosed and treated at PHC level. In other areas, patients should be referred for treatment.

10.8.1 MALARIA, UNCOMPLICATED

B54
Note: notifiable condition.

MEDICINE TREATMENT

- Artemether/lumefantrine 20/120 mg, oral, with fat-containing food/milk to ensure adequate absorption.
  - Give the first dose immediately.
  - Follow with second dose 8 hours later.
  - Then 12 hourly for another 2 days (total number of doses in 3 days = 6).

Weight kg	**Tablet** Artemether/lumefantrine 20/120 mg	**Age** months/years
>5–15 kg	1 tablet	6 months–3 years
>15–25 kg	2 tablets	>3–8 years
>25–35 kg	3 tablets	>8–12 years
>35 kg	4 tablets	>12 years and adults

LoE:III[IX]

For fever in children < 5 years of age:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

LoE:III

REFERRAL

Urgent

» All patients in areas that do not stock antimalarials.
» Patients not responding to oral treatment within 48 hours.
» **After 1st dose of artemether/lumefantrine 20/120 mg:**
  – All patients with any sign of severe (complicated) malaria.
  – All children < 2 years of age.
  – Pregnant women.
  – Patients with co-morbidities such as HIV, diabetes etc.
  – Patients > 65 years of age.

LoE:III[x]

10.8.2 MALARIA, SEVERE (COMPLICATED)

B50.9

Note: notifiable condition.

DESCRIPTION

Any one of the following is a sign of severe (complicated) malaria, is associated with a higher mortality, and requires urgent referral (after initial quinine dose as below):

» prostration (severe general body weakness)
» sleepiness, unconsciousness or coma, convulsions
» respiratory distress and/or cyanosis
» jaundice
» renal failure
» shock
» repeated vomiting
» hypoglycaemia
» severe anaemia (Hb < 7 g/dL)
» haemoglobinuria/black urine
» abnormal bleeding

MEDICINE TREATMENT

Treatment may be commenced before referral in clinics designated by the regional malaria control programme provided they have facilities to diagnose malaria (either microscopy or rapid antigen point of care tests) and healthcare workers trained in the management of severe malaria.

The preferred agent is parenteral artesunate:

- Artesunate IM, 2.4 mg/kg IM immediately as a single dose and refer urgently.
  - If transferral to referral hospital is delayed, administer second dose at 12 hours and third dose at 24 hours.

LoE:I[xi]

If parenteral artesunate is not available:

- Quinine dihydrochloride, IV **or** IM, 15–20 mg/kg immediately as a single dose and refer urgently. See dosing table pg 22.8.
  - IM: dilute quinine dihydrochloride in sodium chloride 0.9% to between 60 and 100 mg/mL. Inject half the volume immediately as a single dose in each thigh (anterolateral) to reduce pain and prevent sterile abscess formation.
  - IV: dilute with 5–10 mL/kg of dextrose 5% and administer **over 4 hours.**

NOTE

For all patients requiring referral, the patient must be transferred to reach the referral hospital **within 6 hours** of being seen at the PHC facility.

REFERRAL

Urgent

All patients.

10.8.3 MALARIA, PROPHYLAXIS (SELF-PROVIDED CARE)

Z79.89

In South Africa, malaria prophylaxis should be used, together with preventive measures against mosquito bites, from September to May in high-risk areas. State facilities do not provide prophylactic therapy. It is recommended that persons intending to travel to high-risk areas take the relevant prophylactic therapy.

Preventative measures against mosquito bites between dusk and dawn include:

» Use of insecticide impregnated mosquito nets, insecticide coils or pads.
» Application of insect repellent to exposed skin and clothing.
» Wearing long sleeves, long trousers and socks, if outside, as mosquitoes are most active at this time.
» Visiting endemic areas only during the dry season.

CAUTION

Immunocompromised patients, pregnant women and children < 5 years of age should avoid visiting malaria-endemicareas, as they are more prone to the serious complications of malaria.

Refer to National Malaria Guidelines.

10.9 MEASLES

B05.9

Note: notifiable condition.

CASE DEFINITION

» Fever.

AND

» Maculopapular (blotchy) rash.

AND

» Cough or coryza (runny nose) or conjunctivitis.

Inform the local EPI co-ordinator about all cases of suspected measles, (i.e. which fulfil the case definition criteria). Send clotted blood and throat swabs to confirm (or exclude) a diagnosis of measles.

DESCRIPTION

A viral infection that is especially dangerous in malnourished children or in children who have other diseases such as TB or HIV/AIDS.

Initial clinical features, that occur 7–14 days after contact with an infected individual, include:

» coryza
» fever
» diarrhoea
» conjunctivitis which may be purulent
» cough

After 2–3 days of the initial clinical features, a few tiny white spots, like salt grains appear in the mouth (Koplik spots).

The skin rash appears 1–2 days later, lasting about 5 days and:

» usually starts behind the ears and on the neck
» then on the face and body
» thereafter, on the arms and legs

Secondary bacterial infection (bronchitis, bronchopneumonia, otitis media) may occur, especially in children with poor nutrition or other concomitant conditions.

GENERAL MEASURES

Isolate the patient to prevent spread.

MEDICINE TREATMENT

All children < 5 years of age with measles should be given an extra dose of vitamin A, unless the last dose was received within a month:

- Vitamin A (retinol), oral, as a single dose.

Age range	Dose units	Capsule 100 000 u	Capsule 200 000 u
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

In children < 5 years of age, give the 1st dose immediately. If the child is sent home, the caregiver should be given a 2nd dose to take home, which should be given the following day.

Administration of a vitamin A capsule

- Cut the narrow end of the capsule with scissors.
- Open the child's mouth by gently squeezing the cheeks.
- Squeeze the drops from the capsule directly into the back of the child's mouth. If a child spits up most of the vitamin A liquid immediately, give one more dose.

For fever with distress:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

LoE:III[xii]

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

LoE:III

Children with diarrhoea:

Treat according to Section 2.8.1: Acute diarrhoea in children.

Children with pneumonia (1st dose before referral):

- Amoxicillin, oral, 30 mg/kg/dose 8 hourly for 5 days. See dosing table, pg 22.1.

Children with otitis media:

Children ≤ 3 years of age

- Amoxicillin, oral, 45 mg/kg/dose 12 hourly for 5 days.

Weight kg	**Dose** mg	**Use one of the following:**				**Age** Months/years
		Syrup mg/ 5mL		**Capsule mg**		
		125	250	250	500	
>7–11kg	375	15 mL	7.5 mL	–	–	>6–18 months
>11–14 kg	500	–	10 mL	2	1	>18 months–3 years

Children > 3 years of age

- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

LoE:I[xiii]

Penicillin allergy

Children

- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children: 18–35 kg (able to take tablets)

- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

Children > 35 kg

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

Purulent conjunctivitis:

- Chloramphenicol, 1%, ophthalmic ointment 8 hourly into lower conjunctival sac.

REFERRAL

» All adults.
» Children < 6 months of age.
» Children who are malnourished or immunocompromised, or who have TB.
» Where serious complications are present. These include:
  – stridor/croup
  – pneumonia
  – dehydration
  – neurological complications
  – severe mouth and eye complications

Provide emergency treatment, if needed, before referral.

10.10 MENINGITIS

See Chapter 15: Central nervous system.

10.11 MUMPS

B29.9

DESCRIPTION

Incubation period: 14–21 days.
A viral infection primarily involving the salivary glands.
Signs and symptoms:
» Fever.
» Pain on opening the mouth or eating.
» About two days later a tender swelling appears below the ears at the angle of the jaw. Often first on one side and later on the other.
» The swelling disappears in about 10 days.

GENERAL MEASURES

» Bed rest during febrile period.
» Advise on oral hygiene.
» Recommend plenty of fluids and soft food during acute stage.
» Patient is infectious from 3 days before parotid swelling to 7 days after it started. Isolate until swelling subsides.
» Children may return to school 1 week after initial swelling.

MEDICINE TREATMENT

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL

» Abdominal pain (to exclude pancreatitis).
» Painful swollen testes (orchitis).
» Suspected meningo-encephalitis.

10.12 RUBELLA (GERMAN MEASLES)

B06.9

DESCRIPTION

Incubation period: 14–21 days. A viral infection with skin lesions that is less severe than measles and lasts only 3–4 days.
A maculopapular red rash starts on the face spreading to the trunk, arms and legs. It usually fades as it spreads.

Note: If cough, coryza or conjunctivitis are also present, it is essential to exclude measles. See case definition of measles (Section: 10.9 Measles).

Clinical features include:
» mild rash
» swollen and tender lymph nodes behind the ears (suboccipital)
» in adults, a small joint arthritis may occur

Note: Infection during the first or second trimester of pregnancy may lead to severe permanent deformities in the baby. All pregnant women should be referred for confirmation of diagnosis of rubella and counselling.

GENERAL MEASURES
» Bed rest, if needed.
» Isolate from pregnant women for 7 days after onset of the rash.

MEDICINE TREATMENT
Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
- Paracetamol, oral, 1 g, 6 hourly when required.

REFERRAL
Urgent
» Pregnant women with rubella.
» Pregnant women who have been in contact with a patient with rubella.

10.13 SCHISTOSOMIASIS (BILHARZIA)
B65

DESCRIPTION
A parasitic infestation with:
» *Schistosoma haematobium*: primarily involves the bladder and renal tract, or
» *Schistosoma mansoni*: primarily involves the intestinal tract.

Infestation occurs during washing, bathing or paddling in water harbouring snails shedding this parasite.
Clinical features vary with the location of the parasite.
Most cases are asymptomatic.
Acute schistosomiasis, consisting of a non-specific febrile illness with marked eosinophilia, may occur in non-immune people several weeks after initial exposure, especially with *Schistosoma mansoni* infection.
Chronic schistosomiasis may present with local or systemic complications due to fibrosis, including urinary tract obstruction with ensuing renal failure, portal hypertension or other organ involvement.

	Schistosoma haematobium	*Schistosoma mansoni*
Clinical features	» blood in the urine » recurrent cystitis » other urinary symptoms	» diarrhoea with blood and mucus in the stools » colicky abdominal pain » enlarged liver and spleen
Diagnosis	» eggs in urine or stool on microscopy » rectal biopsy	

GENERAL MEASURES

» If bilharzia is endemic, educate the community to avoid contact with contaminated water:
- Do not urinate or pass stools near water used for drinking, washing or bathing.
- Do not swim in contaminated water.
- Collect water from rivers and dams at sunrise when risk of infestation is lowest.
- Boil all water before use.

MEDICINE TREATMENT

In endemic areas where urine microscopy cannot be done patients should be treated empirically after first excluding possible glomerulonephritis, i.e. no raised blood pressure, no oedema, and no shortness of breath. See Section 8.3: Glomerular diseases (GN).
In non-endemic areas treatment should be given only if eggs of *S. Haematobium* or *S. mansoni* are found in the urine/faeces.

Children
- Praziquantel, oral, 40 mg/kg as a single dose. See dosing table pg 22.7.

Adults
- Praziquantel, oral, 3 g as a single dose.

REFERRAL

» Children < 2 years of age.
» Ongoing urinary tract symptoms.
» Signs of bleeding disorders or glomerulonephritis.

10.14 TYPHOID FEVER

See Chapter 2: Gastrointestinal conditions.

10.15 TUBERCULOSIS

See Chapter 17: Respiratory conditions.

10.16 VIRAL HAEMORRHAGIC FEVER (VHF)

A98.0/A98.1/A98.2/A98.3/A98.4/A98.4/A98.5/A98.8/A99/A91

Consult the most recent Viral Haemorrhagic Fever Guidelines from the National Department of Health.

DESCRIPTION

Viral haemorrhagic fevers (VHF) are uncommon conditions in South Africa. They may present with non-specific signs (fever, headache, conjunctivitis, pharyngitis, myalgia (especially lower back pain), diarrhea,vomiting, abdominal pain) or with signs strongly suggestive of VHF (petechial rash, ecchymoses, other haemorrhagic signs e.g. epistaxis, haematemesis and melaena). Other symptoms and organ involvement may be variable.

More than 90% of suspected cases of VHF in South Africa prove to be severe forms of common diseases. Many of the diseases mistaken for VHF are treatable if diagnosed early.

These include:

» Severe tick bite fever.
» Severe falciparum malaria.
» Severe bacterial infections, particularly *N. meningitidis.*
» Fulminant hepatitis.
» Leptospirosis.

Endemic causes of VHF in South Africa are Crimean-Congo fever and Rift Valley Fever, both of which may be transmitted between humans by means of blood and body fluids. Imported conditions include Lassa, Ebola and Marburg Fever amongst others.

Obtaining a history of possible exposure to infection (including a detailed travel history) is crucial to diagnosing VHF. Relatives and friends often provide more reliable information than severely ill patients.

GENERAL MEASURES

All suspected, probable VHF cases and contacts of VHF cases must be discussed and managed in consultation with the Regional Virologist or Infectious Diseases Consultant at the referral centre.

Cases should also be discussed with the Special Pathogens Unit of the National Institute for Communicable Diseases (NICD):

Tel: 011 386 6000, Outbreak hotline: 082 883 9920

Transfer of patients will only occur once all relevant arrangements have been made to limit further exposure to a potentially contagious and life threatening agent.

Viral haemorrhagic fevers (VHF) are readily transmitted to healthcare workers, so it is essential to apply strict contact precautions.
ISOLATE ALL SUSPECTED SYMPTOMATIC CASES AT ALL TIMES

If VHF is considered, isolate patient in a single room and take proper precautions to limit further exposure. These include where available:

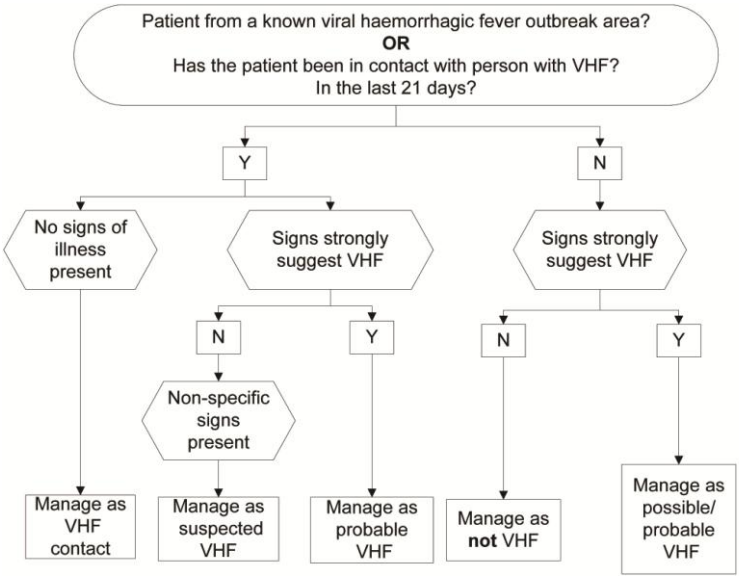
» long sleeved disposable gown,
» waterproof apron if the patient is bleeding,

» two pairs of latex gloves, one underneath the gown and one with the wrist of the glove pulled over the gown wrist,
» disposable face mask (preferably with a visor),
» goggles if a mask without the visor is used,
» waterproof boots or 2 pairs of overshoes, one over the other.

Note: Do not touch your own skin with your gloved hands.

MANAGEMENT

Signs strongly suggesting VHF	Non-specific signs that may occur with VHF
» Petechial rash. » Ecchymoses. » Oher haemorrhagic signs (e.g. epistaxis, haematemesis, melaena). » Non-specific signs of infection.	» Fever. » Headache. » Conjuctivitis. » Pharyngitis. » Myalgia (especially lower back pain). » Vomiting. » Abdominal pain. » Diarrhoea.



Management of VHF contact

» Consult clinician, discuss with NICD and isolate patient (See above).
» Record and follow up all patient contacts.

Management of suspected/possible/probable VHF

» Non-specific signs:

- Consult with clinician, discuss with NICD, isolate patient, initiate ceftriaxone and record and follow up all patient contacts.

» Signs strongly suggestive of VHF:
- Consult with a clinician, discuss with NICD, isolate patient, initiate ceftriaxone and arrange transfer with EMS (providing patient's VHF status, and names, addresses and telephone numbers of patient contacts).

Adults
- Ceftriaxone, IV, 2 g immediately.

CAUTION: USE OF CEFTRIAXONE
Do not administer calcium containing fluids, e.g. Ringer-Lactate, concurrently with ceftriaxone.

Children
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose.** See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site. *LoE:III*[xiv]

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN
Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.
In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

REFERRAL

» All cases, after consultation with clinician, discussion with NICD, isolation of patient and management of acute condition.

Manage all contacts of VHF cases according to the current national guidelines. Ensure that contact details are obtained and that there is a plan to manage contacts.

---

[i] Physical cooling measures: NICE Clinical Guideline-Feverish illness in children: assessment and initial management in children younger than 5 years, May 2013. http://www.nice.org.uk/guidance/cg160/chapter/recommendations
Physical cooling measures: NICE Guidelines, May 2013 evidence tables - Axelrod P. External cooling in the management of fever. *Clinical Infectious Diseases* 2000;31(Suppl 5):S224–9. http://www.ncbi.nlm.nih.gov/pubmed/11113027
Physical cooling measures: NICE Guidelines, May 2013 evidence tables - Purssell E. Physical treatment of fever. *Archives of Disease in Childhood* 2000;82(3):238–9. http://www.ncbi.nlm.nih.gov/pubmed/10685930

[ii] Paracetamol: NICE Clinical Guideline-Feverish illness in children: assessment and initial management in children younger than 5 years, May 2013. http://www.nice.org.uk/guidance/cg160/chapter/recommendations
Paracetamol: NICE Guidelines, May 2013 evidence tables - Perrott DA, Piira T, Goodenough B, Champion GD. Efficacy and safety of acetaminophen vs ibuprofen for treating children's pain or fever: a meta-analysis. *Arch Pediatr Adolesc Med.* 2004 Jun;158(6):521-6. http://www.ncbi.nlm.nih.gov/pubmed/15184213
Paracetamol: NICE Guidelines, May 2013 evidence tables - Wong A, Sibbald A, Ferrero F, Plager M, Santolaya ME, Escobar AM, Campos S, Barragán S, De León González M, Kesselring GL; Fever Pediatric Study Group. Antipyretic effects of dipyrone versus ibuprofen versus acetaminophen in children: results of a multinational, randomized, modified double-blind study. *Clin Pediatr (Phila).* 2001 Jun;40(6):313-24. http://www.ncbi.nlm.nih.gov/pubmed/11824173

Paracetamol: NICE Guidelines, May 2013 evidence tables - Figueras Nadal C, García de Miguel MJ, Gómez Campderá A, Pou Fernández J, Alvarez Calatayud G, Sánchez Bayle M; Paediatric Fever Co-operative Group from the Spanish Paediatric Association. Effectiveness and tolerability of ibuprofen-arginine versus paracetamol in children with fever of likely infectious origin. *Acta Paediatr*. 2002;91(4):383-90. http://www.ncbi.nlm.nih.gov/pubmed/12061352

Paracetamol: NICE Guidelines, May 2013 evidence tables - Autret E, Breart G, Jonville AP, Courcier S, Lassale C, Goehrs JM. Comparative efficacy and tolerance of ibuprofen syrup and acetaminophen syrup in children with pyrexia associated with infectious diseases and treated with antibiotics. *Eur J Clin Pharmacol*. 1994;46(3):197-201. http://www.ncbi.nlm.nih.gov/pubmed/8070499

Paracetamol: World Health Organisation. WHO model formulary for children, 2010. http://www.who.int/selection_medicines/list/WMFc_2010.pdf

Paracetamol: British National Formulary for children, 2011 to 2012.

[iii] Caution - POSSIBLE SERIOUS BACTERIAL INFECTION: National Department of Health, Integrated Management of Childhood Illness (IMCI) Guidelines, 2014. http://www.health.gov.za/

[iv] Ceftriaxone: FDA safety alert: Ceftriaxone, 21 April 2009. Available at: http://www.fda.gov/Drugs/DrugSafety/PostmarketDrugSafetyInformationforPatientsandProviders/DrugSafetyInformationforHeathcareProfessionals/ucm084263.htm

Klassen TP, Hartling L, Wiebe N, Belseck EM. Acyclovir for treating varicella in otherwise healthy children and adolescents. *Cochrane Database Syst Rev*. 2005 Oct 19;(4):CD002980.

[v] Paracetamol: NICE Clinical Guideline-Feverish illness in children: assessment and initial management in children younger than 5 years, May 2013. http://www.nice.org.uk/guidance/cg160/chapter/recommendations

[vi] Aciclovir, indications: Wallace MR, Bowler WA, Murray NB, Brodine SK, Oldfield EC 3rd. Treatment of adult varicella with oral acyclovir. A randomized, placebo-controlled trial. Ann Intern Med. 1992 Sep 1;117(5):358-63. http://www.ncbi.nlm.nih.gov/pubmed/1323943

Aciclovir, indications: Klassen TP, Hartling L, Wiebe N, Belseck EM. Acyclovir for treating varicella in otherwise healthy children and adolescents. Cochrane Database Syst Rev. 2005 Oct 19;(4):CD002980. http://www.ncbi.nlm.nih.gov/pubmed/16235308

[vii] Aciclovir, dosing interval: Klassen TP, Hartling L, Wiebe N, Belseck EM. Acyclovir for treating varicella in otherwise healthy children and adolescents. *Cochrane Database Syst Rev*. 2005 Oct 19;(4):CD002980. http://www.ncbi.nlm.nih.gov/pubmed/16235308

Aciclovir, dosing interval: Balfour HH Jr, Edelman CK, Anderson RS, Reed NV, Slivken RM, Marmor LH, Dix L, Aeppli D, Talarico CL. Controlled trial of acyclovir for chickenpox evaluating time of initiation and duration of therapy and viral resistance. *Pediatr Infect Dis J*. 2001 Oct;20(10):919-26. http://www.ncbi.nlm.nih.gov/pubmed/11642624

Aciclovir, dosing interval: Wallace MR, Bowler WA, Murray NB, Brodine SK, Oldfield EC 3rd. Treatment of adult varicella with oral acyclovir. A randomized, placebo-controlled trial. *Ann Intern Med.* 1992 Sep 1;117(5):358-63. http://www.ncbi.nlm.nih.gov/pubmed/1323943

[viii] Aciclovir, referral criteria: Centers for Disease Control and Prevention (CDC). Updated recommendations for use of VariZIG--United States, 2013. *MMWR Morb Mortal Wkly Rep.* 2013 Jul 19;62(28):574-6. http://www.ncbi.nlm.nih.gov/pubmed/23863705

[ix] Artemether/lumefantrine, >5–15 kg dosing: World Health Organisation. Guidelines for the treatment of malaria. Second edition, March 2010. http://www.who.int/malaria/publications/atoz/9789241547925/en/

Artemether/lumefantrine, >5–15 kg dosing: Food and Drug Administration registered package insert of Co-artem®. http://www.accessdata.fda.gov/drugsatfda_docs/nda/2009/022268s000_SumR.pdf

[x] Artemether/lumefantrine, pregnancy: Tarning J, McGready R, Lindegardh N, Ashley EA, Pimanpanarak M, Kamanikom B, Annerberg A, Day NP, Stepniewska K, Singhasivanon P, White NJ, Nosten F. Population pharmacokinetics of lumefantrine in pregnant women treated with artemether-lumefantrine for uncomplicated Plasmodium falciparum malaria. *Antimicrob Agents Chemother.* 2009 Sep;53(9):3837-46. http://www.ncbi.nlm.nih.gov/pubmed/19564366

Artemether/lumefantrine, pregnancy: Piola P, Nabasumba C, Turyakira E, Dhorda M, Lindegardh N, Nyehangane D, Snounou G, Ashley EA, McGready R, Nosten F, Guerin PJ. Efficacy and safety of artemether-lumefantrine compared with quinine in pregnant women with uncomplicated Plasmodium falciparum malaria: an open-label, randomised, non-inferiority trial. *Lancet Infect Dis.* 2010 Nov;10(11):762-9. http://www.ncbi.nlm.nih.gov/pubmed/20932805

[xi] Artesunate, parenteral: Sinclair D, Donegan S, Isba R, Lalloo DG. Artesunate versus quinine for treating severe malaria. *Cochrane Database Syst Rev*. 2012 Jun 13;6:CD005967.http://www.ncbi.nlm.nih.gov/pubmed/22696354

Artesunate, parenteral: Mehta U, Durrheim DN, Blumberg L, Donohue S, Hansford F, Mabuza A, Kruger P, Gumede JK, Immelman E, Sánchez Canal A, Hugo JJ, Swart G, Barnes KI. Malaria deaths as sentinel events to monitor healthcare delivery and antimalarial drug safety. *Trop Med Int Health.* 2007 May;12(5):617-28.http://www.ncbi.nlm.nih.gov/pubmed/17445129

Artesunate, parenteral: NDoH: Affordable Medicines, EDP-PHC. Medicine Review: Parenteral artesunate, January2014.

[xii] Paracetamol: NICE Clinical Guideline-Feverish illness in children: assessment and initial management in children younger than 5 years, May 2013. http://www.nice.org.uk/guidance/cg160/chapter/recommendations

[xiii] Amoxicillin - Children with otitis media: Thanaviratananich S, Laopaiboon M, Vatanasapt P. Once or twice daily versus three times daily amoxicillin with or without clavulanate for the treatment of acute otitis media. *Cochrane Database Syst Rev.* 2013 Dec 13;12:CD004975. http://www.ncbi.nlm.nih.gov/pubmed/24338106

Amoxicillin - Children with otitis media: Piglansky L, Leibovitz E, Raiz S, Greenberg D, Press J, Leiberman A, Dagan R. Bacteriologic and clinical efficacy of high dose amoxicillin for therapy of acute otitis media in children. Pediatr Infect Dis J. 2003 May;22(5):405-13. http://www.ncbi.nlm.nih.gov/pubmed/12792379

Amoxicillin - Children with otitis media: Klein JO. Microbiologic efficacy of antibacterial drugs for acute otitis media. *Pediatr Infect Dis* J.1993;12(12): 973–975. http://www.ncbi.nlm.nih.gov/pubmed/8108222

Amoxicillin - Children with otitis media: SAMJ, Updated guideline for the management of upper respiratory tract infections in South Africa: 2014, in press.

[xiv] Ceftriaxone: National National Department of Health Viral Haemorrhagic Fever Guidelines, 2014. http://www.health.gov.za/

Chapter 11: Human immunodeficiency virus and acquired immunodeficiency syndrome (HIV AND AIDS)

HIV infection in adults

HIV infection in children

HIV INFECTION IN ADULTS

B24

DESCRIPTION

HIV replicates in CD4+ lymphocytes and monocytes, leading to progressive destruction of CD4+ lymphocytes and impaired immunity.

Primary infection is characterised by:

» glandular fever-type illness
» maculopapular rash
» small orogenital ulcers

After primary infection patients have generalised lymphadenopathy and are usually asymptomatic for several years. Subsequently inflammatory skin conditions and an increased frequency of minor infections occur, followed by more severe infections (especially tuberculosis), weight loss or chronic diarrhoea. Eventually severe opportunistic infections, HIV-associated cancers or other severe HIV manifestations develop, known as the **A**cquired **I**mmune **D**eficiency **S**yndrome (AIDS).

DIAGNOSIS

» Adequate pre- and post-test counselling must be provided.
» Ensure patient confidentiality.
» HIV in adults must be confirmed with a 2nd test. This can either be 2 rapid tests, using kits from different manufacturers, or with 1 rapid test and 1 laboratory test, usually ELISA.
» HIV antibodies are not detected during the 1st few weeks in primary infection. This is known as the window period.

PROGNOSIS

Progression of HIV diseases is variable. The CD4+ lymphocyte count and clinical features of immune suppression (see WHO staging below) both provide independent information on prognosis. Patients may be asymptomatic with very low CD4 counts or have severe clinical features with well-preserved CD4 counts. CD4 counts < 200 indicate severe immune suppression. All HIV-infected patients must have a CD4 count requested and WHO clinical staging done. The CD4 count should be repeated every 6 months in patients not yet eligible for ART. Patients should be counselled about ART.

WHO staging system for HIV infection and disease in adults and adolescents

Clinical stage I

» Asymptomatic.
» Persistent generalized lymphadenopathy.

Clinical stage II

» Unexplained moderate weight loss (< 10% of presumed or measured body weight).
» Recurrent respiratory tract infections (sinusitis, otitis media and pharyngitis).

» Herpes zoster (shingles).
» Angular stomatitis.
» Recurrent oral ulceration.
» Papular pruritic eruption.
» Seborrheic dermatitis.
» Fungal nail infections.

Clinical stage III

» Unexplained severe weight loss (> 10% of presumed or measured body weight).
» Unexplained chronic diarrhoea for > 1 month.
» Unexplained persistent fever (> 37.5ºC intermittent or constant for > 1 month).
» Persistent oral candidiasis (thrush).
» Oral hairy leukoplakia.
» Pulmonary TB.
» Severe bacterial infections (such as pneumonia, empyema, pyomyositis, bone or joint infection, meningitis or bacteraemia).
» Acute necrotizing ulcerative stomatitis, gingivitis or periodontitis.
» Unexplained anaemia (< 8 g/dL), neutropaenia (< 0.5×10^9/L) and/or chronic thrombocytopaenia (< 50×10^9/L).

Clinical stage IV

» HIV wasting syndrome.
» Extrapulmonary tuberculosis.
» Pneumocystis pneumonia.
» Recurrent severe bacterial pneumonia.
» Chronic herpes simplex infection (orolabial, genital or anorectal of >1month duration or visceral at any site).
» Oesophageal candidiasis (or candidiasis of trachea, bronchi or lungs).
» Kaposi's sarcoma.
» Cytomegalovirus infection (retinitis or infection of other organs).
» Central nervous system toxoplasmosis.
» HIV encephalopathy.
» Extrapulmonary cryptococcosis including meningitis.
» Disseminated non-tuberculous mycobacterial infection.
» Progressive multifocal leukoencephalopathy.
» Chronic cryptosporidiosis.
» Chronic Isosporiasis.
» Disseminated mycosis (extrapulmonary histoplasmosis or coccidiomycosis).
» Recurrent septicaemia (including non-typhoidal *Salmonella*).
» Lymphoma (cerebral or B cell non-Hodgkin).
» Invasive cervical carcinoma.
» Atypical disseminated leishmaniasis.
» Symptomatic HIV-associated nephropathy or symptomatic HIV-associated cardiomyopathy.

GENERAL MEASURES

» Patients and their families must be supported and encouraged to join support or peer groups.
» Counsel patients on preventive methods of reducing the spread of the disease:
- use condoms during sexual intercourse
- seek early treatment for sexually transmitted infections
- safe handling of blood spills

11.1 ANTIRETROVIRAL THERAPY, ADULTS

Antiretroviral therapy (ART) suppresses viral replication (measured with the viral load test), increases the CD4 count and reduces HIV-associated diseases and death. ART guidelines are regularly updated, so it is important to consult the current National Guidelines.

The criteria for starting ART in adults are:
» All patients with stage 3 or 4 disease irrespective of CD4 count.
OR
» All patients with CD4 < 500.
OR *LoE: III[i]*
» All pregnant and breastfeeding women, irrespective of CD4 count.
OR *LoE: III[ii]*
» Other severe HIV-related conditions or co-morbidity. This group of conditions requires specialist diagnosis and recommendation for ART. Examples of conditions in this category includes but is not limited to:
- Immune Thrombocytopenic Purpura and Thrombotic Thrombocytopenic Purpura.
- Severe manifestations of the diffuse infiltrative lymphocytic syndrome (e.g. lymphocytic interstitial pneumonitis, polymyositis).
- Chronic liver disease due to hepatitis B.
- Patients being treated for non-HIV-related malignancies.

ART should be initiated immediately in pregnancy and during breastfeeding.
Unless contra-indicated (see table below), ART should be initiated within 1 week in the following cases:
» CD4 count < 200 (except TB patients and cryptococcal meningitis).
» WHO stage 4 (except TB meningitis and cryptococcal meningitis).

In patients with cryptococcal meningitis, ART should be deferred until 4–6 weeks after starting antifungal treatment (earlier initiation has been shown to increase the risk of death). *LoE:III[iii]*

In TB patients with CD4 count > 50, ART should be deferred until 8 weeks after initiating TB treatment, which has shown to be safe and reduces the risk of deterioration due to the immune reconstitution inflammatory syndrome (IRIS).

In TB patients with CD4 counts < 50 (except TB meningitis), start ART at 2 weeks after starting TB therapy. *LoE:II[iv]*

In patients with TB meningitis (irrespective of CD4 count), ART should be deferred until 8 weeks after initiating TB treatment. *LoE:II*[v]

Antiretroviral medicines: Dose and common adverse drug reactions (life-threatening reactions in bold type) *LoE:II*[vi]

MEDICINE	CLASS	DOSE	COMMON OR SEVERE ADVERSE DRUG REACTIONS
Zidovudine (AZT)	NRTI	300 mg 12 hourly	**Bone marrow suppression**, gastro-intestinal (GI) upset, headache, lipoatrophy, **hyperlactataemia**/ steatohepatitis **(medium risk).**
Lamivudine (3TC)	NRTI	150 mg 12 hourly **or** 300 mg daily	**Anaemia (pure red cell aplasia,** rare), **hyperlactataemia**/ steatohepatitis (low risk).
Abacavir (ABC)	NRTI	600 mg daily	**Hypersensitivity reaction**, **hyperlactataemia**/ steatohepatitis (low risk).
Tenofovir (TDF)	NRTI	300 mg daily	**Renal failure**, tubular wasting syndrome, reduced bone mineral density, **hyperlactataemia**/ steatohepatitis (low risk).
Emtricitabine (FTC)	NRTI	200 mg daily	Palmar hyperpigmentation, **hyperlactataemia**/ steatohepatitis (low risk).
Nevirapine (NVP)	NNRTI	200 mg daily for 14 days then 200 mg 12 hourly	**Rash (high risk)**, **hepatitis (high risk).** Not to be used in women with CD4 > 250 or men with CD4 > 400.
Efavirenz (EFV)	NNRTI	600 mg at night	**Rash (medium risk)**, central nervous system symptoms (vivid dreams, problems with concentration, confusion, mood disturbance, **psychosis**), **hepatitis (medium risk)**.
Atazanavir (ATV)	PI	300 mg and ritonavir 100 mg daily	Dyslipidaemia (low risk), unconjugated jaundice, **hepatitis.**
Lopinavir/ritonavir (LPV/r)	PI	400/100 mg 12 hourly	GI upset, **dyslipidaemia** (high risk), **hepatitis.**

NRTI = nucleoside reverse transcriptase inhibitor
NNRTI = non-nucleoside reverse transcriptase inhibitor
PI = protease inhibitor

LoE:III[vii]

Standardised national ART regimens for adults and adolescents

1st line		
All new patients needing treatment, including pregnant women	TDF + FTC (or 3TC) +EFV FDC preferred	Replace EFV with NVP in patients with significant psychiatric co-morbidity or intolerance to EFV and where the neuro-psychiatric toxicity of EFV may impair daily functioning, e.g. shift workers.
Contraindication to EFV	TDF + FTC (or 3TC) + NVP	
Contraindication to TDF	ABC+ 3TC +EFV (or NVP) *LoE:III*[viii]	Renal disease or use of nephrotoxic medicines e.g. aminoglycosides.
Contraindication to TDF and ABC	AZT+ 3TC+ EFV (or NVP)	Renal disease or the use of other nephrotoxic medicines, e.g. aminoglycosides and rash.
2nd line		
Management of virological failure		<u>If plasma HIV RNA > 1000 copies:</u> Check for adherence, tolerability and medicine interactions and assess psychological issues. Repeat VL test 2 months later. <u>If plasma VL confirmed > 1000:</u> Change regimen to 2nd line therapy.
Failing on a TDF-based 1st line regimen	AZT+3TC+ LPV/r	Check hepatitis B surface antigen – if positive continue TDF+3TC (or FTC) and add AZT +LPV/r. *LoE:III*[ix]
Failing on a ABC-based 1st line regimen	AZT+3TC (or FTC) and LPV/r	
Dyslipidaemia or diarrhoea associated with LPV/r	Switch LPV/r to ATV/r	
3rd line		
Failing 2nd line regimen for > 1 year and good adherence documented (e.g. by pharmacy refills on time for the last 6 months).	Genotype antiretroviral resistance test must be done. Only patients with resistance to LPV/r (or ATV/r) qualify for 3rd line. Application for 3rd line using the standard motivation form is required (available from TLART@health.gov.za) – the regimen will be determined by an expert committee based on the pattern of resistant mutations and the prior history of antiretroviral exposure.	

Note: In patients who have defaulted ART:

- **»** Recommence previous regimen and
- **»** Do VL at 6 months.

LoE:III[x]

Standardised national monitoring for adults and adolescents with HIV

At initial diagnosis of HIV	Purpose
Confirm HIV result with rapid antibody test.	Ensure that national testing algorithm has been followed.
If HIV-infected: Do CD4 count and WHO clinical staging.	To assess eligibility for ART. To assess eligibility for fast-tracking.
Screen for pregnancy or ask if planning to conceive.	See Section: 6.2.1 Care of HIV-infected pregnant woman.
Screen for TB symptoms (See Section 17.4: Pulmonary tuberculosis).	To identify TB/HIV co-infected.
Do CD4 count on the same day.	To identify eligibility for ART or ARVs for prophylaxis if pregnant.
If CD4 < 100: Do cryptococcal antigen test (CrAg).	To identify asymptomatic patients who need pre-emptive fluconazole treatment.
If AZT required: Do FBC.	To detect anaemia or neutropaenia.
If TDF required: Do Creatinine.	To detect renal insufficiency.
If NVP required: Do ALT.	To exclude liver disease.

On ART	Purpose
CD4 at 1 year on ART.	To monitor immune response to ART.
VL at month 6, 1 year and then every 12 months.	To identify treatment failures and problems with adherence.
If on NVP and develops rash or symptoms of hepatitis: Do ALT.	To identify NVP toxicity.
If on AZT: Do FBC at month 1, 2, 3 and 6.	To identify AZT toxicity.
If on TDF: Do creatinine at month 3 and 6, 1 year and then every 12 months.	To identify TDF toxicity.
If on LPV/r: Do fasting cholesterol and triglycerides at month 3.	To identify LPV/r toxicity.

At routine follow-up visits for those not yet eligible for ART	Purpose
Repeat CD4 count at 6 months.	To determine patient eligibility for ART.
WHO clinical staging at every visit.	To determine patient eligibility for ART.
Screen for TB symptoms. If no TB symptoms, consider IPT (See Section 11.2.2: Isoniazid preventive therapy (IPT)).	To identify TB/HIV co-infection. To prevent TB activation.
Offer advice on secondary prevention of HIV.	To prevent HIV transmission and re-infection and STIs.

In patients treated for TB with rifampicin regimens there are some important

medicine interactions:
» Efavirenz is not affected and no dose adjustment is needed.
» Nevirapine concentrations are modestly reduced. If efavirenz is contra-indicated nevirapine can be used, but the lead-in dose of nevirapine must be omitted.
» Lopinavir concentrations are markedly reduced. The dose should be doubled slowly (increase to 3 tablets 12 hourly after 1 week, then 4 tablets 12 hourly after the 2nd week, with monthly ALT monitoring).
» Atazanavir cannot be used with rifampicin.

LoE:III[xi]

REFERRAL
Contra-indications to commencing ART.

11.2 OPPORTUNISTIC INFECTIONS, PROPHYLAXIS IN ADULTS
Z29.2

11.2.1 COTRIMOXAZOLE PROPHYLAXIS
Z29.2

Primary prophylaxis with cotrimoxazole prevents many infections, e.g.:
» Pneumocystis pneumonia
» toxoplasmosis
» bacterial pneumonia
» bacteraemia
» isosporiasis

Indications for primary prophylaxis:
» WHO Clinical stage II, III or IV.
» CD4 count < 200.

LoE:I[xii]

Prophylaxis should be discontinued if the CD4 count increases on ART to > 200 for at least 6 months.

- Cotrimoxazole, oral, 160/800 daily.

(See Section 17.3.4.2.4: Pneumocystis pneumonia for secondary prophylaxis).

Note: Cotrimoxazole hypersensitivity is common and usually presents as a maculopapular rash. If there are systemic features or mucosal involvement associated with the use of cotrimoxazole, the medicine must be immediately and permanently stopped and the patient referred to hospital.

11.2.2 ISONIAZID PREVENTIVE THERAPY (IPT)
Z29.2

Patients with HIV infection are more susceptible to TB infection than HIV-uninfected patients at any CD4 count.

It is essential to rule out active TB before IPT is given.
Do not start IPT if the patient has any of the following:
» Active cough (any duration).
» Fever.
» Night sweats.
» Weight loss.

The duration of IPT depends on the Mantoux status and whether the patient is on ART.

In patients not eligible for ART:

» IPT reduces the risk of TB in patients with a positive TST (Mantoux ≥ 5 mm). LoE:I[XIII]

» IPT does not significantly reduce the risk of TB in patients with a negative TST (Mantoux < 5 mm).

» Prolonged IPT (at least 36 months) has been shown to reduce the risk of TB by 92% in TST positive patients compared with 6 months of IPT, but caused harm in TST negative patients. Therefore, TST is strongly encouraged. LoE:I[XIV]

» If TST cannot be done there is a net population benefit with 6 months' IPT. LoE:II[XV]

In patients on ART: LoE:III[XVI]

IPT reduces the risk of TB, irrespective of TST status. LoE:III[XVII]

Mantoux status	Duration of IPT	
	Patients not eligible for ART	Patients on ART
Mantoux ≥ 5 mm	At least 36 months	At least 36 months
Mantoux < 5 mm	No IPT	12 months
Mantoux not done	6 months	12 months

- Isoniazid, oral, 300 mg daily for 6 months.
  - Educate patients on the symptoms of hepatotoxicity (nausea, vomiting, yellow eyes, brown urine, pain in right upper quadrant).
  - Instruct patient to present early if these symptoms arise.
  - Patients should be followed up monthly for the 1st 3 months.
- Pyridoxine, oral, 25 mg once daily.

LoE:III[XVIII]

11.3 OPPORTUNISTIC INFECTIONS, TREATMENT IN ADULTS

11.3.1 APHTHOUS ULCERS IN HIV INFECTION

K12.0

DESCRIPTION

Painful ulcers in the oropharynx.
Minor ulcers < 1 cm diameter) usually heal within 2 weeks.
Major ulcers (> 1 cm diameter) are very painful, often very deep and persist. Major ulcers generally resolve rapidly on ART.
Herpes simplex, histoplasmosis and mycobacteria may also present with major mucosal ulcers.

MEDICINE TREATMENT

Minor aphthous ulcers:

- Tetracaine 0.5 %, oral, topical, applied every 6 hours.
  - Apply a thin layer on the affected areas only.

LoE:III[xix]

REFERRAL
Major aphthous ulcers for further diagnostic evaluation.

11.3.2 CANDIDIASIS, ORAL
B20.4

See Section 1.2: Candidiasis, oral (thrush).
- Commence ART.

11.3.3 CANDIDA OESOPHAGITIS
B20.4

DESCRIPTION
Infection of the oesophagus with candida, a fungus causing oral thrush.
Occurs in patients with oral thrush who have pain or difficulty on swallowing.
See Section 1.2: Candidiasis, oral (thrush).

GENERAL MEASURES
Maintain hydration.

MEDICINE TREATMENT
- Fluconazole, oral, 200 mg daily for 14 days.
- Commence ART.

REFERRAL
» Inability to swallow.
» Frequent relapses.
» Poor response to fluconazole.

11.3.4 CRYPTOCOCCAL INFECTION, PRE-EMPTIVE THERAPY
B45.1

All ART-naïve patients with CD4 < 100 should have cryptococcal antigen (CrAg) test done on serum (unless they had a diagnosis of cryptococcal infection).

<u>If CrAg test is positive and the patient has any symptom of meningitis:</u>
Refer patient immediately for lumbar puncture.

<u>If CrAg testis positive and the patient is asymptomatic:</u>
- Fluconazole, oral.
  - 800 mg daily for 2 weeks, then
  - 400 mg daily for 8 weeks.
  - Followed by 200 mg daily until the CD4 count increases on ART to > 200.

LoE:III[xx]

REFERRAL
Pregnant women with a positive CrAg test.

11.3.5 CRYPTOCOCCAL MENINGITIS

B45.1

DESCRIPTION

Fungal meningitis occurring in advanced HIV infection.
Presents with headache, often lasting for weeks. Neck stiffness is often absent.
Decreased level of consciousness, confusion and fever are common.

MEDICINE TREATMENT

All patients should be treated for cryptococcal meningitis at hospital level. Patients may be down referred for secondary prophylaxis.

Secondary prophylaxis

After completion of fluconazole 400 mg daily for 8 weeks:

- Fluconazole, oral, 200 mg daily for a minimum of 12 months.
  - Continue with fluconazole if CD4 count does not increase to > 200 on ART.

LoE:III[xxi]

- Commence ART 4–6 weeks after starting antifungal therapy.

LoE:III[xxii]

REFERRAL

All patients for initial management in hospital.

11.3.6 DIARRHOEA, HIV ASSOCIATED

A08.3

DESCRIPTION

Diarrhoea that persists for > 2 weeks.
Often associated with wasting.
Stool for ova, cysts and parasites should be requested in all cases.

MEDICINE TREATMENT

If stool is negative for parasites or shows *Cryptosporidium*:

- Loperamide, oral, 2 mg as required.
  - Maximum 8 mg daily.
- Commence ART.

If stool shows *Isospora belli*:

- Cotrimoxazole, oral, 320/1600 mg (4 tablets) 12 hourly for 10 days.
  - Followed by 160/800 mg (two tablets) daily until CD4 > 200 on ART.
- Commence ART.

Diarrhoea persisting for 4 weeks is a WHO stage 3 condition (if there is weight loss or fever it is stage 4) and ART should be commenced.

REFERRAL

Stool contains blood or mucous.

11.3.7 ECZEMA, SEBORRHOEIC

L30.9

See section 5.7.3: Dermatitis, seborrhoeic.

11.3.8 FUNGAL NAIL INFECTIONS

B50.5

This is common in HIV-infected patients and can involve multiple nails. Treatment is not generally recommended because it is mostly of only cosmetic importance and therefore the risk of systemic therapy is not warranted. It generally resolves when patient is on ART.

11.3.9 FUNGAL SKIN INFECTIONS

B50.5

See Section 5.5: Fungal infections of the skin.

11.3.10 GINGIVITIS, ACUTE NECROTISING ULCERATIVE

K05.1

See Section 1.3.3: Necrotising periodontitis.

11.3.11 HERPES SIMPLEX ULCERS, CHRONIC

B20.3

DESCRIPTION

Painful ulcers due to herpes simplex virus, involving the skin around the anogenital area or in and around the mouth and nostrils in patients with advanced HIV infection. Ulcers persist for weeks and may be several centimeters in diameter.

GENERAL MEASURES

Keep affected areas clean with soap and water or diluted antiseptic solution.

MEDICINE TREATMENT

- Aciclovir, oral, 400 mg 8 hourly for 7 days.
- Commence ART.

Pain:

- Paracetamol, oral 1 g when needed up to 4 times a day.

REFERRAL

» No response to therapy.
» Frequent relapses.

11.3.12 HERPES ZOSTER (SHINGLES)

B20.3

DESCRIPTION

Painful vesicular rash in a dermatomal distribution, usually presenting as a band on

one side of the body, due to recrudescence of the varicella-zoster virus that causes chickenpox. The surrounding skin is inflamed and the vesicles often contain cloudy fluid. Secondary bacterial infection is often suspected, but is very uncommon.
The elderly and HIV-infected are most affected.
Severe pain can occur after shingles has healed (post-herpetic neuralgia).
Shingles is less infectious than varicella and isolation is not warranted.

MEDICINE TREATMENT

If fresh vesicles are present:

- Aciclovir, oral, 800 mg five times daily (4 hourly missing the middle of the night dose) for 7 days.

If secondary infection is present:

ADD

- Flucloxacillin, oral, 500 mg 6 hourly.

LoE:III

Pain:

- Paracetamol, oral, 1 g 6 hourly when needed.

If inadequate pain relief

ADD

- Tramadol, oral, 50 mg 6 hourly (Doctor initiated).

For prolonged pain occurring after shingles has healed (post herpetic neuralgia), or if pain not responding to paracetamol and tramadol:

- Amitriptyline, oral, 25 mg at night.
  - Increase dose to 50 mg after two weeks if needed.
  - Increase further to 75 mg after a further two weeks if needed.

REFERRAL

» Involvement of the eye.
» Disseminated disease (many vesicles extending beyond the main area).
» Features of meningitis (headache and neck stiffness).
» Severe post-herpetic neuralgia not responding to amitriptyline.

11.3.13 PAPULAR PRURITIC ERUPTION

L30.9

DESCRIPTION

Itchy inflamed papules at different stages of evolution. Healed lesions are often hyperpigmented. The itch is difficult to manage. May flare after starting ART, but generally improves as the CD4 count increases. It is essential to exclude scabies.

GENERAL MEASURES

Minimise exposure to insect bites, e.g. by regularly dipping pets.

MEDICINE TREATMENT

- Cetirizine 10mg, oral daily.

- Hydrocortisone acetate 1% cream, applied twice daily for 7 days.
  - Apply sparingly to the face.

11.3.14 PNEUMONIA, BACTERIAL

J15.9

See Section 17.2: Respiratory infections.

11.3.15 PNEUMONIA, PNEUMOCYSTIS

B20.6

See Section 17.2: Respiratory infections.

11.3.16 TOXOPLASMOSIS

B58.9

Initial diagnosis can only be made at hospital level.

MEDICINE TREATMENT

- Cotrimoxazole, oral, 320/1600mg 12 hourly for 4 weeks.
  - Then 160/800 mg 12 hourly for 12 weeks.

Secondary prophylaxis

- Cotrimoxazole, oral 160/800 mg daily.
  - Continue until the CD4 count has risen to > 200 on ART.
- Commence ART.

11.3.17 TUBERCULOSIS (TB)

A15.0

See Section 17.2: Respiratory infections.

11.4 HIV AND KIDNEY DISEASE

B20/ N18

DESCRIPTION

Various forms of kidney disorders are described among patients who are HIV-infected. Early detection of HIV kidney disease may be beneficial in an attempt to protect the kidney from further disease progression.

Screening should include all patients at time of HIV diagnosis.

Patients at high risk or susceptible for HIV renal disease includes:

» CD4 count < 200.
» History of nephrotoxic medications.
» Comorbidity such as diabetes mellitus, hypertension, or hepatitis C virus co-infection.

Screening for renal disease in HIV

» Tests should include:
  – Urine dipstix for haematuria and proteinuria.
  – A measure of kidney function, i.e. creatinine to estimate eGFR.

» If there is no evidence of kidney disease at the initial evaluation, screening should be repeated annually.
» Monitor creatinine on initiation and at months 3, 6, 12 and then annually for patients receiving tenofovir.

REFERRAL

» Patients with persistent significant proteinuria (1+ or more).
» Estimated creatinine clearance < 60mL/minute.

HIV INFECTION IN CHILDREN

B24

DESCRIPTION

HIV is a retrovirus affecting immune cells, especially CD4 T lymphocytes. In advanced HIV disease the body loses its ability to fight infections and this is characterised by organ damage, opportunistic infections, malignancies and very low CD4 counts.

In infants, most infection is transmitted from mother to child.
In adolescents and adults sexual spread is the usual cause.

Infants born of HIV-infected mothers may be:
» HIV-infected,
» HIV-uninfected, or
» HIV exposed (at risk of becoming HIV-infected).

To exclude HIV infection in HIV exposed infants/children, a HIV PCR test (if ≥ 18 months of age: a HIV rapid or ELISA test) performed ≥ 6 weeks following cessation of breast feeding should be negative and the infant should be ≥ 6 weeks of age.

If the positive HIV status of a child already initiated on ART is disputed, consult with the closest referral centre for additional HIV testing.

WHEN AND HOW TO TEST IN CHILDREN

Which Test

Child < 18 months of age
HIV PCR test: Always confirm with 2nd HIV PCR test if the 1st test is positive.

Child ≥ 18 months of age
HIV rapid or ELISA test: Always confirm with a 2nd HIV rapid or ELISA test if 1st test is positive.

- HIV rapid tests may be less reliable in children with advanced disease. If clinical findings suggest HIV infection but the rapid test is negative, send a further specimen of blood to the laboratory for HIV ELISA testing.

When to Test

» At 6 weeks (if the child received NVP for 12 weeks – repeat HIV PCR at 16 weeks.
» At any time clinical signs indicate possible HIV infection.
» At 6 weeks, after breastfeeding has stopped.

» If the exposed infant has not been shown to be HIV-infected by 18 months, do an ELISA or HIV rapid test.

AND

Perform PCR testing AT BIRTH on:

- HIV exposed low birth weight infants (< 2.5 kg) or premature infants.
- Infants born to mothers who were on TB treatment for active TB during their pregnancy.
- Infants born to mother with a VL > 1000.
- Infants born to mothers with HIV drug resistance.
- Infants with congenital pneumonia.
- Infants who were symptomatic of HIV at birth.
- Infants of mothers, who were only diagnosed HIV-infected during or shortly after delivery.
- Infants born to mothers initiated on ART < 4 weeks before delivery.
- High risk infants requiring urgent HIV diagnosis.

(Note: The standard 6 week HIV PCR test must still be done).

If the HIV PCR result is not available at discharge, the mother should return within1 week for the result.

If the HIV PCR result is negative, repeat at 6 weeks:

- If HIV PCR result at 6 weeks or an age-appropriate test 6 weeks after breastfeeding has stopped, is still negative, perform HIV rapid test at 18 months of age.
- If positive at any time, start infant ART.

Also perform age-appropriate testing at any time on:

- Parental request to test the child.
- HIV-infected father or sibling.
- Death of mother, father or sibling.
- Mothers HIV status and her whereabouts are unknown.
- Clinical features suggest HIV infection.
- Infant has acute severe illness.
- Breastfed infant of newly diagnosed HIV-infected breastfeeding mother.
- IMCI classification of SUSPECTED SYMPTOMATIC HIV INFECTION or POSSIBLE HIV INFECTION.
- TB diagnosis, history of TB treatment or new TB exposure.
- Suspicion of sexual assault.
- Wet nursed/breastfed infant fed by a woman of unknown or HIV-infected status (and repeat age-appropriate test 6 weeks later).
- Children considered for adoption or fostering.

Newborn child whose mother is of unknown HIV status, has died or is not available due to abandonment or other reasons:

Perform an infant HIV rapid test and if positive perform HIV PCR. Initiate PMTCT.

Perform age-appropriate HIV testing in an HIV-uninfected child at any other time if

clinical symptoms suggest HIV infection.

Clinical indications that HIV infection should be considered in a child are:

» If the mother is HIV-infected or if the mother's HIV status is not known.
» If the child was HIV PCR negative but was subsequently breastfed.
» If a child has any of the following features:
  - Rapid breathing or chest indrawing now ("Pneumonia").
  - Persistent diarrhoea now or in the past.
  - Ear discharge now or in the past.
  - Low weight for age/height or unsatisfactory weight gain.
  - ≥ 2 enlarged glands of: neck, axilla or groin.
  - Oral thrush.
  - Parotid enlargement.

WHO staging of HIV and AIDS for children with confirmed HIV infection

Clinical Stage 1

» Asymptomatic.
» Persistent generalised lymphadenopathy.

Clinical Stage 2

» Unexplained persistent hepatosplenomegaly.
» Papular pruritic eruptions.
» Extensive wart virus infection.
» Extensive molluscum contagiosum.
» Fungal nail infections.
» Recurrent oral ulcerations.
» Unexplained persistent parotid enlargement.
» Linear gingival erythema.
» Herpes zoster.
» Recurrent or chronic upper respiratory tract infections (otitis media, otorrhoea, sinusitis, tonsillitis).
» Seborrhoeic dermatitis.

Clinical Stage 3

» Unexplained moderate malnutrition not adequately responding to standard therapy.
» Unexplained persistent diarrhoea (≥ 14 days).
» Unexplained persistent fever (> 37.5ºC intermittent or constant, for > 1month).
» Persistent oral candidiasis (after the first 6 weeks of life).
» Oral hairy leukoplakia.
» Acute necrotising ulcerative gingivitis or periodontitis.
» Lymph node TB.
» Pulmonary TB.
» Severe recurrent presumed bacterial pneumonia.
» Symptomatic lymphoid interstitial pneumonitis.
» Chronic HIV-associated lung disease including bronchiectasis.

» Unexplained anaemia (< 8 g/dL), neutropaenia (< 0.5 x 10^9/L) and/or chronic thrombocytopaenia (< 50 x 10^9/L).

Clinical Stage 4

» Unexplained severe wasting/severe malnutrition not responding to standard therapy.
» Pneumocystis pneumonia.
» Recurrent severe bacterial infections (such as empyema, pyomyositis, bone or joint infection or meningitis, but excluding pneumonia).
» Chronic herpes simplex infection; (orolabial or cutaneous of >1 months duration).
» Extrapulmonary TB.
» Kaposi sarcoma.
» Oesophageal candidiasis (or candida of trachea, bronchi or lungs).
» Central nervous system toxoplasmosis (after 1 month of life).
» HIV encephalopathy.
» Cytomegalovirus infection: retinitis or cytomegalovirus infection affecting another organ with onset at > 1 month of age.
» Extrapulmonary cryptococcosis (including meningitis).
» Disseminated endemic mycosis (extrapulmonary histoplasmosis, coccidiomycosis).
» Chronic cryptosporidiosis.
» Chronic isosporiasis.
» Disseminated non-tuberculous mycobacterial infection.
» Cerebral or B cell non-Hodgkin lymphoma.
» Progressive multifocal leukoencephalopathy.
» Symptomatic HIV-associated nephropathy or HIV-associated cardiomyopathy.

DIAGNOSIS IN CHILDREN

Testing must be done with counselling of parent/legal guardian/primary caregiver and, where appropriate, the child/and the appropriate consent obtained.

Children < 18 months of age: (HIV PCR test)

» Do HIV PCR at 6 weeks of age in all HIV exposed infants.
» If positive confirm with a 2nd HIV PCR test. Initiate treatment while awaiting the 2nd HIV PCR test result.
» If the child is breast fed and the 6-week HIV PCR is negative, testing should be repeated 6 weeks after complete cessation of breastfeeding. (If the child is ≥ 18 months, an ELISA or rapid test can be done).
» If an exposed child reaches 18 months of age and has not had a positive HIV PCR test or positive HIV infection diagnosis, a rapid test should be done.
» If at any time the child has evidence suggesting HIV infection, even if this is < 6 weeks of age, the child should be tested for HIV infection. If the HIV PCR test was done before 6 weeks and is negative, it should be repeated at 6 weeks.

In children ≥ 18 months of age: (HIV rapid/ELISA tests)

» If 1st HIV rapid test is positive, confirm the result with a 2nd HIV rapid test using a kit from a different manufacturer (preferably on different blood specimens).

» If 2nd HIV rapid test is not available, confirm diagnosis with an ELISA.

Note:

- Negative tests do not exclude infection until 6 weeks after birth and 6 weeks after exposure to other risk of HIV infection (including cessation of breastfeeding).
- Children with discordant HIV test results must be discussed with an expert.
- Do not repeat HIV rapid/Elisa tests in children on established ART.

11.5 THE HIV EXPOSED INFANT

DESCRIPTION

An infant whose mother is HIV-infected, or in whom HIV infection has not been confirmed or excluded.

Transmission of HIV infection from mother to child may occur during pregnancy, during delivery or via breastfeeding. Prevention of transmission of infection from mother to child can be effectively carried out with a very high success rate by means of suppressing the mother's VL and giving ARVs to the infant.

Where the mother's VL cannot be suppressed the risk of breast milk transmission remains significant.

The PMTCT care plan starts with the mother and may take one of the following routes once she is diagnosed as HIV-infected:

1. HIV-infected pregnant women receive combined ART to suppress the VL to undetectable levels after which the risk of breastfeeding transmission is negligible. ART may have been started before the woman became pregnant or may only be started during pregnancy as soon as the infection is detected.
   - » If the mother is started on ART **early** in pregnancy (i.e. > 4 weeks before delivery), and continues while breastfeeding: Give ARV prophylaxis (NVP) to the infant until 6 weeks of age.
     - If 6 week infant PCR is positive: Start infant ART, stop NVP and continue breastfeeding. Start cotrimoxazole prophylaxis.
   - » If the mother is started on ART **late** during pregnancy (i.e. ≤ 4 weeks before delivery) or at delivery: Give NVP to the infant until 12 weeks of age.
     - If 6 week infant PCR is positive: Stop NVP, continue breastfeeding, start infant ART and cotrimoxazole prophylaxis.
   - » HIV-infected mother who has not received ART by delivery:
     - Initiate mother on ART, and give NVP to the infant until 12 weeks of age. If 6 week infant PCR is positive: Stop NVP, continue breastfeeding, start infant ART and cotrimoxazole prophylaxis.
   - » Mother with previously unknown HIV status, newly diagnosed HIV-infection and presents within 72 hours of delivery:
     - Initiate mother on ART and initiate infant ARV prophylaxis:
       - NVP: Start immediately and then daily for 12 weeks.
   - » If mother with previously unknown HIV status, newly diagnosed HIV-infected and presents > 72 hours after delivery:

- Infant is breastfed or stopped breastfeeding < 1 week previously:
  - Infant AZT + NVP started and mother to be initiated on ART. HIV PCR test done and obtain result within 7 days.
    - Negative HIV PCR: Stop AZT and give NVP for 12 weeks.
    - Positive HIV PCR: Initiate infant on ART and confirm with a 2nd HIV PCR.
- Infant not breastfed and has not breast fed in the previous 1 week:
  - Initiate mother on ART. Do HIV PCR and get results within 7 days.
    - Negative HIV PCR: 2nd HIV PCR at 6 weeks of age.
    - Positive HIV PCR: Initiate infant on ART and confirm with a 2nd HIV PCR.

» <u>If the mother has been on lifelong ART before the pregnancy</u>, she must have a VL at 1st booking. If VL is not suppressed, this must be addressed and infant ARV prophylaxis appropriately adjusted.

- VL > 1000: Consider adherence problems or viral resistance. Seek expert advice for the management of the mother and the child.
- VL< 1000 and mother is breastfeeding: Give NVP to the infant until 6 weeks of age. If 6 week infant PCR is positive: Stop NVP, continue breastfeeding, start infant ART and cotrimoxazole prophylaxis.

2. Orphaned or abandoned infants and mother's HIV status is unknown:
   - Give NVP immediately and test infant with rapid HIV test.
     - Positive rapid HIV test: NVP daily for 6 weeks.
     - Negative rapid HIV test: Discontinue NVP.

Perform PCR testing on all HIV exposed infants at 6 weeks of age, and if negative, perform an ELISA/HIV rapid test at 18 months of age (or an age-appropriate test 6 weeks after cessation of breastfeeding).

Note: For recommendations on when to perform additional tests, refer to the guidance on "When to Test" (Section: HIV infection in children).

LoE:III[xxiii]

Infant regimens		
Infant	**Regimen**	**Comment**
Mother starting ART in pregnancy (including TDF + EFV + 3TC or FTC)	1. <u>Mother starts ART > 4 weeks before delivery:</u> • NVP at birth and then daily for 6 weeks. **OR** 2. <u>Mother starts ART < 4 weeks before delivery, or at delivery:</u> • NVP at birth and then daily for 12 weeks.	PCR positive at any time including the 6 week test: Confirm with 2nd HIV PCR test, stop PMTCT and start ART.

Mother on lifelong ART, initiated before pregnancy (including TDF + EFV + 3TC or FTC)	**Mother has VL at booking:** 1. Mother VL < 1000: • NVP at birth and then daily for 6 weeks. 2. Mother VL > 1000: **Mother failing 1st line and initiated on 2nd line:** » > 4 weeks before delivery • AZT + NVP for 6 weeks. » < 4 weeks before delivery • AZT + NVP for 12 weeks. **Mother failing 2nd line ART:** Refer for specialised management.	(If on NVP prophylaxis for 12 weeks and 2nd HIV PCR confirmatory test was negative: Repeat HIV PCR at 16 weeks).
Mother did not get any ART before or during delivery and diagnosed HIV-infected post delivery.	Presents ≤ 72 hours of delivery: Mother to be initiated on ART. • NVP immediately and then daily for 12 weeks. Presents > 72 hours from delivery: » Infant is breastfed or stopped breast feeding < 1 week previously. • AZT + NVP started and HIV PCR sent. Initiate mother on ART. Get HIV PCR result within 7 days: ○ Negative: Stop AZT, and give NVP for 12 weeks. ○ Positive: Initiate infant on ART and confirm with a 2nd HIV PCR. » Infant not breastfed and has not breastfed in the previous 1 week. • Initiate mother on ART. Do HIV PCR and get results within 7 days: ○ Negative: Check PCR at 6 weeks of age. ○ Positive: Initiate infant on ART and confirm with a 2nd HIV PCR.	
Unknown maternal status because orphaned or abandoned.	• Give NVP immediately* and test infant with rapid HIV test. ○ Positive: If presents ≤ 72 hours of delivery, give NVP daily for 6 weeks. Check PCR at 6 weeks of age. ○ Negative: Discontinue NVP.	

***** If rapid HIV test can be done ≤ 2 hours, wait for HIV result before commencing NVP.

Infant PMTCT dosages:
Premature and low-birth weight newborns (< 2 kg) are treated in hospital.

Daily prophylaxis for 6 or 12 weeks administered to infants, as indicated above:
» Give 1st dose as soon as possible after birth.
» If baby vomits: Repeat dose once only.
» If infant HIV PCR is positive at any time, stop prophylactic ARV, confirm with 2nd PCR and initiate/refer for ART, while awaiting 2nd PCR result.
» Continue normal breastfeeding and start cotrimoxazole prophylaxis if > 6 weeks of age.

Nevirapine (NVP) dose for infant on PMTCT:
Newborns ≥ 2 kg and infants:
- Nevirapine, oral, daily.

Weight kg	**Dose** mg	**Syrup** 10 mg/mL	**Age** Months
2–2.5 kg	10 mg	1 mL	Birth–6 weeks
>2.5 kg	15 mg	1.5 mL	
>2.5–7 kg	20 mg	2 mL	>6 weeks–6 months

Zidovudine (AZT) dose for infant on PMTCT:
Newborns ≥ 2 kg and infants:
- Zidovudine, oral, 4 mg/kg/dose 12 hourly.

Weight kg	**Dose** mg	**Syrup** 10 mg/mL	**Age** Months
2–2.499 kg	10mg	1 mL	Birth–6 weeks
≥2.5 kg	15 mg	1.5 mL	>6 weeks

Feeding advice
» Exclusive breast feeding is strongly recommended for the 1st 6 months, after which the nutritional needs of the child will require the introduction of complementary foods, while breastfeeding continues.
» Mothers failing 2nd or 3rd line regimens should not breastfeed, provided the mother fulfils the AFASS (affordable, feasible, acceptable, sustainable and safe) criteria.
» If women are switched from 1st to 2nd line therapy during pregnancy or breastfeeding, consult with a practitioner experienced and knowledgeable of the factors informing the feeding option decision.
» The mother should be encouraged to breastfeed as the advantages of breast feeding exceed the risks of HIV transmission in a mother on effective ART.
» Use of flash pasteurisation or Pretoria pasteurisation to reduce HIV transmission is supported but may pose significant barriers to successful breast milk feeding due to the effort involved.

Cotrimoxazole prophylaxis
Initiation:
» All HIV exposed or infected infants, starting from 6 weeks of age.
» Any child 1–5 years of age with CD4 < 25%.

» Any child > 5 years of age with CD4 < 350.
- Cotrimoxazole, oral, once daily (everyday). See dosing table, pg 22.3.

Discontinuation:
» Child is HIV-uninfected and has not been breastfed for the last 6 weeks.
» HIV-infected child > 1 year of age whose immune system is fully reconstituted on ART (i.e. 1–5 year: CD4 > 25% or > 5 years: CD4 > 350 on 2 tests at least 3–6 months apart).
» Child is HIV-infected with PCP infection: after treatment, continue cotrimoxazole prophylaxis till 5 years of age.

LoE:III[xxiv]

REFERRAL
Mother declines infant ARV prophylaxis.

11.6 MANAGEMENT OF HIV-INFECTED CHILDREN

DESCRIPTION
HIV-infected child: An infant/child in whom HIV infection has been confirmed with 2 age appropriate tests. See Section 11.4. The HIV exposed infant.

GENERAL AND SUPPORTIVE MEASURES
» Identify a caregiver who can supervise the child's treatment.
» Link the HIV interventions to the regular well infant visits/nutritional care. Ensure the road to health booklet is correctly filled and used to reflect and guide care.

Counselling is a vital part of the successful care of children with HIV infection and their families. Specific matters requiring attention are:
» The implications of the disease to the family.
» Implications of treatment and understanding of the condition and its care.
» The disclosure process within the family and extended family should be encouraged. Besides the caregiver, help from the family is often useful.
» Disclosure to the child appropriate to age and maturity with the parents' support.
  - Find out what the child understands of their illness and what they would like to know.
  - Disclosure should be child led in terms of information required, language used and educational/emotional readiness.
  - Anticipate the effects of disclosure on the child, family and other contacts such as friends and school colleagues.
  - Ensure that in disclosure the child is constantly reassured of the parents/caregivers love.

Treatment of mothers, caregivers and other family members:
» Always ask about the caregiver's health, and the health of other family members.
» Ensure that mothers and other family members have timeous access to medical care including ART.
» Encourage breastfeeding in all mothers with HIV-infected children, with introduction of complementary foods from 6 months of age.

» At every visit ask about TB contacts and TB symptoms in all children and their caregivers.

Standardised national monitoring for infants and children with HIV

At initial diagnosis of HIV	Purpose
Verify HIV status.	To ensure that national testing algorithm has been followed.
Document weight, height, head circumference (< 2 years of age) and development.	To monitor growth and development.
Screen for TB symptoms.	To identify TB and HIV co-infection
Do CD4 count.	Children < 5 years: Baseline. Do **not** wait for CD4 count to start ART.
	Children ≥ 5 years: To assist in determining eligibility for ART.
Hb or FBC if available.	To detect anaemia or neutropenia.
At routine follow-up visits (patients not yet on ART)	**Purpose**
Document weight, height, head circumference (< 2 years) and development.	To monitor growth and development.
If > 5 years: Check that a CD4 count has been done in the last 6 months.	To determine eligibility for ART.
If > 5 years: WHO clinical staging.	To determine eligibility for ART.
Screen for TB symptoms.	To identify TB/HIV co-infection.
At initiation of ART (baseline)	**Purpose**
Hb or FBC.	If < 8 g/dL: Manage appropriately.
CD4 count (if not performed in last 6 months).	Baseline assessment.
If on PI-based regimen: Cholesterol + triglyceride.	Baseline assessment.
If considering TDF-based regimen: Serum creatinine + urine dipstick test.	If abnormal refer for specialist opinion.
If jaundiced or on TB treatment: ALT.	To detect liver dysfunction.
On ART	**Purpose**
Height, weight, head circumference (if child < 2 years) and development.	To monitor growth and development. Adjust dosing at each visit according to weight gain.
Clinical assessment including medicine-related adverse events.	To monitor response to ART and detect adverse effects.
CD4: 1 year on ART, and then 12 monthly.	To monitor response to ART. Stop cotrimoxazole prophylaxis if indicated.

On ART	Purpose
Viral load: » < 5 years: At month 6 and 12 on ART, then annually. » 5–15 years: At month 6 on ART, and if suppressed - annually.	To monitor viral response to ART. To identify treatment failure and adherence problems.
If on AZT: Hb or FBC: At month 1, 2, 3 and then annually.	To identify AZT-related anaemia.
If on PI-based regimen: LDL-cholesterol + triglyceride: At 1 year and then 12 monthly.	To monitor for PI-related metabolic side effects.

MEDICINE TREATMENT

Cotrimoxazole prophylaxis

Initiation:

» All HIV exposed or infected infants, starting from 6 weeks of age.
» Any child 1–5 years of age with CD4 < 25%.
» Any child >5 years of age with CD4 < 350.

- Cotrimoxazole, oral, once daily (everyday). See dosing table, pg 22.3.

Discontinuation:

» Child is HIV-uninfected and has not been breastfed for the last 6 weeks.
» HIV-infected child > 1 year of age whose immune system is fully reconstituted on ART (i.e. 1–5 year: CD4 > 25% or > 5 years: CD4 > 350 on 2 tests at least 3–6 months apart).
» Child is HIV-infected with PCP infection: after treatment, continue cotrimoxazole prophylaxis till 5 years of age.

Immunisation, deworming and vitamin A program

» Continue deworming and vitamin A programme as in the HIV-uninfected child.
» Continue immunisation as in the HIV-uninfected child except:
  - Do not give BCG to children with symptomatic HIV unless the child has immune reconstituted on ART.
  - Give an additional dose of measles vaccine at 6 months.
  - See Chapter 13: Immunisation.

LoE:III[xxv]

Nutritional support

Specific nutritional conditions should be treated appropriately.

Antiretroviral therapy

Initiation of ART in well, uncomplicated infants shown to be PCR positive should be carried out at PHC level.

The preparation of the child and family to start ART is critical to the success of the treatment. Failure to achieve adherence and understanding may lead to resistance and adversely affect the prognosis of the child.

Eligibility for ART

Clinical criteria

» Confirmation of diagnosis of HIV infection.

AND

» Child < 5 years of age irrespective of CD4 count or staging.
» Child ≥ 5 years with CD4 < 500 or WHO clinical stage III or IV.

AND

» No medical contraindication (e.g. major organ dysfunction). If medical contraindications are present refer to hospital for rapid review and planning.

Children requiring fast track (i.e. start ART within 7 days of being eligible if safe to do so):

» Children < 1 year of age.
» WHO Clinical stage 4.
» MDR or XDR-TB.
» CD4 count < 200 or < 15%.

Social issues that must be addressed to ensure successful treatment

These are extremely important for success and impact on adherence. Social challenges should be overcome and not be barriers to care. Adherence to treatment must at least be considered probable. Disclosure to another adult living in the same house is encouraged so that there is someone else who can assist with the child's treatment. However, absence of disclosure should not preclude ART initiation.

» Mandatory component: At least one identifiable caregiver able to supervise the child and/or administer medication. All efforts should be made to ensure that the social circumstances of vulnerable children (e.g. orphans) be addressed to facilitate treatment.
» Adherence:
  - High levels of adherence are required for adequate virological response and prevention of viral resistance. This can be achieved with regular education and support.
  - All efforts to encourage this level of adherence should be made.
  - Viral load measurements are useful for monitoring adherence.
  - Sensitive, age-appropriate disclosure facilitates adherence.
» Mother and other family members should be assessed and treated.

Requirements before ART is initiated:

The child's family (parents, caregivers) should understand:

» ART is life-long.
» The prognosis of the condition (treated and untreated).
» Medicines' adverse effects and modes of action, and the risk and implications of developing resistance, if incorrectly used.
» That all medicines should be given. If ≥ 1 antiretroviral is missing from the medicine regimen, treatment should be stopped until they are all available again.

ART regimens

» Are chosen according to age, weight, expected adverse effects, efficacy and prior antiretroviral exposure.
» Adjust the dosage of ART according to weight, during follow up visits.
» Do not change regimens or move to 2nd line therapy without clear guidance from a practitioner experienced in child ARV medicine, as unnecessary loss of effective regimens can shorten life expectancy. Adherence problems need to be addressed thoroughly before switching to a 2nd or 3rd line regimen.
» Single medicine substitutions may only be made when medicine-specific adverse effects are encountered, on condition that virological suppression is documented and the matter is discussed with a practitioner experienced in child ARV medicine.

First Line Regimen	
All infants and children < 3 years **or** Older children < 10 kg.	ABC + 3TC + LPV/r. Do not change from this regimen to regimen below on the sole basis of increased age and weight.
Infants < 3 months or < 3 kg: Seek advice on treatment regimen and dosage.	
All children > 3 years and > 10 kg.	ABC + 3TC + EFV. Do not exceed maximum adult dosage.
Adolescents > 15 years and > 40 kg.	TDF + 3TC (or FTC) + EFV. Do not use in patients with significant psychiatric co-morbidity, renal compromise (creatinine clearance < 50 mL/min/1.73m^2), or co-administration of nephrotoxic medicines.
Children < 6 weeks **or** < 3 kg, who are positive at birth.	Consult a person experienced in initiating ART in such children.

Adjustment of previous 1st line regimens	
d4T-containing 1st line regimens	– If VL is suppressed: Change d4T to ABC. – If VL is > 1000: Manage as virological failure. If VL remains high after enhanced adherence, refer for consideration of a change in regimen. – If VL is 50–1000: Consult or refer.
Change 1st line children regimen to adult treatment, if > 15 years **and** > 40kg.	– If VL is > 1000: Manage as virological failure. If VL remains high after enhanced adherence, refer for consideration of a change in regimen. – If VL is 50–1000: Consult or refer. – If VL is suppressed and on 1st line: 1. ABC + 3TC + EFV. • Change to TDF + 3TC (or FTC) + EFV. 2. ABC + 3TC + LPV/r.

	• Change to TDF + 3TC (or FTC) + EFV. Changing from a 2nd child regimen requires consultation or referral.
ddI-containing 1st line regimens	Change ddI to ABC, irrespective of VL.

LoE:III[xxvi]

Initiating ART in children (the 6 steps/IMCI child NIMART)

(These steps are taken from the IMCI nursing protocol. Doctors may obtain further guidance from the Paediatric Hospital Level EML and STG, 2013).

1. Decide if the child has confirmed HIV infection (see testing above).
2. Decide if the child is eligible to receive ART (see criteria above).
3. Decide if the caregiver is able to give ART (If not, refer to appropriate level to ensure ability to take ART effectively and safely).
4. Decide if a nurse should initiate ART (i.e. NIMART suited patient).
   a. If any of the following are present refer:
      - Fast breathing.
      - TB.
      - Weight < 3 kg.
      - General danger signs or severe disease evident.
5. Assess and record baseline information.
   a. Record the following information:
      - Weight and height.
      - Head circumference in children < 2 years of age.
      - Assess for malnutrition and anaemia.
      - Feeding assessment and feeding problems.
      - Development.
      - Consider and screen for TB.
      - WHO clinical stage.
      - Laboratory results: Hb, VL, CD4 count and percentage.
   b. If SEVERE MALNUTRITION, SEVERE ANAEMIA or TB refer to next level of care.
   c. If POSSIBLE TB provide appropriate follow up.
   d. If Hb < 10 g/dL (but not severe anaemia) treat as per IMCI. Do not delay ART. Send appropriate laboratory tests but do not wait for results to start ART.
6. Start ART:
   a. If < 3 years of age **OR** < 10 kg: ABC+3TC+LPV/r.
   b. If > 3 years of age **AND** ≥ 10 kg: ABC+3TC+EFV.
   c. Continue (or start) cotrimoxazole prophylaxis.
   d. Follow up after 1 week:
      - To check ability to adhere.
      - To check outstanding laboratory results.
      - To resolve any problems that may have arisen.

Then proceed to long term follow up (the 7 steps/IMCI child NIMART).

(These steps are taken from the IMCI nursing protocol. Doctors may obtain further guidance from the Paediatric Hospital Level EML and STG, 2013).

1. Assess for problems:

a. Ask if there are any problems.
b. Check for any danger signs.
c. Check for ART dangers signs:
   - Severe Skin Rash.
   - Difficulty breathing or severe abdominal pain.
   - Yellow eyes.
   - Fever, vomiting, rash.
d. Check for any other symptoms.
e. Consider TB/ask if there has been TB contact and examine at each visit.

2. Monitor progress on ART:
   a. Record weight (and height every 3 months).
   b. Assess development every 6 months.
   c. Assess adherence and record (ask mother, self-assessment, record correct number of pills remain, watch body language).
   d. Assess for side effects. If present manage according to guidelines or refer:
      – yellow eyes
      – nausea and vomiting
      – fever
      – sleep disturbances
      – anxiety
      – lipo-atrophy
      – rash
      – diarrhoea
      – headache
      – nightmares
      – tingling or numbness

      LoE:III[xxvii]
   e. Assess clinical progress.
   f. Monitor blood results.
   g. Indications for referral to a doctor include:
      Not gaining weight for 3 months.
      Regression of milestones.
      Failure to attain milestones.
      Poor adherence after adherence counselling.
      Significant side effects despite appropriate management.
      Deterioration of clinical stage.
      CD4 count significantly dropping.
      VL > 400 despite adherence counselling.
      Fasting total cholesterol > 4.43 mmol/L.
      Fasting TG > 5.6 mmol/L.
3. Provide further ART:
   a. Continue treatment if stable and no significant side effects.
      Note: Check dose is correct for current weight and adjust accordingly.
4. Provide other treatments:
   a. Continue cotrimoxazole prophylaxis till: 1–5 year: CD4 > 25%; or if > 5 years: CD4 > 350; on 2 tests at least 3–6 months apart.
5. Provide routine care:
   a. Check immunisations, vitamin A, de-worming etc. have all been done.
6. Counsel the mother/caregiver:
   a. Use the visit to check mother's knowledge and need for support.

b. Check if family and mother are receiving own necessary care.

7. Arrange further follow up:
   a. Arrange follow up in 1 month (more frequently if other problems are present).

Treatment failure

» VL is the most sensitive method to detect failure of response to ART.
» Virological failure can be defined as a measurable viral load, despite optimal adherence and optimal dosing over a four month period. Clinical and immunological deterioration are late features of ART failure.
» The most common cause of treatment failure is poor adherence. Adherence has to be addressed, before switching to 2nd line therapy.

Viral load (VL)	Response
Lower than detectable limits	» Praise the patient and caregiver(s) and continue 12 monthly VL monitoring.
< 50* copies/mL	» 12 monthly VL monitoring and adherence support.
50*–1 000 copies/mL	» Begin step up adherence package. » Repeat VL in 6 months.
>1 000 copies/mL	» Begin step-up adherence package. » Repeat VL in 3 months: – VL < 400: Return to routine 6–12 monthly monitoring. – VL 400–1000: Continue step up adherence and repeat VL after 6 months. – VL > 1 000 despite stepped up adherence, **and** child is on NNRTI based regimen: Consult or refer for switch to 2nd line therapy after adherence ensured. – Child is on a PI-based regimen and VL > 1000, despite stepped up adherence: » VL < 30 000: Continue with same regimen while monitoring VL 3-monthly. Continue stepping up adherence and consult an expert. » VL > 30 000: Refer.

*If laboratory does not test VL of 50 copies/mL, use cut-off of < 400 copies/mL.

General ART comments

» Switch to tablets or capsules from syrups or solutions as soon as possible.
» Fixed dose combinations are preferred to single agents.
» If available, use daily dose regimens.

Side effects:

	Continue ART with careful monitoring. Get expert advice.	**Consider stopping treatment URGENTLY. Consult expert urgently.**
Symptomatic hyperlactataemia/ lactic acidosis	Lactate: 2–5 mmol/L with no signs or symptoms	Lactate > 5 mmol/L, **or** acidosis,

		or signs or symptoms.
Anaemia	Hb: 7.0–9.9 g/dL	Hb < 7 g/dL, **or** cardiac failure.
Neutropenia	0.4–1.2 X 10^9/L	< 0.4 X 10^9/L
Increased liver enzymes and hepatitis	≤ 9.9 X upper normal limit	≥ 10.0 X upper normal limit
Increased serum triglycerides	1.54–8.46 mmol/L	≥ 8.47 mmol/L
Increased LDL cholesterol	4.43–12.92 mmol/L	≥ 12.93 mmol/L
Skin reactions	- diffuse maculo- papular rash, **or** - dry desquamation	Vesiculation, **or** ulcers, **or** exfoliative dermatitis, **or** Stevens-Johnson syndrome, **or** erythema multiforme, **or** moist desquamation, **or** elevated ALT, **or** elevated AST.
Other side effects: - peripheral neuropathy - myopathy - abdominal pain - nausea and vomiting - pancreatitis - headache - fatigue - sedative effect - sleep disturbance - confusion - abnormal thinking - probably teratogenic	Clinical evaluation. **Discuss all cases with an HIV clinician, before interrupting therapy.**	

ANTIRETROVIRAL MEDICINE DOSAGES BY WEIGHT BANDS

	Abacavir (ABC)		**Lamivudine (3TC)**		**Efavirenz (EFV)**	**Lopinavir/ritonavir (LPV/r)**			**Ritonavir (r) boosting**
Target dose	8 mg/kg 12 hourly **OR** ≥10kg: 16 mg/kg once daily		4 mg/kg 12 hourly **OR** ≥10 kg: 8 mg/kg once daily		By weight band once daily	300/75 mg/m^2/dose LPV/r 12 hourly			**ONLY as booster for LPV/r when on rifampicin** 12 hourly (0.75xLPV dose 12 hourly)
Available formula-tions	Sol. 20mg/mL Tab 60 mg (scored, dispersible) Tab 300 mg (not scored), ABC/3TC 600/300 mg.		Sol. 10mg/ml Tab 150 mg (scored),300 mg; Tab ABC/3TC 600/300 mg		Caps 50,200 mg Tabs 50,200, 600 mg (not scored)	Sol. 80/20 mg/mL Adult Tabs 200/50 mg, Paeds Tabs 100/25 mg			Sol: 80 mg/mL
Weight Kg	Currently available tablet formulations of ABC (except 60 mg), EFV, LPV/r must be swallowed whole and **not** chewed, divided or crushed.								
< 3	Consult with a clinician experienced in paediatric ARV prescribing for neonates (< 28 days of age) and infants weighing < 3 kg								
3–4.9	2 mL 12 hourly		2 mL 12 hourly		Don't Use **< 10 kg or < 3 years:**	1 mL 12 hourly			1 mL 12 hourly
5–6.9	3 mL 12 hourly		3 mL 12 hourly			1.5 mL 12 hourly			1.5 mL 12 hourly
7–9.9	4 mL 12 hourly		4 mL 12 hourly						
10–13.9	Choose only one option: 6 mL 12 hourly **OR** 2x60* tabs 12 hourly	12 mL daily **OR** 4x60* tabs daily	Choose only one option: 6 mL 12 hourly	12 mL daily	1x200* cap/tab at night	2 mL 12 hourly			2 mL12 hourly
14–19.9	8mL 12 hourly **OR** 2.5x60* tabs12 hourly	1x300* tab daily **OR** 15 mL daily	8 mL 12 hourly **OR** ½x150* tab 12 hourly	1x150* tab daily **OR** 15 mL daily	1x200* cap/tab + 2x50* cap/tab at night	Choose one option: **Either** 2.5 mL12 hourly	**OR** 2 x 100/25* tabs 12 hourly	**OR** 1 x200/50* tab 12 hourly	
20–24.9	10 mL 12 hourly **OR** 3x60* tabs12 hourly	20 mL daily **OR** 1x300*+ 1x60* tab D / 20 mL daily **OR** 1x300*+ 2x60* tabs daily	1x150* tab 12 hourly **OR** 15 mL 12 hourly	30 mL daily **OR** 1x300* tab daily **OR** 2x150* tab daily		**Either** 3 mL 12 hourly	**OR** 2x100/25* tabs 12 hourly	**OR** 1x200/50* tab 12 hourly	2.5 mL 12 hourly
25–29.9	1x300* tab 12 hourly	2x300 tabs daily **OR** 1 x ABC/3TC 600/300* tab daily	1x150 tab 12 hourly	2x150* tabs daily **OR** 1x300* tab daily **OR** 1 x ABC/3TC 600/300* tab daily	2x200* caps/tab at night	**Either** 3.5 mL 12 hourly	**OR** 3x100/25* tabs12 hourly	**OR** 1x200/50* tab+1x100/25* tab 12 hourly	3 mL 12 hourly
30–34.9						**Either** 4 mL 12 hourly			
35–39.9						**Either** 5 mL 12 hourly	**OR** 2x200/50* tabs 12 hourly		4 mL 12 hourly
>40					600 tab at night				

*dosage in mg Sol: solution Tab: tablet Cap: capsule

11.7 OPPORTUNISTIC INFECTIONS, PROPHYLAXIS IN CHILDREN

Z29.2

Cotrimoxazole prophylaxis

Indications:

» All HIV exposed or infected infants, starting from 6 weeks of age.
» Any child 1–5 years of age with CD4 < 25%.
» Any child > 5 years of age with CD4 < 350.

- Cotrimoxazole, oral, once daily (everyday). See dosing table, pg 22.3.

Discontinuation:

» Child is HIV-uninfected and has not been breastfed for the last 6 weeks.
» HIV-infected child > 1 year of age whose immune system is fully reconstituted on ART (i.e. 1– 5 year: CD4 > 25% or >5 years: CD4 > 350 on 2 tests at least 3–6 months apart).
» Child is HIV-infected with PCP infection: after treatment, continue cotrimoxazole prophylaxis till 5 years of age.

TB prophylaxis

See Section 11.5.7: Tuberculosis: TB prophylaxis.

Immunisation

Continue immunisation as in the HIV-uninfected child except:

- Give an additional measles vaccination at 6 months of age.
- Do not give BCG to children with symptomatic HIV unless the child has immune reconstituted on ART.
- See Chapter 13: Immunisation.

LoE:III[xxviii]

11.8 OPPORTUNISTIC INFECTIONS, TREATMENT IN CHILDREN

11.8.1 CANDIDIASIS, ORAL (THRUSH), RECURRENT

B20.4

MEDICINE TREATMENT

- Nystatin suspension, oral, 100 000 IU/mL, 0.5 mL after each feed.
  - Keep in contact with the affected area for as long as possible prior to swallowing.
  - In the older child, ask child to swirl in the mouth, prior to swallowing.
  - In the infant, advise mom to apply to front of the mouth and spread over the oral mucosa with a clean finger.
  - Continue for 48 hours after resolution of symptoms.

If there is oral candidiasis and the child cannot swallow, this

LoE:III[xxix]

indicates the presence of oesophageal candidiasis. See Section 11.8.2: Candidiasis, oesophageal.

11.8.2 CANDIDIASIS, OESOPHAGEAL

B20.4

MEDICINE TREATMENT

- Fluconazole, oral, 6 mg/kg once daily for 21 days. See dosing table, pg 22.4.

LoE:III[xxx]

11.8.3 DIARRHOEA, HIV ASSOCIATED

B23.8

See Section 2.8: Diarrhoea.

11.8.4 PNEUMONIA

B23.8

See Section 17.2: Respiratory infections.

11.8.5 MEASLES AND CHICKENPOX

B20.7

Refer all patients.

11.8.6 SKIN CONDITIONS

B20.7

These are common and include scabies, seborrhoeic eczema and others. See Chapter 5: Skin conditions.
If no response to care as directed in the chapter, refer.

11.8.7 TUBERCULOSIS (TB)

A15.0

DESCRIPTION

TB and HIV are often co-morbid conditions. Exclude TB in all patients before starting ART. See Section 17.4.2: Pulmonary tuberculosis, in children.

Re-evaluate the risk for TB and TB contact at each visit on history (including contact history) and clinical examination.

TB should be considered early in non-resolving pneumonias.
Tuberculin tests are often not reliable and a negative test does not exclude TB.
If TB is suspected but cannot be proven, refer early for diagnostic evaluation.

MEDICINE TREATMENT

TB prophylaxis

Give TB prophylaxis to all children in whom no evidence of TB disease is present and who are:

» Exposed to a close contact with infectious pulmonary TB or
» TST positive (only the 1st time a positive TST is shown).

- Isoniazid, oral, 10 mg/kg/dose once daily for 6 months. See Section 17.4.2.1: TB chemoprophylaxis/Isoniazid preventive therapy (IPT) in children.

Repeat course if an HIV-infected patient, irrespective of age, is re-exposed to a TB contact at any point after completing TB treatment or prophylaxis.

If patient has been exposed to a known MDR or XDR-TB source case or the contact case has failed standard TB treatment, refer.

TB treatment

<u>If the child is not yet on ART:</u>

» Commence TB treatment first. Follow with ART, usually after 2–8 weeks:
  – 2 weeks if CD4 < 50
  – 8 weeks if CD4 > 50

LoE:III[xxxi]

» Check ALT before commencing ART. If the ALT is raised, discuss this with an expert as it may not be an absolute contra-indication to treatment.
» Be aware of the possibility of Immune Reconstitution Inflammatory Syndrome (IRIS).

<u>If the child is already on ART:</u>

» Commence TB treatment taking into consideration possible medicine interactions.

<u>If the child needs to take concomitant ART and rifampicin:</u>

» Abacavir and lamivudine: no dose adjustment required.
» Lopinavir/ritonavir: Add additional ritonavir to ensure an equal dose in mg of lopinavir and ritonavir while on rifampicin. For example for each mL of LPV/r solution (80/20 mg/mL), add 0.75 mL of ritonavir solution (80 mg/mL).

LoE:III[xxxii]

» Give pyridoxine (vitamin B_6) to all children on TB and ART, to avoid development of peripheral neuropathy.

11.9 DEVELOPMENTAL DELAY OR DETERIORATION

B23.8

Refer for assessment.

11.10 ANAEMIA

B23.8

See Section 3.1: Anaemia

11.11 COMPLICATIONS OF ART

11.11.1 LACTIC ACIDOSIS

E87.2

DESCRIPTION

All nucleoside analogues have been associated with lactic acidosis, which is rare but life threatening. Initial symptoms vary and occur between 1–20 months (median 4 months) after starting therapy. The risk is highest with stavudine, followed by didanosine and then zidovudine.

DIAGNOSTIC CRITERIA

Clinical

Clinical prodromal syndrome:

» Generalised fatigue
» Weakness and myalgia
» Gastrointestinal symptoms:
  – nausea
  – vomiting
  – diarrhoea
  – unexplained weight loss
  – vague abdominal pain
  – hepatomegaly
  – anorexia
» Respiratory symptoms: tachypnoea and dyspnoea.
» Neurologic symptoms, including motor weakness.

Investigations

» Laboratory abnormalities:
  – Hyperlactataemia
    Raised: 2.1–5 mmol/L
    Severely raised : > 5 mmol/L
  – Lactic acidosis, defined by:
    Lactate > 5 mmol/L.
    Bicarbonate < 20 mmol/L.
    Severe acidosis i.e. pH < 7.3.
    Increased anion gap i.e. >15 mEq/L.

REFERRAL

All urgently.

11.11.2 LIPODYSTROPHY

E88.1

DESCRIPTION

Stavudine and zidovudine, in decreasing order, are the main causes of lipoatrophy. Lipohypertrophy was thought to be an adverse drug reaction of certain ARVs, but is

no longer considered to be a consequence of ART, but rather a feature of HIV infection.

Risk factors include pubertal development during protease inhibitor therapy.
Lipodystrophy contributes to non-adherence to ART as patients may be embarrassed by their physical appearance.

The relationship between hypercholesterolaemia, insulin resistance with puberty, hypertriglyceridaemia, body habitus and ART (especially protease inhibitors), is less clear but an association has been described.

DIAGNOSTIC CRITERIA

» Lipoatrophy:
  - Subcutaneous fat loss (lipoatrophy) of the face, extremities or buttocks.
» Insulin resistance may be suspected if there is:
  - fasting hyperglycaemia,
  - frank diabetes or acanthosis nigricans,
» Abnormal lipid profile: See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.
  - Hypercholesterolaemia, i.e. total cholesterol level > 5 mmol/L

REFERRAL

» All with abnormal lipid profile.
» Significant lipodystrophy for consideration of surgical intervention.

11.11.3 IMMUNE RECONSTITUTION INFLAMMATORY SYNDROME (IRIS)

D89.3

DESCRIPTION

Clinical deterioration can occur after starting ART due an improvement in the immune system response to organisms already causing infection, e.g.

» *M. Bovis* (BCG)
» *M. tuberculosis* (MTB)

There are 2 types of IRIS:

1. Unmasking: when a previously unsuspected condition becomes manifest.
2. Paradoxical: known condition on appropriate treatment becomes worse.

DIAGNOSTIC CRITERIA

» Exclude other active or inadequately treated diseases (including DR-TB).
» Presentation:
  - Usually during the first 6 weeks after starting ART.
  - Depends on the causative organism and the organ-system involved, e.g. TB presents with fever, lymphadenopathy, worsening of the original tuberculous lesion, and/or deteriorating chest radiographic manifestations such as miliary pattern or pleural effusion.

REFERRAL

All.

---

[i] Criteria for starting ART, CD4 < 500: WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, June 2013.Web annexes: Chapter 7 Clinical guidance across the continuum of care: antiretroviral therapy guidelines; section 7.1.1: When to start ART in adults and adolescents and GRADE tables.: http://www.who.int/hiv/pub/guidelines/arv2013/annexes/en/index2.html

[ii] Criteria for starting ART, pregnant and breastfeeding women: WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, June 2013.Web annexes: Chapter 7 Clinical guidance across the continuum of care: antiretroviral therapy guidelines;Section 7.1.2: When to start ART in pregnant and breastfeeding women and GRADE tables.http://www.who.int/hiv/pub/guidelines/arv2013/annexes/en/index2.html

[iii] Criteria for fast track of ART: WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, June 2013; March 2014 and December 2014 supplements.http://www.who.int/hiv/pub/guidelines/arv2013/en/

Criteria for fast track of ART: National Department of Health.National consolidated guidelines for the prevention of mother-to-child transmission of HIV (PMTCT) and the management of HIV in children, adolescents and adults, 2014.http://www.health.gov.za/

[iv] Time to start ART: TB & CD4 > 50: Naidoo K, Yende-Zuma N, Padayatchi N, Naidoo K, Jithoo N, Nair G, Bamber S,Gengiah S, El-Sadr WM, Friedland G, AbdoolKarim S. The immune reconstitution inflammatory syndrome after antiretroviral therapy initiation in patients with tuberculosis: findings from the SAPiT trial. *Ann Intern Med*. 2012 Sep 4;157(5):313-24.http://www.ncbi.nlm.nih.gov/pubmed/22944873

Time to start ART: TB & CD4 > 50: Abdool Karim SS, Naidoo K, Grobler A, Padayatchi N, Baxter C, Gray AL, Gengiah T, Gengiah S, Naidoo A, Jithoo N, Nair G, El-Sadr WM, Friedland G, Abdool Karim Q. Integration of antiretroviral therapy with tuberculosis treatment. *N Engl J Med*. 2011 Oct 20;365(16):1492-501.http://www.ncbi.nlm.nih.gov/pubmed/22010915

Time to start ART: TB & CD4 > 50: Havlir DV, Kendall MA, Ive P, Kumwenda J, Swindells S, Qasba SS, Luetkemeyer AF, Hogg E, Rooney JF, Wu X, Hosseinipour MC, Lalloo U, Veloso VG, Some FF, Kumarasamy N, Padayatchi N, Santos BR, Reid S, Hakim J, Mohapi L, Mugyenyi P, Sanchez J, Lama JR, Pape JW, Sanchez A, Asmelash A, Moko E, Sawe F, Andersen J, Sanne I; AIDS Clinical Trials Group Study A5221. Timing of antiretroviral therapy for HIV-1 infection and tuberculosis. *N Engl J Med*. 2011 Oct 20;365(16):1482-91.http://www.ncbi.nlm.nih.gov/pubmed/22010914

Time to start ART: TB & CD4 > 50: Blanc FX, Sok T, Laureillard D, Borand L, Rekacewicz C, Nerrienet E, Madec Y, Marcy O, Chan S, Prak N, Kim C, Lak KK, Hak C, Dim B, Sin CI, Sun S, Guillard B, Sar B, Vong S, Fernandez M, Fox L, Delfraissy JF, Goldfeld AE; CAMELIA (ANRS 1295–CIPRA KH001) Study Team. Earlier versus later start of antiretroviral therapy in HIV-infected adults with tuberculosis. *N Engl J Med*. 2011 Oct 20;365(16):1471-81.http://www.ncbi.nlm.nih.gov/pubmed/22010913

[v] Time to start ART: TB & CD4 < 50: Blanc FX, Sok T, Laureillard D, Borand L, Rekacewicz C, Nerrienet E, Madec Y, Marcy O, Chan S, Prak N, Kim C, Lak KK, Hak C, Dim B, Sin CI, Sun S, Guillard B, Sar B, Vong S, Fernandez M, Fox L, Delfraissy JF, Goldfeld AE; CAMELIA (ANRS 1295–CIPRA KH001) Study Team. Earlier versus later start of antiretroviral therapy in HIV-infected adults with tuberculosis. *N Engl J Med*. 2011 Oct 20;365(16):1471-81.http://www.ncbi.nlm.nih.gov/pubmed/22010913

Time to start ART: Havlir DV, Kendall MA, Ive P, Kumwenda J, Swindells S, Qasba SS, LuetkemeyerAF, Hogg E, Rooney JF, Wu X, Hosseinipour MC, Lalloo U, Veloso VG, Some FF, Kumarasamy N, Padayatchi N, Santos BR, Reid S, Hakim J, Mohapi L, Mugyenyi P, Sanchez J, Lama JR, Pape JW, Sanchez A, Asmelash A, Moko E, Sawe F, Andersen J, Sanne I; AIDS Clinical Trials Group Study A5221. Timing of antiretroviral therapy for HIV-1 infection and tuberculosis. *N Engl J Med.* 2011 Oct 20;365(16):1482-91.http://www.ncbi.nlm.nih.gov/pubmed/22010914

Time to start ART: Abdool Karim SS, Naidoo K, Grobler A, Padayatchi N, Baxter C, Gray AL, GengiahT, Gengiah S, Naidoo A, Jithoo N, Nair G, El-Sadr WM, Friedland G, Abdool Karim Q. Integration of antiretroviral therapy with tuberculosis treatment. *N Engl J Med*. 2011 Oct 20;365(16):1492-501.http://www.ncbi.nlm.nih.gov/pubmed/22010915

[vi] Time to start ART: TB meningitis: Török ME, Yen NT, Chau TT, Mai NT, Phu NH, Mai PP, Dung NT, Chau NV, Bang ND, Tien NA, Minh NH, Hien NQ, Thai PV, Dong DT, Anh do TT, Thoa NT, Hai NN, Lan NN, Lan NT, Quy HT, Dung NH, Hien TT, Chinh NT, Simmons CP, de Jong M, Wolbers M, Farrar JJ. Timing of initiation of antiretroviral therapy in human immunodeficiency virus (HIV)--associated tuberculous meningitis. *Clin Infect Dis*. 2011 Jun;52(11):1374-83.http://www.ncbi.nlm.nih.gov/pubmed/21596680

[vii] Antiretroviral medicines: WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, June 2013; March 2014 and December 2014 supplements.http://www.who.int/hiv/pub/guidelines/arv2013/en/

Criteria for fast track of ART: National Department of Health.National consolidated guidelines for the prevention of mother-to-child transmission of HIV (PMTCT) and the management of HIV in children, adolescents and adults, 2014.

[viii] ABC: Cruciani M, Zanichelli V, Serpelloni G, Bosco O, Malena M, Mazzi R, Mengoli C, Parisi SG, Moyle G. Abacavir use and cardiovascular disease events: a meta-analysis of published and unpublished data. *AIDS*. 2011 Oct 23;25(16):1993-2004.http://www.ncbi.nlm.nih.gov/pubmed/21716077

ABC: Cruciani M, Mengoli C, Malena M, Serpelloni G, Parisi SG, Moyle G, Bosco O. Virological efficacy of abacavir: systematic review and meta-analysis. *J Antimicrob Chemother.* 2014 Dec;69(12):3169-3180. Epub 2014 Jul 28. Review. http://www.ncbi.nlm.nih.gov/pubmed/25074854

[ix]Tenofovir (positive hepatitis B surface antigen): Adult Hospital level STG, 2012. http://www.health.gov.za/

[x] 2nd and 3rd line regimens: WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, June 2013; March 2014 and December 2014 supplements.http://www.who.int/hiv/pub/guidelines/arv2013/en/

Criteria for fast track of ART: National Department of Health.National consolidated guidelines for the prevention of mother-to-child transmission of HIV (PMTCT) and the management of HIV in children, adolescents and adults, 2014.

[xi] Rifampicin-ART drug interactions: Adult Hospital level STG, 2012. http://www.health.gov.za/

[xii]Cotrimoxazole: Grimwade K, Swingler, G. Cotrimoxazole prophylaxis for opportunistic infections in adults with HIV. *Cochrane Database Syst Rev*. 2003;(3):CD003108. http://www.ncbi.nlm.nih.gov/pubmed/12917946

[xiii] IPT: In patients not eligible for ART, positive TST: Akolo C, Adetifa I, Shepperd S, Volmink J. Treatment of latent tuberculosis infection in HIV infected persons. *Cochrane Database Syst Rev*. 2010 Jan 20;(1):CD000171. http://www.ncbi.nlm.nih.gov/pubmed/20091503

[xiv] IPT: In patients not eligible for ART, negative TST: Akolo C, Adetifa I, Shepperd S, Volmink J. Treatment of latent tuberculosis infection in HIV infected persons. *Cochrane Database Syst Rev*. 2010 Jan 20;(1):CD000171. http://www.ncbi.nlm.nih.gov/pubmed/20091503

[xv] Prolonged IPT, positive TST: Samandari T, Agizew TB, Nyirenda S, Tedla Z, Sibanda T, Shang N,Mosimaneotsile B, Motsamai OI, Bozeman L, Davis MK, Talbot EA, Moeti TL, Moffat HJ, Kilmarx PH, Castro KG, Wells CD. 6-month versus 36-month isoniazid preventive treatment for tuberculosis in adults with HIV infection in Botswana: a randomised, double-blind, placebo-controlled trial. *Lancet*. 2011 May 7;377(9777):1588-98. http://www.ncbi.nlm.nih.gov/pubmed/21492926

IPT: In patients not eligible for ART negative TST: Samandari T, Agizew TB, Nyirenda S, Tedla Z, Sibanda T, Shang N,Mosimaneotsile B, Motsamai OI, Bozeman L, Davis MK, Talbot EA, Moeti TL, Moffat HJ, Kilmarx PH, Castro KG, Wells CD. 6-month versus 36-month isoniazid preventive treatment for tuberculosis in adults with HIV infection in Botswana: a randomised, double-blind, placebo-controlled trial. *Lancet*. 2011 May 7;377(9777):1588-98.http://www.ncbi.nlm.nih.gov/pubmed/21492926

[xvi] IPT: In patients not eligible for ART unknown TST status: WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, June 2013; March 2014 and December 2014 supplements.http://www.who.int/hiv/pub/guidelines/arv2013/en/

IPT: In patients not eligible for ART unknown TST status: National Department of Health.National consolidated guidelines for the prevention of mother-to-child transmission of HIV (PMTCT) and the management of HIV in children, adolescents and adults, 2014.http://www.health.gov.za/

[xvii] IPT: In patients on ART, irrespective of TST status: Rangaka MX, Wilkinson RJ, Boulle A, Glynn JR, Fielding K, van Cutsem G, Wilkinson KA, Goliath R, Mathee S, Goemaere E, Maartens G. Isoniazid plus antiretroviral therapy to prevent tuberculosis: a randomised double-blind placebo-controlled trial. *Lancet* 2014;384(9944):682-90. http://www.ncbi.nlm.nih.gov/pubmed/24835842

IPT: In patients on ART, irrespective of TST status:Samandari T, Agizew TB, Nyirenda S, Tedla Z, Sibanda T, Shang N,Mosimaneotsile B, Motsamai OI, Bozeman L, Davis MK, Talbot EA, Moeti TL, Moffat HJ, Kilmarx PH, Castro KG, Wells CD. 6-month versus 36-month isoniazid preventive treatment for tuberculosis in adults with HIV infection in Botswana: a randomised, double-blind, placebo-controlled trial. *Lancet*. 2011 May 7;377(9777):1588-98.http://www.ncbi.nlm.nih.gov/pubmed/21492926

[xviii] Pyridoxine: van der Watt JJ, Harrison TB, Benatar M, Heckmann JM. Polyneuropathy, anti-tuberculosis treatment and the role of pyridoxine in the HIV/AIDS era: a systematic review. *Int J Tuberc Lung Dis*. 2011 Jun;15(6):722-8.http://www.ncbi.nlm.nih.gov/pubmed/21477422

Pyridoxine: Zilber LA, Bajdakova ZL, Gardasjan AN, Konovalov NV, Bunina TL, Barabadze EM.The prevention and treatment of isoniazid toxicity in the therapy of pulmonary tuberculosis. 2. An assessment of the prophylactic effect of pyridoxine in low dosage. *Bull World Health Organ*. 1963;29:457-81. http://www.ncbi.nlm.nih.gov/pubmed/14099673

Pyridoxine: Snider DE Jr. Pyridoxine supplementation during isoniazid therapy.Tubercle.1980 Dec;61(4):191-6. http://www.ncbi.nlm.nih.gov/pubmed/6269259

Pyridoxine: Carlson HB, Anthony EM, Russell WF jr, MiddlebrookG. Prophylaxis of isoniazid neuropathy with pyridoxine. *N Engl J Med*. 1956 Jul 19;255(3):119-22. http://www.ncbi.nlm.nih.gov/pubmed/13334809

[xix]Tetracaine 0.5 %, oral, topical: PHC STG, Chapter 1: Dental and oral conditions, 2014/15. http://www.health.gov.za

[xx] Fluconazole: Jarvis JN, Harrison TS, Govender N, Lawn SD, Longley N, Bicanic T, Maartens G, Venter F, Bekker LG, Wood R, Meintjes G. Routine cryptococcal antigen screening for HIV-infected patients with low CD4+ T-lymphocyte counts--time to implement in South Africa? *S Afr Med J*. 2011 Apr;101(4):232-4. http://www.ncbi.nlm.nih.gov/pubmed/21786721

Fluconazole: Harling G, Orrell C, Wood R. Healthcare utilization of patients accessing an African national treatment program. *BMC Health Serv Res* 2007;7:80. http://www.ncbi.nlm.nih.gov/pubmed/17555564

Fluconazole: Jarvis JN, Lawn SD, Vogt M, Bangani N, Wood R, Harrison TS. Screening for cryptococcalantigenemia in patients accessing an antiretroviral treatment program in South Africa.*Clin Infect Dis* 2009;48(7):856-862. http://www.ncbi.nlm.nih.gov/pubmed/19222372

[xxi] Fluconazole: Jarvis JN, Harrison TS, Govender N, Lawn SD, Longley N, Bicanic T, Maartens G, Venter F, Bekker LG, Wood R, Meintjes G. Routine cryptococcal antigen screening for HIV-infected patients with low CD4+ T-lymphocyte counts--time to implement in South Africa? *S Afr Med J*. 2011 Apr;101(4):232-4. http://www.ncbi.nlm.nih.gov/pubmed/21786721

Fluconazole: Harling G, Orrell C, Wood R. Healthcare utilization of patients accessing an African national treatment program. *BMC Health Serv Res* 2007;7:80. http://www.ncbi.nlm.nih.gov/pubmed/17555564

Fluconazole: Jarvis JN, Lawn SD, Vogt M, Bangani N, Wood R, Harrison TS. Screening for cryptococcalantigenemia in patients accessing an antiretroviral treatment program in South Africa.*Clin Infect Dis* 2009;48(7):856-862. http://www.ncbi.nlm.nih.gov/pubmed/19222372

[xxii] ART: Makadzange AT, Ndhlovu CE, Takarinda K, Reid M, Kurangwa M, Gona P, Hakim JG. Early versus delayed initiation of antiretroviral therapy for concurrent HIV infection and cryptococcal meningitis in sub-saharan Africa. *Clin Infect Dis.* 2010 Jun 1;50(11):1532-8.http://www.ncbi.nlm.nih.gov/pubmed/20415574

ART: WHO guidelines: Rapid advice: Diagnosis, prevention and management of cryptococcal disease in HIV-infected adults, adolescents and children. December, 2011. Available at: http://www.who.int/hiv/pub/cryptococcal_disease2011/en/index.html

[xxiii] PMTCT care plan: National Department of Health.National consolidated guidelines for the prevention of mother-to-child transmission of HIV (PMTCT) and the management of HIV in children, adolescents and adults, 2014.http://www.health.gov.za/

PMTCT care plan: Paediatric Hospital level STG, 2013. http://www.health.gov.za/

PMTCT care plan:National Department of Health. Integrated Management of Childhood Illnesses Guidelines,2014.http://www.health.gov.za/

PMTCT care plan: Bera E, Nkosazana J, Pauls F, Mancotywa T, Ngcelwane N, Hlati Y. Risk factors for perinatal HIV-1 transmission in pregnant women requiring lifelong antiretroviral therapy: A longitudinal study at a tertiary hospital in South Africa. *SAJOG* 2010;16(1):6-13. http://www.ajol.info/index.php/sajog/article/view/70521

PMTCT care plan: Boyd MA, Dixit NM, Siangphoe U, Buss NE, Salgo MP, Lange JM, Phanuphak P, Cooper DA, Perelson AS, Ruxrungtham K. Viral decay dynamics in HIV-infected patients receiving ritonavir-boosted saquinavir and efavirenz with or without enfuvirtide: a randomized, controlled trial (HIV-NAT 012). *J Infect Dis.* 2006 Nov 1;194(9):1319-22. http://www.ncbi.nlm.nih.gov/pubmed/17041859

PMTCT care plan: Murray JM, Emery S, Kelleher AD, Law M, Chen J, Hazuda DJ, Nguyen BY, Teppler H, Cooper DA. Antiretroviral therapy with the integrase inhibitor raltegravir alters decay kinetics of HIV, significantly reducing the second phase. *AIDS*. 2007 Nov 12;21(17):2315-21. http://www.ncbi.nlm.nih.gov/pubmed/18090280

PMTCT care plan: Townsend CL, Cortina-Borja M, Peckham CS, de Ruiter A, Lyall H, Tookey PA. Lowrates of mother-to-child transmission of HIV following effective pregnancy interventions in the United Kingdom and Ireland, 2000-2006.*AIDS.* 2008 May 11;22(8):973-81. http://www.ncbi.nlm.nih.gov/pubmed/18453857

[xxiv] Cotrimoxazole: WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, June 2013; March 2014 and December 2014 supplements.http://www.who.int/hiv/pub/guidelines/arv2013/en/

Cotrimoxazole: References from WHO Guidelines:

- Chintu C et al. Co-trimoxazole as prophylaxis against opportunistic infections in HIV-infected Zambian children (CHAP): a double-blind randomised placebo-controlled trial. *Lancet.* 2004;364:1865–71.http://www.ncbi.nlm.nih.gov/pubmed/15555666
- Grimwade K, Swingler GH. Co-trimoxazole prophylaxis for opportunistic infections in children with HIV infection. *Cochrane Database Syst Rev*. 2006;1:CD003508.http://www.ncbi.nlm.nih.gov/pubmed/16437457
- Ryan M et al. The cost-effectiveness of co-trimoxazole prophylaxis in HIV-infected children in Zambia.*AIDS.* 2008;22:749–57.http://www.ncbi.nlm.nih.gov/pubmed/18356605
- Prendergast A, Walker AS, Mulenga V et al. Improved growth and anemia in HIV-infected African children taking cotrimoxazole prophylaxis. *Clin Infect Dis*. 2011;52:953–6.http://www.ncbi.nlm.nih.gov/pubmed/21427404
- Walker AS et al. The impact of daily co-trimoxazole prophylaxis and antiretroviral therapy on mortality and hospital admissions in HIV-infected Zambian children. *Clin Infect Dis*. 2007;44:1361–7.http://www.ncbi.nlm.nih.gov/pubmed/17443476
- Mulenga V et al. Effect of co-trimoxazole on causes of death, hospital admissions and antibiotic use in HIV-infected children. AIDS. 2007;21:77–84.http://www.ncbi.nlm.nih.gov/pubmed/17148971

Cotrimoxazole: National Department of Health. National consolidated guidelines for the prevention of mother-to-child transmission of HIV (PMTCT) and the management of HIV in children, adolescents and adults, 2014. http://www.health.gov.za/

[xxv] Measles vaccine: Scott P, Moss WJ, Gilani Z, Low N. Measles vaccination in HIV-infectedchildren: systematic review and meta-analysis of safety and immunogenicity. *J Infect Dis.* 2011 Jul;204Suppl 1:S164-78. http://www.ncbi.nlm.nih.gov/pubmed/21666158

Measles vaccine: Rubin LG, Levin MJ, Ljungman P, Davies EG, Avery R, Tomblyn M, Bousvaros A, Dhanireddy S, Sung L, Keyserling H, Kang I, Infectious Diseases Society of America. 2013 IDSA clinical practice guideline for vaccination of the immunocompromised host.*Clin Infect Dis.* 2014 Feb;58(3):309-18.http://www.ncbi.nlm.nih.gov/pubmed/24421306

[xxvi] 1st line ART regimen (children):National Department of Health.National consolidated guidelines for the prevention of mother-to-child transmission of HIV (PMTCT) and the management of HIV in children, adolescents and adults, 2014.http://www.health.gov.za/

1st line ART regimen (children):Paediatric Hospital level STG, 2013. http://www.health.gov.za/

1st line ART regimen (children):National Department of Health. Integrated Management of Childhood Illnesses Guidelines,2014. http://www.health.gov.za/

[xxvii] ART side effects (lipohypertrophy):de Waal R, Cohen K, Maartens G. Systematic review of antiretroviral-associated lipodystrophy: lipoatrophy, but not central fat gain, is an antiretroviral adverse drug reaction. *PLoS One.* 2013 May 28;8(5):e63623.http://www.ncbi.nlm.nih.gov/pubmed/23723990

[xxviii] Measles vaccine: Scott P, Moss WJ, Gilani Z, Low N. Measles vaccination in HIV-infectedchildren: systematic review and meta-analysis of safety and immunogenicity. *J Infect Dis.* 2011 Jul;204Suppl 1:S164-78. http://www.ncbi.nlm.nih.gov/pubmed/21666158

Measles vaccine: Rubin LG, Levin MJ, Ljungman P, Davies EG, Avery R, Tomblyn M, Bousvaros A, Dhanireddy S, Sung L, Keyserling H, Kang I, Infectious Diseases Society of America. 2013 IDSA clinical practice guideline for vaccination of the immunocompromised host.*Clin Infect Dis.* 2014 Feb;58(3):309-18.http://www.ncbi.nlm.nih.gov/pubmed/24421306

[xxix] Nystatin suspension: PHC STG, 2014. Chapter 1: Dental & oral conditions, Section 1.2 Candidiasis, oral (thrush). http://www.health.gov.za/

[xxx] Fluconazole: Paediatric STG, 2013. http://www.health.gov.za/

[xxxi] CD4 cut off of 50: WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, June 2013; March 2014 and December 2014 supplements.http://www.who.int/hiv/pub/guidelines/arv2013/en/

CD4 cut off of 50:National Department of Health. National consolidated guidelines for the prevention of mother-to-child transmission of HIV (PMTCT) and the management of HIV in children, adolescents and adults, 2014. http://www.health.gov.za/

[xxxii] Lopinavir/ritonavir (Rifampicin medicine interaction):Ren Y, Nuttall JJ, Egbers C, Eley BS, Meyers TM, Smith PJ, Maartens G, McIlleron HM. Effect of rifampicin on lopinavir pharmacokinetics in HIV-infected children with tuberculosis. *J Acquir Immune Defic Syndr.* 2008 Apr 15;47(5):566-9. http://www.ncbi.nlm.nih.gov/pubmed/18197120

Lopinavir/ritonavir (Rifampicin medicine interaction):McIlleron H, Ren Y, Nuttall J, Fairlie L, Rabie H, Cotton M, Eley B, Meyers T, Smith PJ, Merry C, Maartens G. Lopinavir exposure is insufficient in children given double doses of lopinavir/ritonavir during rifampicin-based treatment for tuberculosis. *Antivir Ther.* 2011;16(3):417-21.http://www.ncbi.nlm.nih.gov/pubmed/21555825

Chapter 12: Sexually transmitted infections

The syndromic approach to Sexually Transmitted Infections (STI) diagnosis and management is to treat the signs or symptoms (syndrome) of a group of diseases rather than treating a specific disease. This allows for the treatment of one or more conditions that often occur at the same time and has been accepted as the management of choice.

It is important to take a good sexual history and undertake a thorough ano-genital examination in order to perform a proper clinical assessment. The history should include questions concerning symptoms, recent sexual history, sexual orientation, type of sexual activity (oral, vaginal, anal sex), the possibility of pregnancy (females), use of contraceptives including condoms, recent antibiotic history, antibiotic allergy and recent overseas travel.

Suspected STI in children should be referred to hospital for further management.

GENERAL MEASURES

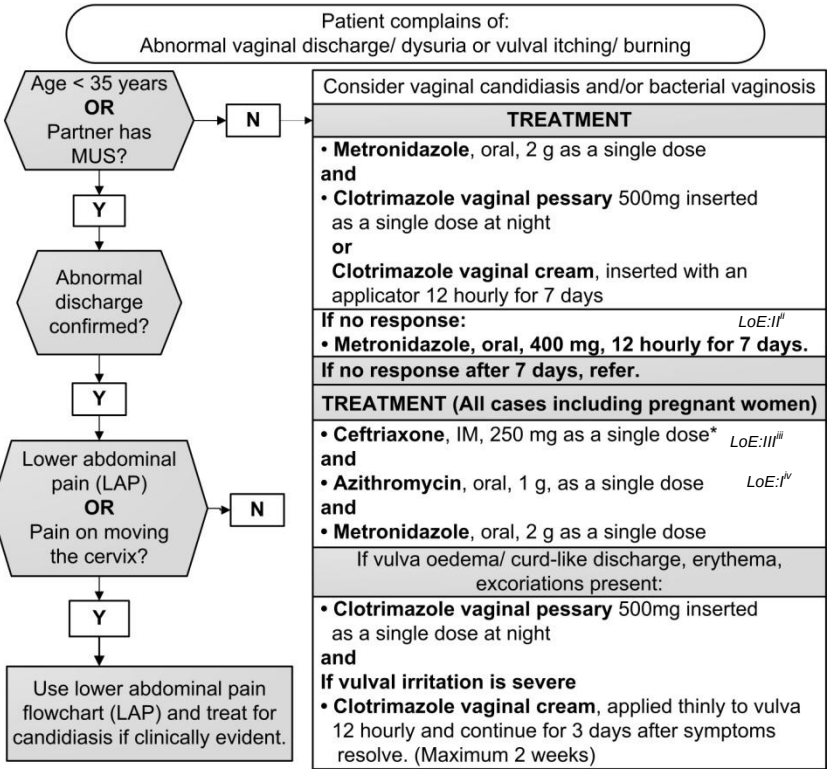
» **C**ounselling and education, including HIV testing.
» **C**ondom promotion, provision and demonstration to reduce the risk of STIs.
» **C**ompliance/ adherence with treatment.
» **C**ontact treatment/ partner management.
» **C**ircumcision promotion with appropriate counselling concerning condoms.
» **C**ervical cancer screening.

Promote HIV counselling and testing.

For negative test results repeat test after 6 weeks.

12.1 VAGINAL DISCHARGE SYNDROME (VDS)

B37.3/N76.0/N89.8



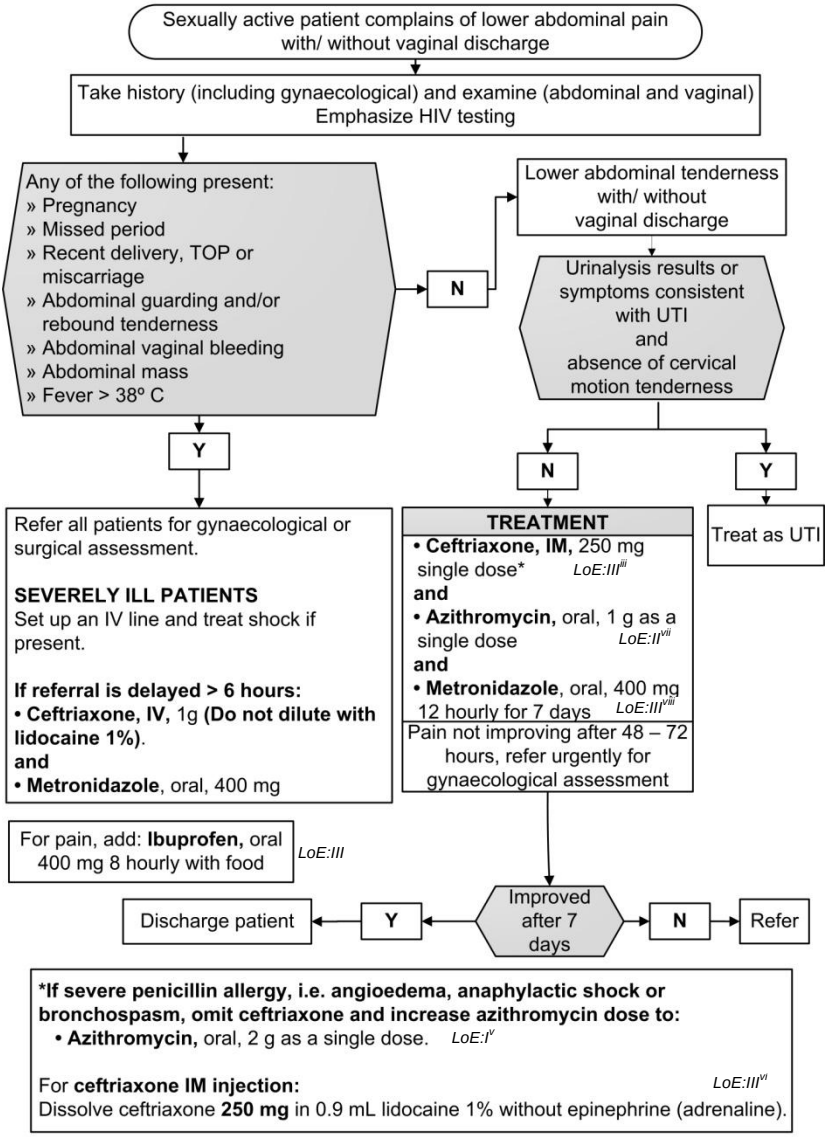
*People who are allergic to penicillin may also react to ceftriaxone.
If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm, omit ceftriaxone and increase azithromycin dose to:
• Azithromycin, oral, 2 g, as a single dose. LoE:I[v]

For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without epinephrine (adrenaline). LoE:III[vi]

Take Pap smear after treatment, if indicated according to screening guidelines.
Note: Suspected STI in children should be referred to hospital for further management.

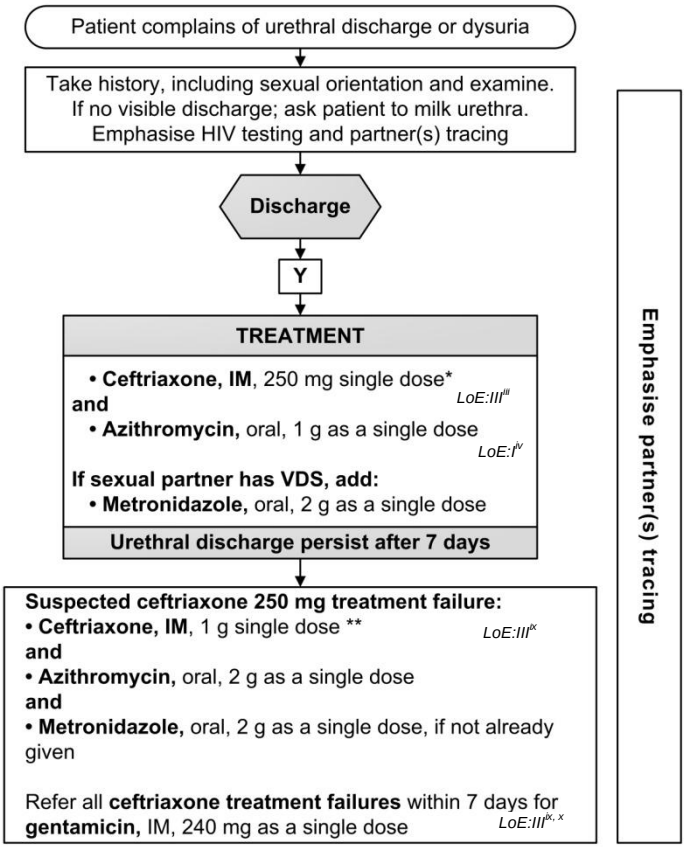
12.2 LOWER ABDOMINAL PAIN (LAP)

N73.9



12.3 MALE URETHRITIS SYNDROME (MUS)

A64 + N34.1

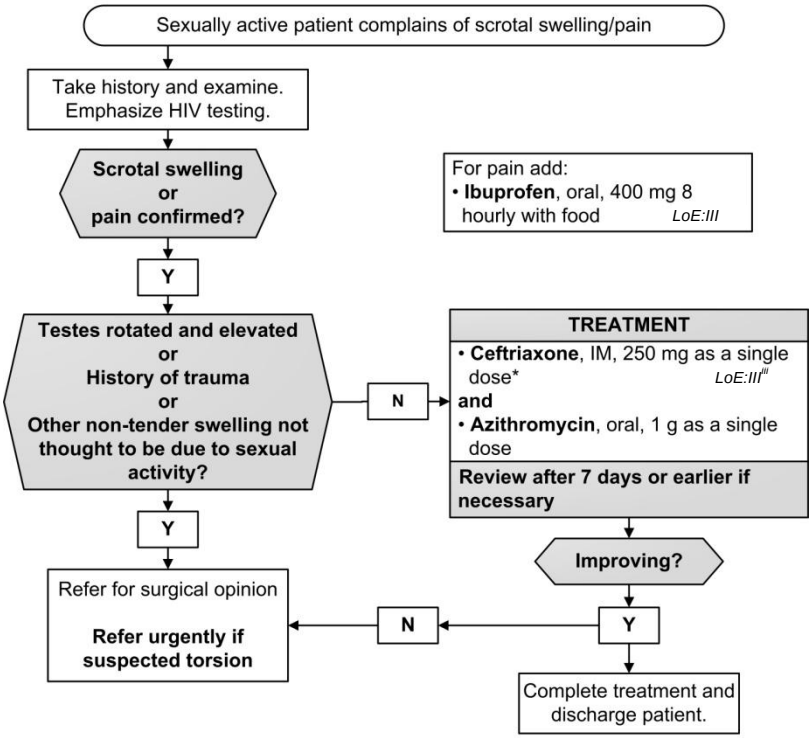


If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm:
* omit ceftriaxone, IM, 250 mg and increase azithromycin dose to azithromycin, oral, 2 g as a single dose LoE:I[v]
** omit ceftriaxone, IM, 1 g and refer to a centre for gentamicin, IM, 240 mg as a single dose plus azithromycin, oral, 2 g as a single dose LoE:III[ix, x]

For **ceftriaxone IM injection:**
- Dissolve ceftriaxone **250 mg** in 0.9 mL lidocaine 1% without epinephrine (adrenaline).
- Dissolve ceftriaxone **1 g** in 3.6 mL lidocaine 1% without epinephrine (adrenaline)LoE:III[vi]

12.4 SCROTAL SWELLING (SSW)

N45.1



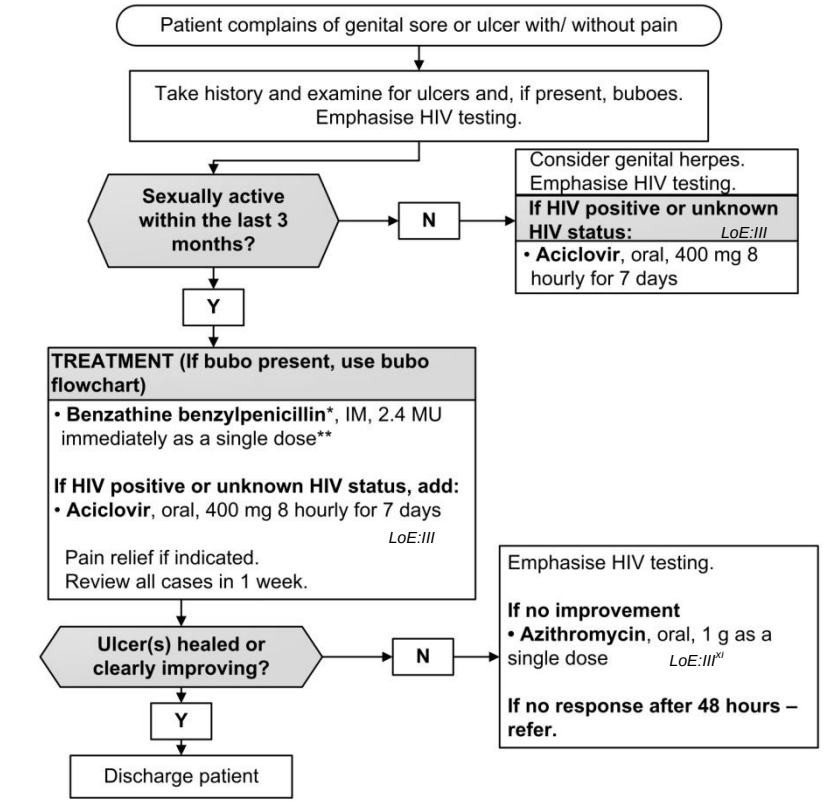
***If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm, omit ceftriaxone and increase azithromycin dose to:**

• **Azithromycin,** oral, 2 g as a single dose *LoE:I, III* [v]

For **ceftriaxone IM injection**, dissolve ceftriaxone **250 mg** in 0.9 mL lidocaine 1% without epinephrine (adrenaline). *LoE:III* [vi]

12.5 GENITAL ULCER SYNDROME (GUS)

A60.9/A51.0



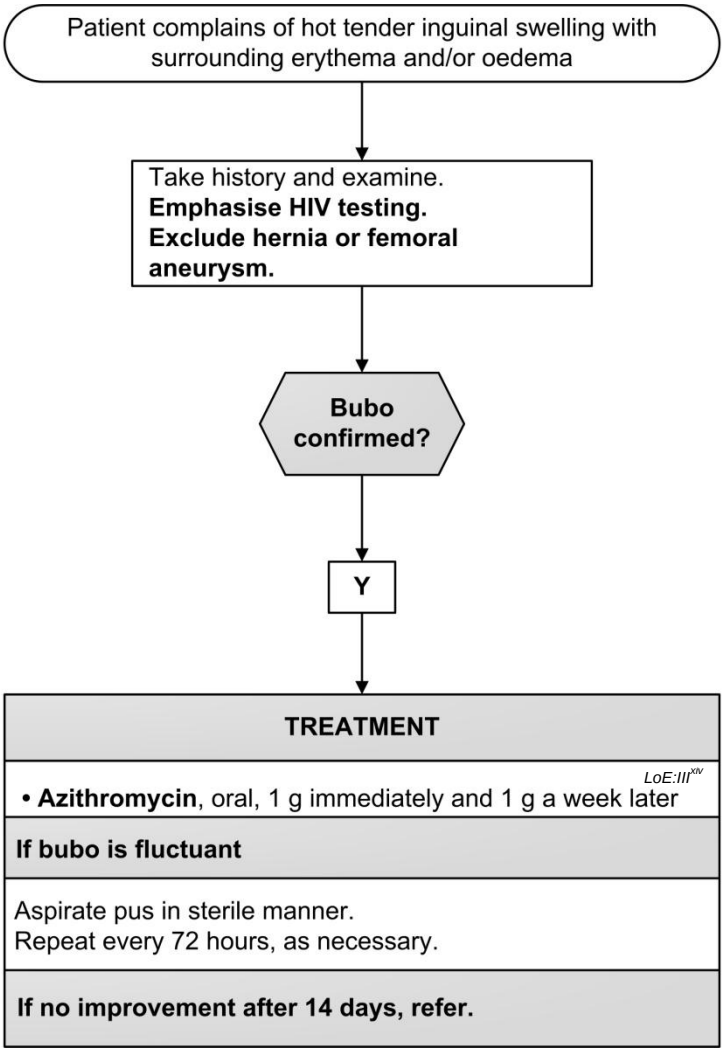
***Penicillin allergic men and non-pregnant women:**
» Perform a baseline RPR and replace benzathine penicillin with:
• **Doxycycline**, oral, 100 mg 12 hourly for 14 days.
» Patient to return for a follow-up RPR 6 months later. *LoE:III*

***Penicillin allergic pregnant women/ breast feeding women, refer for confirmation of new syphilis infection and possible penicillin desensitisation.** *LoE:III*[xii]

For **benzathine benzylpenicillin**, IM, 2.4 MU: Dissolve benzathine benzylpenicillin **2.4 MU** in 6 mL lidocaine 1% without epinephrine (adrenaline). *LoE:III*[xiii]

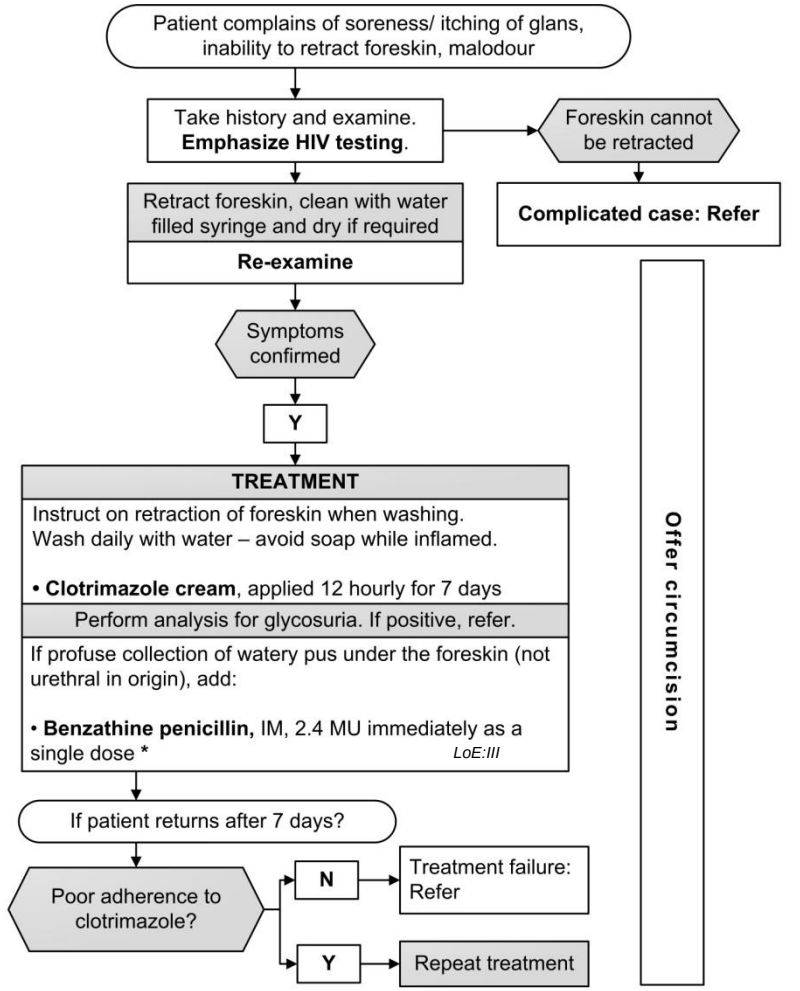
12.6 BUBO

A58


Patient complains of hot tender inguinal swelling with surrounding erythema and/or oedema
Take history and examine.
Emphasise HIV testing.
Exclude hernia or femoral aneurysm.
Bubo confirmed?
Y
TREATMENT
• Azithromycin, oral, 1 g immediately and 1 g a week later
LoE:III[xiv]
If bubo is fluctuant
Aspirate pus in sterile manner.
Repeat every 72 hours, as necessary.
If no improvement after 14 days, refer.

12.7 BALANITIS/BALANOPOSTHITIS (BAL)

N48.1



***Penicillin allergic men:**
» replace benzathine penicillin with:
• **Doxycycline**, oral, 100 mg 12 hourly for 14 days.

For **benzathine benzylpenicillin**, IM, 2.4 MU: Dissolve benzathine benzylpenicillin **2.4 MU** in 6 mL lidocaine 1% without epinephrine (adrenaline). *LoE:III*[xiii]

12.8 SYPHILIS SEROLOGY AND TREATMENT

A53.9

Syphilis serology

The Rapid Plasmin Reagin (RPR) measures disease activity, but is not specific for syphilis. False RPR positive reactions may occur, notably in patients with connective tissue disorders (false positive reactions are usually low titre < 1:8). For this reason, positive RPR results should be confirmed as due to syphilis by further testing of the serum with a specific treponemal test, e.g.:

» *Treponema pallidum* haemagglutination (TPHA) assay.
» *Treponema pallidum* particle agglutination (TPPA) assay.
» Fluorescent Treponemal Antibody (FTA) assay.
» *Treponema pallidum* ELISA.
» Rapid treponemal antibody test.

Screening can also be done the other way around starting with a specific treponemal test followed by a RPR in patients who have a positive specific treponemal test. This is sometimes referred to as the “reverse algorithm”.

Once positive, specific treponemal tests generally remain positive for life.

The RPR can be used:

» To determine if the patient’s syphilis disease is active or not,
» To measure a successful response to therapy (at least a fourfold reduction in titre, e.g. 1:256 improving to 1:64), or
» To determine a new re-infection.

Some patients, even with successful treatment for syphilis, may retain life-long positive RPR results at low titres (≤1:8), which do not change by more than one dilution difference (up or down) over time (so-called serofast patients).

Note:

» Up to 30% of primary syphilis cases, i.e. those with genital ulcers may have a negative RPR.
» The RPR is always positive in the secondary syphilis stage and remains high during the first two (infectious) years of syphilis.

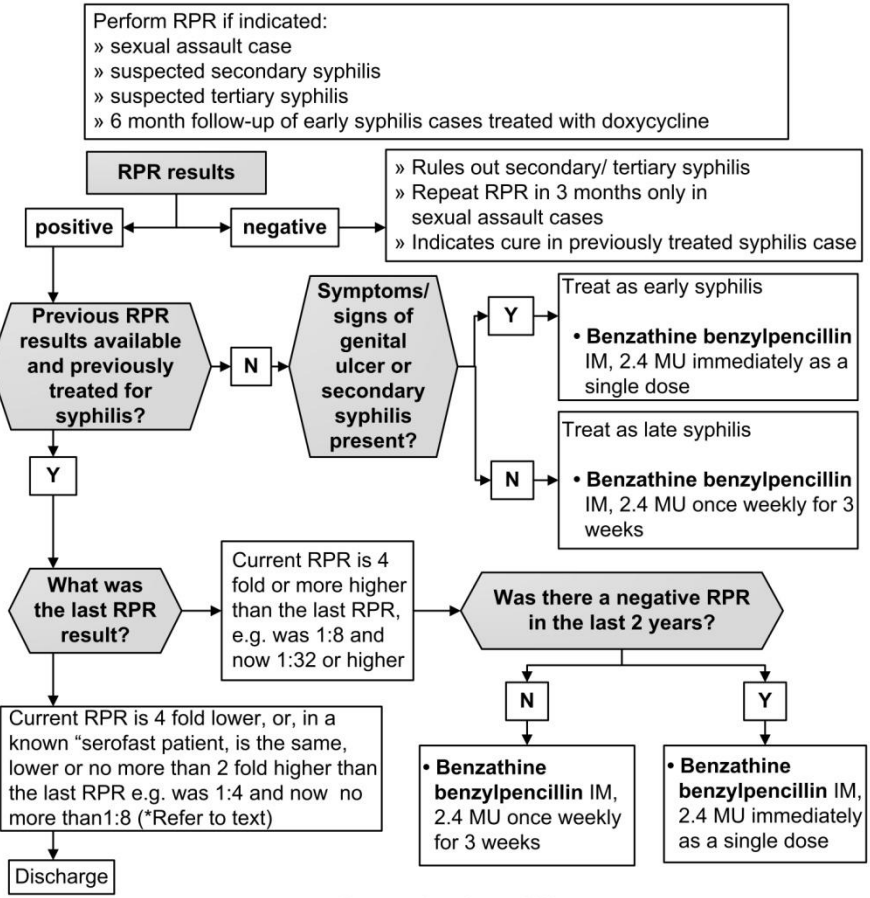
For syphilis treatment in pregnancy, see Section 6.2.4 Syphilis in pregnancy.

MEDICINE TREATMENT

Early syphilis treatment

Check if treated at initial visit.

- Benzathine benzylpenicillin, IM, 2.4 MU immediately as a single dose.
  - Dissolve benzathine benzylpenicillin, IM, 2.4 MU in 6 mL lidocaine 1% without epinephrine (adrenaline).



Late and early syphilis:
» record titre on patient's record
» issue a partner notification slip
and
» repeat RPR in 6 months if treated with doxycycline *LoE:III*

For **benzathine benzylpenicillin**, IM, 2.4 MU: Dissolve benzathine benzylpenicillin **2.4 MU** in 6 mL lidocaine 1% without epinephrine (adrenaline). *LoE:III*[xii]

In penicillin-allergic patients:
- Doxycycline, oral, 100 mg twice daily for 14 days.

If penicillin-allergic and pregnant: Refer for penicillin desensitisation.

Late syphilis treatment
Check if treatment was commenced at initial visit.
- Benzathine benzylpenicillin, IM, 2.4 MU once weekly for 3 weeks.
  - Dissolve benzathine benzylpenicillin, IM, 2.4 MU in 6 mL lidocaine 1% without epinephrine (adrenaline).

If penicillin-allergic and pregnant: Refer for penicillin desensitisation.

REFERRAL
» Neurosyphilis.
» Clinical congenital syphilis.

12.9 TREATMENT OF MORE THAN ONE STI SYNDROME

STI syndromes	Treatment (new episode)
MUS + SSW	Treat according to SSW flow chart.
MUS + BAL	Treat according to MUS flow chart. **AND** • Clotrimazole cream, 12 hourly for 7 days.
MUS + GUS	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose. **AND** • Aciclovir, oral, 400 mg 8 hourly for 7 days***.**
VDS + LAP	Treat according to LAP flow chart. **AND** Treat for candidiasis, if required (see VDS flow chart).
VDS + GUS	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Metronidazole, oral, 2 g immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose. **AND** • Aciclovir, oral, 400 mg 8 hourly for 7 days*. **AND** Treat for candidiasis, if required (see VDS flow chart).
LAP + GUS	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND**

	• Metronidazole, oral, 400 mg 12 hourly for 7days. **AND** • Aciclovir, oral, 400 mg 8 hourly for 7 days***.**
SSW + GUS	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Aciclovir, oral, 400 mg 8 hourly for 7 days***.**

***Treat with aciclovir only if HIV status is positive or unknown.**

****Penicillin allergic men and non-pregnant women avoid ceftriaxone and refer to relevant algorithms.**

Penicillin allergic pregnant or breastfeeding women, refer for penicillin desensitisation.

12.10 GENITAL MOLLUSCUM CONTAGIOSUM (MC)

B08.1

DESCRIPTION

This is a viral infection which can be transmitted sexually and non-sexually. It is usually self-limiting but can be progressive in an advanced stage of immunodeficiency.
Clinical signs include papules at the genitals or other parts of the body.
The papules usually have a central dent (umbilicated papules).

MEDICINE TREATMENT

- Tincture of iodine BP.
  - Apply with an applicator to the core of the lesions.

12.11 GENITAL WARTS (GW): *CONDYLOMATA ACCUMINATA*

A63.0

DESCRIPTION

The clinical signs include:
» Warts on the ano-genital areas, vagina, cervix, meatus or urethra.
» Warts can be soft or hard.
In most cases, warts resolve without treatment after 2 years in non-immunosuppressed patients.

GENERAL MEASURES

» If warts do not look typical or are fleshy or wet, perform a RPR test to exclude secondary syphilis, which may present with similar lesions.
» Emphasise HIV testing.

REFERRAL

» All patients with:
  – warts > 10 mm

- inaccessible warts, e.g. intra-vaginal or cervical warts
- numerous warts

12.12 PUBIC LICE (PL)

B85.3

DESCRIPTION

Infestation of lice mostly confined to pubic and peri-anal areas, and occasionally involves eyelashes.
The bites cause intense itching, which often results in scratching with bacterial super-infection.

GENERAL MEASURES

Thoroughly wash clothing and bed linen that may have been contaminated by the patient in the 2 days prior to the start of treatment in hot water and then iron.

MEDICINE TREATMENT

- Benzyl benzoate 25%
  - Apply to affected area.
  - Leave on for 24 hours, then wash thoroughly.
  - Repeat in 7 days.

Pediculosis of the eyelashes or eyebrows

- Petroleum jelly.
  - Apply to the eyelid margins (cover the eyelashes) daily for 10 days to smother lice and nits.
  - Do not apply to eyes.

REFERRAL

All children with lice on pubic, perianal area and eyelashes to exclude sexual abuse.

i: Criteria for STI therapy in VDS: Unpublished surveillance data for VDS at Alexander Health Centre, Gauteng (2007 -2012) shared by NICD: Centre for STI and HIV.

ii: Metronidazole: Swedberg J, Steiner JF, Deiss F, Steiner S, Driggers DA. Comparison of single-dose *vs.* one-week course of metronidazole for symptomatic bacterial vaginosis.*JAMA.* 1985 Aug 23-30;254(8):1046-9. http://www.ncbi.nlm.nih.gov/pubmed/3894707

Metronidazole: Kissinger P, Secor WE, Leichliter JS, Clark RA, Schmidt N, Curtin E, Martin DH. Early repeated infections with Trichomonasvaginalis among HIV-positive and HIV-negative women.*Clin Infect Dis.* 2008 Apr 1;46(7):994-9. http://www.ncbi.nlm.nih.gov/pubmed/18444815

Metronidazole: Kissinger P, Mena L, Levison J, Clark RA, Gatski M, Henderson H, Schmidt N, Rosenthal SL, Myers L, Martin DH. A randomized treatment trial: single versus 7-day dose of metronidazole for the treatment of Trichomonasvaginalis among HIV-infected women. *J Acquir Immune DeficSyndr.* 2010 Dec 15;55(5):565-71. http://www.ncbi.nlm.nih.gov/pubmed/21423852

iii: Ceftriaxone:Newman LM, Moran JS, Workowski KA. Update on the management of gonorrhea in adults in the United States. *Clin Infect Dis*. 2007 Apr 1;44Suppl 3:S84-101.Review. http://www.ncbi.nlm.nih.gov/pubmed/17342672

Ceftriaxone:Ito M, Yasuda M, Yokoi S, Ito S, Takahashi Y, Ishihara S, Maeda S, Deguchi T. Remarkable increase in central Japan in 2001-2002 of Neisseria gonorrhoeaeisolates with decreased susceptibility to penicillin, tetracycline, oral cephalosporins, and fluoroquinolones. *Antimicrob Agents Chemother*. 2004 Aug;48(8):3185-7. http://www.ncbi.nlm.nih.gov/pubmed/15273147

Ceftriaxone:Tanaka M, Nakayama H, Tunoe H, Egashira T, Kanayama A, Saika T, Kobayashi I, Naito S. A remarkable reduction in the susceptibility of Neisseria gonorrhoeae isolates to cephems and the selection of antibiotic regimens for the single-dose treatment of gonococcal infection in Japan. *J Infect Chemother.* 2002 Mar;8(1):81-6. http://www.ncbi.nlm.nih.gov/pubmed/11957125

Ceftriaxone:Deguchi T, Yasuda M, Yokoi S, Ishida K, Ito M, Ishihara S, Minamidate K, Harada Y, Tei K, Kojima K, Tamaki M, Maeda S. Treatment of uncomplicated gonococcal urethritis by double-dosing of 200 mg cefixime at a 6-h interval. *J Infect Chemother*. 2003 Mar;9(1):35-9. http://www.ncbi.nlm.nih.gov/pubmed/12673405

Ceftriaxone:Lewis DA. Gonorrhoea resistance among men-who-have-sex-with-men: what's oral sex got to do with it? *S Afr J Epid Infect*. 2013;28: 77. www.sajei.co.za/index.php/SAJEI/article/download/569/706

Ceftriaxone: Lewis DA, Sriruttan C, Müller EE, Golparian D, Gumede L, Fick D, de Wet J,Maseko V, Coetzee J, Unemo M. Phenotypic and genetic characterization of the first two cases of extended-spectrum-cephalosporin-resistant Neisseria gonorrhoeae infection in South Africa and association with cefixime treatment failure. *J AntimicrobChemother.* 2013 Jun;68(6):1267-70. http://www.ncbi.nlm.nih.gov/pubmed/23416957

Ceftriaxone: Lewis DA. The role of core groups in the emergence and dissemination ofantimicrobial-resistant N gonorrhoeae. *Sex Transm Infect.* 2013 Dec;89Suppl4:iv47-51. Review. http://www.ncbi.nlm.nih.gov/pubmed/24243880

Ceftriaxone: Health Protection Agency. Gonoccocal Resistance to Antimicrobials Surveillance Programme (GRASP) Action Plan for England and Wales: Informing the Public Health Response. (Ed.^(Eds) (HPA, London, 2013)

Ceftriaxone: Bignell C, Fitzgerald M; Guideline Development Group; British Association for Sexual Health and HIV UK. UK national guideline for the management of gonorrhoea in adults, 2011. *Int J STD AIDS.* 2011 Oct;22(10):541-7. http://www.ncbi.nlm.nih.gov/pubmed/21998172

Ceftriaxone: Centers for Disease Control and Prevention. Cephalosporin-resistant Neisseria gonorrhoeae public health response plan. (Ed.^(Eds) (CDC, Atlanta, 2012)

Ceftriaxone: Centers for Disease Control and Prevention. Update to CDC's Sexually transmitted diseases treatment guidelines, 2010: oral cephalosporins no longer a recommended treatment for gonococcal infections. *MMWR Morb Mortal Wkly Rep*. 2012;6: 590-594. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6131a3.htm

iv: Azithromycin: Lau CY, Qureshi AK. Azithromycin versus doxycycline for genital chlamydial infections: a meta-analysis of randomized clinical trials. *Sex Transm Dis.* 2002 Sep;29(9):497-502. http://www.ncbi.nlm.nih.gov/pubmed/12218839

Azithromycin:Bignell C, Garley J. Azithromycin in the treatment of infection with Neisseria gonorrhoeae. *Sex Transm Infect*. 2010 Nov;86(6):422-6. http://www.ncbi.nlm.nih.gov/pubmed/20940153

Azithromycin: Stamm WE, Hicks CB, Martin DH, Leone P, Hook EW 3rd, Cooper RH, Cohen MS, Batteiger BE, Workowski K, McCormack WM. Azithromycin for empirical treatment of the nongonococcal urethritis syndrome in men. A randomized double-blind study.*JAMA.* 1995 Aug 16;274(7):545-9. http://www.ncbi.nlm.nih.gov/pubmed/7629982

Azithromycin: Lister PJ, Balechandran T, Ridgway GL, Robinson AJ. Comparison of azithromycin and doxycycline in the treatment of non-gonococcal urethritis in men.*J AntimicrobChemother*. 1993 Jun;31Suppl E:185-92. http://www.ncbi.nlm.nih.gov/pubmed/8396092

Azithromycin: Schwebke JR, Rompalo A, Taylor S, Seña AC, Martin DH, Lopez LM, Lensing S, Lee JY. Re-evaluating the treatment of nongonococcal urethritis: emphasizing emerging pathogens--a randomized clinical trial. *Clin Infect Dis.* 2011 Jan 15;52(2):163-70. http://www.ncbi.nlm.nih.gov/pubmed/21288838

Azithromycin: Manhart LE, Gillespie CW, Lowens MS, KhosropourCM,Colombara DV, Golden MR, Hakhu NR, Thomas KK, Hughes JP, Jensen NL, Totten PA. Standard treatment regimens for nongonococcal urethritis have similar but declining cure rates: a randomized controlled trial. *Clin Infect Dis.* 2013 Apr;56(7):934-42. http://www.ncbi.nlm.nih.gov/pubmed/23223595

Azithromycin: Handsfield HH, Dalu ZA, Martin DH, Douglas JM Jr, McCarty JM, Schlossberg D. Multicenter trial of single-dose azithromycin vs. ceftriaxone in the treatment of uncomplicated gonorrhea. Azithromycin Gonorrhea Study Group. *Sex Transm Dis*. 1994 Mar-Apr;21(2):107-11. http://www.ncbi.nlm.nih.gov/pubmed/9071422

Azithromycin: Riedner G, Rusizoka M, Todd J, Maboko L, Hoelscher M, Mmbando D, Samky E, Lyamuya E, Mabey D, Grosskurth H, Hayes R. Single-dose azithromycin versus penicillin G benzathine for the treatment of early syphilis. *N Engl J Med*. 2005 Sep 22;353(12):1236-44. http://www.ncbi.nlm.nih.gov/pubmed/16177249

Azithromycin: Hook EW 3rd, Martin DH, Stephens J, Smith BS, Smith K. A randomized, comparative pilot study of azithromycin versus benzathine penicillin G for treatment of early syphilis.*Sex Transm Dis*. 2002 Aug;29(8):486-90. http://www.ncbi.nlm.nih.gov/pubmed/12172535

Azithromycin:McLean CA, Wang SA, Hoff GL, Dennis LY, Trees DL, Knapp JS, Markowitz LE, Levine WC. The emergence of Neisseria gonorrhoeae with decreased susceptibility to Azithromycin in Kansas City, Missouri, 1999 to 2000.*Sex Transm Dis.* 2004 Feb;31(2):73-8. http://www.ncbi.nlm.nih.gov/pubmed/14743069

Azithromycin: Galarza PG, Abad R, Canigia LF, Buscemi L, Pagano I, Oviedo C, Vázquez JA. New mutation in 23S rRNA gene associated with high level of azithromycin resistance in Neisseria gonorrhoeae. *Antimicrob Agents Chemother.* 2010 Apr;54(4):1652-3. doi: 10.1128/AAC.01506-09. http://www.ncbi.nlm.nih.gov/pubmed/20123998

Azithromycin: Bignell C, Fitzgerald M; Guideline Development Group; British Association for Sexual Health and HIV UK. UK national guideline for the management of gonorrhoea in adults, 2011.*Int J STD AIDS.* 2011 Oct;22(10):541-7. http://www.ncbi.nlm.nih.gov/pubmed/21998172

Azithromycin: Workowski KA, Berman S; Centers for Disease Control and Prevention (CDC). Sexually transmitted diseases treatment guidelines, 2010.*MMWR Recomm Rep.* 2010 Dec 17;59(RR-12):1-110. Erratum in: *MMWR Recomm Rep.* 2011 Jan 14;60(1):18. Dosage error in article text. http://www.cdc.gov/std/treatment/2010/

Azithromycin: Chisholm SA, Mouton JW, Lewis DA, Nichols T, Ison CA, Livermore DM.Cephalosporin MIC creep among gonococci: time for a pharmacodynamic rethink*? J AntimicrobChemother*. 2010 Oct;65(10):2141-8. http://www.ncbi.nlm.nih.gov/pubmed/20693173

Azithromycin: Fayemiwo SA, Muller EE, Gumede L, Lewis DA. Plasmid-mediated penicillin and tetracycline resistance among Neisseria gonorrhoeae isolates in South Africa: prevalence, detection and typing using a novel molecular assay. *Sex Transm Dis.*2011; 38: 329-333. http://www.ncbi.nlm.nih.gov/pubmed/21042234

Azithromycin: deJongh M, Dangor Y, Adam A, Hoosen AA. Gonococcal resistance: evolving from penicillin, tetracycline to the quinolones in South Africa - implications for treatment guidelines. *Int J STD AIDS.* 2007;18:697-699. http://www.ncbi.nlm.nih.gov/pubmed/17945048

Azithromycin: Manhart LE, Broad JM, Golden MR. Mycoplasma genitalium: should we treat and how? *Clin Infect Dis,* 53 Suppl 3, S129-142 (2011). http://www.ncbi.nlm.nih.gov/pubmed/22080266

Azithromycin: Mena LA, Mroczkowski TF, Nsuami M, Martin DH. A randomized comparison of azithromycin and doxycycline for the treatment of Mycoplasma genitalium-positive urethritis in men.*Clin Infect Dis*. 2009;48:1649-1654. http://www.ncbi.nlm.nih.gov/pubmed/19438399

Azithromycin: Amsden GW, Gray CL. Serum and WBC pharmacokinetics of 1500 mg of azithromycin when given either as a single dose or over a 3 day period in healthy volunteers. *J AntimicrobChemother*. 2001 Jan;47(1):61-6. http://www.ncbi.nlm.nih.gov/pubmed/11152432

Azithromycin: Sampson MR, Dumitrescu TP, Brouwer KL, Schmith VD. Population pharmacokinetics of azithromycin in whole blood, peripheral blood mononuclear cells, and polymorphonuclear cells in healthy adults. *CPT PharmacometricsSystPharmacol*. 2014 Mar 5;3:e103. http://www.ncbi.nlm.nih.gov/pubmed/24599342

Azithromycin: Lewis DA, Maartens GM: Medicine review: The use of azithromycin in the syndromic management algorithms for the management of sexually transmitted infections (STIs) in South Africa, 16 March 2014.

Azithromycin: SAMF, 2012 edition.

v: Azithromycin: Pitsouni E, Iavazzo C, Athanasiou S, Falagas ME. Single-dose azithromycin versus erythromycin or amoxicillin for Chlamydia trachomatis infection during pregnancy: a meta-analysis of randomised controlled trials. *Int J Antimicrob Agents.* 2007 Sep;30(3):213-21. http://www.ncbi.nlm.nih.gov/pubmed/17596917

vi: Lidocaine 1%: Contract circular HP02-2013AI (1August2013to31July2015): MCC registered package inserts of Kocef® 250 mg, 500 mg, 1 g; Rociject® 500 mg, 1 g; Oframax® 250 mg, 1 g

vii:Azithromycin (LAP): Savaris RF, Teixeira LM, Torres TG, Edelweiss MI, Moncada J, Schachter J. Comparing ceftriaxone plus azithromycin or doxycycline for pelvic inflammatory disease: a randomized controlled trial. *Obstet Gynecol.* 2007 Jul;110(1):53-60. http://www.ncbi.nlm.nih.gov/pubmed/17601896

Azithromycin (LAP/ SSW/ BUBO): Amsden GW, Gray CL. Serum and WBC pharmacokinetics of 1500 mg of azithromycin when given either as a single dose or over a 3 day period in healthy volunteers. *J AntimicrobChemother.* 2001 Jan;47(1):61-6. http://www.ncbi.nlm.nih.gov/pubmed/11152432

Azithromycin (LAP/ SSW/ BUBO): Sampson MR, Dumitrescu TP, Brouwer KL, Schmith VD. Population pharmacokinetics of azithromycin in whole blood, peripheral blood mononuclear cells, and polymorphonuclear cells in healthy adults.*CPT PharmacometricsSystPharmacol.* 2014 Mar 5;3:e103. http://www.ncbi.nlm.nih.gov/pubmed/24599342

viii: Metronidazole (LAP): Bignell C, Fitzgerald M; Guideline Development Group; British Association for Sexual Health and HIV UK. UK national guideline for the management of gonorrhoea in adults, 2011.*Int J STD AIDS*. 2011 Oct;22(10):541-7. http://www.ncbi.nlm.nih.gov/pubmed/21998172

Metronidazole (LAP): Workowski KA, Berman S; Centers for Disease Control and Prevention (CDC). Sexually transmitted diseases treatment guidelines, 2010.*MMWR Recomm Rep*. 2010 Dec 17;59(RR-12):1-110. Erratum in: *MMWR Recomm Rep.* 2011 Jan 14;60(1):18. Dosage error in article text. http://www.cdc.gov/std/treatment/2010/

ix:Ceftriaxone 1 g + Azithromycin 2 g (MUS): WHO. Global action plan to control the spread and impact of antimicrobial resistance in Neisseria gonorrhoeae. 2012. www.who.int/reproductivehealth/publications/rtis/9789241503501/en/

x: Gentamicin: Brown LB, Krysiak R, Kamanga G, Mapanje C, Kanyamula H, Banda B, Mhango C, Hoffman M, Kamwendo D, Hobbs M, Hosseinipour MC, Martinson F, Cohen MS, Hoffman IF. Neisseria gonorrhoeae antimicrobial susceptibility in Lilongwe, Malawi, 2007.*Sex Transm Dis.* 2010 Mar;37(3):169-72. http://www.ncbi.nlm.nih.gov/pubmed/19901860

xi: Azithromycin (GUS): National STI Surveillance Programme, Centre for HIV & STIs, NICD/NHLS, 2006-2011

Azithromycin (GUS): Lewis D, Newton DC, Guy RJ, Ali H, Chen MY, Fairley CK, Hocking JS. The prevalence of Chlamydia trachomatis infection in Australia: a systematic reviewand meta-analysis. *BMC Infect Dis.* 2012 May 14;12:113. http://www.ncbi.nlm.nih.gov/pubmed/22583480

Azithromycin (GUS): World Health Organization. Guidelines for the management of sexually transmitted infections.WHO, Geneva. 2003. www.emro.who.int/aiecf/web79.pdf

xii: Pregnancy/ breast feeding (GUS): Adult Hospital level STG, 2012. http://www.health.gov.za/

xiii: Lidocaine 1% (GUS/ Syphilis): Kingston M, French P, Goh B, Goold P, Higgins S, Sukthankar A, Stott C, Turner A, Tyler C, Young H; Syphilis Guidelines Revision Group 2008, Clinical Effectiveness Group. UK National Guidelines on the Management of Syphilis 2008.*Int J STD AIDS*. 2008 Nov;19(11):729-40. Erratum in: *Int J STD AIDS.* 2011 Oct;22(10):613-4. http://www.ncbi.nlm.nih.gov/pubmed/18931264

Lidocaine 1% (GUS/ Syphilis): Amir J, Ginat S, Cohen YH, Marcus TE, Keller N, Varsano I. Lidocaine as a diluent for administration of benzathine penicillin G. *Pediatr Infect Dis J.* 1998 Oct;17(10):890-3. http://www.ncbi.nlm.nih.gov/pubmed/9802630

xiv: Azithromycin (Bubo): Workowski KA, Berman S; Centers for Disease Control and Prevention (CDC). Sexually transmitted diseases treatment guidelines, 2010.*MMWR Recomm Rep*. 2010 Dec 17;59(RR-12):1-110. Erratum in: *MMWR Recomm Rep.* 2011 Jan 14;60(1):18. Dosage error in article text. http://www.cdc.gov/std/treatment/2010/

Chapter 13: Immunisation

The contents of this chapter are based on the National Vaccinators Manual that contains recommendations from the National Advisory Group on Immunisation (NAGI).

13.1 IMMUNISATION SCHEDULE

Any medical incident that takes place after immunisation causes concern and if believed to be caused by immunisation should be reported.

» Every clinic day is an immunisation day.
» Never miss a chance to immunise – never turn a child away if an immunisation is needed, even if it means opening a multidose vial for just one child.
» Check the Road to Health Booklet every time the child visits the clinic, and give missed immunisations. These should be given according to the catch-up schedule which is shown in the table on page 4.
» Mild illnesses are not a contra-indication to immunisation – most children who are well enough to be sent home, are well enough to be immunised. Do not immunise a sick child if the mother seriously objects, but encourage her to bring the child for immunisation on recovery.
» Give an extra dose if in doubt whether a child has had a certain dose or not, as extra doses are not harmful.
» All vaccines listed in the table can be given safely at the same time, **but should not be mixed in the same syringe.**
» Serious adverse events following immunisation are uncommon. All adverse events other than mild systemic symptoms (irritability, fever > 39°C) and minor local reactions (redness/swelling at infection site) should be reported.

There are very few contra-indications, but many missed opportunities.

Adverse events requiring reporting

Local reactions
» Severe local reaction (swelling extending > 5 cm from the injection site or redness and swelling for > 3 days).
» Lymphadenitis.
» Injection site abscess.

Systemic reactions
» All cases of hospitalisation (thought to be related to immunisation).
» Encephalopathy within 7 days.
» Collapse or shock-like state within 48 hours.
» Fever of more than 38°C within 48 hours.
» Seizures within 3 days.
» All deaths (thought to be related to immunisation).

Conditions that are *not* contraindications to any of the standard EPI vaccines
» Family history of any adverse reactions following vaccination.
» Family history of convulsions.
» Previous convulsions.
» Previous measles, mumps, rubella or pertussis-like illness.

» Preterm birth.
» History of jaundice after birth.
» Stable neurological conditions such as cerebral palsy and trisomy 21.
» Contact with an infectious disease.
» Minor illness (without systemic illness and with a temperature below 38.5°C).
» Treatment with antibiotics.
» Asthma, eczema, hay fever or 'snuffles'.
» Treatment with locally acting (inhaled or low-dose topical) steroids.
» Child's mother is pregnant.
» Child being breastfed.
» Underweight, but otherwise healthy child.
» Over the age recommended in vaccination schedule.
» Recent or imminent surgery.

13.2 CHILDHOOD IMMUNISATION SCHEDULE

Immunisation schedule

Age of child	Vaccine
At birth	OPV0 BCG
6 weeks	OPV1 RV1 Hexavalent (DTaP-IPV-HB-Hib)1 PCV 1
10 weeks	Hexavalent (DTaP-IPV-HB-Hib)2
14 weeks	RV2 Hexavalent (DTaP-IPV-HB-Hib)3 PCV2
9 months	Measles1 PCV3
18 months	Hexavalent (DTaP-IPV-HB-Hib)4 Measles2
6 years	Td
12 years	Td

Note:

» Children with HIV should receive the full schedule of vaccines.
» Exception: Symptomatic HIV infected children (WHO Stage 3 or Stage 4) should not be administered BCG vaccine.

Catch-up doses

Any child who is unimmunised should be given a full schedule of immunisations.

Vaccine	Age of child	First dose	Interval for subsequent doses		
			Second	Third	Fourth
BCG	<1 year	Give one dose			
	> 1 year	Do not give			
OPV	<6 months	Give first dose	4 weeks		
	>6 months	Do not give			
Hexavalent (DTaP-IPV-HB-Hib)	Up to 5 years	Give first dose	4 weeks	4 weeks	12 months (do not give before child is 18 months old)
Rotavirus	<20 weeks	Give first dose	4 weeks		
	20–24 weeks	Give one dose			
	>24 weeks	Do not give			
PCV	<6 months	Give first dose	4 weeks	Give at 9 months of age	
	6–9 months	Give first dose	4 weeks	8 weeks	
	>9–12 months	Give first dose	4 weeks	8 weeks	
	1–6 years	Give one dose			
Measles	17 months or younger	Give first dose	At 18 months		
	>17 months	Give first dose	4 weeks		
Td	>6 years	Give first dose	At 12 years		

13.3 VACCINES FOR ROUTINE ADMINISTRATION

Vaccine	Form	Dose	Route	Recommended site	Age
BCG	Powder	0.05 mL	Intra-dermal	Right upper arm, at the deltoid muscle	Birth
OPV	Liquid	2 drops	Oral	Oral	Birth, 6 weeks
RV	Liquid	1.5 mL	Oral	Oral	6, 14 weeks
Hexavalent (DTaP-IPV-HB-Hib)	Liquid and Powder	0.5 mL	IM	< 1 year: lateral aspect of the left thigh > 1 year: left upper arm	6,10,14 weeks, 18 months
Measles	Powder	0.5 mL	IM	< 1 year: lateral aspect of the left thigh > 1 year: right upper arm	9, 18 months
PCV	Liquid	0.5 mL	IM	Lateral aspect of the right thigh	6, 14 weeks, 9 months
Td	Liquid	0.5 mL	IM	Left arm	5–7 years, ≥ 12 years.

BCG *(Bacillus Calmette-Guérin)*

Protects against TB meningitis and miliary TB in children < 2 years of age.

- BCG**,** 0.05 mL of reconstituted intradermal BCG vaccine.
  - Administered into the skin (intradermally) on the right upper arm, at insertion of the deltoid.
  - » Storage:
    - Fridge: diluent on middle shelf and vaccine on top shelf at 2–8°C.
    - Discard opened vial after 6 hours or at end of immunisation session, whichever comes first.
  - » Adverse events:
    - Initial reaction to intradermal vaccination is a papule formation that lasts a maximum of 4–6 weeks. This develops into a scar (visible in 40% of vaccinated infants).
    - In 1–10% there is oozing, ulceration and lymphadenopathy after vaccination. This is a usual reaction and not a cause for alarm. Lymphadenopathy < 1.5 cm is not clinically significant.
    - Occasionally the papule becomes a pustule.
    - Refer all cases with significant lymphadenopathy or a draining sinus.
  - » Contraindications:
    - Children with signs of symptomatic HIV infection (AIDS) should not get BCG vaccination.
    - Children > 12 months old should not get BCG vaccination.
    - Newborn infants: if the mother is on TB chemotherapy, the infant should be on chemoprophylaxis and receive BCG later.

Hexavalent (DTaP-IPV-HB-Hib) vaccine (Diptheria, tetanus, acellular pertussis, inactivated polio, hepatitis B and *Haemophilus influenza* type b vaccine).
Protects against diphtheria, tetanus, pertussis, poliomyelitis, hepatitis B infection and invasive infections caused by *Haemophilus influenza* type b.

- Hexavalent (DTaP-IPV-HB-Hib), IM, 0.5 mL.
  - <1 year of age: administer into outer side of left thigh.
  - >1 year of age: administer into upper left arm.

Hexavalent (DTaP-IPV-HB-Hib) vaccine is a combination of diphtheria toxoid, tetanus toxoid, acelluar pertussis vaccine, inactivated polio vaccine, hepatitis B vaccine and *Haemophilus influenza* type b vaccine with a freeze-dried powder conjugate.

Hib conjugate vaccine is presented as a white, homogenous powder while the acellular component of pertussis vaccine is combined with diphtheria and tetanus toxoids and injectable polio vaccine is in a form of whitish turbid suspension for injection.

» Storage:
  - Fridge: middle shelf at 2–8°C.
  - Hexavalent (DTaP-IPV-HB-Hib) vaccine should never be frozen.
  - The vaccine must be injected immediately after reconstitution of the freeze-dried powder by the suspension.

» Adverse events:
  - Irritability.
  - Fever ≥ 38°C and acute illness.
  - Redness and induration at the site of the injection.

» Contra Indications:
  - Known hypersensitivity to any component of the vaccine or pertussis vaccine (acellular or whole cell pertussis) or a life-threatening reaction after previous administration of the vaccine or a vaccine containing the same substance.

Td (Tetanus and diphtheria vaccine)
Protects against diphtheria and tetanus.

- Td, IM, 0.5 mL in upper arm.

» Storage:
  - Fridge: middle shelf at 2–8°C.
  - Easily damaged by freezing.
  - Keep opened vials for next session if kept at correct temperature and not contaminated.
  - Discard after 30 days.
  - Record date of reconstitution.

» Adverse events:
  - Mild fever.
  - Pain.
  - Local swelling occasionally.

» Contraindications:
  - Previous anaphylaxis.

- Children < 6 years of age should not get Td.

OPV (Oral polio vaccine)
Protects against polio.

- OPV, oral, 2 drops given by mouth.
  - If spat out or vomited, repeat immediately.
  - Not affected by feeding (breast or other).
    - » Storage:
      - Fridge: top shelf (in clinics); or freezer (in pharmacy).
      - Not damaged by freezing.
      - Easily damaged by temperature > 8°C.
      - Discard after 30 days.
      - Record date of opening.
    - » Adverse events:
      - May be associated with a flu-like illness and gastroenteritis.
      - Mild fever.
    - » Contraindications:
      - Previous anaphylaxis.
      - Children with congenital or acquired immunodeficiency.

RV (Rotavirus Vaccine)
Protects against gastro-enteritis caused by rotavirus.

- RV, oral, 1.5 mL given by mouth.
  - Squeeze the entire contents of the tube in the inner cheek.
    - » Storage:
      - Fridge: top shelf (in clinics) at temperature 2–8°C.
      - Easily damaged by freezing.
      - Protect the vaccine from light.
    - » Adverse events:
      - Mild fever.
      - Irritability.
    - » Contra-indications:
      - Previous anaphylaxis to rotavirus or any ingredients in the formulation.
      - Do not give Rotavirus vaccine if a child has a history of chronic gastro-intestinal disease or severe diarrhoea including children with any history of uncorrected congenital malformation of the gastrointestinal tract. Refer the child for medical opinion.
      - A history of intussusception (severe abdominal pain, persistent vomiting, bloody stools, abdominal bloating and/or high fever).
      - Rotavirus vaccine should not be given after 24 weeks of age (see table above for catch-up schedule).

PCV (Pneumococcal Conjugated Vaccine)
Protects against invasive pneumococcal disease (meningitis, septicaemia), pneumonia and otitis media.

- PCV, IM, 0.5 mL

- < 1 year of age: administer into outer side of right thigh.
- > 1 year of age: administer into upper arm in the deltoid muscle.
- PCV and Hexavalent (DTaP-IPV-HB-Hib) can be administered at the same time, but at different sites.
  - » Storage:
    - Fridge: middle shelf at 2–8°C.
    - Easily damaged by freezing.
    - Do not freeze.
    - Do not mix PCV in the same syringe with other vaccines.
    - Shake the vaccine well before use.
  - » Contra- indications:
    - Previous anaphylaxis.

Measles

- Measles vaccine, IM, 0.5 mL.
  - < 1 year of age: administer into outer side of right thigh.
  - > 1 year of age: administer into upper arm in the deltoid muscle.
    - » Storage:
      - Fridge: diluent on middle shelf and vaccine on top shelf at 2–8°C.
      - Discard opened vial after 6 hours or at end of immunisation session (whichever comes first).
    - » Adverse events:
      - Transient morbilliform rash and mild pyrexia 6–11 days after vaccination.
    - » Contra-indications:
      - Previous anaphylaxis.
      - Give an additional dose to HIV-infected children at 6 months of age.

13.4 THE COLD CHAIN

Maintaining the cold chain means keeping vaccines at the right temperature throughout distribution, storage and use. The cold chain can be maintained by:

» Never exposing vaccines to heat or freezing conditions, especially during transportation from one point to another.
» Always using a cold box to keep the vaccines cold during transport and immunisation.
» All vaccines should be kept in a refrigerator at a temperature of 2–8°C.
» Defrosted OPV should not be kept in the freezer or be allowed to freeze again.
» Use a metal dial thermometer or a fridge-tag for all vaccines (Min-max thermometer not recommended).
» Do not let Hexavalent (DTaP-IPV-HB-Hib), HPV, PCV, RV, Td and TT vaccines touch the evaporator at the back of the fridge as they may freeze. Do not freeze these vaccines. Do not use frozen vaccines. Do shake test to check whether vaccines have frozen, if unsure.
» Monitor and record fridge temperature twice daily.
» Leave space between each tray to allow cold air to circulate.
» Do not keep food in the same fridge as the vaccines.

Correct packing of the cold box

» **Fully** conditioned ice packs (the ice should rattle inside the pack) are placed on the bottom, at the sides and on top.
» If there are not enough ice packs, place available ice packs at the sides and on top of the vaccines.
» Td, TT, HPV, PCV, RV and vaccines must not be allowed to freeze.
» Keep measles and polio vaccines very cold - place on bottom of the cold box, closest to the ice packs.
» BCG can be placed anywhere in the box.
» Keep the lid firmly closed and the box out of the sun.
» Keep a thermometer and a freeze tag in the cold box with the vaccines and the temperature at 2–8°C.
» Live vaccines (BCG, OPV, measles) contain weakened organisms and are very sensitive to heat, sunlight and skin antiseptics.

How to pack your fridge correctly

» Top shelf: measles and polio vaccines in the coldest part.
» Middle shelf: BCG, Td, Hexavalent (DTaP-IPV-HB-Hib), HPV,RV, PCV and TT vaccines (do not freeze) with sufficient diluent for the BCG and measles for 2 days.
» Do not let Td, Hexavalent (DTaP-IPV-HB-Hib), HPV, RV, PCV and TT vaccines touch the evaporator plate at the back of the fridge as they are destroyed by freezing.
» Do not keep vaccines in the fridge door.
» Store the same kind of vaccines together in one tray.
» Leave about 2cm space between each tray to allow the cold air to move around.
» Bottles filled with salt water stored in the bottom of the fridge will keep the fridge contents cold when the door is opened.
» **Do not keep food in the same fridge as the vaccines to avoid unnecessary opening of the door.**
» If there has been a power failure consult the supervisor.
» Monitor and record temperature twice daily.

CAUTION

Do not use vaccines that have expired, missed the cold chain or that VVM has reached discard point.
Keep the fridge temperature between 2–8°C.

Note: All vaccines with a "T" in the name are sensitive to freezing –TT, Td, liquid Hib-Type b, RoTavirus, HepaTiTis B and even diluent.

13.5 OPEN MULTI-DOSE VIAL POLICY

Opened vials of TT, Td, HepB and OPV vaccines:

» May be used in subsequent immunisation sessions **for a maximum of one month,** provided that each of the following conditions have been met:
  – the expiry date has not passed
  – each vial must be dated when opened

- the vaccines are stored under appropriate cold chain conditions (2–8°C with temperature monitoring and recording)
- the vaccine vial septum has not been submerged in water
- aseptic technique has been used to withdraw all doses

If one of these vaccines has a VVM e.g. OPV, the vaccine vial monitor (VVM) will indicate the potency of the vaccine and the vaccine may be used for any length of time as long as the VVM has not reached discard point, and the other conditions above apply.

Opened vials of measles, BCG

Check the VVM and expiration date prior to reconstitution.
Reconstituted vials of measles and BCG vaccines must be discarded at the end of each immunisation session or at the end of 6 hours, whichever comes first.
Always label the vials with the date and time when opening or reconstituting.
All opened vials must be discarded immediately if:

» sterile procedures have not been fully observed,
» there is even a suspicion that the opened vial has been contaminated,
» there is visible evidence of contamination such as a change in appearance or floating particles, etc.

INJECTION SAFETY

» Always wash hands before and after giving the vaccine.
» Always keep a fully equipped emergency tray at the immunisation point.
» Use a sterile syringe and sterile needle for each immunisation.
» Clean the skin adequately with cotton wool and water, no alcohol swabs must be used.
» Check all vaccines for safety.
» Return all unsafe vaccines back to the pharmacist.
» Use the same needle for drawing up and administering the vaccine. “One Needle, One Syringe”.
» Diluents are not interchangeable. Different vaccines have different diluents.
» Always use the same diluent from the same manufacturer as the vaccine.
» Used needles and syringes must be disposed of safely.
» Discard all used empty vaccines in the sharps container.

13.6 ADVERSE EVENTS FOLLOWING IMMUNISATION (AEFI)

Report all AEFIs to the local EPI Coordinator.

13.7 OTHER VACCINES

TT (Tetanus toxoid)
Protects against tetanus (neonatal and after wounds)

- TT, IM, 0.5 mL into arm
  - » Storage:
    - Fridge: middle shelf at 2–8°C.
    - Easily damaged by freezing.

- Keep opened vials for next session if kept at correct temperature and not contaminated.
- Discard after 30 days.
- Record date of reconstitution.

» Contraindications:
- Previous anaphylaxis.

Pregnant women

All pregnant women should routinely receive tetanus toxoid.

	TT or Td	**TT or Td**	**TT or Td**	**TT or Td**	**TT or Td**
Pregnant women with no previous immunisation (or unreliable immunisation information)	As early as possible in 1st pregnancy	At least 4 weeks later.	At least 6 months later, or in next pregnancy.	At least 1 year later, or in next pregnancy.	At least 1 year later, or in next pregnancy.
Pregnant women with 3 childhood DTP, DTP-Hib or DTaP-IPV//Hib doses	As early as possible in 1stpregnancy	At least 4 weeks later.	At least 1 year later.		
Pregnant women with 4 childhood DTP, DTP-Hib or DTaP-IPV//Hib doses	As early as possible in 1stpregnancy.	At least 1 year later.			

Trauma

- Give booster dose of TT/Td after each trauma episode (unless given in previous 5 years).

Human Papillomavirus (HPV) Vaccine

Protects against infection with HPV serotypes 16 and 18.
Persistent HPV infection is associated with the development a number of reproductive tract cancers, especially cancer of the cervix.
Two dose schedule (6 months apart) currently offered as part of the **Integrated School Health programme** to Grade 4 girls (≥ 9 years of age) in public schools.

HPV, IM, 0.5 mL

- Administered into the deltoid of the non-dominant arm.
- Storage:
  - Fridge: middle shelf at 2–8°C.
  - Easily damaged by freezing – do not freeze and discard any vaccine which has been frozen.
  - Store in original package and protect from light.
  - Use immediately once withdrawn into a syringe.

» Contraindications:
- Previous anaphylaxis.
- Febrile illness (≥ 38.5°C).

  - Should not be administered to girls/women who are known to be pregnant.
- » Adverse events:
  - Injection site pain and swelling in the arm are common.
  - Itching, rash, redness and urticaria may also occur.
  - Nausea, diarrhoea, abdominal pain, headache, myalgia, fever (38^{o}C) are not uncommon.
  - Syncope, dizziness, lymphadenopathy, and anaphylaxis have been reported.

All personnel working in a health care facility (including support staff)

- Hepatitis B, 3 adult doses of 1 mL.
  - **first dose** administered immediately;
  - **second dose** 1 month after the first dose;
  - **third dose** 6 months after the first dose.

Influenza vaccine

- Influenza vaccine, IM, 0.5 mL

Should be given annually to:

» Elderly patients > 65 years of age.
» Medical and nursing personnel.
» HIV-infected people.
» All patients with chronic cardiac or pulmonary conditions.

Chapter 14: Musculoskeletal conditions

14.1 ARTHRALGIA

M15.9

DESCRIPTION

Joint pain without swelling, warmth, redness or systemic manifestations such as fever. It is usually self-limiting. May be an early manifestation of degenerative joint conditions (osteoarthrosis) or local and systemic diseases. May follow injury to the joint, e.g. work, play and position during sleep. Suspect rheumatic fever in children, especially if arthralgia affects several joints in succession.

GENERAL MEASURES

» Advise patient to:
  – apply heat locally to the affected joint, taking precautions not to burn oneself
  – exercise after relief from pain
  – reduce weight, if overweight, to decrease stress on the joint
» Exclude other causes.
» Reassure patient.

MEDICINE TREATMENT

Treat for 1 week (maximum 2 weeks) provided no new signs develop.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g, 6 hourly when required.
- Methyl salicylate ointment, topical, applied to affected areas may be considered in selected patients.

REFERRAL

» Pain for 1 week in children, and pain for > 2 weeks in adults.
» Recurrent pain.
» Severe pain.
» Backache with radiation to one or other lower limb.
» Neurological signs.
» Signs of arthritis (swelling, redness, tender on pressure, warmth).
» Fever.

14.2 ARTHRITIS, RHEUMATOID

M06.9/M05.9

DESCRIPTION

A chronic, inflammatory, systemic condition of fluctuating course.
May affect many organs, predominantly joints with:
– Swelling or fluid, affecting at least 3 joint areas simultaneously.
– Rheumatoid nodules occur most frequently on extensor surfaces of the forearm.

– Pain.
– Limited movement with morning stiffness for longer than 30 minutes, which improves with activity. This distinguishes osteoarthrosis from rheumatoid arthritis.
– Destruction of affected joints.
  – Mainly affects the small joints of the fingers and hands with the exception of the distal interphalangeal joints, although any joint can be involved. The distribution is symmetrical.

REFERRAL
All patients.

14.3 ARTHRITIS, SEPTIC
M00.9

DESCRIPTION
An acute infective condition involving one or more joints.
The joint is hot, swollen, very painful and with restricted movements.
Signs of systemic infection, including fever, are usually present. The infection is usually blood borne, but may follow trauma to the joint. The course may be acute or protracted. A wide spectrum of organisms is involved, including staphylococci and *N. gonorrhoea*.
Note: Haemophiliacs may present with an acute arthritis similar to septic arthritis. This is due to bleeding into a joint and not due to infection.

MEDICINE TREATMENT
» Infants ≤ 2 months of age, who fulfill the IMCI criteria for "POSSIBLE SERIOUS BACTERIAL INFECTION" should receive a first dose of ceftriaxone and other IMCI urgent care while arranging transfer.

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose.** *LoE: III*[i]
  See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

Treat shock if present, while preparing for transfer.

REFERRAL
Urgent
» All patients for confirmation of diagnosis and surgical drainage.
» Children with suspected septic arthritis should be assessed for evidence of

septicaemia and septicaemic shock, which should be treated accordingly.

14.4 GOUT

14.4.1 GOUT, ACUTE

M10.9

DESCRIPTION

A metabolic disease in which uric acid crystal deposition occurs in joints and other tissues. Characterised by recurrent attacks of a characteristic acute arthritis thatoften affects one joint and is accompanied by extreme pain, tenderness, swelling, redness and is hot. The inflammation may extend beyond the joint.
In many patients the 1st metatarso-phalangeal joint is initially involved. The instep, ankle, heel, and knee are also commonly involved. Bursae (such as the olecranon) may be involved.
Gout commonly occurs in men > 40 years of age and in postmenopausal women.

INVESTIGATIONS

Increased serum uric acid level.
However, the serum uric acid level may be normal during acute attacks.

GENERAL MEASURES

» Immobilise the affected joint during the acute painful attack.
» Increase (high) fluid intake.
» Avoid alcohol.
» Avoid aspirin.

MEDICINE TREATMENT

Initiate treatment as early as possible in an acute attack.

- NSAIDs, e.g.:
- Ibuprofen, oral, 800 mg 8 hourly with or after a meal for 24–48 hours.

Thereafter, if needed, reduce dose of NSAID, e.g.:

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal until pain and inflammation has subsided.

If NSAIDS are contraindicated, e.g. peptic ulceration, warfarin therapy and renal dysfunction:

- Prednisone, oral, 40 mg daily for 5 days (Doctor initiated).

LoE: III[4]

REFERRAL

» No response to treatment.
» For confirmation of diagnosis, if in doubt.
» Patients with chronic kidney disease.
» Patients with suspected secondary gout (e.g. haematological malignancies).

Note:

» Patients with suspected metabolic syndrome often have impaired renal function and the use of NSAIDs has safety implications.

» Gout may be secondary to other medical conditions, e.g. haematological malignancies.
» Gout may co-exist with hypertension, diabetes mellitus (as a risk factor for degenerative vascular disease) and chronic renal disease. The pharmacological treatment of these conditions could precipitate gout.

14.4.2 GOUT, CHRONIC

M10.9

DESCRIPTION

Gout with one or more of the following:
» uric acid deposits in and around the joints and cartilages of the extremities (tophi)
» initial involvement of the first metatarso-phalangeal joint in the majority of patients
» involvement of the instep, ankle, heel and knee
» involvement of bursae (such as the olecranon)
» significant periarticular inflammation
» serum uric acid over 0.5 mmol/L
» bone destruction
» prolongation of attacks, often with reduction in pain severity
» incomplete resolution between attacks

GENERAL MEASURES

» If possible, avoid known precipitants and medicines that may increase uric acid, e.g. low dose aspirin, ethambutol, pyrazinamide and diuretics, especially hydrochlorothiazide at a dose of ≥ 25 mg/day.
» Encourage weight loss.
» Avoid alcohol.

MEDICINE TREATMENT

Uric acid lowering therapy is required in all of the following:

» 2 acute attacks per year
» chronic tophaceous gout
» urate renal stones
» urate nephropathy

When the acute attack has settled completely, i.e. usually after 3 weeks:

- Allopurinol, oral, 100 mg daily (Doctor initiated).
  - Increase monthly by 100 mg according to urate blood levels.
  - Titrate dose to reduce serum urate to < 0.3 mmol/L.
  - Average dose: 300 mg/day.
  - Maximum dose: 400 mg daily.
  - The elderly and patients with renal impairment require lower doses.

REFERRAL

» Suspected secondary gout.
» No response to treatment.
» Non-resolving tophaceous gout.

14.5 OSTEOARTHROSIS (OSTEOARTHRITIS)

M19.9

DESCRIPTION

A degenerative disorder typically affecting weight-bearing joints.
Signs and symptoms include:

» pain
» limited movement
» morning stiffness, lasting < 30 minutes
» joint swelling

GENERAL MEASURES

Patient and family education on:

» weight reduction
» exercise

Rest during acute painful episodes.
Recommend use of a walking stick or crutch to alleviate stress on weight bearing joint.
Physiotherapy and/or occupational therapy.

MEDICINE TREATMENT

Pain:

- Paracetamol, oral, 1 g, 6 hourly when required.
- Methyl salicylate ointment, topical, applied to affected areas may be considered in selected patients.

<u>If patient responds to paracetamol reduce the dose to:</u>

- Paracetamol, oral, 500 mg, 6–8 hourly when required.

<u>If no response and inflammation is present:</u>

ADD

- NSAID, e.g.:
- Ibuprofen, oral, 200–400 mg, 8 hourly with or after meals, as needed (Doctor initiated).

CAUTION

Long-term use of NSAIDs has adverse effects on renal and cardiac function, the GIT and on joint cartilage.

REFERRAL

All cases with:

» intractable pain
» infection
» uncertain diagnosis
» for consideration of joint replacement

[i] Ceftriaxone: National Department of Health. Integrated Management of Childhood Illness Guidelines, 2014. http://www.health.gov.za/

[ii] Prednisone: Janssens HJ, Janssen M, van de Lisdonk EH, van Riel PL, van Weel C. Use of oral prednisolone or naproxen for the treatment of gout arthritis: a double-blind, randomised equivalence trial. *Lancet.* 2008 May31;371(9627):1854-60. http://www.ncbi.nlm.nih.gov/pubmed/18514729

Prednisone: SAMF 10th edition, 2012.

Chapter 15: Central nervous system conditions

15.1 STROKE

I64

DESCRIPTION

Stroke consists of rapidly developing clinical signs of focal (at times global) disturbance of cerebral function, lasting > 24 hours or leading to death.
Most strokes are ischaemic (embolism or thrombosis) whilst others may be caused by cerebral haemorrhage.

A transient ischaemic attack (TIA) is defined as stroke symptoms and signs that resolve within 24 hours.

The diagnosis of stroke depends on the presentation of sudden onset of neurological loss, including:

» Weakness, numbness or paralysis of the face or a limbor limbs.
» Sudden onset of blurred or decreased vision in one or both eyes; or double vision.
» Difficulty speaking or understanding.
» Dizziness, loss of balance or any unexplained fall or unsteady gait.
» Headache (severe, abrupt).

GENERAL MEASURES

Acute management

» Assess airway, breathing, circulation and disability.
» Measure blood glucose and treat hypoglycaemia if present. See Section 21.11: Hypoglycaemia and hypoglycaemic coma.
» Do not treat blood pressure, unless systolic BP ≥ 220 mmHg and/or diastolic BP ≥ 120 mm Hg.
» Patients should be given nil by mouth until swallowing is formally assessed.

MEDICINE TREATMENT

Secondary prevention for adults

All patients, if not contraindicated (e.g. haemorraghic stroke, peptic ulcer, etc):

- Aspirin, oral, 150 mg daily.

Lipid lowering medicine therapy, see Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

Hypertension
For blood pressure management, see Section 4.7: Hypertension.

Diabetes mellitus
See Chapter 9: Endocrine system.

REFERRAL

All patients including patients with TIA.

15.2 SEIZURES (CONVULSIONS/FITS)

R56.8

DESCRIPTION

A seizure is a change in movement, attention or level of awareness that is sustained or repetitive, and occurs as a result of abnormal and excessive neuronal discharge within the brain. Seizures may be secondary (where there is an underlying cause) or idiopathic (where no underlying cause is evident). When seizures are recurrent or typical of a specific syndrome, then the term epilepsy is used.

Seizures should be differentiated from:

» syncope
» hyperventilation
» transient ischaemic attack (TIA)
» pseudoseizure
» rigors

Important conditions that should be excluded include:

» meningitis
» encephalitis or encephalopathy (including hypertensive encephalopathy)
» metabolic conditions, e.g. hypoglycaemia
» brain lesions

GENERAL MEASURES

If convulsing:

Measure blood glucose and treat hypoglycaemia, if present.

MEDICINE TREATMENT

Treatment is indicated if the patient presents with a seizure that lasts > 5 minutes and the seizure is causing systemic compromise.

Children < 12 years of age

- Midazolam, buccal, 0.5 mg/kg/dose as a single dose. See dosing table, pg 22.6.
  - Use midazolam for injection 5 mg in 1 mL undiluted.
  - Draw up the required volume in a 5 mL syringe.
  - Remove needle then administer midazolam into the buccal cavity (between gum and cheeks).
  - **Note**: Buccal midazolam should not be used in infants < 6 months of age.

OR *LoE:II*[1]

- Diazepam, rectal, 0.5 mg/kg/dose as a single dose. See dosing table, pg 22.3.
  - Use diazepam for injection 10 mg in 2 mL undiluted.
  - Draw up the required volume in a 2 mL syringe.
  - Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
  - Remove syringe and hold buttocks together to minimise leakage.
  - Maximum dose: 10 mg in 1 hour.
  - May be repeated after 10 minutes if convulsions continue.

- Expect a response within 1–5 minutes.

If no response after one dose of midazolam **or** two doses of diazepam, manage as Status epilepticus. See Section 21.19: Status epilepticus.

Adults

- Diazepam, slow IV infusion, 10 mg at a rate not exceeding 2 mg/minute.
  - Repeat within 10–15 minutes, if needed.
  - If no response after the second dose of diazepam manage as Status epilepticus. See Section 21.19: Status epilepticus.

Always check blood glucose concentrations to exclude hypoglycaemia.

For management of eclamptic convulsions in pregnancy, see Section 6.2.2: Hypertensive disorders of pregnancy – Eclampsia.

LoE:I[II]

After seizure

» All patients presenting with a first seizure must be investigated to exclude underlying causes, including meningitis.
» A patient who presents with a first seizure should not automatically be labeled as an epileptic, or started on treatment.
» When indicated, long term therapy should be initiated by a doctor.

REFERRAL

Urgent:

» All patients with status epilepticus or suspected meningitis, see Section 16.5: Meningitis.
» All patients following a 1st seizure should be examined by a doctor to exclude underlying causes.

Note: Persons known to have epilepsy who recover fully following a seizure do not usually require referral. See criteria for referral under epilepsy.

15.2.1 STATUS EPILEPTICUS

G41.9

See Chapter 21: Trauma and emergencies.

15.2.2 EPILEPSY

G40.9

DESCRIPTION

Epilepsy is defined as recurrent unprovoked seizures. Epilepsy is associated with many psychological, social and legal problems, and cultural misperceptions.

DIAGNOSIS

» Is usually made clinically.
» Requires an accurate witness description of the seizure.

Some different types of seizures

Partial	Simple partial	Seizure on one side of the body with no loss of consciousness.
	Complex partial	Partial seizure associated with loss of consciousness.
Generalised	Generalised tonic clonic	Loss of consciousness preceded by: » a brief stiff phase, followed by » jerking of all of the limbs
	Tonic	One or more limbs become stiff without any jerking.
	Myoclonic	Brief, usually generalised jerks, with retained awareness.
	Absence	» Occurs in childhood. » Sudden cessation of activity followed by a blank stare. » Usually no muscle twitching. » Some children will smack their lips.

GENERAL MEASURES

» Extensive health education.
» Record keeping in a seizure diary recording dates and, if possible, the times of the seizures.
» Present seizure diary at each consultation for assessment of therapy.
» Carry a disease identification bracelet, necklace or card.
» Counselling and advice on:
  – the adverse effect of alcohol on seizures,
  – the effect of missing a dose of medication,
  – the risks of discontinuingmedicine treatment without advice of the doctor.

Patient should be counseled about driving, working at heights, swimming and operating machinery - the patient should sign in the notes that they have received this advice.

MEDICINE TREATMENT

Note:

» General rule: a single medicine is best.
» Combination therapy should only be initiated by a specialist.
  – Recommended doses are general guides and will be effective in most patients.
  – Some patients may need much higher or lower doses. Doses should only be increased at 2-weekly intervals.
  – Therapeutic monitoring will assist with dosage adjustments, or in suspected non-adherence. However, it is only mandatory in the case of higher than usual doses of phenytoin.

<u>Medicine interactions</u>

» Carbamazepine, phenytoin and phenobarbital are associated with many medicine interactions.
» Always check for possible interactions before prescribing concomitant medicines.

» Oral contraceptives and subdermal implants may be less effective. Progestin-only injectable contraceptives or IUDs are preferred. See Chapter 7: Family planning.

LoE:III[III]

Generalised tonic clonic seizures

Adults

The aim is to use monotherapy, i.e. a single anticonvulsant, progressively increasing the dose until the seizures are controlled or clinically important side effects occur.

- Lamotrigine, oral (Doctor initiated).
  - 25 mg daily for 2 weeks.
  - Then 50 mg daily for 2 weeks.
  - Thereafter, increase by 50 mg every 2 weeks according to response.
  - Usual maintenance dose: 100–200 mg daily as a single dose.

OR

LoE:III[IV]

- Carbamazepine, oral (Doctor initiated).
  - 100 mg 12 hourly for one week then, 200 mg 12 hourly.
  - Titrate upwards every 2 weeks according to response to a maximum dose of 600 mg 12 hourly.

LoE:III[V]

If the initial medicine fails to achieve satisfactory control with optimal dosages, or causes unacceptable adverse effects, then a 2nd medicine may be started. The 1st medicine should be continued for 2 weeks and then gradually reduced over 6–8 weeks until stopped.

Only if already well controlled on phenytoin, continue with:

- Phenytoin, oral, 4.5–5 mg/kg daily on lean body mass, at night (Doctor initiated).
  - Phenytoin is a useful and effective agent. However, doses > 300 mg/day are potentially toxic, and increased dosages should be monitored carefully, both clinically and by medicine concentrations.

LoE:III[VI]

Children

The decision to initiate long-term therapy is generally made if the child has experienced ≥ 2 unprovoked convulsions (except febrile convulsions).

» Phenobarbital and carbamazepine are both effective in generalised tonic clonic seizures.

» Monitor the behaviour profile and academic performance of children on phenobarbital. Change treatment if any problems are identified.

- Phenobarbital, oral, 3.5–5 mg/kg at night (< 6 months of age) (Doctor prescribed).

OR

LoE:III[VII]

Carbamazepine, oral, 5 mg/kg 12 hourly for 2 weeks, then 7.5–10 mg/kg 12 hourly (Doctor prescribed).

- Maximum dose: 10 mg/kg 12 hourly.

LoE:I[VIII]

HIV-infected individuals on ART

Children

For HIV-infected children on ART, valproate is preferred because of fewer medicine interactions. When switching to valproate, commence treatment with maintenance

dose of the medicine as below and discontinue the other anticonvulsant after 7 days.

- Valproate, oral, 5 mg/kg 12 hourly (Doctor prescribed).
  - Titrate according to response over 4 weeks up to 15 mg/kg 12 hourly.
  - If poorly tolerated divide total daily dose into 3 equal doses.
  - Maximum daily dose 40 mg/kg/day.

LoE:III[ix]

Adults

For HIV-infected adults on ART, lamotrigine is preferred because of fewer medicine interactions. When switching to lamotrigine, commence treatment as below and discontinue the other anticonvulsant after 28 days.

- Lamotrigine, oral (Doctor initiated)
  - 25 mg daily for 2 weeks.
  - Then 50 mg daily for 2 weeks.
  - Thereafter, increase by 50 mg every 2 weeks according to response.
  - Usual maintenance dose: 100–200 mg/day as a single dose.

  Note: The dose of lamotrigine will need to be doubled when patients are switched from efavirenz- or nevirapine-based ART to lopinavir/ritonavir-based ART because the metabolism of lamotrigine is induced by lopinavir/ritonavir.

Poorly controlled epilepsy

Ask about the following, as these factors can influence decisions regarding medicine therapy:

» Has the patient been adherent in taking the medication regularly for at least 2 weeks or more before the seizure? Ask about medicine dosage and frequency.
» Has the patient recently used some other medicine? (i.e. look for drug interactions).
» Is there a chance that alcohol is involved?

If ≥ 1 of the above are present, address the problem/s but leave anticonvulsant therapy unchanged (unless dose adjustment is necessary because of a drug interaction). Reassess the patient within 2 weeks.

REFERRAL

» Patients with seizures other than generalised tonic clonic seizures, including absence seizures.
» Increased number of seizures or changes in the seizure type.
» Patients who have been seizure free on therapy for ≥ 2 years (to review therapy).
» Failure of lamotrigine and carbamazepine monotherapy in adults or phenobarbital and carbamazepine monotherapy in children.
» Pregnancy.
» Development of neurological signs and symptoms.
» Adverse medicine reactions or suspected toxicity in children.

Information on the seizures that should accompany each referral case.

» Number and frequency of seizures per month (or year).
» Date and time of most recent seizures.
» Detailed description of the seizures, including:

- aura or warning sign
- what happens during the seizure? (give a step-by-step account)
- is the person conscious during the seizure?
- how long do the seizures last on average?
- what does the patient experience after the seizure?
- how long does this experience last?

» Is there a family history of seizures?
» What is the initial date of diagnosis?
» Is there evidence of alcohol use?
» Is there another medical condition present, e.g. diabetes and what medication is used?
» What is the name and dosage of the anti-epileptic medicines used to date?
» Does the person return regularly for repeat of medication?

15.2.3 FEBRILE CONVULSIONS

R56.0

DESCRIPTION

A febrile convulsion is a seizure occurring in a child between the ages of 6 months and 5 years of age in association with a significant fever in the absence of an intracranial infection. These are the most common type of seizures in children of this age. However, the diagnosis requires the exclusion of other causes of seizures.

Febrile convulsions can be simple or complex.

Simple febrile convulsions:
» are generalised,
» occur once per illness,
» always last for < 15 minutes (typically lasting 1–2 minutes),
» are not associated with any neurological deficit,
» are self limiting.

Complex febrile seizures:
» last > 15 minutes; or
» are recurrent within the same febrile illness; or
» have a focal onset.

Children with febrile convulsions have a good prognosis, and very rarely develop epilepsy.

If convulsing:

Children

- Midazolam, buccal, 0.5 mg/kg/dose as a single dose. See dosing table, pg 22.6.
  - Use midazolam for injection 5 mg in 1 mL undiluted.
  - Draw up the required volume in a 5 mL syringe.
  - Remove needle then administer midazolam into the buccal cavity (between gum and cheeks).
  - **Note**: Buccal midazolam should not be used in infants < 6 months of age.

OR *LoE:II*[x]

- Diazepam, rectal, 0.5 mg/kg/dose as a single dose. See dosing

table, pg 22.3.
- Use diazepam for injection 10 mg in 2 mL undiluted.
- Draw up the required volume in a 2 mL syringe.
- Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
- Remove syringe and hold buttocks together to minimise leakage.
- Maximum dose: 10 mg in 1 hour.
- May be repeated after 10 minutes if convulsions continue.
- Expect a response within 1–5 minutes.

If no response after the 2nd dose of diazepam, manage as Status epilepticus. See Section 21.19: Status epilepticus.

Note:
» Look for a cause of the fever.
» **Always exclude meningitis.** See Section 15.3.1. Meningitis, acute.

GENERAL MEASURES
» Reassure parents and caregivers.
» Symptomatic treatment of fever.

MEDICINE TREATMENT
Treat the underlying cause.

For symptomatic relief:
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.
  - Paracetamol has no effect on seizure prevention.

LoE:III[xi]

REFERRAL
» All febrile convulsions except where:
  – the diagnosis of recurrent simple febrile seizures has been well established **AND**
  – the child regains full consciousness and function immediately after the seizure **AND**
  – meningitis has been excluded (See Section 15.3.1. Meningitis, acute).
» Complex convulsions.

15.3 MENINGITIS

15.3.1 MENINGITIS, ACUTE
G00.9/A39.0

DESCRIPTION
Infection of the membranes of the brain.
Clinical signs and symptoms include:
» headache
» neck stiffness
» impaired level of consciousness
» photophobia

» vomiting
» fever
» bulging fontanelle in infants

Neck stiffness is rare in young children, and especially neonates, and may be absent in adults, especially debilitated patients and the elderly.

Young children with fever, vomiting and convulsions or an impaired level of consciousness must be assumed to have meningitis. Signs may be even more subtle in newborns.

Initial management

» If safe, perform a lumbar puncture. Send cerebrospinal fluid (CSF) in separate sterile containers (for culture, microscopy, chemistry and glucose) with patients.

EMERGENCY MEASURES

» Stabilise before referral.
» Treat for shock, if present.
» If patient's level of consciousness is depressed:
  – maintain airway
  – give oxygen
» Ensure hydration.

MEDICINE TREATMENT

Initiate medicine treatment before transfer.

Children

- Ceftriaxone, IM, 80 mg/kg/dose immediately **as a single dose** before referral. See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

Adults

- Ceftriaxone, IM, 2 g immediately before referral.
  - Do not inject more than 1 g at one injection site.

If convulsing, see Section 15.2 Seizures (convulsions/fits).

REFERRAL

All patients with meningitis, or suspected meningitis.

15.3.2 MENINGITIS MENINGOCOCCAL, PROPHYLAXIS

Z29.2

In cases of meningococcal infection, the following close contacts should receive prophylaxis. Close contacts include:

» household members,
» child-care centre contacts, and
» anyone directly exposed to the patient's oral secretions, e.g. kissing, mouth-to-mouth resuscitation, endotracheal intubation, or endotracheal tube management.

Chemoprophylaxis is only effective for the current exposure.

MEDICINE TREATMENT

Prophylaxis

Children < 6 years of age

- Ceftriaxone, IM**,** 125 mg, as a **single dose.**

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

Children 6–12 years of age

- Ciprofloxacin, oral, 250 mg, as a single dose.

Children > 12 years of age and adults

- Ciprofloxacin, oral, 500 mg, as a single dose.

Pregnant women

- Ceftriaxone, IM, 250 mg, as a single dose.

LoE:III[xii]

15.4 HEADACHE, MILD, NON-SPECIFIC

R51

DESCRIPTION

Headache can be benign or serious.

Headache can have serious underlying causes including:

» encephalitis
» meningitis
» mastoiditis
» benign intracranial hypertension
» hypertensive emergencies
» venous sinus thrombosis
» stroke
» brain tumour

Headache due to a serious disease will often be associated with neurological symptoms and signs including:

» vomiting
» fever
» mood change
» cranial nerve fall-out
» convulsions
» confusion
» impaired consciousness
» pupillary changes and difference in size
» focal paralysis
» visual disturbances
» neck stiffness

Tension headache due to muscle spasm:
» May be worse in the afternoon, but often present all day.
» Is normally felt in the neck and the back of the head, but may be felt over the entire head.
» Is often associated with dizziness and/or blurring of vision.
» Is often described as a tight band around the head or pressure on the top of the head.
» Does not progress through stages like a migraine (no nausea, no visual symptoms).

GENERAL MEASURES
» Teach relaxation techniques where appropriate.
» Reassurance, where applicable.
» Exclude analgesia overuse headache.

MEDICINE TREATMENT
Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
- Paracetamol, oral, 1 g, 6 hourly when required.

REFERRAL
» Suspected meningitis should be referred immediately after initial treatment. See Section 16.5: Meningitis.
» Headache in children lasting for 3 days.
» Recent headache of increasing severity.
» Headache with neurological manifestations.
» Analgesia overuse headache.
» Newly developed headache persisting for > 1 week in an adult.
» Chronic recurrent headaches in an otherwise healthy patient: refer if no improvement after 1 month of treatment.
» Tension headache due to muscle spasm: refer if no improvement after 1 month of treatment.

15.5 NEUROPATHY
G60.9

DESCRIPTION
Defective functioning of nerves, which may involve peripheral nerves (peripheral neuropathy) and/or cranial nerves.

Clinical features may be predominantly of a sensory, sensorimotor or motor nature.

15.5.1 POST-HERPES ZOSTER NEUROPATHY (POST HERPETIC NEURALGIA)

M79.2

See Section 11.3.10: Herpes zoster (Shingles)

15.5.2 BELLS PALSY

G51.0

DESCRIPTION

Unilateral paralysis of all the muscles of facial expression (the corner of the mouth drops, the forehead is unfurrowed, and the eyelids will not close).
Taste sensation may be lost unilaterally and hyperacusis (painful sensitivity to loud sounds) may be present.
Most patients recover within a few weeks or months.

GENERAL MEASURES

» HIV testing.
» Referral for facial muscle massage and exercises.
» Eye pad for protection of the eye during sleep.

MEDICINE TREATMENT

Adults

- Prednisone, oral, 60 mg daily for 7 days started within 3 days of onset (Doctor prescribed).

Children

- Prednisone, oral, 2 mg/kg daily for 7 days within 3 days of onset (Doctor prescribed).

Weight kg	**Dose** mg	**Tablet** 5mg	**Age** Months/years
>17.5–25 kg	40 mg	8 tablets	>5–7 years
>25–40 kg	55 mg	11 tablets	>7–12 years

LoE:III[xiii]

REFERRAL

All cases for physiotherapy.

15.5.3 PERIPHERAL NEUROPATHY

G60.9/G62.9/G62.0 /G62.1/E10.21/E11.21

DESCRIPTION

Initially sensory symptoms consisting of tingling, prickling, burning in the balls of the feet or tips of the toes or in a general distribution over the soles. The symptoms are symmetrical and with progression spread proximally.

Later sensory loss over both feet and weakness of dorsiflexion of the toes may be present. Patients may experience difficulty in walking on their heels and foot drop becomes apparent.
Common causes include HIV, diabetes mellitus, isoniazid, antiretrovirals (stavudine and didanosine) and alcohol.

GENERAL MEASURES

» HIV testing.
» Avoid alcohol.
» A balanced diet to prevent nutritional deficiency.

MEDICINE TREATMENT

» Stop the offending medicine or give suitable substitute e.g. substitute stavudine or didanosine with tenofovir or lamivudine.
» Patients on isoniazid (TB treatment or prophylaxis): increase pyridoxine to 25–50 mg 8 hourly for 3 weeks, followed by 25–50 mg daily.
- Amitriptyline, oral, 25 mg at night (Doctor prescribed).
  - Titrate at 2 weekly intervals to a maximum of 75 mg at night.

REFERRAL

» All children.
» Difficulty in walking or foot drop.
» Unsteady/ataxic gait.
» Severe sensory loss.

---

[i] Midazolam: European Medicines Agency – Committee for Medicinal Products for Human Use. Assessment report of Buccolam (midazolam), EMA/662938/2011, September 2011. [Online] [Cited November 2014] Available at: http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Public_assessment_report/human/002267/WC500112312.pdf
Midazolam: McMullan J, Sasson C, Pancioli A, Silbergleit R. Midazolam versus diazepam for the treatment of status epilepticus in children and young adults: a meta-analysis. *Acad Emerg Med*. 2010 Jun;17(6):575-82. http://www.ncbi.nlm.nih.gov/pubmed/20624136
Midazolam: McIntyre J, Robertson S, Norris E, Appleton R, Whitehouse WP, Phillips B, Martland T, Berry K, Collier J, Smith S, Choonara I. Safety and efficacy of buccal midazolam versus rectal diazepam for emergency treatment of seizures in children: a randomised controlled trial. *Lancet*. 2005 Jul 16-22;366(9481):205-10. http://www.ncbi.nlm.nih.gov/pubmed/16023510
Midazolam: Mpimbaza A, Ndeezi G, Staedke S, Rosenthal PJ, Byarugaba J. Comparison of buccal midazolam with rectal diazepam in the treatment of prolonged seizures in Ugandan children: a randomized clinical trial. *Pediatrics*. 2008; 121:e58–64. http://www.ncbi.nlm.nih.gov/pubmed/18166545
Midazolam: Scott RC, Besag FM, Neville BG. Buccal midazolam and rectal diazepam for treatment of prolonged seizures in childhood and adolescence: a randomised trial. Lancet.1999; 353:623–6. http://www.ncbi.nlm.nih.gov/pubmed/10030327
Midazolam: Medicines and Healthcare products Regulatory Agency registered summary of product characteristics: Buccolam® oromucosal solution, 2011. http://www.medicines.org.uk/emc/medicine/25538

[ii] Eclamptic convulsions in pregnancy: Duley L, Henderson-Smart DJ, Walker GJ, Chou D. Magnesium sulphate versus diazepam for eclampsia.*Cochrane Database Syst Rev.* 2010 Dec 8;(12):CD000127.

[iii] Anti-epileptic medicines-contraceptives interaction: Primary healthcare STG, 2014. Chapter 7: Family planning. http://www.health.gov.za/

[iv] Lamotrigine: FDA. Postmarket drug safety information for patients and providers: Information for Healthcare Professionals: Lamotrigine (marketed as Lamictal) [Online, 08/14/2013] [Cited November 2014] Available at: http://www.fda.gov/Drugs/DrugSafety/PostmarketDrugSafetyInformationforPatientsandProviders/ucm126225.htm
Lamotrigine: SAMF 2012, 10th edition.
Lamotrigine: Contract circular HP09-2014SD. http://www.health.gov.za/
Lamotrigine: Messenheimer J, Mullens EL, Giorgi L, Young F. Safety review of adult clinical trial experience with lamotrigine. *Drug Saf.* 1998 Apr;18(4):281-96. http://www.ncbi.nlm.nih.gov/pubmed/9565739
Lamotrigine: Guberman AH, Besag FM, Brodie MJ, Dooley JM, Duchowny MS, Pellock JM, Richens A, Stern RS, Trevathan E. Lamotrigine-associated rash: risk/benefit considerations in adults and children. *Epilepsia*. 1999 Jul;40(7):985-91. http://www.ncbi.nlm.nih.gov/pubmed/10403224
Lamotrigine: Wong IC, Mawer GE, Sander JW. Factors influencing the incidence of lamotrigine-related skin rash. Ann Pharmacother. 1999 Oct;33(10):1037-42. http://www.ncbi.nlm.nih.gov/pubmed/10534214

[v] Carbamazepine (adults): Contract circular HP09-2014SD. http://www.health.gov.za/
Carbamazepine: Ferrendelli JA. Concerns with antiepileptic drug initiation: safety, tolerability, and efficacy. *Epilepsia.* 2001;42 Suppl 4:28-30. http://www.ncbi.nlm.nih.gov/pubmed/11564122

[vi] Phenytoin: SAMF 2012, 10th edition.

[vii]Phenobarbital: Banu SH, Jahan M, Koli UK, Ferdousi S, Khan NZ, Neville B. Side effects of phenobarbital and carbamazepine in childhood epilepsy: randomised controlled trial. *BMJ*. 2007 Jun 9;334(7605):1207. http://www.ncbi.nlm.nih.gov/pubmed/17145735

[viii]Carbamazepine (children): Glauser T, Ben-Menachem E, Bourgeois B, Cnaan A, Chadwick D, Guerreiro C, Kalviainen R, Mattson R, Perucca E, Tomson T. ILAE treatment guidelines: evidence-based analysis of antiepileptic drug efficacy and effectiveness as initial monotherapy for epileptic seizures and syndromes. *Epilepsia.* 2006Jul;47(7):1094-120. http://www.ncbi.nlm.nih.gov/pubmed/16886973
Carbamazepine (children): Glauser T, Ben-Menachem E, Bourgeois B, Cnaan A, Guerreiro C, Kälviäinen R, Mattson R, French JA, Perucca E, Tomson T; ILAE Subcommission on AED Guidelines. Updated ILAE evidence review of antiepileptic drug efficacy and effectiveness as initial monotherapy for epileptic seizures and syndromes. *Epilepsia.* 2013 Mar;54(3):551-63. http://www.ncbi.nlm.nih.gov/pubmed/23350722
Carbamazepine (children): Marson AG, Williamson PR, Hutton JL, Clough HE, Chadwick DW. Carbamazepine versus valproate monotherapy for epilepsy. *Cochrane Database Syst Rev*. 2000;(3):CD001030. http://www.ncbi.nlm.nih.gov/pubmed/10908558
Carbamazepine: Contract circular HP09-2014SD. http://www.health.gov.za/

[ix] Valproate (children on ART): Birbeck GL, French JA, Perucca E, Simpson DM, Fraimow H, George JM, Okulicz JF, Clifford DB, Hachad H, Levy RH; Quality Standards Subcommittee Of The American Academy Of Neurology; Ad Hoc Task Force Of The Commission On Therapeutic Strategies Of The International League Against Epilepsy. Antiepileptic drug selection for people with HIV/AIDS: evidence-based guidelines from the ILAE and AAN. *Epilepsia*. 2012 Jan;53(1):207-14. http://www.ncbi.nlm.nih.gov/pubmed/22221159
Valproate (children on ART): SAMF 2012, 10th edition.

[x] Midazolam: McMullan J, Sasson C, Pancioli A, Silbergleit R. Midazolam versus diazepam for the treatment of status epilepticus in children and young adults: a meta-analysis. *AcadEmerg Med*. 2010 Jun;17(6):575-82. http://www.ncbi.nlm.nih.gov/pubmed/20624136
Midazolam: McIntyre J, Robertson S, Norris E, Appleton R, Whitehouse WP, Phillips B, Martland T, Berry K, Collier J, Smith S, Choonara I. Safety and efficacy of buccal midazolam versus rectal diazepam for emergency treatment of seizures in children: a randomised controlled trial. *Lancet*. 2005 Jul 16-22;366(9481):205-10. http://www.ncbi.nlm.nih.gov/pubmed/16023510
Midazolam: Mpimbaza A, Ndeezi G, Staedke S, Rosenthal PJ, Byarugaba J. Comparison of buccal midazolam with rectal diazepam in the treatment of prolonged seizures in Ugandan children: a randomized clinical trial. *Pediatrics*. 2008; 121:e58–64. http://www.ncbi.nlm.nih.gov/pubmed/18166545
Midazolam: Scott RC, Besag FM, Neville BG. Buccal midazolam and rectal diazepam for treatment of prolonged seizures in childhood and adolescence: a randomised trial. *Lancet*.1999; 353:623–6. http://www.ncbi.nlm.nih.gov/pubmed/10030327
European Medicines Agency – Committee for Medicinal Products for Human Use. Assessment report of Buccolam (midazolam), EMA/662938/2011, September 2011. [Online] [Cited November 2014] Available at: http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Public_assessment_report/human/002267/WC500112312.pdf
Midazolam: Medicines and Healthcare products Regulatory Agency (MHRA) registered summary of product characteristics: Buccolam® oromucosal solution, 2011. Available at: http://www.medicines.org.uk/emc/medicine/25538

[xi] Paracetamol: NICE Clinical Guideline-Feverish illness in children: assessment and initial management in children younger than 5 years, May 2013. http://www.nice.org.uk/guidance/cg160/chapter/recommendations
Paracetamol: NICE Guidelines, May 2013 evidence tables - Perrott DA, Piira T, Goodenough B, Champion GD. Efficacy and safety of acetaminophen vs ibuprofen for treating children's pain or fever: a meta-analysis. *Arch Pediatr Adolesc Med.* 2004 Jun;158(6):521-6. http://www.ncbi.nlm.nih.gov/pubmed/15184213
Paracetamol: NICE Guidelines, May 2013 evidence tables - Wong A, Sibbald A, Ferrero F, Plager M, Santolaya ME, Escobar AM, Campos S, Barragán S, De León González M, Kesselring GL; Fever Pediatric Study Group. Antipyretic effects of dipyrone versus ibuprofen versus acetaminophen in children: results of a multinational, randomized, modified double-blind study. *Clin Pediatr (Phila)*. 2001 Jun;40(6):313-24. http://www.ncbi.nlm.nih.gov/pubmed/11824173
Paracetamol: NICE Guidelines, May 2013 evidence tables - Figueras Nadal C, García de Miguel MJ, Gómez Campderá A, Pou Fernández J, Alvarez Calatayud G, Sánchez Bayle M; Paediatric Fever Co-operative Group from the Spanish Paediatric Association. Effectiveness and tolerability of ibuprofen-arginine versus paracetamol in children with fever of likely infectious origin. Acta Paediatr. 2002;91(4):383-90. http://www.ncbi.nlm.nih.gov/pubmed/12061352
Paracetamol: NICE Guidelines, May 2013 evidence tables - Autret E, Breart G, Jonville AP, Courcier S, Lassale C, Goehrs JM. Comparative efficacy and tolerance of ibuprofen syrup and acetaminophen syrup in children with pyrexia associated with infectious diseases and treated with antibiotics. *Eur J Clin Pharmacol*. 1994;46(3):197-201. http://www.ncbi.nlm.nih.gov/pubmed/8070499
Paracetamol: Offringa M, Newton R. Prophylactic drug management for febrile seizures in children. *Cochrane Database of Systematic Reviews* 2012, Issue 4. Art. No.: CD003031. http://www.ncbi.nlm.nih.gov/pubmed/22513908

[xii]Ceftriaxone (pregnancy): Boyles TH, Bamford C, Bateman K, Blumberg L, Dramowski A, Karstaedt A, Korsman S, le Roux DM, Maartens G, Madhi S, Naidoo R, Nuttall J, Reubenson G, TaljaardJ,Thomas J, van Zyl G, von Gottberg A, Whitelaw A, Mendelson M. Federation of Infectious Diseases Societies of Southern Africa Working Group on Acute Meningitis in Children and Adults Infectious Diseases Society of Southern Africa. Guidelines for the management of acute meningitis in children and adults in South Africa.*South Afr J Epidemiol Infect* 2013;28(1):5-15. http://www.fidssa.co.za/images/Acute_Meningitis_Guidelines_May%202013.pdf

[xiii]Prednisone (children): Salinas RA, Alvarez G, Daly F, Ferreira J. Corticosteroids for Bell's palsy (idiopathic facial paralysis). *Cochrane Database Syst Rev*. 2010 Mar 17;(3):CD001942. http://www.ncbi.nlm.nih.gov/pubmed/20238317

Chapter 16: Mental health conditions

Maintenance treatment of medicines mentioned in this chapter may be continued by nurses with proven competency to do so, under medical supervision and subject to regular review in accordance with best practice and prevailing legislation.

16.1 AGGRESSIVE DISRUPTIVE BEHAVIOUR IN ADULTS

R45.1

DESCRIPTION

Agitated and acutely disturbed patients. May be known to suffer from a psychiatric condition or not.

Note: Many acute medical conditions and substance abuse can present with agitation and aggressive behaviour. See Section 21.7: Delirium with acute confusion and aggression in adults.

GENERAL MEASURES

» Ensure the safety of the patient and those caring for them.
» Be cautious when sedating medically ill or frail patients, especially with regards to respiratory depression.
» Elderly and frail patients may be vulnerable to falls and further injury if sedated.
» Mechanical restraint should be used only when necessary to protect the patient and others in an acute setting, and for as short a period of time as possible, at all times monitoring the safety of the patient.

MEDICINE TREATMENT

Always use non-pharmacological de-escalation techniques first:
» Calm the patient.
» Manage in a safe environment.
» Ensure the safety of all staff members.

Offer oral treatment

- Benzodiazepines, e.g.: *LoE:III[I]*
- Diazepam, oral, 5 mg, immediately. *LoE:II[II]*

  OR

  Midazolam, buccal, 7.5–15 mg, immediately.

If oral treatment fails after 30–60 minutes, *LoE:III[III]*

OR

The patient is placing themselves and others at significant risk:

Consider IM treatment

- Benzodiazepines, e.g.: *LoE:III[IV]*
- Midazolam, IM, 7.5–15 mg immediately.
  - Repeat after 30–60 minutes if needed.

OR

Haloperidol, IM, 5 mg, immediately.
  - Repeat after 30–60 minutes if needed.

AND

Promethazine, IM, 25–50 mg.
  - In the elderly 25 mg.

Always monitor vital signs of sedated patient: LoE:II[V]

» Vital signs: pulse, respiratory rate, blood pressure, temperature.
» Monitor every 5–10 minutes for the first hour, and then every 30 minutes until the patient is ambulatory.

REFERRAL

All cases.

16.2 ANXIETY AND STRESS RELATED DISORDERS IN ADULTS

F41.9

DESCRIPTION

A group of related disorders which manifest as a response to a threat in a situation (stress) or reaction to stress (anxiety) or spontaneously and include the following:

» Panic attack and panic disorder,
» Generalised anxiety disorder,
» Obsessive-compulsive disorder, and
» Acute stress disorder and post-traumatic stress disorder.

GENERAL MEASURES

» Reassurance/information and support of the patient and family.
» Always consider whether there is an underlying medical condition (e.g. cardiac, lung disease, thyrotoxicosis) or a substance-related condition (intoxication or withdrawal).
» All cases should preferably receive psychotherapy.

MEDICINE TREATMENT

For acute management of anxiety:

- Benzodiazepines, e.g.:
- Diazepam, oral, 2–5 mg, daily for a maximum of 10 days.
  - If required give 12 hourly.
- Citalopram, oral (Doctor initiated) LoE:III[VI]
  - Initiate at 10 mg daily for the 1st week.
  - Then increase to 20 mg daily.

LoE:III[VII]

REFERRAL

» Poor response to treatment.
» Ongoing symptoms despite acute treatment.
» Co morbid conditions.

16.3 DELERIUM WITH ACUTE CONFUSION AND AGGRESSION

F05.9

See Sections16.1: Aggressive disruptive behaviour in adults and 21.7: Delirium with acute confusion and aggression.

16.4 MENTAL HEALTH CONDITIONS IN CHILDREN AND ADOLESCENTS

All children presenting with mental health conditions at a primary care setting should have any medical conditions identified and managed and then be referred.

16.4.1 ACUTELY DISTURBED CHILD OR ADOLESCENT AWAITING FURTHEREVALUATION

F98.9

MEDICINE TREATMENT

Exclude medical causes, e.g. encephalopathy or other intracranial pathology, infection, seizures, metabolic disease, medication adverse effects and intoxication.

For children < 6 years of age:

Sedation with psychotropic agents should only be considered in extreme cases and only after consultation with a specialist.

For children > 6 years of age:

- Benzodiazepines, e.g.:
- Midazolam, IM, 0.1–0.15 mg/kg/dose as a single dose (Doctor initiated).
  - Onset of action: within 5 minutes.

If sedation is inadequate: *LoE:III*[viii]

- Haloperidol, IM, 0.025–0.05 mg/kg/day in 2–3 divided doses to a maximum of 0.15 mg/kg/day (Doctor initiated).

Extrapyramidal side effects *LoE:III*[ix]

If extrapyramidal side effects occur (such as dystonia, rigidity or tremor) with the lowest effective dose of antipsychotic medication, co-prescribe an anticholinergic agent, e.g. orphenadrine or biperiden:

- Anticholinergic e.g.
- Orphenadrine, oral, 50 mg, 12 hourly (Doctor initiated).

For acute dystonic reaction: See Section 16.6: Acute dystonic reaction. *LoE:III*[x]

CAUTION

Always consult with a doctor, preferably a psychiatrist where possible, when prescribing antipsychotic medication to children and adolescents.

16.5 ACUTE DYSTONIC REACTION

G24.02

DESCRIPTION

An acute dystonic reaction is sustained muscle contractions that cause twisting and repetitive movements, abnormal posture or abnormal eye position, or laryngospasm within a few minutes to days after receiving medicines such as haloperidol.

MEDICINE TREATMENT

In case of an acute dystonic reaction:

Children

- Anticholinergic, e.g.:
- Biperiden, IM/slow IV, 0.05–0.1 mg/kg, as a single dose and refer (Doctor initiated).
  - 6–10 years: 3 mg
  - >10 years: 5 mg

OR

LoE:III[xi]

Promethazine, IM, 0.125–0.5mg/kg, as a single dose and refer (Doctor initiated).

- 5–10 years: 12.5 mg
- 10–16 years: 25 mg

LoE:III[xii]

Adults

- Anticholinergic, e.g.:
- Biperiden, IM, 2 mg.
  - May be repeated every 30 minutes.
  - Maximum of 4 doses within 24 hours.

OR

Promethazine, IM, 50 mg.

LoE:III[xiii]

REFERRAL

» Children and adolescents.
» No response to treatment.

16.6 MOOD DISORDERS

DESCRIPTION

Mood disorders include:

» Major depressive disorder: episodes of major depression, according to accepted diagnostic criteria.
» Dysthymia: not all the criteria for a major depressive episode are met
  – lasts at least 2 years.
» Bipolar disorder: ≥ 1 episode of mania with/without episodes of major depression.
» Mood disorder due to a general medical disorder: the mood disturbance is secondary to an underlying medical condition.
» Substance-induced mood disorder: secondary to substance use or withdrawal.

Disorders with disturbances of mood include:

» Adjustment disorder with depressed mood: depressive symptoms as a response to a major crisis or event
  – usually lasts ≤ 6 months unless the stressor persists.

16.6.1 MAJOR DEPRESSIVE DISORDER

F32.9

DESCRIPTION

Major depressive disorder is a mood disorder characterised by at least 2 weeks of depressed mood as well as diminished interest and pleasure in activities and is associated with:

» Somatic symptoms, e.g. change in appetite and sleep, agitation or retardation and loss of energy
» psychic symptoms, e.g. sadness, feeling of worthlessness, guilt, diminished concentration and memory, thoughts of death and suicide

Note: Consultation with a community psychiatrist or medical practitioner is recommended to verify diagnosis and to rule out other conditions, e.g. hypothyroidism.

GENERAL MEASURES

Supportive measures should be provided.

Broader stressors may need to be addressed:

» stress management/coping skills
» marital and family issues
» accommodation and vocational issues

Ask for suicidal ideation in all patients, before initiating a SSRI. See Section 16.5.1.1: Suicide risk assessment.

MEDICINE TREAMENT

Major depressive disorder

Adults

- SSRI, e.g.:
- Fluoxetine, oral.
  - Initial dose: 20 mg.
  - Increase to 40 mg if there is only a partial response after 4 weeks.
  - If no response after 4 weeks, refer.

LoE:III[xiv]

OR

If a sedating antidepressant is required:

- Tricyclic antidepressants, e.g.:
- Amitriptyline, oral, at bedtime.
  - Initial dose: 25 mg per day.
  - Increase by 25 mg per day at 3–5 day intervals.
  - Maximum dose: 150 mg per day.

LoE:III

CAUTION

» Tricyclic antidepressants can be fatal in overdose.
» Caution is advised when prescribing these agents to outpatients with possible suicidal ideation and requires risk assessment.
» The elderly are more sensitive to side effects and tricyclic antidepressants should be used with caution.
» Avoid tricyclic antidepressants in patients with heart disease, urinary retention, glaucoma and epilepsy.

Note:

» In cases of 1st episode of major depressive disorder, continue SSRI treatment for 6 months after symptoms have resolved. *LoE:III*[xv]
» In cases where there have been multiple episodes, or where other complications exist, longer treatment is indicated which should be reviewed at least annually.
» Do not increase the dose too quickly. Although some patients show early improvement, in others response is delayed for up to 4–8 weeks.

CAUTION

» Do not prescribe antidepressants to a patient with bipolar disorder without consultation, as antidepressants may precipitate a manic episode.
» Be careful of interactions between antidepressants and any other agents that the patient might be taking (e.g. St John's Wort or traditional African medicine).

REFERRAL

» Suicidal ideation.
» Major depression with psychotic features.
» Bipolar disorder.
» Failure to respond to antidepressants.
» Patients with concomitant medical illness, e.g. heart disease, epilepsy.
» Poor social support systems.
» Pregnancy and lactation.
» Children and adolescents.

16.6.1.1 SUICIDE RISK ASSESMENT

T14.91

DESCRIPTION

Screen patients with mood and anxiety disorders, schizophrenia and other psychotic disorders, eating disorder and substance use disorders for suicidal ideation.

WARNING

These tools are useful to identify patients at risk of suicide, but does not replace clinical judgment.

Use the suicidality subscale of the MINI INTERNATIONAL NEURO-PSYCHIATRIC INTERVIEW (MINI), English Version 5.0.0 for ADULT patients:

In the past month did you:			
A	Think that you would be better off dead or wish you were dead?	NO	YES
B	Want to harm yourself?	NO	YES
C	Think about suicide?	NO	YES
D	Have a suicide plan?	NO	YES
E	Attempt suicide	NO	YES
In your lifetime			
F	Did you ever make a suicide attempt	NO	YES

CURRENT SUICIDE RISK	
A or B or F = YES	LOW
C = YES	MODERATE
D or E or (C AND F) = YES	HIGH

Reference: Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, Hergueta T, Baker R, Dunbar GC. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry.* 1998;59Suppl 20:22-33..

Use the Risk of Suicide Questionnaire (RSQ) 4 item subscale, English Version for children and adolescents

Question		
1. Are you here because you tried to hurt yourself?	NO	YES
2. In the past week, have you been having thoughts about hurting yourself?	NO	YES
3. Have you ever tried to hurt yourself in the past other that this time?	NO	YES
4. Has something very stressful happened to you in the past few weeks?	NO	YES

Refer if:

- Question 1 is YES.
- Two or three of questions 2, 3 and 4 are YES.

*Reference:*Horowitz LM, Wang PS, Koocher GP, Burr BH, Smith MF, Klavon S, Cleary PD. Detecting suicide risk in a pediatric emergency department: development of a brief screening tool. *Pediatrics.* 2001 May;107(5):1133-7.

REFERRAL

» All patients with a high index of suspicion.
» For ADULTS: refer if risk according to the MINI tool is MODERATE TO HIGH.
» For CHILDREN AND ADOLESCENTS: refer if YES to Question 1 or ANY COMBINATION of questions in the RSQ tool.

16.6.2 BIPOLAR DISORDER

F31.9

DESCRIPTION

A lifelong illness which may have an episodic, variable course with the presenting episode being manic, hypomanic, mixed or depressive (according to accepted

diagnostic criteria). Diagnosis of bipolar disorder requires either a current or previous episode of mania. An episode of mania is typically characterised by an elevated mood where a patient may experience extreme happiness, lasting days to weeks, which might also be associated with an underlying irritability. Such mood is associated with increased energy/activity, talkativeness and a reduction in the need for sleep, and features may be accompanied by grandiose and/or religious delusions.

GENERAL MEASURES

Reassurance and support of the patient and family.

MEDICINE TREATMENT

For agitated and acutely disturbed patients:

Always use non-pharmacological de-escalation techniques first.

» Calm the patient.
» Manage in a safe environment.
» Ensure the safety of all staff members.

Offer oral treatment

- Benzodiazepines, e.g.: *LoE:III*[xvi]
- Diazepam, oral, 5 mg, immediately. *LoE:II*[xvii]

OR

Midazolam, buccal, 7.5–15 mg, immediately.

If oral treatment fails after 30–60 minutes, *LoE:III*[xviii]

OR

The patient is placing themselves and others at significant risk:

Consider IM treatment

- Benzodiazepines, e.g.: *LoE:III*[xix]
- Midazolam, IM, 7.5–15 mg immediately.
  - Repeat after 30–60 minutes if needed.

OR

Haloperidol, IM, 5 mg, immediately.
- Repeat after 30–60 minutes if needed.

AND

Promethazine, IM, 25–50 mg.
- In the elderly 25 mg.

Always monitor vital signs of sedated patient: *LoE:III*[xx]

» Vital signs: pulse, respiratory rate, blood pressure, temperature.
» Monitor every 5–10 minutes for the first hour, and then every 30 minutes until the patient is ambulatory.

REFERRAL

All patients.

16.7 PSYCHOSIS

DESCRIPTION

The patient may experience perceptual disturbances, e.g. hallucinations that are generally auditory, as well as disturbances of thought content, i.e. delusional thought process. Patients generally have no insight into their symptoms and may be resistant to intervention. The presentation may be acute (acute psychosis) or chronic (schizophrenia).

16.7.1 ACUTE PSYCHOSIS

F23.9

DESCRIPTION

Acute psychosis is a clinical state characterised by recent onset of psychotic symptoms such as: hallucinations, delusions, disorganised or illogical speech, agitation or bizarre behaviour and extreme and labile emotional states.
These symptoms may be preceded by a period of deteriorating social, occupational and academic functioning.

GENERAL MEASURES

» Ensure the safety of the patient and those caring for them.
» Minimise stress and stimulation (do not argue with psychotic thinking).
» Avoid confrontation or criticism, unless it is necessary to prevent harmful or disruptive behaviour.

MEDICINE TREATMENT

Always use non-pharmacological de-escalation techniques first.
» Calm the patient.
» Manage in a safe environment.
» Ensure the safety of all staff members.

Offer oral treatment

- Benzodiazepines, e.g.: *LoE:III*[xxi]
- Diazepam, oral, 5 mg, immediately.

OR *LoE:II*[xxii]

Midazolam, buccal, 7.5–15 mg, immediately.

If oral treatment fails after 30–60 minutes, *LoE:III*[xxiii]
OR
The patient is placing themselves and others at significant risk:
Consider IM treatment *LoE:III*[xxiv]

- Benzodiazepines, e.g.:
- Midazolam, IM 7.5–15 mg immediately.
  - Repeat after 30–60 minutes if needed.

OR

Haloperidol, IM, 5 mg, immediately.
  - Repeat after 30–60 minutes if needed.

AND

Promethazine, IM, 25–50 mg.

- In the elderly 25 mg.

LoE:III[xxv]

Always monitor vital signs of sedated patient:

» Vital signs: pulse, respiratory rate, blood pressure, temperature.
» Monitor every 5–10 minutes for the first hour, and then every 30 minutes until the patient is ambulatory.

OR

If known with schizophrenia, known to have used antipsychotics previously, and non-aggressive:

- Zuclopenthixol acetate, IM, 50 mg immediately. Do not repeat within 2 days.

Violent patients:

- Zuclopenthixol acetate, IM, 50–150 mg immediately.
  - Do not repeat within 72 hours.
  - Vital signs must be monitored 8 hourly for 72 hours.
  - Refer where there is no or poor response.

LoE:III[xxvi]

CAUTION

Always monitor for acute dystonic reactions after administration of antipsychotic agents (see Section 16.6: Acute dystonic reaction).

REFERRAL

All patients.

16.7.2 CHRONIC PSYCHOSIS (SCHIZOPHRENIA)

F20.9

DESCRIPTION

Schizophrenia is the most common chronic psychotic disorder and is characterised by a loss of contact with reality. It is further characterised by:

» positive symptoms, delusions, hallucinations and thought process disorder
» negative symptoms, blunting of affect, social withdrawal
» mood symptoms such as depression may be present

Clinical features include:

» delusions: fixed, unshakeable false beliefs (not shared by society)
» hallucinations: perceptions without adequate corresponding external stimuli, e.g. hearing voices
» disorganised thoughts and speech: e.g. derailment or incoherence
» grossly disorganised or catatonic behaviour
» negative symptoms: affective flattening, social withdrawal
» social and/or occupational dysfunction

Only make the diagnosis if:

» there is social or occupational dysfunction
» signs and symptoms are present for at least 6 months (if less: consider schizophreniform disorder)

» general medical and substance-related causes are excluded

GENERAL MEASURES

Supportive intervention includes:
» family counselling and psycho-education to patient and family
» supportive group therapy for patients with schizophrenia

Rehabilitation may be enhanced by:
» assertive community programs
» work assessment, occupational therapy and bridging programmes before return to the community
» appropriate placement and supported employment

Note: Consultation with a community psychiatrist is essential to confirm diagnosis and treatment in specific cases. See referral criteria.

MEDICINE TREATMENT

Schizophrenia where a less sedating agent is required:

Adults

- Haloperidol, oral.
  - Initial dose: 1 mg daily, increasing to 5 mg daily.
  - Once stabilised, administer as a single dose at bedtime.

LoE:III

Elderly

- Haloperidol, oral.
  - Initial dose: 0.5 mg twice daily.
  - Increase dose more gradually until symptoms are controlled or until a maximum of 5 mg daily, if tolerated, is reached.
  - Once stabilised, administer as a single dose at bedtime.

If extrapyramidal side effects: switch to risperidone rather than adding an anticholinergic medicine:

- Risperidone, oral.
  - Initial dose: 2 mg daily.
  - Increase to 4 mg daily, if poor response after 4 weeks.

LoE:I[xxvii]

Note: Anticholinergic medicines (e.g. orphenadrine) should not be added prophylactically to antipsychotics to prevent extrapyramidal side effects.

Patients already stabilised on chlorpromazine:

- Chlorpromazine, oral.
  - Maintenance dose: 75–300 mg at night, but may be as high as 800 mg.

LoE:III[xxviii]

Only for health care workers with advanced psychiatric training

Long-term depot therapy where adherence problem, or patient preference:

- Fluphenazine decanoate, IM, 12.5–50 mg every 4 weeks.
  - Initial dose: 12.5 mg.

OR

LoE:III[xxix]

- Flupenthixol decanoate, IM, 20–80 mg every 4 weeks.
  - Initial dose: 20 mg.

OR LoE:III[xxx]

- Zuclopenthixol decanoate, IM, 200–600 mg every 4 weeks.
  - Initial dose: 100 mg.

Note: LoE:III[xxxi]

» Initially, patients should be stabilised on an oral antipsychotic agent before changing to a depot preparation. Administer an initial test dose and observe the patient for 1 week before administering higher doses. Reduce the oral antipsychotic formulation, stopping once patient is stabilised on the long-term depot therapy.

» For breakthrough episodes, consider short-term therapy of: LoE:III[xxxii]

- Risperidone, oral 2 mg daily (Doctor prescribed).

» Long-acting antipsychotics are particularly useful in patients unable to adhere to their oral medication regimens.

» Long-term therapy should always be in consultation with a doctor or, if available, with a psychiatrist. Patients should be re-assessed every 6 months.

Extrapyramidal side effects

If extrapyramidal side effects occur (such as dystonia, rigidity or tremor) with the lowest effective dose of antipsychotic medication:

» an anticholinergic agent, e.g. orphenadrine or biperiden can be co-prescribed

» low potency agent, chlorpromazine, is less likely to cause dystonia extrapyramidal side effects

- Anticholinergic, e.g.:
- Orphenadrine, oral, 50–150 mg, daily or in divided doses according to individual response.
  - 50 mg twice daily is usually sufficient.
  - Do not prescribe more than 150 mg per day at primary care level.
  - Use with caution in the elderly as it may cause confusion and urinary retention.

LoE:III[xxxiii]

For acute dystonic reaction: See Section 16.6: Acute dystonic reaction.

REFERRAL

» Poor social support.
» High suicidal risk or risk of harm to others.
» Children and adolescents.
» The elderly.
» Pregnant and lactating women.
» No response or intolerance to medicine treatment.
» Concurrent medical or other psychiatric illness.
» Epilepsy with psychosis.

16.8 SUBSTANCE RELATED DISORDERS

16.8.1 SUBSTANCE USE DISORDERS

F10.8, F11.1, F12.1, F13.1, F14.1, F15.1, F16.1

Consult the most recent National Policy guidelines on detoxification of psychoactive substances.

DESCRIPTION

Substance use disorder is mental and physical symptoms caused by the use of one or more substance despite significant substance-related problems (including abuse and dependence). Substance-induced disorders include intoxication, withdrawal and other substance/medication-induced mental disorder.

Alcohol withdrawal

See Section 16.7.3 Alcohol withdrawal (uncomplicated).

Methamphetamines (tik), cocaine (crack), methaqualone (mandrax), cannabis

These patients usually do not require hospitalisation.

GENERAL MEASURES

Reassurance and support of the patient and family.

MEDICINE TREATMENT

For severe anxiety, irritability and insomnia:

- Benzodiazepine, e.g.:
- Diazepam, oral, 5–10 mg as a single dose or 12 hourly for 5–7 days.

For seizure control and /or sedation:

- Diazepam, slow IV, 10 mg

LoE:III[xxxiv]

REFERRAL

» Severe alcohol dependence.
» Past history of withdrawal seizures or a history of epilepsy.
» Past history of Delirium Tremens.
» Younger (< 12 years of age) or older age (> 60 years of age).
» Pregnancy.
» Significant polydrug use.
» Cognitive impairment.
» Lack of support at home or homelessness.
» Previous failed community detoxification attempts.
» Opioid substance use disorder.

16.8.2 SUBSTANCE-INDUCED MOOD DISORDERS

F10.8, F11.1, F12.1, F13.1, F14.1, F15.1, F16.1

DESCRIPTION

Mood disorder secondary to substance use or withdrawal such as abuse of alcohol,

drugs e.g.cannabis.

GENERAL MEASURES

» Generally treated by removal of the causative substance.
» Requires acute detoxification followed by maintenance treatment.
» If symptoms of mood disorder persist after 2 weeks, consider treating the mood disorder. See Section16.5: Mood disorders.

16.8.3 SUBSTANCE-INDUCED PSYCHOSIS

F19.15

DESCRIPTION

Psychosis secondary to a substance use or withdrawal such as abuse of alcohol, drugs e.g.cannabis.

GENERAL MEASURES

» Most patients with substance-induced psychosis can be managed without medication.
» Ensure the safety of the patient and those caring for them.
» Minimise stress and stimulation (do not argue with psychotic thinking).
» Avoid confrontation or criticism, unless it is necessary to prevent harmful or disruptive behaviour.

MEDICINE TREATMENT

Always use non-pharmacological de-escalation techniques first.

» Calm the patient.
» Manage in a safe environment.
» Ensure the safety of all staff members.

Offer oral treatment:

- Benzodiazepines, e.g.: *LoE:III*[xxxv]
- Diazepam, oral, 5 mg, immediately.

OR *LoE:II*[xxxvi]

Midazolam, buccal, 7.5–15 mg, immediately. *LoE:III*[xxxvii]

If oral treatment fails after 30–60 minutes,

OR

The patient is placing themselves and others at significant risk:

Consider IM treatment: *LoE:III*[xxxviii]

- Benzodiazepines, e.g.:
- Midazolam, IM, 7.5–15 mg, immediately.
  - Repeat after 30–60 minutes if needed.

OR

Haloperidol, IM, 5 mg, immediately.
  - Repeat after 30–60 minutes if needed.

AND

Promethazine, IM, 25–50 mg.
  - In the elderly 25 mg.

Always monitor vital signs of sedated patient: LoE:III[xxxix]

» Vital signs: pulse, respiratory rate, blood pressure, temperature.
» Monitor every 5–10 minutes for the 1st hour, and then every 30 minutes until the patient is ambulatory.

REFERRAL
All patients.

16.8.4 ALCOHOL WITHDRAWAL (UNCOMPLICATED)
F10.23

DESCRIPTION
A syndrome characterised by central nervous system hyperactivity that occurs when an alcohol dependent individual abruptly stops or significantly reduces alcohol consumption.
The symptoms of an uncomplicated Alcohol Withdrawal Syndrome include:
» Autonomic (sweating, tachycardia, hypertension, tremors,tonic-clonic seizuresand low grade fever).
» Gastrointestinal (anorexia, nausea, vomiting, dyspepsia and diarrhoea).
» Cognitive and perceptual disturbances (poor concentration, anxiety, psychomotor agitation, disturbed sleep with vivid dreams,visual hallucinations and disorientation).

Although the typical delirium occurs 2–3 days following cessation of prolonged alcohol intake, some withdrawal symptoms such as the typical tremor, may start within 12 hours.

GENERAL MEASURES
Assess for comorbid infections.

MEDICINE TREATMENT
- Thiamine, oral, 300 mg daily for 14 days.

AND LoE:III[xl]

- Diazepam, oral, 10 mg immediately.
  - Then 5 mg 6 hourly for 3 days.
  - Then 5 mg 12 hourly for 2 days.
  - Then 5 mg daily for 2 days.
  - Then stop.

LoE:III[xli]

REFERRAL
See referral criteria of Section16.8.1: Substance use disorders.

---

[i] Benzodiazepines, oral: Leucht S, Heres S, Kissling W, Davis JM. Evidence-based pharmacotherapy of schizophrenia.*Int J Neuropsychopharmacol.*2011 Mar;14(2):269-84. http://www.ncbi.nlm.nih.gov/pubmed/21208500

[ii] Benzodiazepines:Gillies D, Sampson S, Beck A, Rathbone J. Benzodiazepines for psychosis-induced aggression or agitation. *Cochrane Database Syst Rev*. 2013 Apr 30;4:CD003079.http://www.ncbi.nlm.nih.gov/pubmed/23633309

Benzodiazepines: TREC Collaborative Group. Rapid tranquillisation for agitated patients in emergency psychiatric rooms: a randomised trial of midazolam versus haloperidol plus promethazine. BMJ. 2003 Sep 27;327(7417):708-13.http://www.ncbi.nlm.nih.gov/pubmed/14512476

Benzodiazepines: Alexander J, Tharyan P, Adams C, John T, Mol C, Philip J. Rapid tranquillisation of violent or agitated patients in a psychiatric emergency setting. Pragmatic randomised trial of intramuscular lorazepam v. haloperidol plus promethazine. *Br J Psychiatry*. 2004 Jul;185:63-9. http://www.ncbi.nlm.nih.gov/pubmed/15231557

[iii] Midazolam, buccal: Taylor D, Okocha C, Paton C, Smith S, Connolly A. Buccal midazolam for agitation on psychiatric intensive care wards.*Int J Psychiatry ClinPract*.2008;12(4):309-11. http://www.ncbi.nlm.nih.gov/pubmed/24937720

[iv] Sedation algorithm (stepwise approach): NICE. The short-term management of disturbed/violent behaviour in in-patient psychiatric settings and emergency departments, NICE clinical guideline 25, February 2005. Available at: www.nice.org.uk/cg25

Sedation algorithm (stepwise approach): Wilson MP, Pepper D, Currier GW, Holloman GH Jr, Feifel D. The psychopharmacology of agitation: consensus statement of the americanassociation for emergency psychiatry project Beta psychopharmacology workgroup. *West J Emerg Med*. 2012 Feb;13(1):26-34. http://www.ncbi.nlm.nih.gov/pubmed/22461918

[v] Promethazine, IM: Adult Hospital level STG, 2012. http://www.health.gov.za/

Promethazine, IM: Huf G, Coutinho ES, Adams CE; TREC Collaborative Group. Rapid tranquillisation in psychiatric emergency settings in Brazil: pragmatic randomised controlled trial of intramuscular haloperidol versus intramuscular haloperidol plus promethazine. BMJ. 2007 Oct 27;335(7625):869. http://www.ncbi.nlm.nih.gov/pubmed/17954515

[vi] Diazepam: Adult Hospital level STG, 2012. http://www.health.gov.za/

[vii] Citalopram: NICE. NICE clicnial guideline CG113: Generalised anxiety disorder and panic disorder (with or without agoraphobia) in adults: Management in primary, secondary and community care, January 2011. http://www.nice.org.uk/guidance/cg113

Citalopram: Lenze EJ, Mulsant BH, Shear MK, Dew MA, Miller MD, Pollock BG, Houck P, Tracey B, Reynolds CF 3rd. Efficacy and tolerability of citalopram in the treatment oflate-life anxiety disorders: results from an 8-week randomized,placebo-controlled trial. Am J Psychiatry. 2005 Jan;162(1):146-50.http://www.ncbi.nlm.nih.gov/pubmed/15625213

Citalopram: SAMF 10th edition, 2012.

[viii] Benzodiazepines: Paediatric Hospital level STG, 2013. http://www.health.gov.za/

Midazolam: SAMF 10th edition, 2012.

[ix] Haloperidol: Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[x] Orphenadrine: Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[xi] Biperiden (children): Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[xii] Promethazine (children): Paediatric Hospital level STG, 2013. http://www.health.gov.za/

Promethazine (children): SAMF 10th edition, 2012.

[xiii] Biperiden (adults): Adult Hospital level STG, 2012. http://www.health.gov.za/

Promethazine (adults): Adult Hospital level STG, 2012. http://www.health.gov.za/

[xiv] Fluoxetine: Contract circular HP09-2014SD. http://www.health.gov.za/

[xv] SSRI period of therapy for continuation phase: American Psychiatric Association (APA). Practice guideline for the treatment of patients with major depressive disorder. 3rd ed. Arlington (VA): American Psychiatric Association (APA); 2010 Oct. http://www.guideline.gov/content.aspx?id=24158

SSRI period of therapy for continuation phase: NICE clinical guideline 90. [Internet] Depression in adults.[Issued: October 2009; cited February 2014]. Available at: www.guidance.nice.org.uk/cg90

SSRI period of therapy for continuation phase: Malani AK, Ammar H. Medical management of depression. N Engl J Med. 2006 Feb 9;354(6):646-8; author reply 646-8. http://www.ncbi.nlm.nih.gov/pubmed/16470956

SSRI period of therapy for continuation phase: Anderson IM, Ferrier IN, Baldwin RC, Cowen PJ, Howard L, Lewis G, Matthews K, McAllister-Williams RH, Peveler RC, Scott J, Tylee A. Evidence-based guidelines for treating depressive disorders with antidepressants: a revision of the 2000 British Association for Psychopharmacology guidelines. *J Psychopharmacol*. 2008 Jun;22(4):343-96. http://www.ncbi.nlm.nih.gov/pubmed/18413657

SSRI period of therapy for continuation phase: Crismon ML, Trivedi M, Pigott TA, Rush AJ, Hirschfeld RM, Kahn DA, DeBattista C, Nelson JC, Nierenberg AA, Sackeim HA, Thase ME. The Texas Medication Algorithm Project: report of the Texas Consensus Conference Panel on Medication Treatment of Major Depressive Disorder. *J Clin Psychiatry*. 1999 Mar;60(3):142-56. http://www.ncbi.nlm.nih.gov/pubmed/10192589

[xvi] Benzodiazepines, oral: Leucht S, Heres S, Kissling W, Davis JM. Evidence-based pharmacotherapy of schizophrenia.*Int J Neuropsychopharmacol*.2011 Mar;14(2):269-84. http://www.ncbi.nlm.nih.gov/pubmed/21208500

[xvii] Benzodiazepines:Gillies D, Sampson S, Beck A, Rathbone J. Benzodiazepines for psychosis-induced aggression or agitation. *Cochrane Database Syst Rev*. 2013 Apr 30;4:CD003079. http://www.ncbi.nlm.nih.gov/pubmed/23633309

Benzodiazepines: TREC Collaborative Group. Rapid tranquillisation for agitated patients in emergency psychiatric rooms: a randomised trial of midazolam versus haloperidol plus promethazine. *BMJ*. 2003 Sep 27;327(7417):708-13. http://www.ncbi.nlm.nih.gov/pubmed/14512476

Benzodiazepines: Alexander J, Tharyan P, Adams C, John T, Mol C, Philip J. Rapid tranquillisation of violent or agitated patients in a psychiatric emergency setting. Pragmatic randomised trial of intramuscular lorazepam v. haloperidol plus promethazine. *Br J Psychiatry*. 2004 Jul;185:63-9. http://www.ncbi.nlm.nih.gov/pubmed/15231557

[xviii] Midazolam, buccal: Taylor D, Okocha C, Paton C, Smith S, Connolly A. Buccal midazolam for agitation on psychiatric intensive care wards.*Int J Psychiatry ClinPract*. 2008;12(4):309-11. http://www.ncbi.nlm.nih.gov/pubmed/24937720

[xix] Sedation algorithm (stepwise approach): NICE. The short-term management of disturbed/violent behaviour in in-patient psychiatric settings and emergency departments, NICE clinical guideline 25, February 2005. Available at: www.nice.org.uk/cg25

Sedation algorithm (stepwise approach): Wilson MP, Pepper D, Currier GW, Holloman GH Jr, Feifel D. The psychopharmacology of agitation: consensus statement of the americanassociation for emergency psychiatry project Beta psychopharmacology workgroup. *West J Emerg Med*. 2012 Feb;13(1):26-34. http://www.ncbi.nlm.nih.gov/pubmed/22461918

[xx] Promethazine, IM: Adult Hospital level STG, 2012. http://www.health.gov.za/

Promethazine, IM: Huf G, Coutinho ES, Adams CE; TREC Collaborative Group. Rapid tranquillisation in psychiatric emergency settings in Brazil: pragmatic randomised controlled trial of intramuscular haloperidol versus intramuscular haloperidol plus promethazine. BMJ. 2007 Oct 27;335(7625):869. http://www.ncbi.nlm.nih.gov/pubmed/17954515

[xxi] Benzodiazepines, oral: Leucht S, Heres S, Kissling W, Davis JM. Evidence-based pharmacotherapy of schizophrenia.*Int J Neuropsychopharmacol.* 2011 Mar;14(2):269-84. http://www.ncbi.nlm.nih.gov/pubmed/21208500

[xxii] Benzodiazepines:Gillies D, Sampson S, Beck A, Rathbone J. Benzodiazepines for psychosis-induced aggression or agitation. *Cochrane Database Syst Rev*. 2013 Apr 30;4:CD003079. http://www.ncbi.nlm.nih.gov/pubmed/23633309

Benzodiazepines: TREC Collaborative Group. Rapid tranquillisation for agitated patients in emergency psychiatric rooms: a randomised trial of midazolam versus haloperidol plus promethazine. *BMJ*. 2003 Sep 27;327(7417):708-13. http://www.ncbi.nlm.nih.gov/pubmed/14512476

Benzodiazepines: Alexander J, Tharyan P, Adams C, John T, Mol C, Philip J. Rapid tranquillisation of violent or agitated patients in a psychiatric emergency setting. Pragmatic randomised trial of intramuscular lorazepam v. haloperidol plus promethazine. *Br J Psychiatry*. 2004 Jul;185:63-9.http://www.ncbi.nlm.nih.gov/pubmed/15231557

[xxiii] Midazolam, buccal: Taylor D, Okocha C, Paton C, Smith S, Connolly A. Buccal midazolam for agitation on psychiatric intensive care wards.*Int J Psychiatry ClinPract*.2008;12(4):309-11. http://www.ncbi.nlm.nih.gov/pubmed/24937720

[xxiv] Sedation algorithm (stepwise approach): NICE. The short-term management of disturbed/violent behaviour in in-patient psychiatric settings and emergency departments, NICE clinical guideline 25, February 2005. Available at: www.nice.org.uk/cg25

Sedation algorithm (stepwise approach): Wilson MP, Pepper D, Currier GW, Holloman GH Jr, Feifel D. The psychopharmacology of agitation: consensus statement of the American association for emergency psychiatry project Beta psychopharmacology workgroup. *West J Emerg Med*. 2012 Feb;13(1):26-34. http://www.ncbi.nlm.nih.gov/pubmed/22461918

[xxv] Promethazine, IM: Adult Hospital level STG, 2012. http://www.health.gov.za/

Promethazine, IM: Huf G, Coutinho ES, Adams CE; TREC Collaborative Group. Rapid tranquillisation in psychiatric emergency settings in Brazil: pragmatic randomised controlled trial of intramuscular haloperidol versus intramuscular haloperidol plus promethazine. *BMJ*. 2007 Oct 27;335(7625):869. http://www.ncbi.nlm.nih.gov/pubmed/17954515

[xxvi] Zuclopenthixol acetate: SAMF 10th edition, 2012.

[xxvii] Risperidone:Leucht S, Corves C, Arbter D, Engel RR, Li C, Davis JM. Second-generation versus first-generation antipsychotic drugs for schizophrenia: a meta-analysis. *Lancet*. 2009 Jan 3;373(9657):31-41. http://www.ncbi.nlm.nih.gov/pubmed/19058842

Risperidone: Crespo-Facorro B, Pérez-Iglesias R, Mata I, Ramirez-Bonilla M, Martínez-Garcia O, Pardo-Garcia G, Caseiro O, Pelayo-Terán JM, Vázquez-Barquero JL. Effectiveness of haloperidol, risperidone and olanzapine in the treatment of first-episode non-affective psychosis: results of a randomized, flexible-dose, open-label 1-year follow-up comparison. *J Psychopharmacol.*2011 Jun;25(6):744-54. http://www.ncbi.nlm.nih.gov/pubmed/21292922

Risperidone: Contract circular HP09-2014SD. http://www.health.gov.za/

[xxviii] Chlopromazine: SAMF 10th edition, 2012.

[xxix] Fluphenazine decanoate: SAMF 10th edition, 2012.

[xxx] Flupenthixol decanoate: SAMF 10th edition, 2012.

[xxxi] Zuclopenthixol decanoate: SAMF 10th edition, 2012.

[xxxii] Long-term depot therapy: SAMF 10th edition, 2012.

[xxxiii] Orphenadrine: SAMF 10th edition, 2012.

Orphenadrine: Adult Hospital level STG, 2012.http://www.health.gov.za/

[xxxiv] Diazepam: Adult Hospital level STG, 2012.http://www.health.gov.za/

Diazepam: National Department of Health. National Policy guidelines on detoxification of psychoactive substances.http://www.health.gov.za/

[xxxv] Benzodiazepines, oral: Leucht S, Heres S, Kissling W, Davis JM. Evidence-based pharmacotherapy of schizophrenia.*Int J Neuropsychopharmacol.* 2011 Mar;14(2):269-84. http://www.ncbi.nlm.nih.gov/pubmed/21208500

[xxxvi] Benzodiazepines:Gillies D, Sampson S, Beck A, Rathbone J. Benzodiazepines for psychosis-induced aggression or agitation. *Cochrane Database Syst Rev*. 2013 Apr 30;4:CD003079. http://www.ncbi.nlm.nih.gov/pubmed/23633309

Benzodiazepines: TREC Collaborative Group. Rapid tranquillisation for agitated patients in emergency psychiatric rooms: a randomised trial of midazolam versus haloperidol plus promethazine. *BMJ*. 2003 Sep 27;327(7417):708-13. http://www.ncbi.nlm.nih.gov/pubmed/14512476

Benzodiazepines: Alexander J, Tharyan P, Adams C, John T, Mol C, Philip J. Rapid tranquillisation of violent or agitated patients in a psychiatric emergencysetting. Pragmatic randomised trial of intramuscular lorazepam v. haloperidol plus promethazine. *Br J Psychiatry*. 2004 Jul;185:63-9.http://www.ncbi.nlm.nih.gov/pubmed/15231557

[xxxvii] Midazolam, buccal: Taylor D, Okocha C, Paton C, Smith S, Connolly A. Buccal midazolam for agitation on psychiatric intensive care wards.Int*J Psychiatry ClinPract*.2008;12(4):309-11. http://www.ncbi.nlm.nih.gov/pubmed/24937720

[xxxviii] Sedation algorithm (stepwise approach): NICE. The short-term management of disturbed/violent behaviour in in-patient psychiatric settings and emergency departments, NICE clinical guideline 25, February 2005. Available at: www.nice.org.uk/cg25

Sedation algorithm (stepwise approach): Wilson MP, Pepper D, Currier GW, Holloman GH Jr, Feifel D. The psychopharmacology of agitation: consensus statement of the American association for emergency psychiatry project Beta psychopharmacology workgroup. *West J Emerg Med*. 2012 Feb;13(1):26-34. http://www.ncbi.nlm.nih.gov/pubmed/22461918

[xxxix] Promethazine, IM: Adult Hospital level STG, 2012.http://www.health.gov.za/

Promethazine, IM: Huf G, Coutinho ES, Adams CE; TREC Collaborative Group. Rapid tranquillisation in psychiatric emergency settings in Brazil: pragmatic randomised controlled trial of intramuscular haloperidol versus intramuscular haloperidol plus promethazine. *BMJ*. 2007 Oct 27;335(7625):869. http://www.ncbi.nlm.nih.gov/pubmed/17954515

[xl] Thiamine: Day E, Bentham PW, Callaghan R, Kuruvilla T, George S. Thiamine for prevention and treatment of Wernicke-Korsakoff Syndrome in people who abuse alcohol. *Cochrane Database Syst Rev*. 2013 Jul 1;7:CD004033. http://www.ncbi.nlm.nih.gov/pubmed/23818100

Thiamine: Lingford-Hughes AR, Welch S, Peters L, Nutt DJ; British Association for Psychopharmacology, Expert Reviewers Group. BAP updated guidelines: evidence-based guidelines for the pharmacological management of substance abuse, harmful use, addiction and comorbidity: recommendations from BAP. *J Psychopharmacol.* 2012 Jul;26(7):899-952.http://www.ncbi.nlm.nih.gov/pubmed/22628390

Thiamine: Ambrose ML, Bowden SC, Wehan G. Thiamine treatment and working memory function of alcohol dependent people: preliminary findings. *Alcohol ClinExp Res* 2001; 25: 112–16.http://www.ncbi.nlm.nih.gov/pubmed/11198705

Thiamine: Cook CC. Prevention and treatment of Wernicke-Korsakoff Syndrome. *Alcohol AlcoholSuppl* 2000; 35: 19–20. http://www.ncbi.nlm.nih.gov/pubmed/11304070

Thiamine: Thomson AD, Cook CCH, Touquet R, Henry JA. The Royal College of Physicians report on alcohol: guidelines for managing Wernicke's encephalopathy in the accident and emergency department. *Alcohol AlcoholSuppl* 2002; 37: 513–21. http://www.ncbi.nlm.nih.gov/pubmed/12414541

Thiamine: Cook CCH, Hallwood PM, Thomson AD. B-vitamin deficiency and neuro-psychiatric syndromes in alcohol misuse. *Alcohol AlcoholSuppl* 1998; 33: 317–36.http://www.ncbi.nlm.nih.gov/pubmed/9719389

Sechi G, Serra A. Wernicke's encephalopathy: new clinical settings and recent advances in diagnosis and management. *Lancet Neurol*. 2007 May;6(5):442-55. Review.http://www.ncbi.nlm.nih.gov/pubmed/17434099

[xii]Diazepam: Adult Hospital level STG, 2012.http://www.health.gov.za/

Chapter 17 - Respiratory conditions

17.1 CONDITIONS WITH PREDOMINANT WHEEZE

17.1.1 ACUTE ASTHMA & ACUTE EXACERBATION OF COPD

J46/J44.1

DESCRIPTION

This is an emergency situation recognised by various combinations of:

- » wheeze
- » tightness of the chest
- » chest indrawing in children
- » use of accessory muscles of respiration
- » breathlessness
- » respiratory distress
- » cough

In adults bronchospasm is usually associated with asthma (where the bronchospasm is usually completely reversible) or chronic obstructive pulmonary disease (COPD) (where the bronchospasm is partially reversible).

> The clinical picture of pulmonary oedema due to left ventricular heart failure may be similar to that of asthma. If patients > 50 years of age present with asthma for the first time, consider pulmonary oedema due to left ventricular heart failure.

Bronchospasm in children is usually associated with asthma or with infections such as bronchiolitis or bronchopneumonia. Consider foreign bodies or obstruction of airways due to tuberculous nodes or congenital malformation, especially if the wheeze is unilateral.

> All PHC facilities must have peak expiratory flow rate (PEFR) meters, as asthma cannot be correctly managed without measuring PEFR.

Recognition and assessment of severity of attacks in <u>children</u>

	Moderate	Severe
Respiratory rate	> 40 breaths/minute	> 40 breaths/minute
Chest indrawing/recession	present	present
PEF (if > 5 years of age)	50–70% of predicted	< 50% of predicted
Speech	normal or difficult	unable to speak
Feeding	difficulty with feeding	unable to feed
Wheeze	present	absent
Consciousness	normal	impaired

Recognition and assessment of severity of attacks in <u>adults</u>

	Moderate	Severe
Talks in	phrases	words
Alertness	usually agitated	agitated, drowsy or confused
Respiratory rate	20–30 breaths/minute	often > 30 breaths/minute
Wheeze	loud	loud or absent
Heart rate	100–120 beats/minute	> 120 beats/minute
PEFR after initial nebulisation	± 50–75%	< 50%; may be too short of breath to blow in PEF meter

Note: PEFR is expressed as a percentage of the predicted normal value for the individual, or of the patient's personal best value obtained previously when on optimal treatment.

MEDICINE TREATMENT

- Oxygen, 40% or higher, using highest concentration facemask.

  Note: In chronic obstructive pulmonary disease:
  Give oxygen with care (preferably by 24% or 28% facemask, if available). Observe patients closely, as a small number of patients' condition may deteriorate.

LoE: III[i]

- Salbutamol 0.5%, solution, nebulised, preferably delivered at a flow rate of 8 L/min with oxygen.
  - 1 mL salbutamol 0.5%, solution in 2 mL of sodium chloride 0.9%.
  - If no relief, repeat every 20–30 minutes in the first hour.
  - Thereafter, repeat every 2–4 hours if needed.

AND

LoE: III[ii]

- Ipratropium bromide, solution, added to salbutamol solution.
  - Children: 0.5–1 mL (0.125–0.25 mg)
  - Adults: 2 mL (0.5 mg)

If no nebuliser available:

- Salbutamol, inhalation, 4–8 puffs, using a spacer.
  - Inhale one puff at a time. Allow for 4 breaths through the spacer between puffs.
  - A mask should be used with a spacer, until an infant can co-ordinate using an inhaler with a spacer only. Apply the mask to the face to create a seal so that the child breathes through the spacer.

LoE:III[iii]

If there is no immediate response:

ADD

- Ipratropium bromide, inhalation, 4 puffs, using a spacer.

If no relief:
Repeat salbutamol every 20–30 minutes in the first hour.
Thereafter, repeat every 2–4 hours if needed.

Note: Administering salbutamol via a spacer is as effective and cheaper than using a nebuliser.

Children with asthma
If reversal of bronchospasm is incomplete after the first nebulisation:

- Prednisone, oral, 1–2 mg/kg immediately then once daily for 7 days

Weight kg	**Dose** mg	**Tablet** 5 mg	**Age** months/years
>11–14 kg	20 mg	4 tablets	>2–3 years
>14–17.5 kg	30 mg	6 tablets	>3–5 years
>17.5 kg	40 mg	8 tablets	>5 years and adult

LoE:III[iv]

If oral prednisone cannot be taken:

- Hydrocortisone IM/slow IV, immediately.
  - Children: Hydrocortisone, slow IV, 4–6 mg/kg immediately. See dosing table, pg 22.5.
  - Adults: IM/slow IV, 100 mg immediately.

Follow with:

- Prednisone, oral, 1–2 mg/kg once daily for 7 days.

LoE:III[V]

Adults with asthma or COPD

- Prednisone, oral, 40 mg immediately then 40 mg once daily for 7 days.

LoE:III[VI]

If oral prednisone cannot be taken:

- Hydrocortisone, IV, 100 mg immediately.

Follow with:

- Prednisone, oral, 40 mg once daily for 7 days.

LoE:III[VII]

Note: Patients needing repeated courses of oral corticosteroids (more than twice over 6 months) should be assessed by a doctor for maintenance therapy. (See Section 17.1.2: Chronic asthma).

CAUTION
Avoid sedation of any kind.

Assessment of response in <u>children</u>

	Response	No response
PEFR (if possible)	improvement by > 20%	improvement by < 20%
Respiratory rate	< 40 breaths/ minute	> 40 breaths/ minute
Chest indrawing or recession	absent	present
Speech	normal	impaired
Feeding	normal	impaired

Assessment of response in <u>adults</u>

	Response	No response
PEFR (if possible)	improvement by > 20%	improvement by < 20%
Respiratory rate	< 20 breaths/ minute	> 20 breaths/ minute
Speech	normal	impaired

Patients responding to treatment:

» Routine prescription of antibiotics is not indicated for acute asthma.
» Review current treatment and possible factors causing acute attack including poor adherence and poor inhaler technique.
» Advise patient/caregiver on further care at home, danger signs and that follow up is required.
» Caution patient on the high chance of further wheezing in the week following an acute attack.
» Patients with a first attack should be fully assessed for maintenance treatment.

» Ask about smoking: if yes, urge patient to stop.

REFERRAL

» **Urgent**
» Chest indrawing and distress not responding to nebulisation.
» Difficulty in feeding.
» Any general danger sign and life-threatening features:
  – drowsiness
  – confusion
  – silent chest
  – cyanosis
  – collapse
  – inability to complete a sentence in one breath
  – measured hypoxia
» No response to initial treatment.
» PEFR < 75% of the predicted normal or of personal best value 15–30 minutes after nebulisation.
» A lower threshold to admission is appropriate in patients when:
  – seen in the afternoon or evening, rather than earlier in the day
  – recent onset of nocturnal symptoms or aggravation of symptoms
  – previous severe attacks, especially if the onset was rapid

17.1.2 CHRONIC ASTHMA

J45.9

DESCRIPTION

A chronic inflammatory disorder with reversible airways obstruction. In susceptible patients, exposure to various environmental triggers, allergens or viral infections results in inflammatory changes, bronchospasm, increased bronchial secretions, mucus plug formation and, if not controlled, eventual bronchial muscle hypertrophy of the airways' smooth muscle. All these factors contribute to airways obstruction.

Asthma varies in intensity and is characterised by recurrent attacks of:
» wheezing,
» dyspnoea or shortness of breath,
» cough, especially nocturnal, and
» periods of no airways obstruction between attacks.

Acute attacks may be caused by:
» exposure to allergens,
» respiratory viral infections,
» non-specific irritating substances, and
» exercise.

Asthma must be distinguished from chronic obstructive pulmonary disease, which is often mistaken for asthma. (See Section 17.1.4: COPD). The history is a reliable diagnostic guideline and may be of value in assessing treatment response.

Asthma	COPD
» Young age onset, usually < 20 years. » History of hay fever, eczema and/or allergies. » Family history of asthma. » Symptoms are intermittent with periods of normal breathing in between. » Symptoms are usually worse at night or in the early hours of the morning, during an upper respiratory tract infection, when the weather changes or when upset. » Marked improvement with beta$_2$ agonist.	» Older age onset, usually > 40 years. » Symptoms slowly worsen over a long period of time. » Long history of daily or frequent cough before the onset of shortness of breath. » Symptoms are persistent rather than only at night or during the early morning. » History of heavy smoking (> 20 cigarettes/day for ≥ 15 years), heavy cannabis use or previous TB. » Little improvement with beta$_2$ agonist.

Asthma cannot be cured, but it can be controlled with regular treatment.

Note: The diagnosis of asthma can be difficult in children < 6 years of age.
If the diagnosis of asthma is uncertain, refer the patient.

ASTHMA DIAGNOSIS AND SEVERITY

Peak Expiratory Flow Rate (PEFR)
See PEF charts on pg xliv.

The PEFR may provide additional information for diagnosis and assessing response to therapy.

» PEFR is best assessed in the morning and evening.
  – Instruct the patient to blow forcibly into the device after a deep inspiratory effort.
  – The patient must perform three blows at each testing point.
  – Take the highest value as the true value.
» The PEFR can be helpful in confirming a diagnosis of asthma in primary care.
  – An improvement of 60L/min or ≥ 20% of the pre-bronchodilator PEFR, 10–20 minutes after inhalation of a beta$_2$ agonist e.g. salbutamol, inhalation, 200mcg, confirms a diagnosis of asthma.
  – A normal PEFR excludes the possibility of moderate and severe COPD.
» PEFR may be useful in assessing response to therapy.
  – Any value > 80% of the personal best before the use of a bronchodilator is regarded as adequate control. Ensure that pre-bronchodilator values are measured at follow-up visits.

Note: Initiating and optimising inhalation corticosteroid therapy for moderate and severe asthma should always be done with the use of a peak flow meter to assess severity and treatment response of asthma.

MILD INTERMITTENT ASTHMA

» ≤ 2 episodes of daytime cough and/or wheeze per week
» ≤ 1 night-time cough and/or wheeze per month

» no recent (within the last year) admission to hospital for asthma
» PEFR ≥ 80% predicted between attacks

MILD PERSISTENT ASTHMA

» 3–4 episodes of wheeze and/or cough per week
» 2–4 episodes of night time wheeze or cough per month
» PEFR ≥ 80% predicted between attacks

MODERATE PERSISTENT ASTHMA

» > 4 episodes of day time wheeze, tightness or cough per week
» > 4 night time awakenings per month
» PEFR 60–80% predicted

SEVERE PERSISTENT ASTHMA

» continuous day time wheeze, tightness or cough
» frequent night time awakenings
» PEFR < 60%

GENERAL MEASURES

» No smoking by an asthmatic or in the living area of an asthmatic.
» Avoid contact with household pets.
» Avoid exposure to known allergens and stimulants or irritants.
» Education on early recognition and management of acute attacks.
» Patient and caregiver education:
  - emphasise the diagnosis and explain the nature and natural course of the condition;
  - teach and monitor inhaler technique; and
  - reassure parents and patients of the safety and efficacy of continuous regular controller therapy.

MEDICINE TREATMENT

Medicine treatment is based on the severity of the asthma and consists of therapy to prevent the inflammation leading to bronchospasm (controller) and to relieve bronchospasm (reliever).

Reliever medicines in asthma:

- $Beta_2$ agonists, e.g.:
- Salbutamol (short acting)
  - Indicated for the immediate relief of the symptoms of acute attacks, i.e. cough, wheeze and shortness of breath.
  - Can be used as needed.
  - Increasing need for reliever medicine indicates poor asthma control.

Controller medicines in asthma:

- Inhaled corticosteroids, e.g.:
- Beclomethasone.
  - Must be used twice daily, even when the patient feels well.

Inhalation therapy:
Inhaled therapy is preferable to oral therapy.
Spacer devices
» Spacers are vital for an adequate therapeutic effect of inhaled therapy.
» Spacer devices should be used for all inhaled medications in all age groups to improve efficacy of medicine delivery and limit adverse effects.
» Use the spacer appropriate for the age of the patient.

	Spacer volume	Face mask
Infants	150–250 mL	mandatory
Children	500 mL	highly recommended
Adolescents and adults	750 mL	

» Inhalation spacer devices enable parents to administer inhaled therapy even to small children.
» Children < 3 years of age should have a spacer with a face mask while older children and adults can use the spacer with a mouth piece directly.
» Demonstrate steps 2–6 of the relevant inhaler technique more than once to ensure the correct procedure.

Patient and caregiver education on inhaler and spacer techniques:
» A mask attachment should be used with the spacer for children < 3 years of age.

Inhalation therapy without a spacer in adults:
1. remove the cap from the mouthpiece
2. shake the inhaler well
3. while standing or sitting upright, breathe out as much air as possible
4. place the mouth piece of the inhaler between the lips and gently close the lips around it
5. while beginning to inhale, press down the canister of the metered dose inhaler once to release one puff while breathing in as deeply as possible
6. hold breath for 5–10 seconds, if possible
7. breathe out slowly and rest for a few breaths (30–60 seconds)
8. repeat steps 2–6 for each puff prescribed
9. rinse mouth after inhalation of corticosteroids

Inhalation therapy with a spacer in adults and older children:
1. remove the caps from the inhaler and the spacer
2. shake the inhaler well
3. insert the mouthpiece of the metered dose inhaler into the back of the spacer
4. insert the mouthpiece of the spacer into the mouth and close the lips around the mouthpiece. Avoid covering any small exhalation holes
5. press down the canister of the metered dose inhaler once to release one puff into the spacer
6. immediately take 3–4 slow deep breaths
7. repeat steps 4–6 for each puff prescribed, waiting at least 30 seconds between puffs
8. rinse mouth after inhalation of corticosteroids

Inhalation therapy with the spacer alone in younger children:
1. allow to breathe slowly in and out of the spacer continuously for 30 seconds

2. while still breathing, release one puff from the inhaler into the spacer
3. continue breathing for 3–4 breaths
4. if breathing is through the nose, pinch the nose gently while breathing from the spacer

Inhalation therapy with a spacer and mask for infants and small children:

1. remove the caps from the inhaler and the spacer
2. shake the inhaler well
3. infants may be placed on the caregiver's lap or laid on a bed while administering the medication
4. apply the mask to the face, ensuring that the mouth and nose are well covered
5. with the mask held firmly onto the face, press down the canister of the metered dose inhaler once to release one puff into the spacer
6. keep the mask in place for at least six breaths, then remove
7. repeat steps 4–6 for each puff prescribed, waiting at least 30 seconds between puffs

MILD INTERMITTENT ASTHMA

Adults and children:

- $Beta_2$ agonist e.g.:
- Salbutamol, inhalation, 100–200 mcg (2 puffs), 6–8hourly as needed (until symptoms are controlled).

EXERCISE-INDUCED ASTHMA

Patient must use bronchodilator/reliever inhaler before exercise.

PERSISTENT ASTHMA

Adults and children

- $Beta_2$ agonist e.g.:
- Salbutamol, inhalation, 100–200 mcg (1–2 puffs), 6–8hourly as needed (until symptoms are controlled).

AND

Children

- Inhaled corticosteroids e.g.:
- Beclomethasone, inhalation, 100 mcg 12 hourly.

Adults

- Inhaled corticosteroids e.g.:
- Beclomethasone, inhalation, 200 mcg 12 hourly.

Review treatment every 3 months. Adequate control is defined as:

» ≤ 2 episodes of daytime cough and/or wheeze per week.
» No night-time cough and/or wheeze.
» No recent (within the last year) admission to hospital for asthma.
» PEFR ≥ 80% predicted between attacks.

If control is inadequate:

» check adherence and inhaler technique, and
» exclude on-going exposure to allergens.

After excluding those causes, refer to a doctor to confirm the diagnosis of asthma,

and to exclude TB and heart failure.
Once the diagnosis is confirmed, step-up treatment as follows:
Children
- Inhaled corticosteroids, e.g.:
- Beclomethasone, inhalation, 200 mcg 12 hourly.

LoE:III

Adults
- Inhaled corticosteroids, e.g.:
- Beclomethasone, inhalation, 400 mcg 12 hourly.

If control is still inadequate in adults, stop beclomethasone and replace with:
- Inhaled long-acting beta agonist (LABA)/corticosteroid combination, e.g.:
- Salmeterol/fluticasone, inhalation, 50/250 mcg 12 hourly (Doctor initiated).

LoE:I[VIII]

Stepping down treatment:
» Attempt a reduction in therapy if the patient has not had any acute exacerbation of asthma in the preceding 6 months.
» Gradually reduce the dose or stop regular inhaled corticosteroid therapy.
» If the symptoms are seasonal, corticosteroids may often be stopped until the next season.
» If symptoms reappear, increase the therapy to the level on which the patient was previously controlled.

REFERRAL TO DOCTOR
» All children < 6 years of age for assessment and confirmation of diagnosis.
» Any patient, who has received > 2 courses of oral prednisone within 6 months.
» Brittle asthma (very sudden, very severe attacks).
» All patients with inadequate control of their symptoms.

REFERRALTO HOSPITAL
Uncontrolled asthma.

17.1.3 ACUTE BRONCHIOLITIS IN CHILDREN
J21.9

DESCRIPTION
Acute bronchiolitis is a common cause of wheezing and cough in first two years of life.
It is caused by viral infections and presents with lower airways obstruction due to inflammation and plugging of the small airways. Recurrent episodes can occur, usually during winter.

Child presents with:
» rapid breathing
» chest indrawing
» decreased breath sounds
» an audible wheeze

GENERAL MEASURES
» Minimise contact with other children.
» Avoid use of antibiotics and corticosteroids.
» Do not sedate child.

MEDICINE TREATMENT

- Oxygen, humidified, using nasal prongs or nasal cannula, at 1–2 L/minute.

AND

- Salbutamol 0.5%, solution, 0.5–1 mL diluted to 2–4 mL with sodium chloride 0.9%, nebulised over 3 minutes (single dose).
  - Bronchiolitis does not usually respond to salbutamol. If there is a good response, consider asthma as a cause of the symptoms. See Section 17.1.1: Acute asthma and acute exacerbation of chronic obstructive pulmonary disease (COPD).

<u>If no response</u>

- Epinephrine (adrenaline) 1:1000, 1 mL diluted in 2–4 mL of 3–5% sodium chloride, nebulised over at least 3 minutes, single dose (Doctor initiated).
  - Mix 3 mL of 3–5% sodium chloride with 2 mL water to make 3% sodium chloride solution.
  - Evaluate the response to the nebulisation.
  - If there is a good response which is maintained for at least 2 hours, send patient home. Warn the caregiver that there may be a relapse and advise them to return the patient promptly.

LoE:I[ix]

REFERRAL

» Chest indrawing and distress not responding to nebulisation.
» Difficulty in feeding.
» Previous admission for same problem.
» Oxygen saturation < 90% in room air.

17.1.4 CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

J44.9

DESCRIPTION

Also referred to as chronic obstructive airways disease (COAD), and comprises chronic bronchitis and emphysema which are characterised by:

» chronic cough with/without sputum production on most days of ≥ 3 months for ≥ 2 consecutive years;
» dyspnoea or shortness of breath; and
» wheezing.

The onset is very gradual with progressively worsening symptoms. Due to the large reserve capacity of the lungs, patients often present when there is considerable permanent damage to the lungs. In addition to the symptoms listed above, patients may present with symptoms or signs of right heart failure. The airways obstruction is not fully reversible (in contrast to asthma).

The main causes of COPD are chronic irritation of the airways caused by smoking, air pollution, previous TB, and previous cannabis (dagga) smoking, although there are many other causes.

Note: Oral corticosteroids may be required for acute exacerbations, but these have severe long-term complications and should only be used long term if benefit can be proven by lung function testing.

GENERAL MEASURES

» Smoking cessation, including cannabis (dagga), is the mainstay of therapy.
» Chest physiotherapy where available.
» Exercise.

MEDICINE TREATMENT

Acute lower airways obstruction: Treat as for acute asthma.

Chronic management:

» In a stable patient, check PEFR.
» Then give a test dose of salbutamol – 2 puffs.
» Repeat PEFR 15 minutes later.
» If there is ≥ 20% improvement in peak flow, treat as for asthma. See Section 17.1.2: Chronic asthma.

Patients failing to respond to the test dose of salbutamol:

- $Beta_2$ agonist (SABA) e.g.:
- Salbutamol, inhalation, 100–200 mcg (1–2 puffs), 3–4 times daily as needed for relief of wheeze.

If not controlled or frequent exacerbations:

- Inhaled LABA/corticosteroid combination e.g.:
- Salmeterol/fluticasone, inhalation, 50/250 mcg 12 hourly (Doctor initiated).

LoE:I[X]

Acute infective exacerbation of chronic bronchitis:

- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

LoE:I[XI]

Penicillin allergy

- Doxycycline, oral, 100 mg 12 hourly for 5 days.

LoE:I[XII]

Prophylaxis against respiratory tract infections:

- Influenza vaccination, annually.

REFERRAL

Poor response to above therapy, for further investigations and adjustment of treatment.

17.2 STRIDOR (UPPER AIRWAYS OBSTRUCTION)

J05

17.2.1 CROUP (LARYNGOTRACHEOBRONCHITIS) IN CHILDREN

J05.0

DESCRIPTION

Croup is a common cause of potentially life-threatening airway obstruction in

childhood. It is characterised by inflammation of the larynx, trachea and bronchi. Most common causative pathogens are viruses, including measles.
A clinical diagnosis of viral croup can be made if a previously healthy child develops progressive inspiratory airway obstruction with stridor and a barking cough, 1–2 days after the onset of an upper respiratory tract infection. A mild fever may be present.

Suspect foreign body aspiration if there is a sudden onset of stridor in an otherwise healthy child.

Suspect epiglottitis if the following are present in addition to stridor:
» very ill child
» high fever
» sitting upright with head held erect
» drooling saliva
» unable to swallow

Assessment of the severity of airway obstruction and management in croup

Grade 1 Inspiratory stridor only	• Prednisone, oral, 1–2 mg/kg, single dose. ○ Do not give if measles or herpes infection present. » Refer.

Grade 2
Inspiratory and expiratory stridor
	• Prednisone, oral, 1–2 mg/kg, immediately as a single dose.
	• Epinephrine, 1:1 000 diluted in sodium chloride 0.9%, nebulised, immediately.
	  ○ Dilute 1 mL of 1:1 000 epinephrine with 1 mL sodium chloride 0.9%.
	  ○ Repeat every 15–30 minutes until expiratory stridor disappears.
	» Refer.

Grade 3 Inspiratory and expiratory stridor with active expiration, using abdominal muscles	» Treat as above. » If no improvement within one hour, refer **urgently** (intubate before referral if possible).
Grade 4 Cyanosis, apathy, marked retractions, impending apnoea	» Intubate (if not possible give treatment as above). » Refer **urgently.**

GENERAL MEASURES
» Keep child comfortable.
» Continue oral fluids.
» Encourage parent or caregiver to remain with the child.

MEDICINE TREATMENT
• Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Children grade 2 or more stridor- while awaiting transfer:

- Epinephrine (adrenaline), 1:1000, nebulised, immediately using a nebuliser.
  - If there is no improvement, repeat every 15 minutes, until the child is transferred.
  - Dilute 1 mL of 1:1000 epinephrine (adrenaline) with 1 mL sodium chloride 0.9%.
  - Nebulise the entire volume with oxygen at a flow rate of 6–8 L/minute.
- Prednisone, oral, 1–2 mg/kg immediately as a single dose.

Weight kg	**Dose** mg	**Tablet** 5 mg	**Age** months/years
>11–14 kg	20 mg	4 tablets	>2–3 years
>14–17.5 kg	30 mg	6 tablets	>3–5 years

LoE:III

If epiglottitis suspected

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose** and refer**.** See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

Management during transfer:

» Give the child oxygen.
» Continue nebulisations with epinephrine (adrenaline).
» If grade 3, contact ambulance or nearest doctor.
» If grade 4, intubate and transfer.

REFERRAL

Urgent

» Children with:
  - chest indrawing
  - rapid breathing
  - altered consciousness
  - inability to drink or feed
» For confirmation of diagnosis.
» Suspected foreign body.
» Suspected epiglottitis.

Non Urgent

» All children grade 2 or more stridor.

17.3 RESPIRATORY INFECTIONS

J00-J99

17.3.1 INFLUENZA

J11.1

DESCRIPTION

Influenza is a self-limiting viral condition that may last up to 14 days. It presents with headache, muscular pain and fever, and begins to clear within 7 days.
Malnourished children, the elderly and debilitated patients are at greater risk of developing complications.

CAUTION
Malaria, measles, and HIV seroconversion may present with flu-like symptoms.

Complications
Secondary bacterial infections, including:
» pneumonia secondary to influenza
» otitis media
» sinusitis

GENERAL MEASURES

» Bed rest if feverish.
» Ensure adequate hydration.
» Advise patient to return to clinic if earache, tenderness or pain over sinuses develops and/or cough or fever persists for longer than a week.

MEDICINE TREATMENT

Note: Antibiotics are of no value for the treatment of influenza.

Pain and fever with distress:
Children
- Paracetamol, oral, 10–15 mg/kg/dose 4–6 hourly when required. See dosing table, pg 22.7.

Adults
- Paracetamol, oral, 1 g 6 hourly when required.

Infants
- Sodium chloride 0.9%, instilled into each nostril.

REFERRAL

Severe complications.

17.3.2 ACUTE BRONCHITIS IN ADULTS OR ADOLESCENTS

J20.9

DESCRIPTION

Acute airways infections, mostly of viral origin, accompanied by cough, sputum production and sometimes a burning retrosternal chest pain in patients with

otherwise healthy lungs.

Clinical features:
» initially: non-productive cough
» later: productive cough with yellow or greenish sputum

Viral bronchitis is usually part of an upper respiratory viral infection. It may be accompanied by other manifestations of viral infections. It is important to exclude underlying bronchiectasis or an acute exacerbation of chronic bronchitis in adults.

No antibiotics are indicated in uncomplicated acute bronchitis.
However, antibiotics may be considered for HIV-infected patients because of the higher incidence of bacterial lower respiratory tract infections in this subgroup.

HIV-infected patients:
- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

In penicillin-allergic HIV-infected patients:
- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

For symptomatic relief
- Cough syrup, oral.

17.3.3 ACUTE EXACERBATION OF COPD

See Sections 17.1.1: Acute asthma and acute exacerbation of COPD and 17.1.4: Chronic COPD.

17.3.4 PNEUMONIA

J18.9

DESCRIPTION

Acute infection of the lung parenchyma, usually caused by bacteria, especially *Streptococcus pneumonia* (pneumococcus).

Management is guided by:
» age
» co-morbidity
» severity of the pneumonia

Manifestations include:
» malaise
» fever, often with sudden onset and with rigors
» cough, which becomes productive of rusty brown or yellow-green sputum
» pleuritic type chest pain
» shortness of breath
» in severe cases, shock and respiratory failure

On examination there is:
» fever
» tachypnoea
» crackles or crepitations
» bronchial breath sounds

There may be a pleural rubbing sound or signs of a pleural effusion.

Predisposing conditions include:
» very young or old age
» malnutrition
» other concomitant diseases
» HIV infection

Pneumococcal pneumonia often occurs in previously healthy adults.
Adults with mild to moderately severe pneumonia may be managed at PHC level, depending on the response to initial treatment (see below).

17.3.4.1 PNEUMONIA IN CHILDREN

J15.9

DESCRIPTION

Pneumonia should be distinguished from viral upper respiratory infections. The most valuable sign in pneumonia is the presence of rapid breathing.

Assess the child for the severity of the pneumonia
Classify children according to the severity of the illness:
» Pneumonia: fever, cough and rapid breathing, but no chest indrawing (of the lower chest wall) and no flaring of nostrils.
» Severe pneumonia: fever, cough, rapid breathing, chest indrawing and flaring nostrils.

Note: Children < 2 months of age with rapid breathing should be classified as having severe pneumonia.
Rapid breathing is defined as:
» infants birth–2 months ≥ 60 breaths/minute
» infants 2 months–1 year ≥ 50 breaths/minute
» children 1–5 years ≥ 40 breaths/minute

Danger signs indicating urgent and immediate referral include:
» oxygen saturation of < 90% in room air
» inability to drink
» impaired consciousness
» cyanosis
» < 2 months of age
» grunting

GENERAL MEASURES

» Ensure adequate hydration.
» Continue feeding.

MEDICINE TREATMENT

For pneumonia:
- Amoxicillin, oral, 30mg/kg/dose 8 hourly for 5 days. See dosing table, pg 22.1.

LoE:III[XIII]

Penicillin allergy
Children < 18 kg
- Macrolide, e.g:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children: 18–35 kg (able to take tablets)
- Macrolide, e.g:
- Azithromycin, oral, 250 mg daily for 3 days.

Children> 35 kg
- Macrolide, e.g:
- Azithromycin, oral, 500 mg daily for 3 days.

Severe pneumonia:
- Oxygen, using nasal cannula at 1–2 L/minute before and during transfer.
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose.** See dosing table, page 22.2.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

REFERRAL

Urgent

» All children with severe pneumonia, i.e. chest indrawing (of the lower chest wall), flaring nostrils or cyanosis.
» All children < 2 months of age.

Non urgent

» Inadequate response to treatment.
» Children coughing for > 3 weeks to exclude other causes such as TB, foreign body aspiration or pertussis.

17.3.4.2 PNEUMONIA IN ADULTS

J15.9

17.3.4.2.1 UNCOMPLICATED PNEUMONIA

J15.9

DIAGNOSIS

A chest X-ray should ideally be taken in all patients to confirm the diagnosis. Send one sputum specimen for TB DNA PCR (Xpert MTB/RIF) to exclude pulmonary tuberculosis.

MEDICINE TREATMENT

If not severely ill (see referral criteria below):
- Amoxicillin, oral, 1 g 8 hourly for 5 days.

LoE:I[xiv]

Penicillin allergy:
- Moxifloxacin, oral, 400 mg daily for 5 days.

LoE:III[xv]

REFERRAL

Any of the following:

» Confusion or decreased level of consciousness.
» Cyanosis.
» Respiratory rate of ≥ 30 breaths/minute.
» Systolic BP < 90 mmHg.
» Diastolic BP < 60 mmHg.
» Deterioration at any point.
» No response to treatment after 48 hours.
» Patients with pneumonia:
  – from a poor socio-economic background
  – who are unlikely to comply with treatment
  – living a considerable distance from health centres
  – who have no access to immediate transport

17.3.4.2.2 PNEUMONIA IN ADULTS WITH UNDERLYING MEDICAL CONDITIONS OR > 65 YEARS OF AGE

J15.9

A chest X-ray should ideally be taken in all patients to confirm the diagnosis. Send one sputum specimen for TB DNA PCR (Xpert MTB/RIF) to exclude pulmonary tuberculosis.

Common underlying conditions include:

» Diabetes mellitus.
» HIV infection.
» Cardiac failure.
» COPD.
» Alcoholism.
» Chronic liver disease.
» Chronic kidney disease.

Most of these patients will require referral to a doctor.

MEDICINE TREATMENT

Mild pneumonia:

- Amoxicillin/clavulanic acid 875/125 mg, oral, 12 hourly for 5 days.

LoE:III

Penicillin allergy:

- Moxifloxacin, oral, 400 mg daily for 5 days.

LoE:III[xvi]

17.3.4.2.3 SEVERE PNEUMONIA

J15.9

DESCRIPTION

Severe pneumonia is defined as ≥ 2 of the following:

» confusion or decreased level of consciousness
» respiratory rate of ≥ 30 breaths/ minute
» systolic BP < 90 mmHg
» diastolic BP < 60 mmHg
» > 65 years of age

MEDICINE TREATMENT
While awaiting transfer:

- Oxygen, to achieve a saturation of 92%.
- Ceftriaxone, IV/IM, 1 g, as a single dose before referral.

CAUTION
Do not administer calcium containing fluids, e.g. Ringer-Lactate, concurrently with ceftriaxone.

REFERRAL

Urgent
All patients.

17.3.4.2.4 PNEUMOCYSTIS PNEUMONIA

B59

DESCRIPTION

Interstitial pneumonia occurring with advanced HIV infection due to *Pneumocystis jiroveci* (formerly *carinii*). Patients usually present with shortness of breath or dry cough. Chest X-ray may be normal in the early stages, but typically shows bilateral interstitial or ground glass pattern.

GENERAL MEASURES

Ensure adequate hydration.

MEDICINE TREATMENT

Adults

- Cotrimoxazole, oral, 6 hourly for 3 weeks.

Approx. weight	Use one of the following tablets	
kg	80/400 mg	160/800 mg
<40 kg	2 tablets	1 tablet
>40–56 kg	3 tablets	1½ tablets
>56 kg	4 tablets	2 tablets

For secondary prophylaxis

- Cotrimoxazole, oral, daily.

Use one of the following tablets	
80/400 mg	160/800 mg
2 tablets	1 tablet

REFERRAL

» All children.
» Breathing rate > 24 breaths/minute.
» Shortness of breath with mild effort.
» Cyanosed patients.
» For antiretroviral treatment, if not available at clinic.

17.4 PULMONARY TUBERCULOSIS (TB)

A15.0

Note: TB is a notifiable disease.

TB guidelines are updated regularly. Consult the most recent National Tuberculosis Control Programme Guidelines.

DESCRIPTION

Tuberculosis is an infection caused by *Mycobacterium tuberculosis*. It is exacerbated and complicated by HIV, AIDS and multi drug-resistant mycobacteria.

17.4.1 PULMONARY TUBERCULOSIS (TB) IN ADULTS

A15.0

DIAGNOSIS

» Pulmonary TB is diagnosed on Xpert MTB/RIF testing, sputum smear or culture.
» Send 1 sputum specimen for Xpert MTB/RIF.
  – If Xpert MTB/RIF is positive: treat for TB and send a sputum specimen for smear microscopy. (The smear is used for reporting, not for diagnosis).
  – If Xpert MTB/RIF is positive and susceptible to RIF: treat for TB.
  – If Xpert MTB/RIF is positive and resistant to RIF: commence MDR treatment and send sputum for drug susceptibility testing to confirm MDR TB.
  – If Xpert MTB/RIF is negative and patient is HIV-infected: send sputum for culture.
  – If Xpert MTB/RIF is negative and patient is HIV negative: treat with antibiotics and consider further investigation only if symptoms persist.

Note: If the patient was recently treated for TB, the Xpert MTB/RIF test could be falsely positive. Send sputum for smear microscopy and culture instead.

» If Xpert MTB/RIF is not available, send 2 sputum specimens for smear microscopy.
  – If both smears are negative, send another sputum specimen for culture.
  – In all patients who've had TB previously, send a sputum specimen for culture and sensitivity.

GENERAL MEASURES

» Counsel patients about the disease. Explain the importance of completing treatment.
» Avoid the use of tobacco.
» Avoid excessive alcohol.
» If more than two doses of treatment are missed, extra effort should be made to identify and manage any problems the patient might have.

MEDICINE TREATMENT

Administer the total daily amount of each medicine in one dose and not as divided doses.

Important medicine interactions

Rifampicin may reduce the efficacy of low dose combined oral contraceptives,

resulting in possible unplanned pregnancies (See Chapter 7: Family planning)
» Alter the oral contraceptive to a high dose preparation for the duration of TB treatment or use an injectable contraception or IUD.
» Use additional contraception in patients using a progestin-only subdermal implant for the duration of TB therapy.
» In patients on injectable contraceptives, it is not necessary to shorten the dose interval when using rifampicin or any other enzyme inducing medicine.

CAUTION
Antiretroviral medicines frequently interact with TB medicines.
Consult the National Department of Health antiretroviral treatment guidelines.

Dose adjustment
Ethambutol should be given on alternative days in patients with impaired renal function (eGFR < 10 mL/min).

Adverse effects of TB medicines include:
» Nausea.
  – Taking medicines with meals can minimise nausea.
  – Hepatitis must be excluded if there is new onset nausea. Request serum alanine aminotransferase test urgently in these patients.
» Jaundice and suspected drug induced hepatitis.
  – Stop treatment and refer for management at hospital level.
» New onset skin rash.
  – Refer if suspected drug rash.
» Neuropathy.
  – Can be prevented by taking pyridoxine.
» Arthralgia.
  – Exclude gout, and treat symptomatically.

17.4.1.1 TB CHEMOPROPHYLAXIS/ISONIAZID PREVENTIVE THERAPY (IPT) IN ADULTS

See Section 11.2.2: Isoniazid preventive therapy.

17.4.1.2 TB CONTROL PROGRAMME: MEDICINE REGIMENS IN ADULTS

A15.0

Treatment should be given once daily **seven days per week** in both the intensive and continuation phases.

LoE:I[xvii]

R – Rifampicin
H – Isoniazid
Z or PZA– Pyrazinamide
E or EMB – Ethambutol

Pre-treatment body weight kg	Two months initial phase	Four months continuation phase	
	RHZE (150/75/400/275)	RH (150/75)	RH (300/150)
30–37 kg	2 tablets	2 tablets	
38–54 kg	3 tablets	3 tablets	
55–70 kg	4 tablets		2 tablets
≥71kg	5 tablets		2 tablets

» Keep strictly to the correct dose and the duration of treatment.
» Weigh patient frequently and adjust the dose according to current weight.

17.4.2 PULMONARY TUBERCULOSIS (TB) IN CHILDREN

A15.0

Most children acquire tuberculosis from infected adults by inhalation. Malnourished, immunosuppressed (HIV and AIDS) children and children < 5years of age are at increased risk for pulmonary tuberculosis.

DIAGNOSIS

Any child presenting with symptoms and signs suggestive of pulmonary TB is regarded as a case of TB if there is:

» A chest X-ray suggestive of TB,

AND/OR

» History of exposure to an infectious TB case and/or positive tuberculin skin test (TST) e.g. Mantoux.

A positive Xpert MTB/RIF and/or smear microscopy and/or culture, on early morning gastric aspirate or induced sputum, confirms TB disease.

Signs and symptoms include:

» unexplained weight loss or failure to thrive,
» unexplained fever for ≥ 2 weeks,
» chronic unremitting cough for > 14 days,
» lymphadenopathy (especially cervical, often matted),
» hepatosplenomegaly,
» consolidation and pleural effusion.

Tuberculin skin test (TST), e.g. Mantoux.

» A positive test: TST induration > 10 mm.
» A TST may be falsely negative in the presence of:
  - malnutrition
  - immunodeficiency, e.g. HIV and AIDS
  - immunosuppression, e.g. steroid therapy, cancer chemotherapy
  - following overwhelming viral infection, e.g. measles or post vaccination

  In these circumstances a TST induration > 5 mm may be regarded as positive. Frequently, the TST will be non-reactive in these cases. TB treatment should be considered, despite a negative TST.

The following may be evident on chest X-ray:

» Direct or indirect evidence of hilar or mediastinal adenopathy with or without parenchymal opacification and/or bronchopneumonia.

GENERAL MEASURES

» Identify and treat the source case.
» Screen all contacts for TB infection.
» Monitor the nutritional status of the child to assess response to treatment.

17.4.2.1 TB CHEMOPROPHYLAXIS/ISONIAZID PREVENTIVE THERAPY (IPT) IN CHILDREN

Z29.2

Consider TB chemoprophylaxis/isoniazid preventive therapy (IPT) in all children exposed to a pulmonary TB contact.

Exclude active TB (i.e. no signs or symptoms suggestive of TB).

» Refer to Section 17.4.2: Pulmonary tuberculosis in children.
» If any signs or symptoms of pulmonary TB are present, refer for chest X-ray.
» Never give IPTto children with active TB.

TB chemoprophylaxis/ IPT is only used in:

» Children < 5 years of age.

OR

» Children of any age, who are HIV-infected.

WITH EITHER

- Close contact with an infectious pulmonary TB case. If child is re-exposed to a close contact, TB chemoprophylaxis must be repeated. (Previous IPT does not protect the child against subsequent TB exposure/ infection).
- Positive TST (only applicable on the first occasion of a positive TST).

Note: Refer contacts of MDR or XDR TB for expert advice.

MEDICINE TREATMENT

- Isoniazid, oral, 10mg/kg daily for 6 months.
  - Maximum dose: 300 mg daily.

Weight kg	**Daily isoniazid (INH)** 100 mg tablet
>2–3.4 kg	¼ tablet
>3.5–6.9 kg	½ tablet
>7–9.9 kg	1 tablet
>10–14.9 kg	1½ tablets
>15–19.9 kg	2 tablets
>20–24.9 kg	2½ tablets
>25 kg	3 tablets

LoE:I[XVIII]

Children with HIV or malnutrition or existing neuropathy

ADD

- Pyridoxine, oral, 12.5 mg daily for duration of prophylaxis.

17.4.2.2 TB CONTROL PROGRAMME: MEDICINE REGIMENS IN CHILDREN

A15.0

Directly observed therapy-short-course (DOTS), and using fixed medicine combinations are recommended. Treatment should be given daily in both the intensive (initial) and the continuation phases.

Recommended dose ranges in mg/kg		
	Daily (mg/kg)	**Maximum daily dose**
H	10–15	300 mg
R	10–20	600 mg
Z/ PZA	30–40	2 g
E	15–25	1200 mg

LoE:III[xix]

UNCOMPLICATED PULMONARY TB

Includes smear negative pulmonary TB with no more than mild to moderate lymph node enlargement and/or lung field opacification, or simple pleural effusion on chest x-ray.

Children ≤ 8 years of age

	2 months intensive phase given daily			**4 months continuation phase given daily**
Weight kg	**RH**	**PZA**		**RH**
	60/60	150 mg* **OR** 150mg/3 mL	500mg	60/60
2–2.9 kg	½ tablet	1.5 mL	expert advice on dose	½ tablet
3–3.9 kg	¾ tablet	2.5 mL	¼ tablet	¾ tablet
4–5.9 kg	1 tablet	3 mL	¼ tablet	1 tablet
6–7.9 kg	1½ tablets		½ tablet	1½ tablets
8–11.9 kg	2 tablets		½ tablet	2 tablets
12–14.9 kg	3 tablets		1 tablet	3 tablets
15–19.9 kg	3½ tablets		1 tablet	3½ tablets
20–24.9 kg	4½ tablets		1½ tablet	4½ tablets
25–29.9 kg	5 tablets		2 tablets	5 tablets

* For each dose, dissolve 150 mg dispersible (1 tablet) in 3 mL of water to prepare a concentration of 50 mg/mL (150 mg/3 mL)

Note: Give PZA 150 mg **or** 500 mg, and not both.

AND

- Pyridoxine, oral, 12.5 mg daily for 6 months if HIV-infected, malnourished or have existing neuropathy.

Children > 8 years and adolescents

Pre-treatment body weight kg	**2 months intensive phase given daily**	**4 months continuation phase given daily**	
	RHZE (150,75,400,275)	**RH (150,75)**	**RH (300,150)**
30–37 kg	2 tablets	2 tablets	
38–54 kg	3 tablets	3 tablets	
55–70 kg	4 tablets		2 tablets
≥71 kg	5 tablets		2 tablets

AND

If HIV-infected, malnourished or have existing neuropathy:

- Pyridoxine, oral, 12.5 mg daily for 6 months.

» Adjust treatment dosages to current body weight.

» If calculating dosages, rather give ½ tablet more than ½ tablet less.

COMPLICATED PULMONARY TB

» Includes all other forms of pulmonary TB, such as smear positive TB, cavitating pulmonary TB, bronchopneumonic TB, large lesion pulmonary TB, tuberculous empyema.

» Refer all cases of miliary TB for exclusion of TB meningitis.

Children ≤ 8 years of age

Intensive phase:

» Standard dose 4-drug therapy daily (RHZE) for 2 months.

THEN

Continuation phase:

» Standard dose 2-drug therapy daily (INH+rifampicin) for 4–7 months.

	Intensive phase: 2 months				**Continuation phase:4–7 months*** **
Weight kg	**RH**	**PZA**		**EMB**	**RH**
	60/60	150 mg** **OR** 150 mg/3 mL	500mg	400 mg tablet **OR** 400 mg/8 mL* solution	60/60
2–2.9 kg	½ tablet	1.5 mL	Expert advice on dose	1 mL	½ tablet
3–3.9 kg	¾ tablet	2.5 mL	¼ tablet	1.5 mL	¾ tablet
4–5.9 kg	1 tablet	3 mL	¼ tablet	2 mL	1 tablet
6–7.9 kg	1½ tablet		½ tablet	3 mL	1½ tablets
8–11.9 kg	2 tablets		½ tablet	½ tablet	2 tablets
12–14.9 kg	3 tablets		1 tablet	¾ tablet	3 tablets
15–19.9 kg	3½ tablets		1 tablet	1 tablet	3½ tablets
20–24.9 kg	4½ tablets		1½ tablet	1 tablet	4½ tablets
25–29.9 kg	5 tablets		2 tablets	1½ tablets	5 tablets

*EMB: For each dose, crush 400 mg (1 tablet) to a fine powder and dissolve in 8 mL of water to prepare a concentration of 400mg/8mL. Discard unused solution.

**PZA: For each dose, dissolve 150 mg dispersible (1 tablet) in 3 mL of water to prepare a concentration of 50 mg/mL (150 mg/3mL)

Note: Give PZA 150 mg **or** 500 mg, and not both.

***Continuation phase may be prolonged to 7 months in slow responders and children with HIV.

AND

If HIV-infected, malnourished or have existing neuropathy:

- Pyridoxine, oral, 12.5 mg daily for 6–9 months.

Children > 8 years and adolescents

	2 months intensive phase given daily	**4 months continuation phase given daily**	
Weight kg	**RHZE (150/75/400/275)** mg	**RH (150/75)** mg	**RH (300/150)** mg
30–37 kg	2 tablets	2 tablets	
38–54 kg	3 tablets	3 tablets	
55–70 kg	4 tablets		2 tablets
≥71 kg	5 tablets		2 tablets

AND

If HIV-infected, malnourished or have existing neuropathy:

- Pyridoxine, oral, 12.5 mg daily for 6–9 months.

» Weigh at each visit and adjust treatment dosages to body weight. If calculating dosages, rather give ½ tablet more than ½ tablet less.
» Keep strictly to the correct dose and the duration of treatment.
» The patient should be weighed regularly and the dose adjusted according to the current weight.

REFERRAL

» Disseminated forms of TB.
» All patients who cannot be managed on an ambulatory basis.
» Children < 12 years of age for a chest X-ray for diagnostic purposes.
» Retreatment cases of children.
» Children who are contacts of patients with open MDR or XDR TB.

17.4.3 TB, HIV AND AIDS

A15.0, B20

HIV and AIDS patients with suspected TB should have one negative sputum TB DNA PCR test (Xpert MTB/RIF) or two negative sputum smears, before sputum is sent for culture.

Standard treatment regimens are also effective in patients with HIV and AIDS.
Advise HIV and AIDS patients to present to a clinic if they develop common TB symptoms:

» active cough (any duration)
» fever
» night sweats
» loss of weight

HIV-infected patients with TB should be treated according to the standard TB treatment protocol.

Medicine interactions may occur with ART. (See Sections 11.1: Antiretroviral therapy, adults; 11.7: Opportunistic infections, treatment in children and 11.7.7: Tuberculosis).

17.4.4 MULTIDRUG-RESISTANT TUBERCULOSIS (MDR TB)

U50.0

DESCRIPTION

MDR TB is diagnosed when there is resistance to rifampicin **and** isoniazid.
XDR TB is diagnosed when there is resistance to rifampicin and isoniazid **plus** resistance to fluoroquinolones and an injectable medicine e.g. kanamycin.

17.4.4.1 MULTIDRUG-RESISTANT TUBERCULOSIS (MDR TB, IN ADULTS

GENERAL MEASURES

Counsel and educate patients about the disease and its treatment, including treatment duration. Screen all close contacts for signs and symptoms of MDR TB and by sputum sampling to detect early disease. Infection control and cough etiquette is important to limit spread.

MONITORING

Monitor adherence and check for adverse drug reactions at every visit.

» Monitor patients as follows every month:
- sputum microscopy and culture,
- weight and vital signs,
- vision test,
- urea and electrolytes (while on injectable phase only), and
- audiometry (while on injectable phase only).

MEDICINE TREATMENT

All patients with MDR TB require prolonged treatment, usually for at least 18 months after sputum culture conversion. The treatment of MDR TB should be co-ordinated and monitored by the provincial DR-TB units.

Standardised regimen for treatment of MDR TB in SouthAfrica.

Intensive phase:

» At least 6 months, guided by TB culture conversion.

	<33kg	**33–50 kg**	**51–70 kg**	**>70 kg**
Kanamycin*	15mg/kg	15 mg/kg	15 mg/kg (max: 1 g)	1g
Moxifloxacin	400 mg	400 mg	400 mg	400 mg
Ethionamide	15–20 mg/kg	500 mg	750 mg	750 mg–1 g
Terizidone	15–20 mg/kg	750 mg	750 mg	750 mg–1 g
Pyrazinamide	30–40 mg/kg	1 g–1750 mg	1750 mg–2 g	2 g–2 500 mg

*Consider capreomycin in patients with renal insufficiency, hearing loss, or peripheral neuropathy.

Continuation phase:

» At least 18 months after TB culture conversion.

	<33kg	**33–50 kg**	**51–70 kg**	**>70 kg**
Moxifloxacin	400 mg	400 mg	400 mg	400 mg
Ethionamide	15–20 mg/kg	500 mg	750 mg	750 mg–1 g
Terizidone	15–20 mg/kg	750 mg	750 mg	750 mg–1 g
Pyrazinamide	30–40 mg/kg	1 g–1750 mg	1 750 mg–2 g	2 g–2 500 mg

Note: Give family planning to all women of childbearing potential as the medicines are teratogenic. In pregnant women, the benefits of MDR management outweigh the teratogenicity risks.

LoE:III[xx]

REFERRAL

» All MDR patients who require hospitalisation.
» All XDR patients.
» Patients with impaired renal function.
» If medication is not tolerated, consult with MDR TB units.
» All children diagnosed with TB, who are close contacts of MDR TB patients should be referred to exclude MDR TB.
» All pregnant women with MDR TB.
» Patients with impaired hearing loss at baseline.

17.4.4.2 MULTIDRUG-RESISTANT TUBERCULOSIS (MDR TB), IN CHILDREN

GENERAL MEASURES

Suspect DR-TB when any of the features listed below is present:

» A known source case (or contact) with drug resistant TB or high-risk source case, e.g. on TB therapy who was recently released from prison.
» A smear positive case after 2 months of TB treatment who failed (or deteriorated on) 1st line antituberculosis treatment to which they were adherent (treatment failure or relapse within 6 months of treatment).
» Any severely ill child with TB who failed or got worse on TB treatment.
» Patients who defaulted TB treatment (> 2 months).
» Treatment interruptions (< 1 month) or who relapsed while on TB treatment or at the end of treatment.
» With recurrent TB disease after completion of TB treatment (retreatment case).

Manage confirmed DR-TB in a dedicated MDR-TB centre with appropriate infection control measures to prevent nosocomial transmission. Initiate treatment in consultation with a designated expert while awaiting referral to the designated MDR-TB centre. An uninterrupted medicine supply, direct supervision with proper education and counselling is necessary.

REFERRAL

All children.

---

[i] Oxygen: Adult Hospital level STG, 2012. http://www.health.gov.za/
[ii] Salbutamol 0.5%, solution: Adult Hospital level STG, 2012. http://www.health.gov.za/
[iii] Salbutamol, inhalation: PHC STG, 2014/15: Section 17.1.2 Chronic asthma. http://www.health.gov.za/
[iv] Prednisone, oral: Paediatric Hospital level STG, 2013. http://www.health.gov.za/
[v] Hydrocortisone, IV: Paediatric Hospital level STG, 2012. http://www.health.gov.za/
[vi] Prednisone, oral: Adult Hospital level STG, 2012. http://www.health.gov.za/
[vii] Hydrocortisone, IV: Adult Hospital level STG, 2012http://www.health.gov.za/
[viii] Inhaled LABA/corticosteroid combination (adults): Tee AK, Koh MS, Gibson PG, Lasserson TJ, Wilson AJ, Irving LB. Long-acting beta2-agonists versus theophylline for maintenance treatment of asthma. *Cochrane Database Syst Rev*. 2007 Jul 18;(3):CD001281. http://www.ncbi.nlm.nih.gov/pubmed/17636663
[ix] Epinephrine (adrenaline)1:1000: Paediatric Hospital level STG, 2013. http://www.health.gov.za/

Epinephrine (adrenaline)1:1000: Zhang L, Mendoza-Sassi RA, Wainwright C, Klassen TP. Nebulised hypertonic saline solution for acute bronchiolitis in infants. *Cochrane Database Syst Rev.* 2013 Jul 31;7:CD006458. http://www.ncbi.nlm.nih.gov/pubmed/23900970

Epinephrine (adrenaline)1:1000: Kunkel NC, Baker MD. Use of racemic epinephrine, dexamethasone, and mist in the outpatient management of croup. *Pediatr Emerg Care.* 1996 Jun;12(3):156-9. http://www.ncbi.nlm.nih.gov/pubmed/8806135

Epinephrine (adrenaline)1:1000: Kelley PB, Simon JE. Racemic epinephrine use in croup and disposition. *Am J Emerg Med.* 1992 May;10(3):181-3. http://www.ncbi.nlm.nih.gov/pubmed/1375027

[x] Inhaled LABA/corticosteroid combination: Ram FS, Jones PW, Castro AA, De Brito JA, Atallah AN, Lacasse Y, Mazzini R, Goldstein R, Cendon S. Oral theophylline for chronic obstructive pulmonary disease. *Cochrane Database Syst Rev.* 2002;(4):CD003902. http://www.ncbi.nlm.nih.gov/pubmed/12519617

Inhaled LABA/corticosteroid combination: Spencer S, Evans DJ, Karner C, Cates CJ. Inhaled corticosteroids versus long-acting beta(2)-agonists for chronic obstructive pulmonary disease. *Cochrane Database Syst Rev.* 2011 Oct 5;(10):CD007033. http://www.ncbi.nlm.nih.gov/pubmed/21975759

Inhaled LABA/corticosteroid combination: Nannini LJ, Poole P, Milan SJ, Kesterton A. Combined corticosteroid and long-acting beta(2)-agonist in one inhaler versus inhaled corticosteroids alone for chronic obstructive pulmonary disease. *Cochrane Database Syst Rev.* 2013 Aug 30;8:CD006826. http://www.ncbi.nlm.nih.gov/pubmed/23990350

Inhaled LABA/corticosteroid combination: Nannini LJ, Lasserson TJ, Poole P. Combined corticosteroid and long-acting beta(2)-agonist in one inhaler versus long-acting beta(2)-agonists for chronic obstructive pulmonary disease. *Cochrane Database Syst Rev.* 2012 Sep 12;9:CD006829. http://www.ncbi.nlm.nih.gov/pubmed/22972099

I nhaled LABA/corticosteroid combination: Ni S, Fu Z, Zhao J, Liu H. Inhaled corticosteroids (ICS) and risk of mycobacterium in patients with chronic respiratory diseases: a meta-analysis. *Journal of thoracic disease* 2014; 6(7): 971-8 http://www.ncbi.nlm.nih.gov/pubmed/22972099

Inhaled LABA/corticosteroid combination: Lee CH, Kim K, Hyun MK, Jang EJ, Lee NR, Yim JJ. Use of inhaled corticosteroids and the risk of tuberculosis. *Thorax* 2013; 68(12): 1105-13. http://www.ncbi.nlm.nih.gov/pubmed/23749841

Inhaled LABA/corticosteroid combination: Chung WS, Chen YF, Hsu JC, Yang WT, Chen SC, Chiang JY. Inhaled corticosteroids and the increased risk of pulmonary tuberculosis: a population-based case-control study. *International journal of clinical practice* 2014; 68(10): 1193-9. http://www.ncbi.nlm.nih.gov/pubmed/24838040

[xi] Amoxicillin: El Moussaoui R, Roede BM, Speelman P, Bresser P, Prins JM, Bossuyt PM.Short-course antibiotic treatment in acute exacerbations of chronic bronchitis and COPD: a meta-analysis of double-blind studies. *Thorax.* 2008 May;63(5):415-22. http://www.ncbi.nlm.nih.gov/pubmed/18234905

[xii] Doxycycline: El Moussaoui R, Roede BM, Speelman P, Bresser P, Prins JM, Bossuyt PM.Short-course antibiotic treatment in acute exacerbations of chronic bronchitis and COPD: a meta-analysis of double-blind studies. *Thorax.* 2008 May;63(5):415-22. http://www.ncbi.nlm.nih.gov/pubmed/18234905

[xiii] Amoxicillin: Paediatric Hospital level STG, 2012. http://www.health.gov.za/

[xiv] Amoxicillin: Marras TK, Nopmaneejumruslers C, Chan CK. Efficacy of exclusively oral antibiotic therapy in patients hospitalized with nonsevere community-acquired pneumonia: a retrospective study and meta-analysis. Am J Med. 2004 Mar 15;116(6):385-93. http://www.ncbi.nlm.nih.gov/pubmed/15006587

[xv] Moxifloxacin: South African Society of clinical microbiology.SASCM laboratory surveillance, July to December 2012. [Online][Accessed August 2014] Available at: http://www.fidssa.co.za/images/SASCM_Laboratory_Surveillance_2.pdf

[xvi] Moxifloxacin: South African Society of clinical microbiology.SASCM laboratory surveillance, July to December 2012. [Online][Accessed August 2014] Available at: http://www.fidssa.co.za/images/SASCM_Laboratory_Surveillance_2.pdf

[xvii] Rifampicin: Adult Hospital level STG, 2012. http://www.health.gov.za/

Isoniazid: Adult Hospital level STG, 2012. http://www.health.gov.za/

Pyrazinamide: Adult Hospital level STG, 2012. http://www.health.gov.za/

Ethambutol: Adult Hospital level STG, 2012. http://www.health.gov.za/

[xviii] Isoniazid: Paediatric Hospital level STG, 2012. http://www.health.gov.za/

Isoniazid: Zar HJ, Cotton MF, Strauss S, Karpakis J, Hussey G, Schaaf HS, Rabie H, Lombard CJ. Effect of isoniazid prophylaxis on mortality and incidence of tuberculosis in children with HIV: randomised controlled trial. *BMJ.* 2007 Jan 20;334(7585):136.. http://www.ncbi.nlm.nih.gov/pubmed/17085459

Isoniazid: Madhi SA, Nachman S, Violari A, Kim S, Cotton MF, Bobat R, Jean-Philippe P, McSherry G, Mitchell C; P1041 Study Team. Primary isoniazid prophylaxis against tuberculosis in HIV-exposed children. N Engl J Med. 2011 Jul 7;365(1):21-31. http://www.ncbi.nlm.nih.gov/pubmed/21732834

[xix] TB control programme: medicine regimens in children: Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[xx] MDR TB, in adults: Adult Hospital level STG, 2012. http://www.health.gov.za/

MDR TB, in adults: Department of Health. Management of drug resistant tuberculosis policy guidelines, updated January 2013. http://www.health.gov.za/

Chapter 18: Eye conditions

18.1 CONJUNCTIVITIS

H10.9

An inflammatory condition of the conjunctiva, possibly caused by:
» allergies
» bacterial or viral (pink eye) infections

18.1.1 CONJUNCTIVITIS, ALLERGIC

H10.1

DESCRIPTION

An inflammatory condition of the conjunctivae caused by allergy to pollen, grass, animal fur, medication, cosmetics, etc. Often associated with allergic rhinitis or hay fever. Common features include:
» itching, watery eyes and photophobia
» slightly red or normal conjunctiva
» conjunctival swelling in severe cases
» normal cornea, iris and pupil
» normal visual acuity

In chronic cases, there may be brown discolouration of the conjunctivae or cobblestone elevations of the upper tarsal conjunctivae (vernal conjunctivitis).

GENERAL MEASURES

Relieve symptoms with cold compresses, i.e. a clean moistened cloth over the eyes for 10 minutes.

MEDICINE TREATMENT

Adults and children > 6 years of age

- Oxymetazoline 0.025%, eye drops, instil 1–2 drops 6 hourly for a maximum of 7 days.

LoE: III[I]

If no response within 7 days:

- Sodium cromoglycate, 2 % eye drops, instil 1 drop 6 hourly (Doctor initiated).
  - Use may be seasonal (1−3 months) or long term.

LoE: III[II]

Children: 2–6 years of age

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

LoE: III

If no response within 7 days:

- Sodium cromoglycate, 2 % eye drops, instil 1 drop 6 hourly (Doctor initiated).
  - Use may be seasonal (1−3 months) or long term.

LoE: III[III]

Persistent allergic conjunctivitis in adults and children >2 years:

For long term use:

Children: 2–6 years of age

- Cetirizine, oral, 5 mg once daily. See dosing table, pg 22.2.
  - Use may be seasonal (1−3 months) or long term.

Children > 6 years of age and adults

- Cetirizine, oral, 10 mg once daily.
  - Use may be seasonal (1−3 months) or long term.

LoE: III

CAUTION
Do not give an antihistamine to children < 2 years of age.

REFERRAL

» No response to treatment.
» Persons wearing contact lenses.
» Children < 2 years of age.

18.1.2 CONJUNCTIVITIS, BACTERIAL (EXCLUDING CONJUNCTIVITIS OF THE NEWBORN)

H10.0

DESCRIPTION

An inflammatory purulent condition of the conjunctivae caused by bacterial infection and characterised by:

» sore, gritty or scratchy eyes and swollen lids
» mucopurulent discharge from one or both eyes
» redness especially of conjunctival angles (fornices)

GENERAL MEASURES

» Educate patient on personal hygiene to avoid spread e.g. do not use the same face-cloth or towels as others.
» Educate patient on correct application of ophthalmic ointment.
» Advise patient:
  – to wash hands thoroughly before applying ophthalmic ointment
  – not to share ophthalmic ointments or drops
  – not to rub eyes
  – never to use urine or milk to wash the eyes

MEDICINE TREATMENT

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL

» No response after 5 days.

» All cases of unilateral conjunctivitis, as this may be caused by a foreign body.
» Loss of vision.
» Irregularity of pupil.
» Haziness of the cornea.
» Persistent painful eye.

18.1.3 CONJUNCTIVITIS OF THE NEWBORN

A54.3

DESCRIPTION

Inflammation of the conjunctivae in the neonatal period, presenting with a picture that may range from mildly sticky eyes to an abundant purulent discharge and eyelid oedema.
Common infectious agents include *N. gonorrhoeae*, *S. aureus,* and *Chlamydia.*

Generally, conjunctivitis of the newborn is either mild (small amount of sticky exudates) or severe (profuse pus and swollen eyelids).
The latter is often *N. gonorrhoeae* and threatens damage to the cornea, while the former is often *S. aureus* or undefined.

CAUTION
Treat conjunctivitis with abundant pus immediately to prevent damage to the cornea that may lead to blindness.
This is often caused by gonorrhoeae.
Treat parents of a neonate with purulent discharge, appropriately.

GENERAL MEASURES

» Cleanse or wipe eyes of all newborn babies with a clean cloth, cotton wool or swab, taking care not to touch or injure the eye.

MEDICINE TREATMENT

Prevention

Routine administration for every newborn baby:

- Chloramphenicol 1%, ophthalmic ointment, applied as soon as possible after birth.

LoE: II[IV]

Treatment

Sticky eye(s) without purulent discharge:

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days.

Purulent discharge

Mild discharge without swollen eyelids and no corneal haziness:

- Sodium chloride 0.9%, eye washes, immediately then 2–3 hourly, until discharge clears.

AND

- Ceftriaxone, IM, 50 mg/kg immediately as a **single dose.**

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI)**:		**Age** Months/years
		250 mg/2 mL (250 mg diluted in 2 mL WFI)	500 mg/2 mL (500 mg diluted in 2 mL WFI)	
>2–2.5 kg	100 mg	0.8 mL	0.4 mL	>34–36 weeks
>2.5–3.5 kg	150 mg	1.2 mL	0.6 mL	>36 weeks–1 month
>3.5–5.5 kg	200 mg	1.6 mL	0.8 mL	>1–3 months

LoE: III

Review daily.

Abundant purulent discharge and/or swollen eyelids and/or corneal haziness:

- Sodium chloride 0.9%, eye washes, immediately then hourly until referral.

AND

- Ceftriaxone, IM, 50 mg/kg immediately as a **single dose,** and refer**.**

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI)**:		**Age** Months/years
		250 mg/2 mL (250 mg diluted in 2 mL WFI)	500 mg/2 mL (500 mg diluted in 2 mL WFI)	
>2–2.5 kg	100 mg	0.8 mL	0.4 mL	>34–36 weeks
>2.5–3.5 kg	150 mg	1.2 mL	0.6 mL	>36 weeks–1 month
>3.5–5.5 kg	200 mg	1.6 mL	0.8 mL	>1–3months

LoE: III

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

Treat both parents of newborns who develop purulent conjunctivitis after 24 hours of birth for *N. gonorrhoeae* and *Chlamydia.*

LoE: III[v]

Parents:

- Ceftriaxone, IM, 250 mg as a single dose.

- For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

AND

- Azithromycin, oral, 1 g as a single dose.

REFERRAL

Urgent

» All neonates with abundant purulent discharge and/ or swollen eyelids and/or corneal haziness.
» Neonate unresponsive to treatment within 2 days.

18.1.4 CONJUNCTIVITIS, VIRAL (PINK EYE)

B30.9

DESCRIPTION

A highly contagious, viral infection, which is spread by contact with:

» hands
» face cloths
» towels

It may start in one eye, spreading to the other. More commonly both eyes are infected.

Common symptoms include:

» sore eyes, feeling of itching or burning, often described as being painful
» photophobia
» watery discharge (a yellow discharge indicates a secondary bacterial infection)
» diffuse pink or red conjunctivae, which may become haemorrhagic
» enlarged pre-auricular lymph node

The cornea, iris and pupil are completely normal with normal visual acuity.

GENERAL MEASURES

» Advise on correct cleansing or rinsing of eyes with clean water.
» Cold compresses for symptomatic relief.

MEDICINE TREATMENT

Children > 6 years of age and adults

- Oxymetazoline 0.025%, eye drops, instil 1–2 drops 6 hourly for a maximum of 7 days.

LoE:III[VI]

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g, 6 hourly when required.

REFERRAL

» No response after 5 days.
» A unilateral red eye for more than one day.

» Suspected herpes conjunctivitis.
» Loss of vision.
» Irregularity of pupil.
» Haziness of the cornea.
» Persistent painful eye.

18.2 EYE INJURIES

18.2.1 EYE INJURY, CHEMICAL BURN

T26.9

This is a medical emergency.

DESCRIPTION

Damage to one or both eyes caused by contact with irritating chemical substances e.g. alkali or acid.

Presents with:

» pain
» inability to open eye
» blurred vision
» excessive teary and watery eye

GENERAL MEASURES

» Irrigate or wash the eye immediately and continuously with clean water or sodium chloride 0.9% for at least 20 minutes.
» In severe alkaline burn cases, irrigation should be prolonged further.

MEDICINE TREATMENT

Local anaesthetic if needed:

- Tetracaine 1% eye drops, instil 1 drop in the affected eye(s).
  - Repeat irrigation of the eye.
  - Evert upper eyelid and remove debris with cotton bud.
  - Never give anaesthetic drops to the patient to take home as they can cause blindness if used too often.
- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL

All cases within 12 hours.

18.2.2 EYE INJURY (BLUNT OR PENETRATING)

S05.9/S05.5

DESCRIPTION

Eye injury may be associated with a foreign body, which may cause:

» corneal abrasion or perforation
» disturbance of vision
» complaints of foreign body in the eye that may not be visible
» pain

GENERAL MEASURES

» Establish the cause, to determine likelihood of penetrating trauma.
» If no penetrating injury, irrigate eye with clean water or sodium chloride 0.9%.
» Remove any foreign body if visible on sclera or conjunctivae with cotton bud.
» If foreign body is not visible, check visual acuity first, before testing with fluorescein.
» Stain with fluorescein to reveal corneal foreign body or complications such as abrasion.
» Cover injured eye with eye pad, provided there is no pressure on the eye.
» Consider X-ray of orbit to exclude intra-ocular metallic foreign body.

MEDICINE TREATMENT

Deep corneal or scleral injuries:

Cover with an eye shield and refer immediately.

If immediate referral is not possible, while awaiting transfer:

- Atropine, 1%, drops, instilled immediately.
- Chloramphenicol 1%, ophthalmic ointment applied immediately.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required

CAUTION

Review the problem daily.
Do not use an eye pad if there is ecchymosis, lid oedema or bleeding.

REFERRAL

Immediately:

» If the foreign body cannot be removed or an intraocular foreign body is suspected.
» Laceration, perforation or diffuse damage to the cornea or sclera.
» Damage to other structures of the eye, including the eyelidedge.
» Visual abnormalities or limitation of movement of the eye.

18.3 GLAUCOMA, ACUTE AND CLOSED ANGLE

H40.9

DESCRIPTION

Acute closed angle glaucoma is damage to the optic nerve caused by raised intra-ocular pressure. This may result in loss of vision usually in one eye.

Clinical features:

» pupil is moderately dilated and may be oval in shape
» corneal haziness
» pericorneal conjunctival inflammation
» sudden onset of extremely severe, bursting pain and eye redness
» a unilateral, temporal headache, after being exposed to a period of darkness, e.g. in a cinema
» coloured haloes around lights (bright rings)
» eye feels hard, compared to the other eye, when measured with finger palpation (this is not an accurate test)
» severe pain in eye (acute)
» nausea and vomiting in severe cases

Note: The more common chronic open angle glaucoma is usually without symptoms.

Emergency drug treatment before referral (Doctor prescribed)

- Acetazolamide, oral, 500 mg, immediately, followed by 250 mg 6 hourly until referred.

REFERRAL

Urgent

All patients to an ophthalmologist within 12 hours.

18.4 PAINFUL RED EYE

H57.1

DESCRIPTION

Pain and redness in one eye only, indicates inflammation of the anterior structures of the eye.

Exclude bacterial or viral conjunctivitis (often bilateral and associated with irritation, rather than pain).

Consider acute closed angle glaucoma and manage appropriately. See Section 18.3: Glaucoma, acute and closed angle.

REFERRAL

Urgent within 12–24 hours:

» All patients (excluding those with conjunctivitis):
  – Single painful red eye.
  – Corneal ulceration including herpes infection.
  – Sudden loss or change in vision, including blurred or reduced vision.

- Sudden onset of visual problems, associated with dizziness, weakness on either one or both sides, difficulty speaking or swallowing (possible stroke; see Section 15.1: Stroke).
- Foreign body associated with welding or grinding.
- Chemical burn (see Section 18.2.1: Eye injury, chemical burn).
- Whole eyelid swollen, red and painful (consider orbital cellulitis).
- Coloured haloes around light, dilated oval pupil, headache, nausea, vomiting (possible glaucoma; see Section18.3: Glaucoma, acute and closed angle).

18.5 STRUCTURAL ABNORMALITIES OF THE EYE

Q10

These include:

» eyelashes rubbing on the cornea (trichiasis)
» eyelids bent into the eye (entropion)
» eyelids bent out too much (ectropion)
» ptosis (drooping eyelid)

REFERRAL

All patients.

18.6 VISUAL PROBLEMS

H53.9

DESCRIPTION

Visual problems may be due to refractive errors, damage to the eye or optic nerve. This may be an indication of underlying disease such as diabetes or hypertension.

Assessment

Look for abnormalities of the eye.
Determine visual acuity accurately in both eyes by Snellen chart.
If vision is diminished (less than 6/12) perform the following tests:

» Pin hole test
  - Make a hole of about 1 mm wide in a piece of dark/black paper– you can push a hole in paper or card with a pen tip.
  - Ask the patient to look through this hole at the Snellen chart.
  - If vision improves, this means that the patient has a refractive error.

» Red reflex test
  The patient looks past the examiner's head focussing on a distant target.
  - With the ophthalmoscope at 0 (zero) the examiner keeps it close to his eye and then focuses the beam of light so that it falls on the pupillary area of the cornea.
  - The examiner stands about 60 cm away from the patient.

- In normal individuals, the examiner should be able to see a red or pink colour (reflex) through the pupil which comes from the retina.

Significance of an absent red reflex.
If there is a history of trauma or diabetes the absence of a red reflex is probably due to:
» retinal detachment
» a vitreous or internal haemorrhage
» mature cataract

If there are cataracts one usually sees:
» black shadows against the red reflex in immature cataracts, or
» absence of red reflex in mature cataracts.

In a patient > 50 years of age with no history of trauma, diabetes or previous eye disease, an absent red reflex is oftendue to cataract formation, especially with decreased visual acuity.

Note: Associated diabetes or hypertension should be adequately managed with referral, as surgery can only be considered with appropriately managed disease.

REFERRAL

Urgent: within 12–24 hours

» Sudden visual loss **in one or both eyes.**
» Pain or redness **in one eye only** especially with visual and pupil abnormalities.
» Recent proptosis of one or both eyes or enlargement of the eye (buphthalmos/glaucoma) in children.
» Hazy cornea in children.
» Unilateral watery eye

Within days

» Squint of recent onset.
» Suspected or previously diagnosed glaucoma.
» Double vision following recent injury might indicate orbital fracture.
» Leucokoria (white reflex from the pupil).
» Squint at any age if not previously investigated by ophthalmologist.
» Visual loss in patients with systemic disease such as diabetes.

Non-urgent referral

» Cataracts.
» Refractive errors.
» Long-standing blindness – first visit to health facility.

---

[i]Oxymetazoline: Breakey AS, Cinotti AA, Hirshman M, Skowron RA, Samson CR, Danzig MR. A double-blind, multi-centre controlled trial of 0.25% oxymetazoline ophthalmic solution in patients with allergic and non-infectious conjunctivitis. *Pharmatherapeutica.* 1980;2(6):353-6. http://www.ncbi.nlm.nih.gov/pubmed/7433476
Oxymetazoline: Fox SL, Samson CR, Danzig MR. Oxymetazoline in the treatment of allergic and non-infectious conjunctivitis. *J Int Med Res.* 1979;7(6):528-30. http://www.ncbi.nlm.nih.gov/pubmed/391626
Oxymetazoline: Duzman E, Warman A, Warman R. Efficacy and safety of topical oxymetazoline in treating allergic and environmental conjunctivitis. *Ann Ophthalmol.* 1986 Jan;18(1):28-31. http://www.ncbi.nlm.nih.gov/pubmed/3513687
Oxymetazoline: Allergan. Oxylin®PSUR – Oct2007toAug2010
Oxymetazoline: Allergan Pharmaceuticals Ireland_Oxylin® PSUR SPC, March 2010

Oxymetazoline: Sweetman S (Ed), Martindale: The complete drug reference. London: Pharmaceutical Press. Electronic version, (Edition 2011).

[ii] Sodium cromoglycate: Owen CG, Shah A, Henshaw K, Smeeth L, Sheikh A. Topical treatments for seasonal allergic conjunctivitis: systematic review and meta-analysis of efficacy and effectiveness. *Br J Gen Pract.* 2004 Jun;54(503):451-6. http://www.ncbi.nlm.nih.gov/pubmed/15186569

[iii] Sodium cromoglycate: Owen CG, Shah A, Henshaw K, Smeeth L, Sheikh A. Topical treatments for seasonal allergic conjunctivitis: systematic review and meta-analysis of efficacy and effectiveness. *Br J Gen Pract.* 2004 Jun;54(503):451-6. http://www.ncbi.nlm.nih.gov/pubmed/15186569

[iv] Chloramphenicol: Ramirez-Ortiz MA, Rodriguez-Almaraz M, Ochoa-Diazlopez H, Diaz-Prieto P, Rodriguez-Suárez RS. Randomised equivalency trial comparing 2.5% povidone-iodine eye drops and ophthalmic chloramphenicol for preventing neonatal conjunctivitis in a trachoma endemic area in southern Mexico. *Br J Ophthalmol.* 2007 Nov;91(11):1430-4. http://www.ncbi.nlm.nih.gov/pubmed/17947266

[v] Diagnosis of conjunctivitis by age: Hammerschlag MR, Gelling M, Roblin PM, Kutlin A, Jule JE. Treatment of neonatal chlamydial conjunctivitis with azithromycin. *Pediatr Infect Dis J.* 1998 Nov;17(11):1049-50. http://www.ncbi.nlm.nih.gov/pubmed/9849993

Diagnosis of conjunctivitis by age: Pammi M, Hammerschlag MR, Weisman LE, Edwards MS, Kim MS. UptoDate: Chlamydia trachomatis infections in the newborn. [Online] 2011. [Cited 2012] Available at: www.uptodate.com

Diagnosis of conjunctivitis by age: American Academy of Pediatrics. Chlamydial infections. In: Pickering LK, ed. 2000: Red Book: Report of the Committee on Infectious Diseases, ed 25. Elk Grove Village, IL: American Academy of Pediatrics, 2000;208–211.

[vi] Oxymetazoline: Allergan. Oxylin®PSUR – Oct2007toAug2010

Oxymetazoline: Allergan Pharmaceuticals Ireland_Oxylin® PSUR SPC, March 2010

Oxymetazoline: Sweetman S (Ed), Martindale: The complete drug reference. London: Pharmaceutical Press. Electronic version, (Edition 2011).

Chapter 19: Ear, nose and throat conditions

19.1 ALLERGIC RHINITIS

J30.4

DESCRIPTION

Inflammation of the mucous membranes of the nose and paranasal sinuses in response to an allergen e.g. pollen, house dust, grasses and animal hair.
Allergic rhinitis is characterised by recurrent episodes of:

» blocked stuffy nose
» watery nasal discharge
» frequent sneezing, often accompanied by nasal itching and irritation
» conjunctival itching and watering
» oedematous palenasal mucosa
» mouth breathing
» snoring at night

Exclude other causes, such as infections, vasomotor rhinitis, overuse of decongestant drops, side effects of antihypertensives and antidepressants.

GENERAL MEASURES

Avoid allergens and irritants.

MEDICINE TREATMENT

- Corticosteroid, e.g.:
- Budesonide, aqueous nasal solution, 1 spray of 100 mcg in each nostril 12 hourly.
  - Aim the nozzle laterally and upwards (aim for the eye) and not to the back of the throat.
  - Do not sniff vigorously.
  - Review 3 monthly.

LoE:III[I]

For short term symptomatic use:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

For relief of nocturnal nasal blockage:

Topical nasal decongestant e.g.:

- Oxymetazoline 0.05%, intranasal, administered at night for a maximum of 5 days.

LoE:III

Long-term antihistamines should only be used after an adequate trial of intranasal corticosteroids and should be added to steroid therapy.

For long-term use in adults and school going children

Children: 2–6 years of age

- Cetirizine, oral, 5 mg once daily. See dosing table, pg 22.2.

Children > 6 years of age and adults

- Cetirizine, oral, 10 mg once daily.

CAUTION
Do not give an antihistamine to children < 2 years of age.

LoE:III[ii]

REFERRAL
» Chronic persistent symptoms.
» Severe symptoms.

19.2 VIRAL RHINITIS (COMMON COLD)
J11.1

DESCRIPTION
Colds are self-limiting viral conditions that may last up to 14 days. Colds begin to clear within 3 days. Colds present with nasal stuffiness and throat irritation. Malnourished children, the elderly and debilitated patients are at greater risk of developing complications.

CAUTION
Malaria, measles, and HIV seroconversion may present with flu-like symptoms.

Complications
Secondary bacterial infections, including:
» pneumonia secondary to influenza
» otitis media
» sinusitis

GENERAL MEASURES
» Limit strenuous activity.
» Ensure adequate hydration.
» Advise patient to return to clinic if ear ache, tenderness or pain over sinuses develops or symptoms persist for > 14 days.

MEDICINE TREATMENT
Antibiotics are of no value for the treatment of the common cold and influenza.

Infants
- Sodium chloride 0.9%, instilled into each nostril.

Pain and fever with distress:
Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
- Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL
Severe complications.

19.3 EPISTAXIS

(See Chapter 21.15: Trauma and emergencies)

19.4 OTITIS

19.4.1 OTITIS EXTERNA

H60.9

DESCRIPTION

Inflammation of the external ear may be one of the following:

» Diffuse: An infection of the ear canal, often due to Gram negative bacilli (especially *P. aeruginosa*). Pain is increased when chewing and the lining of the canal may be either inflamed or swollen with dry or moist debris or even a white or clear discharge.

» Furuncular: Usually caused by *Staphylococcus aureus.* A painful localized swelling present at the entrance to the ear canal. May be precipitated by trauma caused by scratching, e.g. matchsticks, ear buds.

GENERAL MEASURES

» Exclude any underlying chronic otitis media before commencing treatment.
» Most cases recover after thorough cleansing and drying of the ear.
» Keep the ear clean and dry (dry mopping).
» Do not leave pieces of cotton wool, etc. in the ear.
» Do not instil anything into the ear unless prescribed.

MEDICINE TREATMENT

Diffuse

» Does not usually require an antibiotic.
» Make a wick where possible, using ribbon gauze or other suitable absorbent cloth, e.g. paper towel to clean and dry the ear.

- Acetic acid 2% in alcohol, topical, instilled into the ear every 6 hours for 5 days.
  - Instill 3–4 drops after cleaning and drying the ear.

LoE:I[III]

Furuncular

Children

- Cephalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.2.

OR

Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 7 years of age and adults

- Cephalexin, oral, 500 mg 6 hourly for 5 days.

OR

Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Penicillin allergy:

Children

- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children: 18–35 kg (able to take tablets)

- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

REFERRAL

No response to treatment.

19.4.2 OTITIS MEDIA, ACUTE

H66.9

DESCRIPTION

Inflammation of the middle ear characterised by:

» pain
» loss of hearing
» red bulging eardrum
» drum perforation
» fever in about half of the cases
» loss of the normal light reflex of the eardrum

Mild redness of the eardrum and rubbing the ear are not reliable signs.

GENERAL MEASURES

» Do not instil anything into the ear.
» Avoid getting the inside of the ear wet (dry mopping).
» Do not plug the ear with cotton wool, etc.
» Exclude HIV infection as a contributing factor for recurrent ear infection.

MEDICINE TREATMENT

Children ≤ 3 years of age

- Amoxicillin, oral, 45 mg/kg/dose 12 hourly for 5 days.

Weight kg	**Dose** mg	**Use one of the following:**				**Age** Months/years
		Syrup mg/ 5mL		**Capsule** mg		
		125	250	250	500	
>2–2.5 kg	100	4 mL	2 mL	–	–	34–36 weeks
>2.5–3.5 kg	125	5 mL	2.5 mL	–	–	Birth–1 month
>3.5–5 kg	175	7 mL	3.5 mL	–	–	>1–3 months
>5–7 kg	250	10 mL	5 mL	–	–	>3–6 months
>7–11 kg	375	15 mL	7.5 mL	–	–	>6–18 months
>11–14 kg	500	–	10 mL	2	1	>18 months–3 years

Children > 3 years of age
- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

LoE:I[IV]

Adults
- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

LoE:III[V]

Penicillin allergy:
Children
- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children: 18–35 kg (able to take tablets)
- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

Children > 35 kg and adults
- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

Pain:
Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
- Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL
» Severe pain, fever or vomiting, not responding to treatment after 72 hours (if otoscopy confirmed) or after 24 hours (if otoscopy unconfirmed).
» Recurrent otitis media.
» Painful swelling behind the ear or tenderness on percussion of the mastoid.
» Suspected meningitis.

19.4.3 OTITIS MEDIA, CHRONIC, SUPPURATIVE
H66.3

DESCRIPTION
A purulent discharge from the ear for > 2 weeks. If the eardrum has been ruptured for ≥ 2 weeks, a secondary infection with multiple organisms usually occurs. Oral antibiotic treatment is generally ineffective.
TB is an important cause of a chronically discharging ear in South Africa.
Note:
» A chronically draining ear can only heal if it is dry.
» Drying the ear is time consuming but it is the most effective treatment.
» HIV status should be established in chronic otitis media.

GENERAL MEASURES
» Dry mopping is the most important part of the treatment. It should be

demonstrated to the child's caregiver or patient if old enough.
– Roll a piece of clean absorbent cloth into a wick.
– Carefully insert the wick into the ear with twisting action.
– Remove the wick and replace with a clean dry wick.
– Repeat this until the wick is dry when removed.

» Do not leave anything in the ear.
» Do not instill anything else in the ear.
» Avoid getting the inside of the ear wet while swimming and bathing.
» ConsiderTB as a cause.

REFERRAL

» All sick children, vomiting, drowsy, etc.
» Painful swelling behind the ear.
» Ear discharge still presentfor ≥ 4 weeks.
» Any attic perforation.
» Any perforation not progressively improving after 3 months or closed by 6 months, even if dry.
» Moderate or severe hearing loss.

19.5 SINUSITIS, ACUTE, BACTERIAL

J01.9

DESCRIPTION

Bacterial infection of one or more paranasal sinuses that occurs most often after a viral nasal infection or allergic rhinitis.
Bacterial sinusitis is characterised by:

» Deterioration of a common cold after 5–7 days.
» Purulent nasal discharge, especially if unilateral.
» Pain and tenderness over one or more sinuses.
» Nasal obstruction.
» Occasional fever.

Note: Sinusitis is uncommon in children < 5 years of age, as sinuses are not fully developed.

GENERAL MEASURES

Consider HIV in recurrent sinusitis.

MEDICINE TREATMENT

Children ≤ 3 years of age

- Amoxicillin, oral, 45 mg/kg/dose 12 hourly for 5 days.

Weight kg	Dose mg	Use one of the following:				Age Months/years
		Syrup mg/ 5mL		Capsule mg		
		125	250	250	500	
>2–2.5 kg	100	4 mL	2 mL	–	–	34–36 weeks
>2.5–3.5 kg	125	5 mL	2.5 mL	–	–	Birth–1 month
>3.5–5 kg	175	7 mL	3.5 mL	–	–	>1–3 months
>5–7 kg	250	10 mL	5 mL	–	–	>3–6 months
>7–11 kg	375	15 mL	7.5 mL	–	–	>6–18 months
>11–14 kg	500	–	10 mL	2	1	>18 months–3 years

Children > 3 years of age

- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

LoE:III[VI]

Adults

- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

LoE:I[VII]

Penicillin allergy

Children

- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children: 18–35 kg (able to take tablets)

- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

AND

- Oxymetazoline, nose drops, 2 drops in each nostril 6–8 hourly for not > 5 days continuously.
  - Children: 0.025%
  - Adults: 0.05%

AND/OR

- Sodium chloride 0.9%, nose drops, use frequently and in fairly large volumes.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL
» Fever lasting > 48 hours.
» Poor response > 5 days.
» Complications, e.g. periorbital cellulitis with periorbital swelling.
» Oedema over a sinus.
» Recurrent sinusitis.
» Meningeal irritation.

19.6 TONSILLITIS AND PHARYNGITIS
J03

DESCRIPTION
A painful red throat and/or enlarged inflamed tonsils. Yellow exudates may be present. Tender anterior cervical lymphadenopathy may be present. Viruses are the cause in the majority of cases. However, streptococcal pharyngitis/tonsillitis may cause local suppurative complications as well as rheumatic fever, which can cause serious heart disease.
Antibiotics to eradicate streptococci should be given to patients with pharyngitis/tonsillitis who are at risk for rheumatic fever (3–21 years of age) **unless** one of the following features of viral infection is present (do **not** give antibiotics if these are present):
» runny nose
» cough
» characteristic viral rash
» hoarseness
» conjunctivitis
» diarrhoea
Note: A scarlatiniform (i.e. rough, diffuse, papular) rash suggests streptococcal infection and should be treated with antibiotics.

GENERAL MEASURES
» Homemade salt mouthwash, gargle for 1 minute twice daily:
– 2.5 mL (½ medicine measure) of table salt in 200 mL lukewarm water.
– Do not give to children unable to gargle.
» Advise adequate hydration.
» Avoid irritants e.g. vaporubs inserted into nostrils.

MEDICINE TREATMENT
- Benzathine benzylpenicillin, **IM**, single dose.
  - Children < 30 kg: 600 000 IU.
  - Children ≥ 30 kg and adults: 1.2 MU.
  - Dissolve benzathine benzylpenicillin 1.2 MU in 3.2 mL lidocaine 1% without epinephrine (adrenaline). *LoE:III[VIII]*

OR *LoE:III[IX]*

Children: 18 months–11 years of age
Phenoxymethylpenicillin, oral, 250 mg 12 hourly for 10 days.

Children > 11 years of age and adults
Phenoxymethylpenicillin, oral, 500 mg 12 hourly for 10 days.

LoE:III[X]

Penicillin allergy:

Children > 3 years of age

- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 10 days. See dosing table, pg 22.4.

Children: 18–35 kg (able to take tablets) *LoE:III*[xi]

- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.6.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

For children < 6 years of age

» Soothe the throat, relieve the cough with a safe remedy:
  - Breastmilk. If not exclusively breastfed, give warm water or weak tea: add sugar or honey and lemon if available.

LoE:III[xii]

REFERRAL

» Any suppurative complications, e.g. retropharyngeal or peritonsillar abscess.
» Tonsillitis accompanied by difficulty in opening the mouth (trismus).
» Recurrent tonsillitis (≥ 6 documented episodes/year) for possible tonsillectomy.
» Suspected acute rheumatic fever.
» Suspected acute glomerulonephritis.
» Heart murmurs not previously diagnosed.

---

[i] Budesonide, nasal spray: Contract circular HP07-2014DAI. http://www.health.gov.za/

[ii] Cetirizine, tablets: Contract circular HP09-2014SD. http://www.health.gov.za/

[iii] Acetic acid 2% in alcohol: Kaushik V, Malik T, Saeed SR. Interventions for acute otitis externa. *Cochrane Database Syst Rev*. 2010 Jan 20;(1):CD004740.http://www.ncbi.nlm.nih.gov/pubmed/20091565

Acetic acid 2% in alcohol: Rosenfeld RM, Singer M, Wasserman JM, Stinnett SS. Systematic review of topical antimicrobial therapy for acute otitis externa.*Otolaryngol Head Neck Surg.* 2006 Apr;134(4 Suppl):S24-48.http://www.ncbi.nlm.nih.gov/pubmed/16638474

[iv] Amoxicillin: Updated guideline for the management of upper respiratory tract infections in South Africa: 2014. *SAMJ*- in press.

Amoxicillin: Thanaviratananich S, Laopaiboon M, Vatanasapt P. Once or twice daily versus three times daily amoxicillin with or without clavulanate for the treatment of acute otitis media.*Cochrane Database Syst Rev*. 2013 Dec 13;12:CD004975.http://www.ncbi.nlm.nih.gov/pubmed/24338106

Amoxicillin: Piglansky L, Leibovitz E, Raiz S, et al. Bacteriologic and clinical efficacy of high dose amoxicillin for therapy of acute otitis media in children. *Pediatr Infect Dis J*. 2003;22(5):405–413.http://www.ncbi.nlm.nih.gov/pubmed/12792379

Amoxicillin: Klein JO. Microbiologic efficacy of antibacterial drugs for acute otitis media.*Pediatr Infect Dis J*.1993;12(12): 973–975]. http://www.ncbi.nlm.nih.gov/pubmed/8108222

[v] Amoxicillin: NICD GERMS-SA annual report, 2012.

Amoxcillin: NICD GERMS-SA annual report, 2013.

Amoxcillin: European Committee on Antimicrobial Susceptibility Testing. Amoxicillin: Rationale for the clinical breakpoints, version 1.0, 2010. [Online, 2010][Cited,2014] Available at: http://www.eucast.org

[vi] Amoxicillin: Smith SR, Montgomery LG, Williams JW Jr. Treatment of mild to moderate sinusitis. *Arch Intern Med.* 2012 Mar 26;172(6):510-3. http://www.ncbi.nlm.nih.gov/pubmed/22450938

Amoxicillin: Updated guideline for the management of upper respiratory tract infections in South Africa: 2014. *SAMJ*- in press.

Amoxicillin: Chow AW, Benninger MS, Brook I, Brozek JL, Goldstein EJ, Hicks LA, Pankey GA, Seleznick M, Volturo G, Wald ER, File TM Jr, Infectious Diseases Society of America. IDSA clinical practice guideline for acute bacterial rhinosinusitis in children and adults.*Clin Infect Dis.* 2012 Apr;54(8):e72-e112.http://www.ncbi.nlm.nih.gov/pubmed/22438350

[vii] Amoxicillin: Smith SR, Montgomery LG, Williams JW Jr. Treatment of mild to moderate sinusitis. *Arch Intern Med.* 2012 Mar 26;172(6):510-3. doi: 10.1001/archinternmed.2012.253.http://www.ncbi.nlm.nih.gov/pubmed/22450938

Amoxicillin: Chow AW, Benninger MS, Brook I, Brozek JL, Goldstein EJ, Hicks LA, Pankey GA, Seleznick M, Volturo G, Wald ER, File TM Jr, Infectious Diseases Society of America. IDSA clinical practice guideline for acute bacterial rhinosinusitis in children and adults.*Clin Infect Dis.* 2012 Apr;54(8):e72-e112.http://www.ncbi.nlm.nih.gov/pubmed/22438350

Amoxicillin: Young J, De Sutter A, Merenstein D, van Essen GA, Kaiser L, Varonen H, Williamson I, Bucher HC. Antibiotics for adults with clinically diagnosed acute rhinosinusitis: a meta-analysis of individual patient data. *Lancet.* 2008 Mar 15;371(9616):908-14.http://www.ncbi.nlm.nih.gov/pubmed/18342685 Amoxicillin: Ip S, Fu L, Balk E, Chew P, Devine D, Lau J. Update on acute bacterial rhinosinusitis. *Evid Rep Technol Assess* (Summ) 2005: 1–3.http://www.ncbi.nlm.nih.gov/pubmed/15989375

Amoxicillin: Rosenfeld RM, Singer M, Jones S. Systematic review of antimicrobial therapy in patients with acute rhinosinusitis. *Otolaryngol Head Neck Surg 2007;* 137:S32–45. http://www.ncbi.nlm.nih.gov/pubmed/17761282

Amoxcillin: Falagas ME, Giannopoulou KP, Vardakas KZ, Dimopoulos G, Karageorgopoulos DE. Comparison of antibiotics with placebo for treatment of acute sinusitis: a meta-analysis of randomised controlled trials. *Lancet Infect Dis* 2008; 8:543–52. http://www.ncbi.nlm.nih.gov/pubmed/18718440

Amoxicillin: Ahovuo-Saloranta A, Rautakorpi UM, Borisenko OV, Liira H, Williams JW Jr, Mäkelä M. Antibiotics for acute maxillary sinusitis in adults. *Cochrane Database Syst Rev.* 2014 Feb 11;2:CD000243. http://www.ncbi.nlm.nih.gov/pubmed/24515610

Amoxicillin: NICD GERMS-SA annual report, 2012.

Amoxcillin: NICD GERMS-SA annual report, 2013.

Amoxcillin: European Committee on Antimicrobial Susceptibility Testing. Amoxicillin: Rationale for the clinical breakpoints, version 1.0, 2010. [Online, 2010][Cited,2014] Available at: http://www.eucast.org

[viii] Benzathine benzylpenicillin: Updated guideline for the management of upper respiratory tract infections in South Africa: 2014. *SAMJ*- in press.

Benzathine benzylpenicillin: Chow AW, Benninger MS, Brook I, Brozek JL, Goldstein EJ, Hicks LA, Pankey GA, Seleznick M, Volturo G, Wald ER, File TM Jr, Infectious Diseases Society of America. IDSA clinical practice guideline for acute bacterial rhinosinusitis in children and adults.*Clin Infect Dis.* 2012 Apr;54(8):e72-e112.http://www.ncbi.nlm.nih.gov/pubmed/22438350

[ix] Lidocaine 1%: Amir J, Ginat S, Cohen YH, Marcus TE, Keller N, Varsano I. Lidocaine as a diluent for administration of benzathine penicillin G. *Pediatr Infect Dis J*. 1998 Oct;17(10):890-3. http://www.ncbi.nlm.nih.gov/pubmed/9802630

[x] Phenoxymethylpenicillin: SAMF, 2012.

Phenoxymethylpenicillin: BNF for children, 2011-2012.

[xi] Erythromycin: Updated guideline for the management of upper respiratory tract infections in South Africa: 2014. *SAMJ*- in press.

Erythromycin: Chow AW, Benninger MS, Brook I, Brozek JL, Goldstein EJ, Hicks LA, Pankey GA, Seleznick M, Volturo G, Wald ER, File TM Jr, Infectious Diseases Society of America. IDSA clinical practice guideline for acute bacterial rhinosinusitis in children and adults.*Clin Infect Dis*. 2012 Apr;54(8):e72-e112. http://www.ncbi.nlm.nih.gov/pubmed/22438350

[xii] Breastmilk/ warm water or weak tea: National Department of Health. Integrated Management of Childhood Illnesses Guidelines,2014.http://www.health.gov.za/

Chapter 20: Pain

20.1 PAIN CONTROL

R52.9

DESCRIPTION

Pain is an unpleasant sensation or emotional experience associated with actual or potential tissue injury. It is always subjective. It is affected by the patient's mood, morale and the meaning the pain has for the patient.

Active pain assessment and self-report is the key to effective pain management.

Different pain assessment scales should be used for different ages and intellectual categories of patients.

FLACC SCALE:

For babies and intellectually impaired children the FLACC (face, legs, activity, cry, consolability) scale is easy to use. For use in children < 3 years of age, or older non-verbal children.

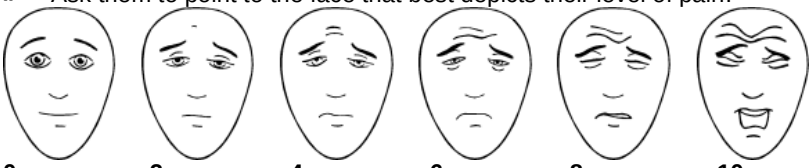
A score of ≥ 4 needs active pain management. Evaluate each item and arrive at a total score/10.

Item	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn disinterested	Frequent to constant frown, clenched jaw, quivering chin
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed, no need to console	Reassured by occasional touching, hugging or “talking to”, distractible	Difficult to console or comfort

REVISED FACES PAIN SCALE

» Use in children >4 years of age.

» Ask them to point to the face that best depicts their level of pain.



0 2 4 6 8 10

Pain should be assessed by:

» duration

» severity, e.g. does the patient wake up because of the pain

» site

» character, e.g. stabbing, throbbing, crushing, cramp like
» persistent or intermittent
» relieving or aggravating factors
» accompanying symptoms e.g. nausea and vomiting, visual disturbances
» distribution of pain
» referred pain

GENERAL MEASURES

» Patient counselling.
» Lifestyle adjustment.

MEDICINE TREATMENT

Mild pain:

Non-opioid treatment.

Non-inflammatory or post trauma:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g, 6 hourly when required.

Pain associated with trauma or inflammation:

Adults

- NSAIDs,
- e.g. Ibuprofen, oral, 400 mg 6–8 hourly with food, to a maximum of 2400 mg daily.
  - Nurse may only prescribe up to 1 200 mg per day.

OR

Adults

If no relief after 2 or 3 doses, combine paracetamol and ibuprofen at the above dosages.

Moderate pain:

If no relief to paracetamol:

ADD

Children

- NSAIDs, e.g.:
- Ibuprofen, oral, 5–10 mg/kg/dose 8 hourly with food. See dosing table, pg 22.5.
  - Discontinue if not effective after 2–3 days. *LoE:III*[1]

If no response to paracetamol or ibuprofen, refer.

Adults

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg 6–8 hourly with food, to a maximum of 2400 mg daily.
  - Nurse may only prescribe up to 1 200 mg per day.

- Discontinue if not effective after 2–3 days.

If still no relief to simple analgesics (paracetamol or ibuprofen):

ADD

- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose. (Doctor initiated)
  - May be increased to a maximum of 400 mg daily.

Acute severe pain:

Children

Refer.

Adults

If no response to therapy options for moderate pain, initiate one of the following:

- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose (Doctor initiated).
  - May be increased to a maximum of 400 mg daily.

AND

- Paracetamol, oral, 1 g, 6 hourly when required.

OR

- Morphine, IM, 10–15 mg, 4–6 hourly when required (Doctor initiated).

OR

- Morphine, IV, 10–15 mg 4–6 hours as required (Doctor initiated).
  - Dilute in 10 mL water for injection or sodium chloride 0.9%.
  - Administer slowly over 4–5 minutes. A dose of 5 mg may provide adequate pain relief in smaller patients.
  - Titrate dose slowly.

Patients requiring morphine for acute pain of unknown cause or pain not responding with 1 dose must be referred for definitive treatment.

Precautions and special comments on the use of morphine

» Morphine may cause respiratory depression. This can be reversed with naloxone. See Section 21.8: Exposure to poisonous substances.

» **Do not administer** morphine in:
  – advanced liver disease
  – severe head injury
  – acute asthma
  – advanced chronic obstructive bronchitis, emphysema or other respiratory disease with imminent respiratory failure
  – untreated hypothyroidism

» Morphine can be used for acute abdominal pain without leading to surgical misdiagnosis.

» **Use** morphine **with extreme care** if there is:
  – recent or concurrent alcohol intake or other CNS depressants
  – hypovolaemia or shock
  – in the elderly

In these circumstances use:

Adults

- Morphine, IV, 10–15 mg 4–6 hours as required (Doctor initiated).

- Dilute IV morphine to 10 mL with water for injection or sodium chloride 0.9%.
- Start with 2-5 mg, thereafter slowly increase by 2 mg every 10 minutes.
- Maximum dose: 10–15 mg depending on body weight.

If morphine has been administered, the time and dose should be clearly documented on the referral letter as this may alter some of the clinical features of acute abdomen or head injury.

REFERRAL

» All children with acute severe pain.
» No response to oral pain control and unable to initiate opioid therapy.
» Uncertain diagnosis.
» Management of serious underlying conditions.

20.2 CHRONIC NON-CANCER PAIN

DESCRIPTION

Pain that is present for more than 4–6 weeks.
It can arise from:
» tissue damage (nociceptive pain), e.g. arthritis, fibromyalgia, lower back pain, pleurisy, cancer pain (discussed below) etc.; or
» injury to nerves (neuropathic pain) e.g. post herpetic neuralgia (pain following shingles), trigeminal neuralgia, diabetic neuropathy, HIV related peripheral neuropathy, drug induced peripheral neuropathy or phantom limb; or
» abnormal nerve activity following disease

Assess pain severity, functional status, medication use including self-medication, co-morbid illnesses, etc.
Actively look for concomitant depression and anxiety/somatoform pain disorders.

GENERAL MEASURES

» Lifestyle adjustments.
» Occupational therapy and physiotherapy as appropriate.
» Address psycho-social problems e.g. stress, anxiety, sleep disturbances.

MEDICINE TREATMENT

The principles are the same as with cancer pain relief. Analgesics should be given by mouth, regularly, in a stepwise manner to ensure adequate relief. Neuropathic pain is best treated with analgesics in addition to tricyclic antidepressants.
It is useful to combine different classes of analgesics for the additive effects, depending on pain severity.

Mild pain:
Adults
- Paracetamol, oral, 1 g, 6 hourly when required.

Pain associated with trauma or inflammation:

Adults

- NSAIDs, e.g.:
- Ibuprofen, oral, 400–800 mg 6–8 hourly with food.
  - Maximum dose: 2 400 mg daily.
  - Discontinue if no improvement after 2–3 days.
  - Nurse may only prescribe up to 1 200 mg per day.

OR

Combine paracetamol and ibuprofen at the above dosages.

Moderate pain:

Adults

If still no relief to simple analgesics (paracetamol and/or ibuprofen), as above

ADD

- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose (Doctor initiated).
  - May be increased to a maximum of 400 mg daily.

Adjuvant therapy:

Adults

In addition to analgesia as above:

- Amitriptyline, oral, 25 mg at night (Doctor initiated).
  - Titrate up to a maximum of 75 mg at night.

Under-recognition of pain and under-dosing of analgesics is common in chronic pain.
Analgesics should be given regularly rather than only when required in patients with ongoing pain.

REFERRAL

» Pain requiring strong opioids.
» Pain requiring definitive treatment for the underlying disease.
» All children.

20.3 CHRONIC CANCER PAIN

R52.9

DESCRIPTION

Cancer pain is usually persistent and progressive. Pain assessment requires training in:

» psycho-social assessment
» assessment of need of type and dose of analgesics
» pain severity assessment

Pain severity and not the presence of pain determine the need for treatment.
Medicinal treatment for pain should never be withheld.
Pain is what the patient says it is.

Under-recognition of pain and under-dosing with analgesics is common in chronic cancer pain.
Analgesics should be given regularly rather than only when required in patients with ongoing pain.

GENERAL MEASURES

» Counselling/hospice care.
» Occupational therapy may be required.
» Management of psycho-social factors.

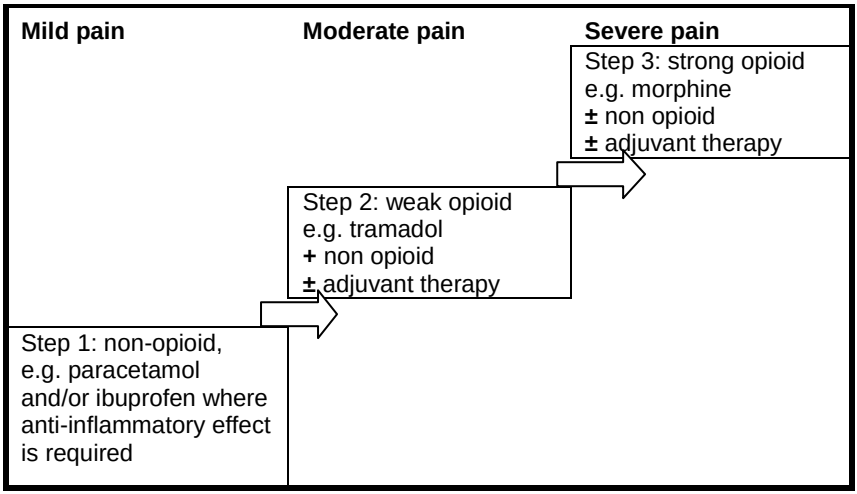
Note:

» Appropriate care is provided from the time of diagnosis.
» Home palliative care is provided by the family or caregiver with the support of health care professionals: It also involves:
  – spiritual care
  – social care
  – cultural care
  – radiation/chemotherapeutic care as appropriate and adjunctive care for emotional pain, nerve root pain, bone pain
  – providing moral support for caregivers

MEDICINE TREATMENT

When pain is not controlled according to step 1 and 2, morphine is the treatment of choice for chronic cancer-related pain. Cancer pain in children is managed by the same principles but using lower doses of morphine than adults.

RECOMMENDED STEPS IN MANAGEMENT OF CANCER PAIN
Adults



Step 1a
Non-opioid

- Paracetamol, oral, 1 g, 6 hourly.

OR

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 6–8 hourly with food.
  - Maximum dose: 2 400 mg daily.
  - Discontinue if no improvement after 2–3 days.
  - Nurse may only prescribe up to 1 200 mg per day.

Step 1b
Combine paracetamol and NSAID.

Step 2
Add weak opioid to Step 1

- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose (Doctor initiated).
  - May be increased to a maximum of 400 mg daily.

Step 3
Paracetamol and/or ibuprofen can be used with morphine in step 3

- Morphine, oral, 4 hourly (Doctor initiated).
  - **Start with** 5–10 mg.

If dosage is established and patient is able to swallow:

- Morphine, long-acting, oral, 12 hourly (Doctor initiated).
  - **Start with** 10–20 mg.

Elderly adults or severe liver impairment: *LoE:III[ii]*

- Morphine solution, oral, 4 hourly. (Doctor initiated)
  - **Start with** 2.5–5 mg.

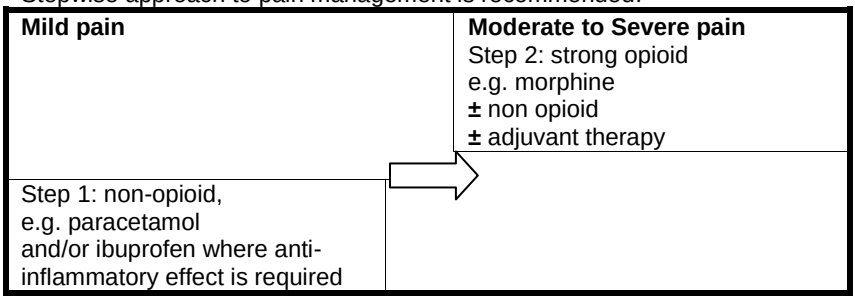
Titrate the dose and dose frequency against the effect on pain.

Note:

» There is no maximum dose for morphine – dose is titrated upward against the effect on pain.
» For the management of morphine overdose, see Section 21.8: Exposure to poisonous substances.

Children

Stepwise approach to pain management is recommended:



LoE:III[III]

Non-opioid

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.
- NSAIDs, e.g.:
- Ibuprofen, oral, 5–10 mg/kg/dose 8 hourly with food. See dosing table, pg 22.5.
  - Where anti-inflammatory effect is required.
  - Can be used in combination with paracetamol or opioids.
  - Discontinue if not effective after 2–3 days.

Opioid

- Morphine, oral, 0.2–0.4 mg/kg/dose 4–6 hourly according to severity of the pain. See dosing table, pg 22.6.

Adjuvant therapy:

Adults

In addition to analgesia as above:

- Amitriptyline, oral, 25 mg at night. (Doctor initiated)
  - Titrate up to a maximum of 75 mg at night.

Significant nausea and vomiting:

Adults

- Metoclopramide oral, 10 mg, 8 hourly as needed.

Constipation:

A common problem due to long-term use of opioids, which can be prevented and should always be treated.

Children

- Lactulose, oral, 0.5 mL/kg/dose once daily. See dosing table, pg 22.5.
  - If poor response, increase frequency to 12 hourly.

Adult

- Lactulose, oral, 10–20 mL once daily.
  - If poor response, increase frequency to 12 hourly.

For pruritus or nausea:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

CAUTION
Do not give an antihistamine to children < 2 years of age.

For anxiety:

Children

- Diazepam, oral, 0.04 mg/kg/dose 8–12 hourly (Doctor initiated).

Weight kg	**Dose** mg	**Tablet** 2 mg	**Age** months/years
>9–17.5 kg	0.5 mg	¼ tablet	>12 months–3 years
>17.5–25 kg	1 mg	½ tablet	>5–7 years
>25–35 kg	1.5 mg	¾ tablet	>7–11 years
>35 kg	2mg	1 tablet	>11 years

  - May be increased to 0.2 mg/kg/dose 8–12 hourly.
  - Beware of respiratory depression if given with morphine.

- Diazepam, oral, 0.2 mg/kg/dose 8–12 hourly (Doctor initiated).
  - Beware of respiratory depression if given with morphine.

Weight kg	**Dose** mg	**Use one of the following tablets:**		**Age** months/years
		2 mg	5 mg	
>9–11 kg	2 mg	1 tablet	–	>12–18 months
>11–14 kg	2.5 mg	–	½ tablet	>18 months–3 years
>14–17.5 kg	3 mg	1½ tablets	–	>5–7 years
>17.5–25 kg	4 mg	2 tablets	–	>5–7 years
>25 kg	5 mg	–	1 tablet	>7 years

Adults

- Diazepam, oral, 2–5 mg every 12 hours for a maximum of two weeks.

Breakthrough pain:

Breakthrough pain is pain that occurs before the next regular dose of analgesics. This is due to an inadequate regular dose.

It is recommended that the full dose equivalent to a 4-hourly dose of morphine be administered for breakthrough pain, but it is important that the next dose of morphine be given at the prescribed time, and not be delayed because of the intervening dose.

The dosage should be titrated upward against the effect on pain in the following way:

» Add up the amount of “breakthrough morphine” needed in 24 hours.

» Divide this amount by 6 (the number of 4 hourly doses in 24 hours).
» The next day increase each dose by that amount.

Example:

Patient gets 10 mg morphine every four hours.
The patient has 3 episodes of breakthrough pain:

3 x 10 mg = 30 mg

30 mg ÷ 6 = 5 mg

The regular 4 hourly dose of 10 mg will be increased by 5 mg
i.e. 10 mg + 5 mg = 15 mg.
The increased morphine dose will be 15 mg 4 hourly.

REFERRAL

» Uncontrolled pain.
» Pain uncontrolled by step 1 if no doctor available.
» Severe emotional or other distress which may aggravate the perception of pain.
» Nausea and vomiting associated with pain in children.

---

[i] Ibuprofen: Paediatric Hospital level STG, 2013.http://www.health.gov.za/
[ii] Morphine, long acting: Adult Hospital level STG, 2012.http://www.health.gov.za/
Morphine, long acting: SAMF 2012, 10th edition.
[iii] Pain ladder (children): World Health Organisation. WHO guidelines on the pharmacological treatment of persisting pain in children with medical illnesses
http://whqlibdoc.who.int/publications/2012/9789241548120_Guidelines.pdf

Chapter 21: Trauma and emergencies

21.18 Anaphylaxis

21.19 Sprains and strains

21.20 Status epilepticus

The following conditions are emergencies and must be treated as such. Medicines used for treatment must be properly secured and recorded (time, dosage, route of administration) on the patient's notes and on the referral letter.

21.1 PAEDIATRIC EMERGENCIES

Certain emergencies of the airway, breathing, circulation and neurological system are dealt with in the respiratory, cardiac and nervous system chapters. This section describes the approach to the severely ill child and selected conditions such as cardiorespiratory arrest, anaphylaxis, shock, foreign body inhalation and burns. All doctors should ensure that they have received appropriate training in at least providing basic (and preferably advanced) life support to children.

The most experienced clinician present should take control of the resuscitation.

21.1.1 RAPID TRIAGE OF CHILDREN PRESENTING WITH ACUTE CONDITIONS IN CLINICS AND CHCs

Triage is the process of rapidly examining all sick children when they first arrive at clinics in order to place them in one of 3 categories (Emergency, Priority, Non-urgent):

EMERGENCIES (conditions which require immediate treatment)
If any emergency sign is present, give emergency treatment(s), call for help, and draw blood for emergency laboratory investigations.

(A&B) Airway and breathing
- » Not breathing

or
- » Obstructed breathing

or
- » Central cyanosis

or
- » Severe respiratory distress

(C) Circulation
- » Cold hands

and
- » Capillary refill ≥3 seconds

and
- » Weak and fast pulse

(C) Coma/convulsing
- » Coma

or
- » Convulsing (now)

(D) Severe dehydration (e.g. in child with diarrhoea)
- » Diarrhoea

plus
- » Any two of:

- Lethargy
- Sunken eyes
- Very slow skin pinch

PRIORITY

Priority signs

These children need prompt assessment and treatment

» **T**iny baby (< 3 months of age)
» High **T**emperature
» **T**rauma or other urgent surgical condition
» **P**allor (severe)
» **P**oisoning (history of)
» **P**ain (severe)
» **R**espiratory distress
» **R**estless, continuously irritable, or lethargic
» **R**eferred for urgent attention
» **M**alnutrition: visible severe wasting
» **O**edema of both feet
» **B**urns (major)

NON-URGENT (queue)

Proceed with assessment and further treatment according to the child's priority.

The Emergency Triage Assessment and Treatment (ETAT) tool, presented above should be a minimum standard of triage in community health centres, district and/or regional hospitals – additional items may be added, suitable to local conditions and resources.

LoE: III[i]

21.2 ANGINA PECTORIS, UNSTABLE

I20.0

See Chapter 4: Cardiovascular conditions.

21.3 MYOCARDIAL INFARCTION, ACUTE (AMI)

I21.9

See Section 4.6 Myocardial infarction, acute (AMI).

21.4 BITES AND STINGS

21.4.1 ANIMAL AND HUMAN BITES

T14.1

Note: Rabies and tetanus are notifiable conditions.

DESCRIPTION

Animal bites may be caused by:

» domestic animals e.g. horses, cows, dogs, cats
» wild animals e.g. jackals, mongooses (meerkats), bats

Animal or human bites may result in:

» wound infection, often due to mixed aerobic and anaerobic infection

» puncture wounds
» tissue necrosis
» transmission of diseases, e.g. tetanus, rabies, HIV, hepatitis, syphilis

NICD hotline for rabies advice: 0828839920

Suspected rabid bite

Any mammal bite can transmit rabies. Rabies incubation period is at least 9–90 days, but could be much longer. In suspected rabies exposure of a person by a domestic animal, observe the suspected rabid animal for abnormal behaviour for 10 days. If the animal remains healthy for 10 days, rabies is unlikely.

Note: If the animal has to be put down, care should be taken to preserve the brain, as the brain is required by the state veterinarian for confirmation of diagnosis. The animal must not be killed by shooting it in the head, as this will damage the brain.

Category	Type of exposure	Management
1	» Touching/feeding of animal. » Licking of intact skin.	» No treatment if history is reliable. » If history not reliable, treat as category 2.
2	» Nibbling of uncovered skin. » Superficial scratch without bleeding.	» Wound management. » Administer full course vaccine. Only stop if animal tested negative for rabies or is still healthy after 10 days observation. » Don't give immunoglobulin, except in immunocompromised patients.
3	» Bites/scratches that penetrate the skin and with any visible blood. » Licking of broken skin or mucous membranes e.g. eyes and mouth. » Bat bites: – Any close contact with a bat: single or multiple bites or scratches and bruising (even with minor bites or unapparent skin penetration). – Direct physical contact with bat saliva or neural tissue; contact of mucous membranes with bat saliva, droppings or urine.	» Wound management. » Administer full course vaccine. » Only stop if animal tested negative for rabies or is still healthy after 10 days observation. » Administer rabies immunoglobulin. » Administer tetanus vaccine. » Prescribe antibiotics.

MEDICINE TREATMENT

Emergency management

Wound management:

Wash wound thoroughly with soap under running water for 5–10 minutes.

- Chlorhexidine 0.05%, solution.

Apply disinfectant if available:

LoE: III

- Povidone-iodine 10%, solution.

CAUTION
Do not suture puncture wounds.
Suture lacerations after thorough cleaning and debridement.
Do not apply compressive dressings.

The following treatment may be commenced in facilities designated by Provincial/Regional Pharmaceutical Therapeutics Committees. If access to rabies vaccine and immunoglobulin is not immediately available refer urgently.

Note: Rabies PEP (post exposure prophylaxis) schedule varies for immunocompromised patients. The degree to which a patient is immunocompromised should preferably be verified by a physician and includes congenital immunodeficiency, HIV infection, leukemia, lymphoma, generalized malignancy, radiation, immunosuppressant medicines e.g. long-term therapy of corticosteroids, etc.

Rabies immunoglobulin: *LoE: III[ii]*

» Only indicated for:
  – Category 3, immunocompetent patients.
  – Category 2 and 3 immunocompromised patients.
  – All bat exposures.
» Available from the nearest district hospital.
» If not immediately available, source and give as soon as possible.

- Rabies immunoglobulin 20 IU/kg.
  - Infiltrate as much as possible in and around the wound and inject the rest IM (not buttock, unless the wound is on the buttock).
  - Follow with a complete course of vaccine.

Rabies vaccination: *LoE:III[iii]*

» Only indicated for category 2 and 3 exposure.
» Available from the nearest district hospital.

Children

- Rabies vaccine, 1 amp, IM anterolateral thigh.
  Day 0 – single dose
  Day 3 – single dose
  Day 7 – single dose
  Day 14 – single dose
  Day 28 – single dose (only if immunocompromised).

Adults *LoE:III[iv]*

- Rabies vaccine, 1 amp, IM deltoid.
  Day 0 – single dose
  Day 3 – single dose
  Day 7 – single dose
  Day 14 – single dose
  Day 28 – single dose (only if immunocompromised).

LoE:III^{V}

CAUTION
Do not administer rabies vaccine into buttocks (gluteus maximus).

Tetanus prophylaxis if not previously immunised within the last 5 years:

- Tetanus toxoid vaccine (TT), IM, 0.5 mL.

Note: In a fully immunised person, tetanus toxoid vaccine or tetanus immunoglobulin may produce an unpleasant reaction, e.g. redness, itching, swelling or fever, but in the case of a severe injury the administration is justified.

Antibiotic treatment (only for category 3 exposure, hand wounds, human bites):

Children

- Amoxicillin/clavulanic acid oral, 15–25 mg/kg/dose of amoxicillin component, 8 hourly for 5 days.

Weight kg	**Dose** mg (amoxicillin component)	**Use one of the following**			**Age** months/years
		Susp 125/31.5 mg/5 mL	**Susp** 250/62.5 mg/5 mL	**Tablet** 250/61.5 mg/tab	
>3.5–5kg	75 mg	3 mL	1.5 mL	–	>1–3 months
>5–7 kg	100 mg	4 mL	2mL	–	>3–6 months
>7–9 kg	150 mg	6 mL	3 mL	–	>6–12 months
>9–11 kg	200 mg	8 mL	4 mL	–	>12–18 months
>11–14 kg	250 mg	10 mL	5 mL	1 tablet	>18 months–3 years
>14–17.5 kg	300 mg	12 mL	6 mL	–	>3–5 years
>17.5–25	375 mg	15 mL	7.5 mL	–	>5–7 years
>25–35 kg	500 mg	20 mL	10 mL	2 tablets	>7–11 years

Children > 35 kg and adults

- Amoxicillin/clavulanic acid, oral, 875/125 mg 12 hourly for 5 days.

Penicillin allergy

Children< 18 kg

- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children 18–35 kg (able to take tablets)

- Macrolide, e.g.:
- Azithromycin, oral, 250mg daily for 3 days.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

AND

Children

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. See dosing table, pg

22.6.

Adults
- Metronidazole, oral, 400 mg, 8 hourly for 5 days.

PREVENTION
» Regular vaccination of domestic cats and dogs.
» Pre-exposure vaccine may be given to those at risk, e.g. occupation, endemic areas, laboratories.

REFERRAL
» Deep and large wounds requiring suturing.
» Shock and bleeding.
» Non-immunised or not fully immunised patients for tetanus immunoglobulin.
» Possible rabies exposure (for immunoglobulin and vaccination).

21.4.2 INSECT STINGS AND SPIDER BITES
T63.2/3/4

DESCRIPTION
Injury from spider bites and stings by bees, wasps, scorpions and other insects. Symptoms are usually local such as pain, redness swelling and itching.

Bees and wasps
» venom is usually mild but may provoke severe allergic reactions such as laryngeal oedema or anaphylaxis (see Section 21.18: Anaphylaxis).

Spiders and scorpions
» most are non-venomous or mildly venomous.

MEDICINE TREATMENT
Emergency treatment:
Treat anaphylaxis. See Section 21.18: Anaphylaxis.

Severe local symptoms:
Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

CAUTION
Do not give an antihistamine to children < 2 years of age.

Adults
- Chlorphenamine, oral, 4 mg, 6–8 hourly.

AND
- Calamine lotion, applied when needed.

Pain:
Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
- Paracetamol, oral, 1 g 6 hourly when required.

Very painful scorpion stings:
- Lidocaine 2%, 2 mL injected around the bite as a local anaesthetic.

REFERRAL
For possible antivenom, if applicable, and intensive care, if necessary.
» Presence of systemic manifestations:
  – weakness
  – drooping eyelids
  – difficulty in swallowing and speaking
  – double vision

Note: Send the spider or scorpion with the patient, if available.

21.4.3 SNAKEBITES
T63.0

DESCRIPTION
Of all the species of snakes found in South Africa, about 12% are considered to be potentially dangerous to humans. However, all snake bites should be considered dangerous until proven otherwise.

South African poisonous snakes can be broadly divided into 3 groups according to the action of their venom although there is significant overlap of toxic effects in some snake venoms.

Cytotoxic venoms
» Venom causes local tissue damage and destruction around the area of bite.
» Bite is painful and symptoms usually start within 10–30 minutes after the bite.
» Examples include:
  – Puff adder
  – Gaboon adder
  – Berg adder
  – Night adder
  – Some dwarf adders and the spitting cobras i.e. Mozambique spitting cobra, black spitting cobra, rinkhals.

Neurotoxic venoms
» Neurotoxic venom causes weakness and paralysis of skeletal muscles and respiratory failure.
» Bite is not as painful as cytotoxic venom bites.
» Symptoms usually start in 15–30 minutes.
» Examples include:
  – Cape cobra
  – Black mamba
  – Black spitting cobra
  – Green mamba
  – Rinkhals
  – Berg adder (Berg adder and rinkhals venom: neurotoxic and cytotoxic)

Haemotoxic venoms
» Venom affects the clotting of blood causing bleeding tendency which may present up to a few days after the bite.

- Boomslang
- Vine snake

Symptoms and signs of snakebite envenomation include:

Local

» Bite marks with or without pain.
» Swelling around the bite, which may be severe with discolouration of skin and/or blister formation.

Systemic

» Nausea, vomiting.
» Sweating and hypersalivation.
» Skeletal muscle weakness, which may cause:
  - drooping eyelids
  - double vision
  - difficulty in swallowing
  - difficulty in breathing
» Shock.
» Rarely bleeding(epistaxis, haematuria, haematemesis or haemoptysis).

CAUTION
Do not apply a tourniquet.
Do not apply a restrictive bandage to the head, neck or trunk.
Do not squeeze or incise the wound.
Do not attempt to suck the venom out.

GENERAL MEASURES

Emergency treatment

Remove clothing from site of the bite and clean the wound thoroughly with chlorhexidine 0.05% solution.

For non-cytotoxic bites only:

» To prevent spread to vital organs, immediately apply a wide crepe bandage firmly from just above the bite site up to 10–15 cm proximal to the bite site.Apply no tighter than for a sprained ankle.
» Immobilise the affected limb with a splint or sling.
» Try to obtain an accurate history e.g. time of the bite, type of snake.
» If no signs and symptoms, observe the patient for 6–8 hours with repeated examinations.
» Absence of symptoms and signs for 6–8 hours usually indicates a harmless bite.
» Observation for 24 hours is recommended.

MEDICINE TREATMENT

Venom in the eyes:

Irrigate the eye thoroughly for 15–20 minutes with water.

- Tetracaine1%, drops (if available), instill 1 drop into the affected eye(s) before irrigation.

Refer patient.

Pain:
- Non-opioid analgesics according to severity. See Section 20.2: Chronic non-cancer pain.

Shock:
Treat if present. See Section 21.17: Shock.

Tetanus prophylaxis:
If not previously immunised within the last 5 years:
- Tetanus toxoid (TT), IM, 0.5 mL.

Note:
» The majority of patients do not need and should not be given antivenom.
» All patients with suspected black mamba bites should receive antivenom, even before onset of symptoms.
» Patients with bites due to other species should receive antivenom only at the onset of any symptoms.
» The dose of antivenom is the same for adults and children.

Criteria for antivenom administration
All patients with systemic signs and symptoms or severe spreading local tissue damage should receive antivenom.
» signs of systemic poisoning (see signs, above)
» spreading local damage
  – swelling of hand/foot within 1 hour of bite (80% of bites are on hands/ feet)
  – swelling extends to elbows or knees within 3–6hours of a bite
  – swelling of the groin or chest at any time or if actively advancing
  – significant swelling of head or neck
  – muscle weakness and/or difficulty in breathing

LoE:III

REFERRAL
» All patients with bites or likely bites even if puncture marks are not seen. If possible, take the dead snake to the referral centre for identification.
» If the patient presents at the clinic with their own antivenom, contact the secondary level hospital for advice.

21.5 BURNS
T30.0

DESCRIPTION
Burns lead to skin and soft tissue injury and may be caused by:
» heat, e.g. open flame, hot liquids, hot steam,
» chemical compounds,
» physical agents, e.g. electrical/lightning) or
» radiation.

The extent and depth may vary from superficial (epidermis) to full-thickness burns of the skin and underlying tissues.
Initially, burns are usually sterile.

Assessment of burns

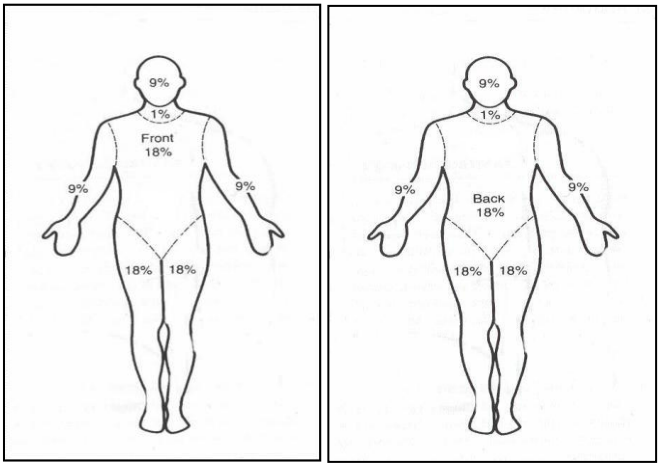
Depth of burn wound	Surface /colour	Pain sensation/healing
Superficial or epidermal	Dry, minor blisters, erythema	» Painful » Heals within 7 days
Partial thickness superficial or superficial dermal	Blisters, moist	» Painful » Heals within 10–14 days
Partial thickness deep or deep dermal	Moist white or yellow slough, red mottled	» Less painful » Heals within a month or more Generally needs surgical debridement and skin graft
Full thickness (complete loss of skin)	Dry, charred whitish, brown or black	» Painless, firm to touch » Healing by contraction of the margins (generally needs surgical debridement and skin graft)

The figures below are used to calculate body surface area %.

These diagrams indicate percentages for the whole leg/arm/head (and neck in adults) not just the front or back.

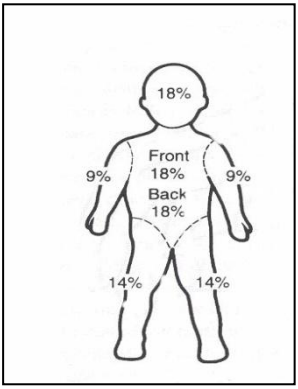
In children the palm of the hand is 1%.

Children 8 years and adults



Published with kind permission from *SAMJ*.South African Burn Society burn stabilisation protocol.JSKarpelowsky, L Wallis, AMaderee and H Rode.*SAMJ*Vol 9, No 8 Page 574–7.

Children < 8 years of age



Child and adult percentages					
Age years	**Head + neck Front + back**	**Torso Front**	**Torso Back**	**Leg + foot Front + back**	**Arm+ hand Front+ back**
<1	18%	18%	18%	14%	9%
1-<2	17%	18%	18%	14.5%	9%
2-<3	16%	18%	18%	15%	9%
3-<4	15%	18%	18%	15.5%	9%
4-<5	14%	18%	18%	16%	9%
5-<6	13%	18%	18%	16.5%	9%
6-<7	12%	18%	18%	17%	9%
7-<8	11%	18%	18%	17.5%	9%
≥ 8	10%	18%	18%	18%	9%

EMERGENCY TREATMENT

» Remove smouldering or hot clothing.
» Remove constrictive clothing/rings.
» To limit the extent of the burn, run cold tap water over the area for 30 minutes after the burn.
» In all burns > 10% or where carbon monoxide poisoning is suspected (enclosed fire, decreased level of consciousness, disorientation) administer high flow oxygen.
» Examine carefully to determine the extent and depth of the burn wounds.
» Respiratory obstruction due to thermal injury/soot inhalation, production of black coloured sputum, shortness of breath, hoarse voice and stridor are serious signals.

MEDICINE TREATMENT

Fluid replacement

Burns ≤ 10% Total Body Surface Area (TBSA):

- Oral fluids.

Burns >10% of TBSA:

- IV fluid for resuscitation.

Calculation of fluid replacement

Fluids in adults

Replacement fluids for burns

» First 24 hours:

- Sodium chloride 0.9%, IV.
  - Calculate total fluid requirement in 24 hours:

    Total % burn x weight (kg) x 4 mL.
  - Give half this volume in the 1st 8 hours.
  - Administer remaining fluid volume in next 16 hours.

LoE:III

Note: If urine output is not adequate, increase fluids for the next hour by 50%. Continue at a higher rate until urine output is adequate, then resume normal calculated rate.

Fluids in children

Replacement fluids for burns

» First 8 hours:

Weight kg	**Fluid volume (mL per hour) for the 1st 8 hours in burns of > 10% seen in PHC clinics while awaiting transfer:** • 0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10mL of 50% dextrose added to each 100mL.			
	Burns percentage of total body area			
	10–20%	>20–30%	>30–40%	>40%
>2–2.5 kg	15	19	23	28
>2.5–3.5 kg	20	25	31	36
>3.5–5 kg	28	36	44	51
>5–7 kg	40	50	62	73
>7–9 kg	53	70	84	100
>9–11 kg	67	85	105	120
>11–14 kg	82	105	125	150
>14–17.5 kg	95	125	155	185
>17.5–25 kg	115	155	190	235
>25–35 kg	147	200	250	310

Avoid circumferential taping when securing infusion lines, as oedema under the eschar may decrease the venous return.

LoE:III[VI]

» Next 16 hours:

Weight kg	**Fluid volume (mL per hour) for the 2nd (next) 16 hours in burns of > 10% seen in PHC clinics if transfer has not been accomplished in the 1st 8 hours:** • 0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.			
	Burns percentage of total body area			
	10–20%	>20–30%	>30–40%	>40%
>2–2.5 kg	12	14	17	19
>2.5–3.5 kg	16	19	22	25
>3.5–5 kg	23	27	31	35
>5–7 kg	33	38	44	49
>7–9 kg	43	50	58	65
>9–11 kg	54	64	72	82
>11–14 kg	64	76	86	97
>14–17.5 kg	75	91	104	118
>17.5–25 kg	91	110	129	148
>25–35 kg	110	138	165	190

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

Severe pain:

See Section 20.2: Chronic non-cancer pain.

Wound cleansing:

» Clean the burn wound gently.

- Sodium chloride 0.9% or clean water.

Burn dressing:

For patients requiring referral:

» If within 12 hours, transfer patient wrapped in clean dry sheet and blankets.

» If delayed by > 12 hours, paraffin gauze dressing and dry gauze on top.

» For full thickness and extensive burns cover with a paraffin gauze occlusive dressing. Cover the dressing with plastic wrap (e.g. cling film).

LoE:III

For patients not requiring transfer (burns that can be treated at home):

» Paraffin gauze dressing.

If infected burn:

- Povidone-iodine 5%, cream, applied daily.

Tetanus prophylaxis:

If not vaccinated within the last 5 years:

- Tetanus toxoid (TT), IM, 0.5 mL.

See Section 21.4.1: Animal and human bites, for detailed indications and

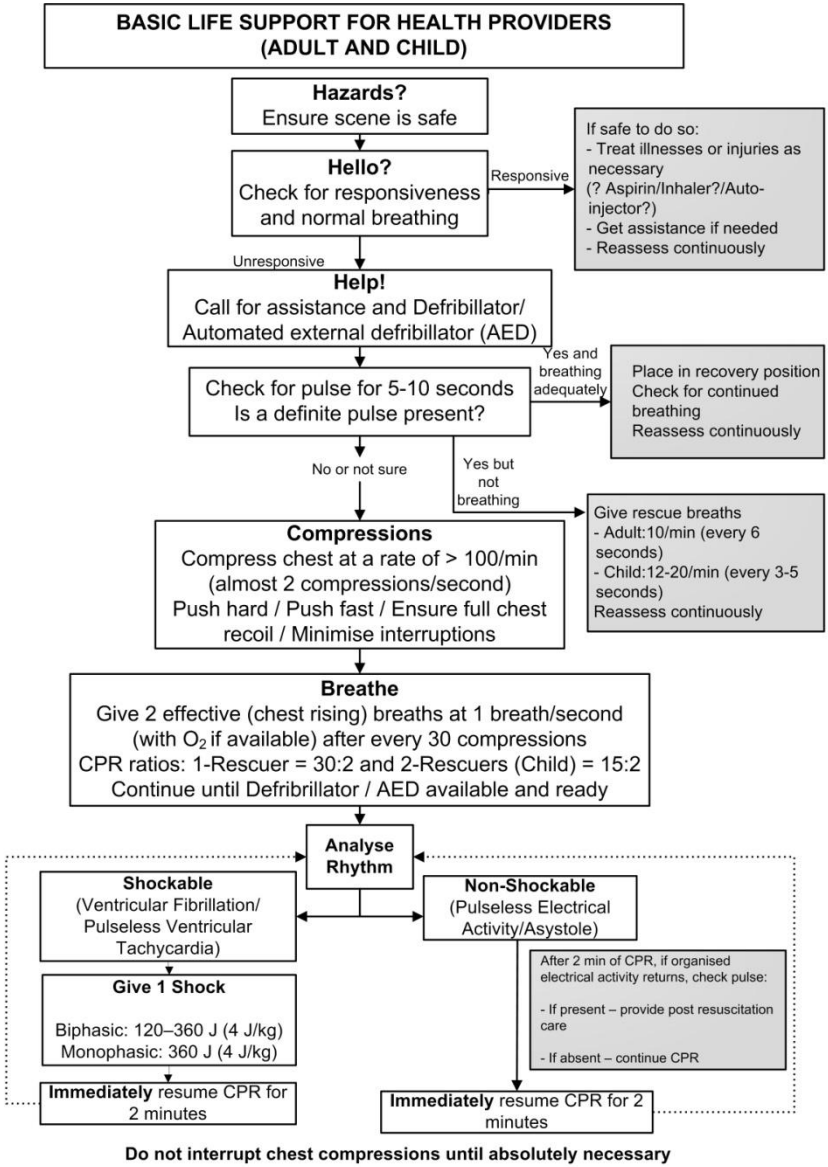
management principles.

REFERRAL

» All children < 1 year of age.
» All burns > 5% in children1–2 years of age.
» Full thickness burns of any size in any age group.
» Partial thickness burns > 10% TBSA.
» Burns of special areas – face, hands, feet, genitalia, perineum and major joints.
» Electrical burns, including lightning injury.
» Chemical burns.
» Inhalation injury – fire or scald injury.
» Circumferential burns of the limbs or chest.
» Burn injury in a patient with pre-existing medical disorders which could complicate management, prolong recovery or affect mortality.
» Any patient with burns and concomitant trauma.
» Suspected child abuse.
» Burns exceeding the capabilities of the referring centre.
» Septic burn wounds.

21.6 CARDIOPULMONARY ARREST –CARDIOPULMONARY RESUSCITATION

I46.9



Published with kind permission from the Resuscitation Council of Southern Africa.
www.reuscitationcouncil.co.za

21.6.1 CARDIAC ARREST, ADULTS

I46.9

DESCRIPTION

Described as the loss of a heart beat and a palpable pulse, irrespective of the electrical activity captured on ECG tracing.
Irreversible brain damage can occur within 2–4 minutes.

Clinical features include:
» sudden loss of consciousness
» absent carotid and all other pulses
» loss of spontaneous respiration

EMERGENCY TREATMENT

» Diagnose rapidly.
» Make a note of the time of starting resuscitation.
» Place the patient on a firm flat surface and commence resuscitation immediately.
» Call for skilled help and an automated external defibrillator (AED) or defibrillator.
» Initiate CAB (Circulation Airways Breathing) sequence of CPR (cardiopulmonary resuscitation).
» A single powerful precordial thump is recommended for witnessed cardiac arrest where a defibrillator is not immediately available.
» Document medication and progress after the resuscitation.

Cardiopulmonary resuscitation

Circulation

» Check for carotid pulse.
» If there is no pulse or you are not sure, start with 30 chest compressions at a rate of at least **100 compressions per minute.**

Airway and **B**reathing

» To open the airway, lift the chin forward with the fingers of the one hand and tilt the head backwards with other hand on the forehead. Do not do this where a neck injury is suspected.
» Insert correctly-sized oropharyngeal airway, if available.

Where neck injury is suspected:

» To open the airway, place your fingers behind the jaw on each side.
» Lift the jaw upwards while opening the mouth with your thumbs “Jaw thrust”.
» If there is no normal breathing, give 2 respirations with bag-valve-mask resuscitator and face mask.
  – The administered breaths must cause visible chest rising in patient. If not, reposition and try again.

Repeat the cycle of 30 compressions followed by 2 respirations for 5 cycles and then re-assess for a pulse.

- Oxygenate with 100% oxygen.

» Initiate IV fluids, if able.

- Sodium chloride 0.9%, IV.

In pulseless tachydysrythmias defibrillate, as indicated.

Call a doctor, if available, without stopping CPR.
Continue until spontaneous breathing and/or heart beat returns.

Immediate emergency medicine treatment:
Epinephrine (adrenaline)is the mainstay of treatment and should be given immediately, IV or endotracheal, when there is no response to initial resuscitation or defibrillation.

- Epinephrine (adrenaline), 1:1 000, 1 mL, IV immediately as a single dose.
  - Flush with 5–10 mL of sterile water or sodium chloride 0.9%.
  - Repeat every 3–5 minutes during resuscitation.

If no IV line is available

- Epinephrine (adrenaline), endotracheal, 1:1 000, 2 mL through endotracheal tube.
  - Flush with 5–10 mL of sterile water or sodium chloride 0.9%.
  - Repeat every 3–5 minutes during resuscitation.

For bradycardia:

- Atropine, IV, 0.5 mg.
  - Repeat after 2–5 minutes if no response.
  - Maximum dose: 3 mg.

Assess continuously until the patient shows signs of recovery.
Consider stopping resuscitation attempts and pronouncing death if:
» further resuscitation is clearly clinically inappropriate, e.g. incurable underlying disease, or
» no success after all the above procedures have been carried out for ≥ 30 minutes and no reversible cause detected.
Consider carrying on for longer especially when:
» hypothermia and drowning
» poisoning or medicine overdose or carbon monoxide poisoning

21.6.2 CARDIOPULMONARY ARREST, CHILDREN

I46.9

For advanced resuscitation training should be undertaken.

SEE FLOW DIAGRAM (Section 21.6: Cardiopulmonary arrest–cardiopulmonary resuscitation).

DESCRIPTION

Cardiopulmonary arrest is the cessation of respiration or cardiac function and in children is usually a pre-terminal event as a result of a critical illness. Resuscitation from cardiac arrest is less often successful in children and it is better to prevent cardiopulmonary arrest by recognising serious illness and managing it appropriately.

The effective treatment of cardiorespiratory arrest in children is the prevention of the arrest by early recognition and management of severe disease. Bradycardia in children is a pre-terminal event and needs to be treated with resuscitation.

Cardiorespiratory arrest in children usually follows poor respiration, poor circulation or poor respiratory effort (e.g. prolonged seizures, poisoning, neuromuscular weakness etc.) If any of the following are present this is evidence of serious disease/impending failure and needs urgent effective management.

	Neurological	Respiratory	Circulatory
Signs of impending failure/severe disease	Decreased level of consciousness or extreme weakness	Increased respiratory rate: > 60	Increased heart rate: > 160 in infants > 120 in children
	Abnormal posture	Marked chest indrawing	Decreased pulse volume
	Pupils –unequal or abnormal size	Grunting	Capillary refill time > 3 seconds
	Presence of convulsions	Flaring nostrils, gasping, shallow or irregular breathing	Poor colour: bluish, grey or marked pallor

Order of resuscitation in Primary healthcare is CAB (Circulation Airway Breathing).

EMERGENCY TREATMENT

» Diagnose the need for resuscitation rapidly.
» Make a note of the time of starting.
» Place the patient on a firm flat surface and commence resuscitation immediately.
» Call for skilled help and resuscitation equipment.
» Initiate CAB (Circulation Airways Breathing) sequence of CPR (Cardiopulmonary Resuscitation).
» Document timings of interventions, medication and any response to these. (Ideally, during resuscitation, one staff member should act as a 'scribe').
» Collect all ampoules used and total them at the end.

Circulation

» Check for signs of life and presence of central pulse for 5–10 seconds. In younger children check brachial or femoral pulse, in older children use brachial or carotid pulse).
» If there is no pulse and no signs of lifegive30 chest compressions at a rate of at least 100 compressions/minute (compress over lower half of sternum and compress chest by approximately $^1/_3$of the anteroposterior diameter of the chest with each compression).Allow chest to recoil before next compression.

Airway

» Manually remove obvious visible obstruction from the mouth.

CAUTION
Do not use blind finger sweeps of the mouth or posterior pharynx as this can impact any obstruction further down the airway.

» In neonates and infants: position the head in neutral position. In children: position in the sniffing position.
» Lift the chin forward with the fingers under the bony tip of the jaw.

» Look, listen and feel for air movement (breathing) to see if the airway is patent.
» **If the child is clearly in cardiac arrest – then proceed to artificially ventilate as quickly as possible**.
» If not sure about air movement and/or it is not good: insert oral artificial airway if necessary and available (airway size – from tip to top of airway should be the distance between the central upper incisors and the tragus [lobe] of the ear). If the child coughs or gags they are probably too alert to tolerate the airway.
» If breathing spontaneously and well, lay the patient on the side to protect the airway and support the patient by bending the uppermost arm and leg. If a foreign body is suspected follow a choking protocol. See Section 21.4.3: Management of suspected choking/foreign body aspiration.
» If neck trauma possible/likely rather do "jaw thrust" manoeuvre: place two or three fingers under the angle of the mandible bilaterally and lift the jaw forwards. During this procedure keep the neck and head stable in the neutral position to protect from cervical spine damage.

Breathing

» If there is **no breathing,** apply artificial respiration:
  – preferably with bag-valve-mask resuscitator
    or
  – mouth-to-nose (covering child's mouth AND nose with your mouth)
    or
  – mouth-to-mouth (occluding nose by pinching child's nostrils)
» Give 2 effective at one breath per second.

Then

» If 2 rescuers are present, carry out cycles of 15 chest compressions followed by 2 respirations.
» If only 1 rescuer present, carry out cycles of 30 compressions to 2 respirations.
» Review after 5 cycles - if pulse is not palpable continue until help arrives.

CAUTION

Cardiac massage is only effective if there is an open airway and the lungs are being filled with air.

• Oxygenate with 100% oxygen, if available.
» Keep patient covered and warm while resuscitating (although the patient should be fully exposed for short periods during examination).
» If there is a pulse but no breathing, ventilate at 12–20 breathes/minute (every 35 seconds).
» Call a doctor, if available, without stopping CPR.

LoE:III

Immediate emergency Drug treatment

» If still no pulse or signs of life after cardiac compressions and ventilations:
• Epinephrine (adrenaline), IV, 0.1 mL/kg of 1:10 000 solution.
  ○ Epinephrine (adrenaline) 1:10 000, (made by diluting 1mL ampoule of epinephrine (adrenaline) 1:1000 with 9mL of sodium chloride 0.9% to give 10mL of 1:10000 solution).

LoE:III[vii]

Weight kg	**Dose** mg	**Volume of diluted solution** (1: 10 000 solution)	**Age** months/years
>2.5–7 kg	0.05 mg	0.5 mL	Birth–6 months
>7–11 kg	0.1 mg	1 mL	>6–18 months
>11–17.5 kg	0.15 mg	1.5 mL	>18 months–5 years
>17.5–25 kg	0.2 mg	2 mL	>5–7 years
>25–35 kg	0.3 mg	3 mL	>7–11 years
>35–55 kg	0.5 mg	5 mL	>11–15 years

Hypoglycaemia in sick children, especially infants

Look for evidence during resuscitation and treat proven hypoglycaemia:

- Dextrose 10%, solution, IV, 2–5 mL/kg.
  - To make 20 mL of 10% dextrose solution: draw 4 mL of 50% dextrose in to a 20 mL syringe and add 16 mL of sodium chloride, 0.9% or water for injections.
  - Do not give unless hypoglycaemic or hypoglycaemia strongly suspected.
  - Do not give excessive volumes.
  - If low blood sugar is treated:
    - re-check blood glucose 10–15minutes later;
    - if still low, give further bolus of dextrose 10%, IV, 2 mL/kg, and commence dextrose 5 or 10%, infusion, 3–5 mL/kg/hour to prevent blood glucose dropping again.

Medicine administration route: *LoE:III*

» **IV** or intraosseous via a drip that flows well.

Initiate IV fluid

- Dextrose 5 or 10%, IV, 3–5 mL/kg/hour until a formal maintenance rate can be calculated.
  - Avoid administration of excessive IV fluid during resuscitation.
  - Use 60 drops per minute IV administration sets for all drips.
  - In arrest due to hypovolaemia, treat according shock protocol (See Section 21.17: Shock).

Assess continuously until the patient shows signs of recovery.

Consider stopping resuscitation attempts and pronouncing death if:

» further resuscitation is clearly clinically inappropriate, e.g. incurable underlying disease; or

» no signs of life are present after 30 minutes of active resuscitation.

However, **carry on** for longer in cases of:

» hypothermia and drowning

» suspected poisoning or medicine overdose or carbon monoxide poisoning

REFERRAL

Transfer all patients on supportive treatment and with an accompanying skilled worker until taken over by doctor at receiving institution.

21.6.3 MANAGEMENT OF SUSPECTED CHOKING/FOREIGN BODY ASPIRATION IN CHILDREN

T17-T18

Choking child

Do not use back blows or chest/abdominal thrusts unless sure that foreign body obstruction is life-threatening, i.e. apparently complete obstruction.

» To clear foreign body in conscious infant with apparently complete obstruction
- 5 back blows
  ↓
- 5 chest/abdominal thrusts
  ↓
- Reassess and repeat if necessary

» In unconscious child
- Perform standard CPR as outlined above.
- Visually check for oral/pharyngeal foreign body before first breaths and intermittently during CPR.

If the child is still **able to breathe**	Transfer urgently to hospital for treatment and accompanied with someone able to treat acute complete choking.
If the child is **able to talk and breathe**	Encourage the child to cough repeatedly while arranging transfer urgently with supervision.
If the child is **not breathing or is in a life-threatening situation with increasing dyspnoea in spite of correct positioning of the head and jaw**	Urgent attempts should be made to dislodge the foreign body. **These should not be done in a child who is able to breathe as in this situation they may make matters worse.**
If the child is **unconscious with no effective air movement**	Initiate full CPR after at least 5 slow rescue breaths and continue with full CPR.
If the child is **conscious but with no effective cough or air movements**	Give 5 back blows, followed by 5 chest/ abdominal thrusts, followed by re-assessment of breathing and then repeated as a cycle until recovery or failure of resuscitation.

Back blows and chest/abdominal thrusts

Infants:

Place the baby along one of the rescuer's arms in a head down position.
Rest the arm along the thigh and deliver 5 back blows to the child.
If this is ineffective turn the baby over and lay it on the rescuer's thigh in the head down position.

Apply 5 chest thrusts – use the lower ½ of the sternum – compress at least $^1/_3$ of the anteroposterior diameter of the chest. If too large to carry out on the thigh this can be done across the lap.

Children:
In children back blows are also used but usually across the lap.
In place of the chest thrust, abdominal thrusts are used (Heimlich manoeuvre) and may be used standing, sitting, kneeling or lying.
For abdominal thrust in the standing, sitting or kneeling position the rescuer moves behind the child and passes his arms around the child's body. One hand is formed into a fist and placed against the child's abdomen above the umbilicus and below the xiphisternum. The other hand is placed over the fist and both hands are thrust sharply upwards into the abdomen towards the chest.
In the lying (supine) position the rescuer kneels astride the victim and does the same manoeuvre except that the heel of one hand is used rather than a fist.
This is repeated 5 times and then the breathing reassessed. If not relieved the cycle of back blows →abdominal thrusts →reassessment is repeated until the relief of obstruction or failure of resuscitation.

21.7 DELIRIUM WITH ACUTE CONFUSION AND AGGRESSION IN ADULTS

F03.91

DESCRIPTION

Delirium is a medical emergency.
Delirium is a sudden onset state of confusion in which there is impaired awareness and memory and disorientation.
Delirium should not be mistaken for psychiatric disorders like schizophrenia or a manic phase of a bipolar disorder. These patients are mostly orientated for time, place and situation, can in a way make contact and co-operate within the evaluation and are of clear consciousness.
There are many possible causes including extracranial causes. Organic or physical illness should also be considered as possible causes.
The elderly are particularly prone to delirium caused by medication, infections, electrolyte and other metabolic disturbances.

Main clinical features are:
» acute onset (usually hours to days)
» impaired awareness
» confusion
» disorientation

Other symptoms may also be present:
» restlessness and agitation
» hallucinations
» autonomic symptoms such as sweating, tachycardia and flushing
» patients may be hypo-active, with reduced responsiveness to the environment
» a fluctuating course and disturbances of the sleep-wake cycle are characteristic
» aggressiveness
» violent behaviour alone occurs in exceptional cases only

Risk factors for delirium include

» extremes of age
» HIV infection
» pre-existing dementia
» cerebrovascular disease
» pre-existing neurological disease e.g. epilepsy
» medicines such as anticholinergics and hypnotics
» substance intoxication and withdrawal

Checklist for diagnosis:

D – Drugs(Intoxication and withdrawal)
I – Infections, e.g. sepsis, pneumonia, urinary tract infections, peritonitis and meningitis
M – Metabolic, e.g. hypoglycaemia, electrolyte abnormalities (e.g. hyponatraemia); organ failure (e.g. liver failure, renal dysfunction), CO_2 narcosis.
T – Trauma
O – Oxygen deficit (including hypoxia, carbon monoxide poisoning)
P – Psychiatric or physical conditions, e.g. severe stressor pain

EMERGENCY TREATMENT

» Calm the patient.
» Manage in a safe environment.
» Treat underlying cause first, e.g. hypoglycaemia, hypoxia, pain etc.

If the delirium is caused by seizures or substance withdrawal, or if communication is difficult

- Diazepam, IV, 10 mg for immediate sedative or hypnotic action.
  - If no response give a 2nd dose.
  - Do not administer at a rate over 5 mg/minute.

OR

Midazolam, IM, 7.5–15 mg immediately.
  - Repeat after 30–60 minutes if needed.

LoE:III[viii]

Switch to oral once containment is achieved.

» Secure airway.
» Exclude hypoglycaemia.
» Monitor for respiratory depression.

If the most likely cause of delirium is a medical disorder and if very restless:

- Haloperidol, IM, 5 mg, immediately.
  - In elderly: 2.5 mg, immediately.
  - If no response give a second dose.

LoE:III[ix]

REFERRAL

Urgent

All cases.

21.8 EXPOSURE TO POISONOUS SUBSTANCES

T65.9

Note: Poisoning from agricultural stock remedies is notifiable.

POISON INFORMATION CENTRES		
Western Cape: (24-hours, every day)	Tygerberg Poison Information Centre	021 931 6129
	Red Cross War Memorial Children's Hospital Poisons Information Service	021 689 5227
Free State: (24-hours, every day)	University of the Free State Poison Control and Medicine Information Centre	082 491 0160
Telephone numbers tested 31 December 2014		

If the above centres cannot be contacted, enquire at the nearest trauma and emergency unit.

DESCRIPTION

Acute poisoning is a common medical emergency. Poisoning may occur by ingestion, inhalation or absorption through skin or mucus membranes. Frequently encountered poisons include:

» analgesics
» anti-epileptic agents
» antidepressants and sedatives
» pesticides
» volatile hydrocarbons, e.g. paraffin
» household cleaning agents
» vitamins and minerals, especially iron in children
» antihypertensive and anti-diabetic agents
» theophylline

Signs and symptoms vary according to the nature of poisoning.

GENERAL MEASURES

» Remove the patient from the source of poison, especially pesticides, e.g. clothing, etc.
» If skin contact has occurred, especially pesticides wash the skin with soap and water, ensuring your safety with protective measures e.g., gloves, gowns, masks, etc.
» Establish and maintain the airway.
» Ensure adequate ventilation and oxygenation.
» Take an accurate history.
  – Obtain collateral information, especially in patients with impaired consciousness.
  – A special effort should be made to obtain tablets, packets, containers, etc. of the suspected agent used in order to identify poisons involved.
» Document and respond to abnormalities of:

- pulse rate
- blood pressure
- respiratory rate
- level of consciousness
- pupillary size and reaction

Ingested poisons

- Activated charcoal.
  - Children: 1 g/kg mixed as a slurry with water. See dosing table, pg 22.1
  - Adults: 100 g mixed as a slurry with water.
  - Only if the patient is fully conscious and able to maintain their airway and if ingestion was within the previous hour prior to presentation.
  - Add water to charcoal and not vice versa.
  - Do not administer orally if the level of consciousness is reduced.

LoE:III[x]

» Activated charcoal should not be given in the case of:
- volatile hydrocarbon poisoning, e.g. paraffin, petrol
- corrosive poisons, i.e. acids or alkalis
- camphor and other convulsants
- metals, e.g. iron, lithium etc
- all alcohols
- paracetamol overdose where oral N-acetylcysteine will be given

» Protect the airway:
- Place in lateral position if decreased level of consciousness.

» Identify the poison and keep a sample of the poison or container.
» Contact the nearest hospital or poison centre for advice.

EMERGENCY MANAGEMENT

» If the patient is unconscious, perform resuscitation. See Section 21.6: Cardiac arrest – cardiopulmonary resuscitation.
» Take a history and identify the nature and route of poisoning.
» Thoroughly wash off any poison from the skin with soap and water and remove contaminated clothes in organophosphate poisoning.

Note: Healthcare workers and relatives should avoid having skin contact with the poison.

Specific antidotes

Hypoxia, especially in carbon monoxide poisoning:

- Oxygen

Organophosphate and carbamate poisoning

» Signs and symptoms of organophosphate poisoning include:
- diarrhoea
- vomiting
- bradycardia
- muscle twitching
- coma
- weakness
- miosis/mydriasis
- confusion
- convulsions
- hypersecretions (hypersalivation, sweating,lacrimation, rhinorrhoea)
- brochospasm and bronchorhoea, causing tightness in the chest, wheezing, cough and pulmonary oedema

» Protect airway if GCS < 8.
» Intubate and ventilate if hypoxia, hypercarbia or decreased respiratory effort.
» Consider inotropic support if resistant hypotension is present.

- Atropine, IV
  - Children: 0.05 mg/kg/dose. See dosing table, pg 22.2.
  - Adults: Initial doses 1 mg, repeat doses are 2–4 mg.
  - Repeat the dose every 10–15 minutes until there is control of bronchial secretions.
  - Refer all patients urgently.
  - Response to a first dose suggests organophosphate poisoning.

Opioid overdose in adults

» Supportive care is the mainstay of treatment.
  – Protect airway if GCS < 8.
  – Intubate and ventilate if decreased respiratory effort.
  – Consider inotropic support if resistant hypotension is present.
  – Naloxone for severe poisoning only(i.e. patients requiring inotropic or ventilatory support) or as a single test dose for uncertain diagnosis.

- Naloxone, IV, 0.4–2 mg immediately.
  - Repeat 0.4 mg every 5 minutes until reversal or pupils dilate.
  - Total effective dose is 10 mg.
  - May be administered endotracheally.
  - Duration of action is short, i.e. 45 minutes.
  - Repeat doses over 24 hours may be required.

» All patients need to be kept under direct observation until the effect of the opiates has completely worn off.
» Further doses of naloxone may be needed while awaiting and during transport as naloxone has a short duration of action.
» In some patients addicted to opioids, naloxone may precipitate an acute withdrawal syndrome after several hours. This must not prevent the use of naloxone.
» Refer all patients.

Paracetamol poisoning *LoE:III*[xi]

All patients should be referred **urgently** for paracetamol blood level and consideration of N-acetylcysteine.

REFERRAL

» All intentional overdoses.
» All symptomatic patients.
» All children in whom toxicity can be expected, e.g. ingestion with:
  – Paracetamol > 6 mL/kg (or 140 mg/kg)
  – anti-epileptics
  – warfarin
  – tricyclic antidepressants
  – sulphonylureas
  – paraffin (unless patient has a normal respiratory rate after 6 hours)

- iron tablets

If in doubt, consult the referral hospital or poison centre.

Note: Send the following to hospital with the patient:

» written information
» a sample of the poison or the empty poison container

21.9 EYE, CHEMICAL BURNS

T26.5

(See Chapter 18: Eye conditions)

21.10 EYE INJURY, FOREIGN BODY

S05.9 / S05.5

(See Chapter 18: Eye conditions)

21.11 HIV PROPHYLAXIS, POST EXPOSURE (PEP)

Z29.2

21.11.1 RAPE AND SEXUAL VIOLATION

T74.2

DESCRIPTION

Sexual offences are of grave concern and in particularly to the most vulnerable persons including women, children and disabled persons.

The definitions of sexual offences are within the Criminal Law (Sexual Offences and Related Matters) Amendment Act, No 32 of 2007.Sexual offences are physically and psychologically damaging to victims, and the ability to consent to a sexual act depends on the competence of the person to give consent and be knowledgeable of the consequences of that act - including the risk of contracting sexually transmitted diseases such as HIV.

GENERAL MEASURES

» Sexual offences victims must be regarded as emergencies but do not displace life-threatening management of other cases.
» Ensure appropriate management is in place for every case. So called “cold cases” (> 72 hours after the incident) may be managed medically and given an appointment for medico-legal investigation.
» If victim wants to open a case, the Family violence, Child protection and Sexual offences Unit (FCS) must be phoned and requested to come to the hospital.
» Cases must be opened in all cases of suspected or alleged rape/sexual abuse in children.

Offer 1st dose of antiretroviral PEP in all cases of suspected rape - the following matters can be resolved in due course:

» Obtain informed consent from the patient and written consent from parent in case of minors before HIV testing and giving treatment.
» Consent for HIV testing in children can be given by:
  - Children who are competent to give consent and are:
    (i) ≥ 12 years of age; or

(ii) < 12 years of age and of sufficient maturity to understand the benefits, risks and social implications of such a test.

- Parents or caregivers of children who are not competent to sign consent (but the child should have this explained to them so they understand what is happening, appropriate to their age and development).
- The clinical head of the institution, where a competent person is not available to give consent for HIV testing and PEP (alleged rape in children is a medical emergency).

» Determine the patient's HIV status before initiating PEP.
- Prophylaxis given to a previously infected HIV person will have no clinical benefit and may lead to the development of viral resistance. Provide counselling and manage accordingly.

» It is the patient's choice to have immediate HIV testing.
- If the patient declines, give a 3–day starter pack of PEP and encourage the patient to reconsider testing within those 3 days.
- **No further PEP will be given in the case of continued refusal of HIV testing in adults, in children where the parent unreasonably refuses PEP this may be taken further.**
- If in doubt about the indications for HIV PEP, give PEP.

» A patient presenting after 72 hours since the alleged incident should not be given PEP, but should be counselled about the possible risk of transmission. *LoE:III*
- HIV testing should still be offered at the time of presentation and 3 months later.

» Perform a pregnancy test in adult and pubertal girls to exclude pregnancy before initiating post exposure contraception and STI prophylaxis.
- Pregnant rape patients should be referred.

» If the HIV Elisa/Rapid test is positive in sexually abused children < 18 months of age, perform HIV PCR to confirm if HIV infection is truly present.

If HIV-uninfected or if the child has no access to immediate HIV PCR results, they should receive prophylaxis (until the HIV PCR result is obtained).

Initial Counselling

Counsel all cases of sexual offences patients and caregivers in the case of children

» Explain the side effects of ARVs, e.g. tiredness, nausea and flu-like symptoms.
» Use condoms for 3 months.
» Avoid blood or tissue donation for 6 months.
» Emphasise the importance of compliance with ARV PEP.
» Provide psychosocial support pertaining to:
- Restoring control of the victim by avoiding secondary traumatisation, and give choices and participation in treatment decisions.
- Medical risks, e.g. transmission of sexually transmitted infections including HIV, syphilis, hepatitis-B and C.
- Risk of pregnancy.
- Psycho-emotional-social effects of the sexual assault according to their level of understanding and maturity.

Follow-up support

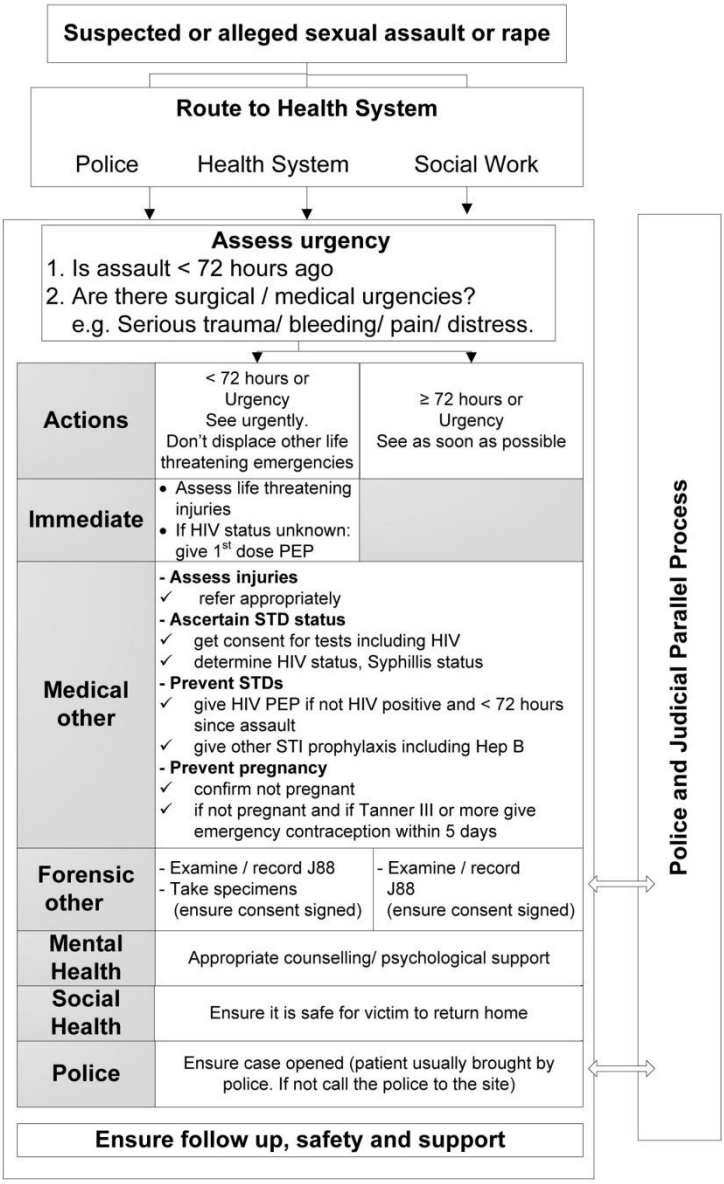
» Discuss issues relating to stress management at subsequent visits.
» Inform the patient of the signs and symptoms of post-traumatic stress, including:
  – general irritability
  – trembling
  – pain in neck and/or lower back
  – change in appetite
  – change in sleep pattern
  – post-traumatic stress syndrome (PTSD), that may eventually cause exhaustion and illness.

Medico-legal assessment of injuries

» Complete appropriate required forms and registers.

Blood tests

» The patient/parent should sign a consent form for both testing and PEP.
» Voluntary rapid HIV testing should be made available and should be done on all opting for PEP.
» Further blood tests should include full blood count RPR test for syphilis and Hepatitis B serology.
» Blood should be taken at presentation and 4 months later for HIV, Hepatitis B and syphilis tests.


Suspected or alleged sexual assault or rape
Route to Health System
Police
Health System
Social Work
Assess urgency
1. Is assault < 72 hours ago
2. Are there surgical / medical urgencies?
e.g. Serious trauma/ bleeding/ pain/ distress.
Actions
< 72 hours or Urgency See urgently. Don't displace other life threatening emergencies
≥ 72 hours or Urgency See as soon as possible
Immediate
• Assess life threatening injuries
• If HIV status unknown: give 1st dose PEP
Medical other
- Assess injuries
✓ refer appropriately
- Ascertain STD status
✓ get consent for tests including HIV
✓ determine HIV status, Syphillis status
- Prevent STDs
✓ give HIV PEP if not HIV positive and < 72 hours since assault
✓ give other STI prophylaxis including Hep B
- Prevent pregnancy
✓ confirm not pregnant
✓ if not pregnant and if Tanner III or more give emergency contraception within 5 days
Forensic other
- Examine / record J88
- Take specimens (ensure consent signed)
- Examine / record J88 (ensure consent signed)
Mental Health
Appropriate counselling/ psychological support
Social Health
Ensure it is safe for victim to return home
Police
Ensure case opened (patient usually brought by police. If not call the police to the site)
Ensure follow up, safety and support
Police and Judicial Parallel Process

MEDICINE TREATMENT

Note:

» Obtain consent for HIV testing from all patients before initiating PEP.
» Offer PEP if the patient presents within 72 hours of being raped and is HIV-uninfected or HIV status is unknown.
» Initiate PEP as soon as possible. Testing can be done up to 3 days after the incident.
» It is important to manage the medical condition before medico-legal examination. Most of these will require referral.
» In children < 18 months of age: antiretroviral PEP should be initiated while awaiting transfer and HIV PCR results.
» Initiate therapy as early as possible after the exposure to maximize the chance of effective prophylaxis. Therapy may be given up to 72 hours after exposure.
» If, for practical reasons, a person cannot return for the 3 day follow up, a 28 day course of ART should be provided.
» Do a pregnancy test in all women and female adolescents prior to post exposure contraception and STI prophylaxis to exclude pregnancy.

HIV PEP

Children

As the body surface area is very difficult to calculate, the following guidelines are provided:

- Zidovudine, oral, 12 hourly for 28 days.
  - Paediatric dose: 180–240 mg/m^2. See dosing table, pg 22.8.
  - Maximum: 300 mg/dose.

AND

- Lamivudine, oral, 4 mg/kg 12 hourly or 8 mg/kg daily for 28 days.
  - Maximum: 150 mg/dose if given 12 hourly or 300 mg/dose if given daily. See dosing table, pg 22.5.

AND

- Lopinavir/ritonavir, oral 12 hourly for 28 days.
  - Paediatric dose: 300/75 mg/m^2. See dosing table, pg 22.6.
  - Maximum: 400/100 mg/dose.

Dosages may vary by ± 1 mg/kg/dose, to allow a convenient volume of medication. Use the adult dosage regimen if children require more than the maximum dose.

Follow up visits should be at 6 weeks and 4 months after the rape. HIV testing should be performed at each of these visits with consent. *LoE:III*[xii]

Adults

- Tenofovir, oral, 300 mg daily for 4 weeks

and

- Emtricitabine, oral, 200 mg daily for 4 weeks

or

Lamivudine, oral, 150 mg 12 hourly for 4 weeks.

OR

- Zidovudine, oral, 300 mg 12 hourly for 4 weeks.

and

- Lamivudine, oral, 150 mg 12 hourly for 4 weeks.

AND

- Atazanavir/ritonavir, oral, 300/100 mg, daily.

OR

Lopinavir/ritonavir, oral, 200/50, 2 tablets 12 hourly.

Tenofovir is contra-indicated in renal disease or with concomitant use of nephrotoxic medicines e.g. aminoglycosides (check baseline creatinine clearance). Where tenofovir is contraindicated, switch to zidovudine. If zidovudine is not tolerated consult or refer for further management.
Lopinavir/ritonavir often causes diarrhoea. If lopinavir/ritonavir is not tolerated switch to atazanavir/ ritonavir.

LoE:III[xiii]

PREVENTION OF HEPATITIS B

Hepatitis-B vaccination

See Section 13.2: Dosage and administration (Chapter 13: Immunisation).

EMERGENCY CONTRACEPTION AFTER PREGNANCY IS EXCLUDED

Do a pregnancy test in all women and female adolescents. Children must be tested and given Emergency contraception from Breast Tanner Stage III, if unsure of staging, give Emergency contraception when you detect any breast development (DO NOT REGARD MENARCHE AS AN INDICATION).

- Levonorgestrel oral, 1.5 mg as a single dose as soon as possible after unprotected intercourse.

LoE:III[xiv]

CAUTION
Tablets must be taken as soon as possible, preferably within 72 hours of unprotected intercourse and not > 5 days later.

An anti-emetic:
Adults

- Metoclopramide oral, 10 mg 8 hourly as needed.

LoE:III

STI PROPHYLAXIS

Adults

- Ceftriaxone, IM, 250 mg as a single dose.
  - For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

AND

- Azithromycin, oral, 1 g, as a single dose.

AND

- Metronidazole, oral, 2 g immediately as a single dose.

LoE:III[xv]

Children
Prior to hospital referral, administer:

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose.** See dosing

table, pg 22.2.
- Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

AND *LoE:III*

Children < 45 kg
- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose as a single dose, and refer. See dosing table, pg 22.4.
  - If transfer is delayed, administer additional doses at 6 hourly intervals.

Children ≥ 45 kg
- Macrolide, e.g.:
- Azithromycin, oral, 1g, as a single dose, and refer.

AND *LoE:III*[xvi]
- Metronidazole, oral, as a single dose, and refer.
  - 1–3 years 500 mg
  - 3–7 years 600–800 mg
  - 7–10 years 1 g
  - > 10 years 2 g

REFERRAL
» All patients with severe physical or psychological injuries.
- **All Children:** All for medico legal and general care assessment after initiation of PEP as outlined above at PHC.
  If uncertain, phone **Childline 0800055555**
- **Adults** with:
  - » Active bleeding
  - » Abdominal pain
  - » Multiple injuries
  - » History of the use of a foreign object

Note: Refer if there are inadequate resources with regard to:
- – counselling
- – laboratory for testing
- – medico-legal examination
- – medicine treatment

21.11.2 OCCUPATIONAL POST-EXPOSURE HIV PROPHYLAXIS FOR HEALTH-CARE WORKERS (HCW)

Z29.2

DESCRIPTION
Exposure to infectious material from HIV sero-positive patients including:

» blood
» CSF
» semen
» vaginal secretions
» synovial, pleural, pericardial, peritoneal, amniotic fluid

The risk of acquiring HIV following occupational exposure is estimated at 0.3%.

There is a higher risk when:
» the injury is deep
» involves a hollow needle
» or when the source patient is more infectious, e.g.:
  – terminal AIDS,
  – seroconversion illness, or
  – known to have a high viral load.

GENERAL MEASURES

Where the source patient is on ARVs or has been on ARVs, start normal prophylaxis and seek expert opinion. An extra blood sample (unclotted - EDTA) of the source patient should be stored in case of need for further viral testing.

Other blood borne infections that can be transmitted include hepatitis B, hepatitis C and syphilis and all source patients should be tested.
Comprehensive and confidential pre-test counselling should be offered.

Test	**Source patient**	**Exposed health care worker** *Only if source patient was positive			
	Baseline	**Baseline**	**2 weeks**	**6 weeks**	**4 months**
HIV	Rapid test **PLUS** HIV ELISA (NHLS test)	Rapid test **PLUS** HIV ELISA (NHLS test)		HIV ELISA (NHLS test)	HIV ELISA (NHLS test)
Hepatitis B	Surface antigen	Surface antibody*			
Hepatitis C	HCV antibody	HCV antibody*		HCV PCR*	
Syphilis	RPR/ TP antibody	RPR/TP antibody*			RPR/TP antibody*
Serum creatinine		If TDF part of PEP	If TDF part of PEP		
FBC		If AZT part of PEP	If AZT part of PEP		

MEDICINE TREATMENT

» Initiate PEP immediately after the injury - within 72 hours.
  – Do not wait for the confirmatory test results on the source patient and health care worker.
» With very high risk exposures, consider initiation of treatment beyond 72 hours.
  – The risks of prophylaxis in this setting may outweigh the benefits.
» Do not consider initiating PEP beyond 7 days after exposure.
» Duration of prophylactic treatment is 4 weeks.

» PEP should not be offered for exposures to body fluids which carry no risk of infection, e.g. vomitus, urine, faeces or saliva.
» PEP is not indicated for health care workers who are HIV-infected.
» PEP is not indicated when the source is HIV sero-negative unless there are features suggesting sero-conversion illness.
  – Continue prophylaxis until the results of additional tests are available.
  – These cases should be discussed with virologists.
» Test for HIV infection at the time of the exposure and then at 6 weeks and 4 months.
» Advise about the need to take precautions, e.g. condom use, to prevent infection of their own sexual partners, should sero-conversion occur.
» Stop PEP if HIV test of the health care worker is positive at the time of the injury.
» Perform full blood count after 2 and 4 weeks on PEP.

When PEP is indicated, the following regimen is recommended:

- Tenofovir, oral, 300 mg daily for 4 weeks

and

- Emtricitabine, oral, 200 mg daily for 4 weeks

or

Lamivudine, oral, 150 mg 12 hourly for 4 weeks.

OR

- Zidovudine, oral, 300 mg 12 hourly for 4 weeks.

and

- Lamivudine, oral, 150 mg 12 hourly for 4 weeks.

AND

- Atazanavir/ritonavir 300/100 mg, oral, daily

OR

Lopinavir/ritonavir 200/50 mg, oral, 2 tablets 12 hourly.

LoE:III[xvii]

PEP is generally not well tolerated. Adverse effects occur in about half of cases and therapy is discontinued in about a third. Nevirapine must never be used for PEP as there is a high risk of severe hepatitis, when given to people without HIV infection.

Tenofovir is contra-indicated in renal disease or with concomitant use of nephrotoxic medicines e.g. aminoglycosides (check baseline creatinine clearance). Where tenofovir is contraindicated, switch to zidovudine. If zidovudine is not tolerated consult or refer for further management.

Lopinavir/ritonavir often causes diarrhoea. If lopinavir/ritonavir is not tolerated switch to atazanavir/ ritonavir.

LoE:III[xviii]

In cases of known antiretroviral resistance consult an expert.

Recommendations for PEP after occupational exposure to infectious material (includes blood, CSF, semen, vaginal secretions and synovial/pleural/ pericardial/ peritoneal/amniotic fluid) from HIV sero-positive patients.

Exposure	HIV Status of source patient	
	Negative	Unknown or Positive
Intact skin	no PEP	no PEP
Mucosal splash/ Non-intact skin	no PEP	PEP
Percutaneous injury	no PEP	PEP

When the source patient is known to be failing ART, modify the PEP regimen:
» If the patient is on zidovudine or stavudine then tenofovir should be used.
» If the patient is on tenofovir then zidovudine should be used.
» If the patient is on efavirenz or nevirapine then lopinavir/ritonavir should be used.

Patients failing second line ART almost always have no resistance to protease inhibitors, so lopinavir/ritonavir should still be effective.
Consultation with a virologist or infectious diseases physician is recommended for advice on which antiretroviral medicines to use for PEP.

REFERRAL

Patients in need of a protease inhibitor.
Note: Refer if there are inadequate resources with regard to:
» counselling
» laboratory for testing
» medico-legal examination
» medicine treatment

21.11.3 INADVERTENT (NON-OCCUPATIONAL) POST EXPOSURE HIV PROPHYLAXIS

Z20.6

DESCRIPTION

Inadvertent (non-occupational) exposure to infectious material from HIV sero-positive persons often requires clinical judgement and includes:
» human bites
» sharing of needles during recreational drug use
» consensual sexual exposure, burst condoms
» contact sports with blood exposure

LoE:III[xix]

Management of inadvertent (non-occupational) HIV exposure is the same as for occupational HIV exposure. See Section: 21.11.2 Occupational post-exposure HIV prophylaxis for healthcare workers (HCW).

21.12 HYPERGLYCAEMIA AND KETOACIDOSIS

E10.1/E11.1
See Section 9.4: Diabetic emergencies

21.13 HYPOGLYCAEMIA AND HYPOGLYCAEMIC COMA

E16.2

DESCRIPTION

Hypoglycaemia is a blood sugar < 3 mmol/L (< 2.6 mmol/L in neonate) and may rapidly cause irreversible brain damage and/or death.

Clinical features include:

- tremor
- sweating
- tachycardia
- dizziness
- hunger
- headache
- impaired concentration
- confusion
- delirium
- coma
- convulsions
- transient aphasia or speech disorders
- irritability

There may be few or no symptoms in the following situations:

- chronically low blood sugar
- patients with impaired autonomic nervous system response, e.g.
  - the elderly
  - very ill
  - those with long-standing diabetes mellitus
  - malnourished
  - treatment with beta-blockers

People at risk of hypoglycaemia:

- neonates with low birth weight or ill or not feeding well
- malnourished or sick children
- shocked, unconscious or convulsing patients
- alcohol binge
- liver disease
- diabetics on treatment

Hypoglycaemia may be a marker of deteriorating renal function.

EMERGENCY TREATMENT

- Obtain blood for glucose determination immediately.
- Establish blood glucose level with glucometers or testing strip.

Conscious patient, able to feed

Adult

- Sweets, sugar, glucose by mouth.

or

- Oral sugar solution.
  - Dissolve 3 teaspoons of sugar (15 g) in a 200 mL cup of water.

Breastfeeding child

- administer breast milk

Older children

- A formula feed of 5 mL/kg.

or

- Oral sugar solution.

- Dissolve 3 teaspoons of sugar (15 g) in a 200 mL cup of water – administer 5 mL/kg

or

- Sweets, sugar, glucose by mouth.

Conscious patient, not able to feed without danger of aspiration

Administer via nasogastric tube:

- Dextrose 10%, 5 mL/kg.
  (add 1 part 50% dextrose water to 4 parts water to make 10% solution)

  or
- Milk.

  LoE:III[xx]

  or
- Sugar solution.
  - Dissolve 3 teaspoons of sugar (15 g) in a 200 mL cup of water – administer 5 mL/kg.

Unconscious patient

Children

- Dextrose 10%, IV, 2–5 mL/kg.
  - 10% solution, e.g. add 1 part 50% dextrose water to 4 parts water for injection to make 10% solution.

IV administration of dextrose in children with hypoglycaemia:

» Establish an IV line - do not give excessive volumes of fluid - usually can keep line open with 2 mL/kg/hour.
» Take a blood sample for emergency investigations and blood glucose.
» Check blood glucose.
  - If low, i.e. < 2.5 mmol/L or if blood glucose testing strips are not available, administer 2 mL/kg of 10% dextrose solution IV rapidly.

  In the majority of cases an immediate clinical response can be expected.
» Recheck the blood glucose after infusion.
  - If still low, repeat 2 mL/kg of 10% dextrose solution.
  - Continue maintenance at 3–5 mL/kg of 5% or 10% dextrose, IV.
» After recovery, maintain with 5–10% dextrose solution until blood glucose is stabilised.
» Feed the child as soon as conscious.
» Investigate the cause e.g. infection.

Adults

LoE:III[xxi]

- Dextrose 50%, IV, 1mL/kg immediately and reassess.
  - Followed with dextrose 10% solution.
  - In the majority of cases an immediate clinical response can be expected.
  - Maintain with 5% dextrose solution after recovery until blood glucose is stabilised.
  - Investigate the cause e.g. infection.

Alcoholics /Malnourished

- Thiamine, IV/IM, 100 mg immediately.

CAUTION
Thiamine should be preferably be administered prior to intravenous glucose to prevent permanent neurological damage.
Do not delay the dextrose administration in a hypoglycaemic patient.

REFERRAL

Urgent

» All hypoglycaemic patients on oral hypoglycaemic agents.
» Hypoglycaemic patients who do not recover completely after treatment.
» All children who have had documented hypoglycaemia (unless the cause is clearly identified and safe management instituted to prevent recurrence).

21.14 INJURIES

T14

DESCRIPTION

Soft tissue injury may present as follows:

» pain only
» traumatic swelling
» bruises with intact skin
» lacerations
» abrasions
» puncture wounds
» underlying crush injury
» other open wounds of varying size and severity

Injury to internal organs must be recognised and referred, including subtle signs of organ damage, e.g.:

» blood in the urine – kidney or bladder damage
» shock – internal bleeding
» blood or serous drainage from the ear or nose – skull base fracture

Referral must not be delayed by waiting for a diagnosis.

Human and animal bites can cause extensive injuries and infection. See Section 21.4.1: Animal and human bites.
An injury causing a sprain or strain may be initially overlooked.
Exclude fractures.
Closed injuries and fractures of long bones may be serious and damage blood vessels. Contamination with dirt and soil complicates the outcome of treatment.

EMERGENCY MANAGEMENT

» Immobilise injured limb.
» Monitor vital signs.
» Monitor pulses below an injury on a limb with swelling.
» Monitor and document neurovascular status, i.e. circulation (capillary refill time) and pin prick sensation at and distal to the injury site.

Wound care

» Remove foreign bodies and clean the wound with normal saline.
» Suture or splint when needed.
» Avoid primary suture if the wound is infected:

- dirty or contaminated
- crushed
- in need of debridement
- projectile inflicted
- caused by bites

MEDICINE TREATMENT

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

Tetanus prophylaxis

If not previously immunised within the last 5 years

- Tetanus toxoid (TT), IM, 0.5 mL.

(See Section 21.4.1: Animal and human bites for detailed indications and management principles for tetanus and rabies post exposure prophylaxis).

Note: In a fully immunised person, tetanus toxoid vaccine might produce an unpleasant reaction, e.g. redness, itching, swelling or fever, but in the case of a severe injury the administration is justified.

REFERRAL

Urgent

» Extensive closed or open wounds.
» Injury to vital structures or internal organs.
» Suspected underlying fracture.
» Sepsis.
» Shock.
» Anaemia.
» Blood in the urine.
» Infants and young children except when the injury is minor.
» Enlarging and/or pulsating swelling.

21.15 NOSE BLEED (EPISTAXIS)

R04.0

DESCRIPTION

Nose bleed may be caused by local or systemic diseases, or local trauma, especially nose picking and occurs from an area anterior and inferior to the nasal septum. Consider other conditions associated with nosebleeds, especially if recurrent, e.g. hypertension and bleeding tendency.

MANAGEMENT

Acute episode

Most bleeding can be controlled by pinching the nasal wings (alae) together for 5–10 minutes. If this fails, insert nasal tampons or BIPP stripping into bleeding nostril(s), if available. Identify the cause.

REFERRAL
» Recurrent nose bleeds.
» Failure to stop the bleeding.

21.16 PULMONARY OEDEMA, ACUTE
J81.0

DESCRIPTION
A life-threatening condition with abnormal accumulation of fluid in the lungs.
Common causes include acute heart failure and acute renal failure (e.g. acute nephritis).
Persons with pulmonary oedema may present similarly to acute bronchospasm.
It is important to distinguish this condition from an acute attack of asthma.

EMERGENCY TREATMENT
Place the patient in a sitting or semi-Fowler's position.
Children
- Oxygen, using a 40% face mask **or** nasal cannula at 2–3 L per minute.
- Furosemide, IV, 1 mg/kg immediately administered slowly over 5 minutes. See dosing table, pg 22.4.
  - Do not put up a drip or run in any IV fluids

Adults
- Oxygen, using face mask to deliver 40% oxygen at a rate of 6–8 L per minute.
- Furosemide, IV, 40 mg. *LoE:III*

If response is adequate follow with:
- Furosemide, IV, 40 mg over 2–4 hours.

If no response within 20–30 minutes:
- Furosemide, IV, 80 mg.
- Morphine 10 mg diluted with 10 mL of water for injection or sodium chloride 0.9%, slow IV (Doctor initiated).
  - Start with 5 mg; thereafter slowly increase by 1 mg/minute up to 10mg.
  - Can be repeated after 4–6 hours if necessary, for pain relief.
  - Beware of hypotension.

AND/OR
- Isosorbide dinitrate, sublingual, 5 mg 4 hourly.
  - Isosorbide dinitrate, sublingual, 5 mg immediately and then repeat once if necessary for pain relief.
  - Do not administer if hypotensive.

Pulmonary oedema due to a hypertensive crisis:
ADD
To treat hypertension
- ACE-inhibitor,e.g.
- Enalapril 10 mg, oral, as a single dose and refer.

LoE:III

REFERRAL

Urgent

All cases. Continue oxygen during transfer.

21.17 SHOCK

R57.9

DESCRIPTION

Shock is a life-threatening condition characterised by any evidence of inadequate organ perfusion.

Signs and symptoms of shock in adults

- Low blood pressure (systolic BP < 80 mmHg) is the key sign of shock.
- Weak and rapid pulse
- Rapid shallow breathing
- Low urine output
- Restlessness and altered mental state
- Weakness

Signs and symptoms of shock in children

Shock must be recognised while still in the compensated state to avoid irreversible deterioration. Therefore, the following are primarily assessed in children:

1. Prolonged capillary filling (> 3 seconds).
2. Decreased pulse volume (weak thready pulse).
3. Increased heart rate (> 160 beats/minute in infants, > 120 beats/minute in children).
4. Decreased level of consciousness (poor eye contact).
5. Rapid breathing.
6. Blood pressure. Decreased blood pressure and decreased urine output are late signs of shock and can be monitored. The other signs mentioned above are more sensitive in detecting shock, before irreversible.

Normotensive BP values in children:

Age	Systolic 5% percentile* mm Hg	MAP 5% percentile** mm Hg
28 weeks	–	28
30 weeks	–	30
32 weeks	–	32
34 weeks	–	34
36 weeks	–	36
38 weeks	–	38
40 weeks	–	40
1–11 months	–	41
1 year	67	42
2 years	69	43
3 years	71	45
4 years	73	46
5 years	75	48
6 years	77	49
7 years	79	51
8 years	81	52
9 years	83	54

10 years	85	55
11 years	87	57
12 years	89	58
13 years	91	60
14 years	93	61
15 years	95	63

* Adapted from calculation as found in "Analysis of the evidence for the lower limit of systolic and mean arterial pressure in children" I Haque, A Zaritsky, *PediatrCrit Care Med* 2007 Vol. 8, No. 2.
[SBP 5th percentile at 50th height percentile = (2 x age in years) + 65]

** 1 month–15 years adapted from calculation as found in "Analysis of the evidence for the lower limit of systolic and mean arterial pressure in children" I Haque, A Zaritsky, *PediatrCrit Care Med* 2007 Vol. 8, No 2.
[MAP 5th percentile at 50th height percentile = 1.5 x age in years) + 40]

** Neonatal estimate by Gestational Age from "Is blood pressure measurement important in children?" Mogane P, *S AfrFamPract* 2013;55(3)(Suppl 1):S36-S39 – and common practice

Note: BP values in this table have been simplified for practical use at primary level of care.

Types of shock		**Additional symptoms**
» Hypovolaemic shock	– Most common type of shock – Primary cause is loss of fluid from circulation due to haemorrhage, burns, diarrhoea, etc.	Weak thready pulse, cold and clammy skin.
» Cardiogenic shock	– Caused by the failure of heart to pump effectively e.g. in myocardial infarction, cardiac failure, etc.	Distended neck veins, weak or absent pulses.
» Septic shock	– Caused by an overwhelming infection, leading to vasodilation.	Elevated or decreased body temperature.
» Neurogenic shock	– Caused by trauma to the spinal cord, resulting in sudden decrease in peripheral vascular resistance and hypotension.	Warm and dry skin.
» Anaphylactic shock	– Caused by severe allergic reaction to an allergen, or medicine.	Bronchospasm, angioedema and/or urticaria.

EMERGENCY TREATMENT

Treatment depends on the type of shock. Intravenous fluid therapy is important in the treatment of all types of shock except for cardiogenic shock and septic shock after fluid challenge. Prompt diagnosis of underlying cause is essential to ensure optimal treatment.

» Maintain open airway.
» Administer face mask oxygen and if needed after intubation with assisted ventilation.
» Check for and manage hypoglycaemia.

Fluid challenge in adults with suspected septic shock:

- Sodium chloride 0.9%, IV, 500 mL over 30 minutes.
  - Assess blood pressure and pulse rate response. Response is defined by a good urine output and adequate cerebral perfusion rather than an absolute blood pressure value.
  - If there is a positive response, then continue with intravenous fluid. Avoid over hydrating as this could exacerbate hypoxia associated with adult respiratory distress syndrome.
  - If no haemodynamic response to fluid challenge, suspect septic shock.

LoE:III[xxii]

Fluid replacement (Not for cardiogenic shock):

Adults

- Sodium chloride 0.9%, IV, 1 L as a rapid bolus.
  - Repeat bolus until blood pressure is improved.

Children

- Sodium chloride 0.9%, IV, 20 mL/kg as a rapid bolus.
  - Repeat bolus if no adequate response.

Note:

» Do not administer IV fluids in case of cardiogenic shock but maintain IV access.
» If patient develops respiratory distress, discontinue fluids.

Septicaemia in children:

All children with shock, which is not obviously due to trauma or simple watery diarrhoea, should in addition to fluid resuscitation, receive antibiotic cover for probable septicaemia.

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose.** See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

REFERRAL

Urgent

All patients, after resuscitation.

21.18 ANAPHYLAXIS

T78.2

DESCRIPTION

A very severe allergic reaction that usually occurs within seconds or minutes after exposure to an allergen, but may be delayed for up to 1 hour. The reaction can be short-lived, protracted or biphasic, i.e. acute with recurrence several hours later. Immediate reactions are usually the most severe and/or life-threatening.

Clinical features include:

» Acute onset of signs and symptoms.
» Urticaria (hives) or angioedema.
» Bronchospasm, wheezing, dyspnoea, chest tightness.
» Laryngeal oedema with upper airway obstruction or stridor.
» Gastrointestinal symptoms such as nausea, vomiting, diarrhoea.
» Hypotension and/or shock.
» Dizziness, paraesthesia, syncope, sweating, flushing, dysrhythmias.

EMERGENCY TREATMENT

» Resuscitate (CAB) immediately (See Section 21.5: Cardiac arrest – cardiopulmonary resuscitation).
» Place hypotensive or shocked patient in horizontal position. Do NOT sit the patient up.
» Severe anaphylaxis: administer oxygen by facemask at high flow rate of 15 L/min.

MEDICINE TREATMENT

Epinephrine (adrenaline) is the mainstay of treatment and should be given immediately.

- Epinephrine (adrenaline), 1:1000, IM, 0.01 mL/kg as a single dose.
  - Children: 1:1000, IM, 0.01 mL/kg as a single dose. See dosing table, pg 22.3.
  - Adults: 1:1000, **IM**, 1 mg (1 mL) as a single dose, into the lateral thigh.
  - **Repeat in 5 minutes if no improvement.**
- Hydrocortisone IM/slow IV, immediately.
  - Children: Hydrocortisone, slow IV, 4–6 mg/kg immediately. See dosing table, pg 22.5.
  - Adults: IM/slow IV, 100 mg immediately.
- Promethazine IM/slow IV.
  - Children > 2 years: 0.25 mg/kg. See dosing table, pg 22.7.
  - Adults: 25–50 mg.

REFERRAL

All patients.

Note: Epinephrine (adrenaline) administration may have to be repeated due to its short duration of action. Close observation during transport is essential.

21.19 SPRAINS AND STRAINS

T14.3

DESCRIPTION

Soft tissue injuries.

Clinical features include:

» pain, especially on movement
» tenderness on touch
» limited movement
» history of trauma

May be caused by:

» sport injuries
» slips and twists
» overuse of muscles
» abnormal posture

Note: In children always bear non-accidental injuries (assault) in mind.

EMERGENCY TREATMENT

Immobilise with firm bandage and/or temporary splinting.

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

AND

Children > 12 years of age and adults

- Ibuprofen, oral, 200–400 mg 8 hourly with or after a meal.

REFERRAL

» Severe progressive pain.
» Progressive swelling.
» Extensive bruising.
» Deformity.
» Joint tenderness on bone.
» No response to treatment.
» Severe limitation of movement.
» Suspected serious injury.
» Recurrence.
» Previous history of bleeding disorder.

21.20 STATUS EPILEPTICUS

G41.9

For initial treatment of seizures see Section 15.2: Seizures.

DESCRIPTION

This is a medical emergency andhas the potential for causing high mortality.

Status epilepticus is a series of seizures follow one another lasting > 30 minutes with no intervening periods of recovery of consciousness. The seizure may be generalised or partial, convulsive or non-convulsive.

Do not wait for established status epilepticus to terminate convulsions. Convulsions lasting > 5 minutes should be terminated.

GENERAL MEASURES

» Place the patient in a lateral (recovery) position.
» **Do not** place anything (spoon or spatula etc) in the patient's mouth.
» Do not try to open the patient's mouth.
» Maintain airway.
» Assist respiration and give high flow oxygen.
» Prepare for intubation if sufficiently skilled in the procedure and relevant rescue devices are available.
» Check blood glucose (exclude hypoglycaemia).
» Monitor vital signs every 15 minutes.
» Establish an IV line.

MEDICINE TREATMENT

Children < 12 years of age

- Midazolam, buccal, 0.5 mg/kg/dose as a single dose. See dosing table, pg 22.6.
  - Use midazolam for injection 5 mg in 1 mL undiluted.
  - Draw up the required volume in a 5 mL syringe.
  - Remove needle then administer midazolam into the buccal cavity (between gum and cheeks).
  - **Note**: Buccal midazolam should not be used in infants < 6 months of age.

OR *LoE:II*[xxiii]

- Diazepam, rectal, 0.5 mg/kg/dose as a single dose. See dosing table, pg 22.3.
  - Use diazepam for injection 10mg in 2 mL undiluted.
  - Draw up the required volume in a 2 mL syringe.
  - Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
  - Remove syringe and hold buttocks together to minimise leakage.
  - Maximum dose: 10 mg in 1 hour.
  - May be repeated after 10 minutes if convulsions continue.
  - Expect a response within 1–5 minutes.

If no response after one dose of midazolam or two doses of diazepam, and if the convulsion has lasted more than 20 minutes: *LoE:I*[xxiv]

ADD

- Phenobarbital, oral, crushed and given by nasogastric tube, 20 mg/kg as a single dose. See dosing table, pg 22.7.

Adults

- Midazolam, IM, 10 mg as a single dose.

OR *LoE:I*[xxv]

Diazepam, slow IV, 10–20 mg.
  - Administer at a rate not exceeding 2 mg/minute.
  - Repeat within 10–15 minutes if needed.
  - Maximum dose: 30 mg within 1 hour.
  - Expect a response within 1–5 minutes.

CAUTION
Avoid diazepam IM since absorption is slow and erratic.
Do not mix with other medicines.

REFERRAL

Urgent

Seizures that cannot be controlled.

Non-urgent

All patients once stabilised. Clinical notes including detail on medication given should accompany patients.

---

[i] Rapid triage of children presenting with acute conditions: Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[ii] Immunocompromised patients: Recommendations of the Advisory Committee on Immunization Practices (ACIP):use of vaccines and immune globulins for persons with altered immunocompetence. *MMWR Recomm Rep.* 1993 Apr 9;42(RR-4):1-18. http://www.ncbi.nlm.nih.gov/pubmed/8474421

[iii] Rabies immunoglobulin: WHO. WHO Guide for rabies pre and post exposure prophylaxis in humans, 2013. http://www.who.int/rabies/WHO_Guide_Rabies_Pre_Post_Exposure_Prophylaxis_Humans_2013.pdf

[iv] Rabies vaccine – immunocompetent patients: World Health Organization. WHO Expert Consultation on Rabies.2nd report. WHO Technical Report Series, No. 982. Geneva, Switzerland: World Health Organization; 2013. http://www.who.int/neglected_diseases/support_to_rabies_elimination_2013/en/

Rabies vaccine – immunocompetent patients: Rupprecht CE, Briggs D, Brown CM, Franka R, Katz SL, Kerr HD, Lett SM, Levis R, Meltzer MI, Schaffner W, Cieslak PR; Centers for Disease Control and Prevention (CDC). Use of a reduced (4-dose) vaccine schedule for post exposure prophylaxis to prevent human rabies: recommendations of the advisory committee on immunization practices. MMWR Recomm Rep. 2010 Mar 19;59(RR-2):1-9. Erratum in:MMWRRecomm Rep. 2010 Apr 30;59(16):493. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5902a1.htm

Rabies vaccine – immunocompetent patients: Rupprecht CE, Briggs D, Brown CM, Franka R, Katz SL, Kerr HD, Lett S, Levis R, Meltzer MI, Schaffner W, Cieslak PR. Evidence for a 4-dose vaccine schedule for human rabies post-exposure prophylaxis in previously non-vaccinated individuals. *Vaccine*. 2009 Nov 27;27(51):7141-8. http://www.ncbi.nlm.nih.gov/pubmed/19925944

Rabies vaccine – immunocompetent patients: Bahmanyar M, Fayaz A, Nour-Salehi S, Mohammadi M, Koprowski H. Successful protection of humans exposed to rabies infection. Post exposure treatment with the new human diploid cell rabies vaccine and antirabies serum. *JAMA* 1976;236:2751–4.http://www.ncbi.nlm.nih.gov/pubmed/1036566

Rabies vaccine – immunocompetent patients: Kuwert EK, Werner J, Marcus I, Cabasso VJ. Immunization against rabies with rabies immune globulin, human (RIGH) and a human diploid cell strain (HDCS) rabies vaccine. *J Biol Stand* 1978;6:211–9. http://www.ncbi.nlm.nih.gov/pubmed/721838

Rabies vaccine – immunocompetent patients: Aoki FY, Rubin ME, Friesen AD, Bowman JM, Saunders JR. Intravenous human rabies immunoglobulin for post-exposure prophylaxis: serum rabies neutralizing antibody concentrations and side-effects. *J Biol Stand* 1989;17: 91–104. http://www.ncbi.nlm.nih.gov/pubmed/2646301

Rabies vaccine – immunocompetent patients: Aoki FY, Rubin ME, Fast MV. Rabies neutralizing antibody in serum of children compared to adults following post-exposure prophylaxis. *Biologicals*1992;20:283–7. http://www.ncbi.nlm.nih.gov/pubmed/1305405

Rabies vaccine – immunocompetent patients: Seghal S, Bhattacharya D, Bhardwaj M. Five-year longitudinal study of efficacy and safety of purified Vero cell rabies vaccine for post-exposure prophylaxis of rabies in Indian population. *J Commun Dis* 1997;29:23–8. http://www.ncbi.nlm.nih.gov/pubmed/9282525

Rabies vaccine – immunocompetent patients. Lang J, Gravenstein S, Briggs D, Miller B, Froeschle J, Dukes C, Le Mener V, Lutsch C. Evaluation of the safety and immunogenicity of a new, heat-treated human rabies immune globulin using a sham, post-exposure prophylaxis of rabies.*Biologicals*. 1998 Mar;26(1):7-15.. http://www.ncbi.nlm.nih.gov/pubmed/9637744

Rabies vaccine – immunocompetent patients: Jones RL, Froeschle JE, Atmar RL, Matthews JS, Sanders R, Pardalos J, Moeller L, Chin JE, Famula M, Briggs DJ, Lang J. Immunogenicity, safety and lot consistency in adults of a chromatographically purified Vero-cell rabies vaccine: a randomized, double-blind trial with human diploid cell rabies vaccine. *Vaccine*.2001 Sep 14;19(32):4635-43. http://www.ncbi.nlm.nih.gov/pubmed/11535311

Rabies vaccine – immunocompetent patients: Briggs DJ, Banzhoff A, Nicolay U, Sirikwin S, Dumavibhat B, Tongswas S, Wasi C. Antibody response of patients after postexposure rabies vaccination with small intradermal doses of purified chick embryo cell vaccine or purified Vero cell rabies vaccine. *Bull World Health Organ*. 2000;78(5):693-8.http://www.ncbi.nlm.nih.gov/pubmed/10859864

Rabies vaccine – immunocompetent patients: Bakker AB, Python C, Kissling CJ, Pandya P, Marissen WE, Brink MF, Lagerwerf F, Worst S, van Corven E, Kostense S, Hartmann K, Weverling GJ, Uytdehaag F, Herzog C, Briggs DJ, Rupprecht CE, Grimaldi R, Goudsmit J. First administration to humans of a monoclonal antibody cocktail against rabies virus: safety, tolerability, and neutralizing activity. *Vaccine*. 2008 Nov 5;26(47):5922-7.. http://www.ncbi.nlm.nih.gov/pubmed/18804136

Rabies vaccine – immunocompetent patients: Wilde H. Failures of post-exposure rabies prophylaxis. Vaccine. 2007 Nov 1;25(44):7605-9. http://www.ncbi.nlm.nih.gov/pubmed/17905484

Rabies vaccine – immunocompetent patients: Centers for Disease Control and Prevention. Recommendations of the Advisory Committee on Immunization Practices (ACIP): Use of vaccines and immune globulins in persons with altered immunocompetence.

MMWR 1993;42(No. RR-5): 1-18. Use of vaccines and immune globulins in persons with altered immunocompetence. http://www.cdc.gov/mmwr/pdf/rr/rr4204.pdf

[v] Rabies vaccine – immunocompromised patients: World Health Organization. WHO Expert Consultation on Rabies.2nd report. WHO Technical Report Series, No. 982. Geneva, Switzerland: World Health Organization; 2013. http://www.who.int/neglected_diseases/support_to_rabies_elimination_2013/en/

- Rabies vaccine – immunocompromised patients: Rupprecht CE, Briggs D, Brown CM, Franka R, Katz SL, Kerr HD, Lett SM, Levis R, Meltzer MI, Schaffner W, Cieslak PR; Centers for Disease Control and Prevention (CDC). Use of a reduced (4-dose) vaccine schedule for post exposure prophylaxis to prevent human rabies: recommendations of the advisory committee on immunization practices. *MMWR Recomm Rep*. 2010 Mar 19;59(RR-2):1-9. Erratum in: *MMWR Recomm Rep*. 2010 Apr 30;59(16):493. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5902a1.htm

[vi] Replacement fluid in children: Stander M, Wallis LA.The emergency management and treatment of severe burns.*Emerg Med Int*. 2011;2011:161375. http://www.ncbi.nlm.nih.gov/pubmed/22046536

Replacement fluid in children: Meyers RS. Pediatric fluid and electrolyte therapy.*J PediatrPharmacolTher.* 2009 Oct;14(4):204-11. http://www.ncbi.nlm.nih.gov/pubmed/23055905

[vii]Epinephrine (adrenaline): Paediatric Hospital level STG, 2013. http://www.health.gov.za/

[viii] Diazepam; midazolam: Primary Healthcare STG, 2014: Chapter 16 Mental health conditions. http://www.health.gov.za/

[ix] Haloperidol: SAMF 10th edition, 2012.

[x]Activated charcoal: Adult hospital level STG, 2012. http://www.health.gov.za/

[xi]Opioid overdose in adults: Adult hospital level STG, 2012. http://www.health.gov.za/

[xii]IV PEP for children (rape):WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, June 2013; March 2014 and December 2014 supplements.http://www.who.int/hiv/pub/guidelines/arv2013/en/

[xiii]HIV PEP for adults (rape):WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, June 2013; March 2014 and December 2014 supplements.http://www.who.int/hiv/pub/guidelines/arv2013/en/

[xiv]Levonorgestrel 1.5 mg: Contract circular HP03-2013FP. http://www.health.gov.za/

[xv]STI prophylaxis for adults:Primary Healthcare STG, 2014: Chapter 12Sexually transmitted infections. http://www.health.gov.za/

[xvi] Erythromycin (children): Workowski KA, Berman S; Centers for Disease Control and Prevention (CDC). Sexually transmitted diseases treatment guidelines, 2010.*MMWR Recomm Rep*. 2010 Dec 17;59(RR-12):1-110. Erratum in: *MMWR Recomm Rep.* 2011 Jan 14;60(1):18. Dosage error in article text. http://www.cdc.gov/std/treatment/2010/

Azithromycin (children): Workowski KA, Berman S; Centers for Disease Control and Prevention (CDC). Sexually transmitted diseases treatment guidelines, 2010.*MMWR Recomm Rep*. 2010 Dec 17;59(RR-12):1-110. Erratum in: *MMWR Recomm Rep.* 2011 Jan 14;60(1):18. Dosage error in article text. http://www.cdc.gov/std/treatment/2010/

[xvii]HIV PEP for adults (rape):WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, June 2013; March 2014 and December 2014 supplements.http://www.who.int/hiv/pub/guidelines/arv2013/en/

[xviii]HIV PEP for healthcare workers (occupational PEP HIV prophylaxis): National Department of Health. National consolidated guidelines for the prevention of mother-to-child transmission of HIV (PMTCT) and the management of HIV in children, adolescents and adults, 2014. http://www.health.gov.za/

[xix]Non-occupational PEP: South African HIV Clinician Society. Post-exposure prophylaxis guidelines. *The S A Jr of HIV Med,* Winter 2008.[Online] Available at: http://www.sahivsoc.org/upload/documents/guidelines_nov_2008.pdf

[xx] Dextrose 10% (conscious patient): Adult hospital level STG, 2012. http://www.health.gov.za/

[xxi]Dextrose 10% (unconscious patient; children): Paediatric hospital level STG, 2013. http://www.health.gov.za/
Dextrose 10% (unconscious patient; children): Advanced paediatric life support guidelines.

[xxii]Sodium chloride 0.9% IV (septic shock):Vincent JL, Gerlach H. Fluid resuscitation in severe sepsis and septic shock: an evidence-based review. *Crit Care Med*. 2004 Nov;32(11 Suppl):S451-4.http://www.ncbi.nlm.nih.gov/pubmed/15542955
Sodium chloride 0.9% IV (septic shock): Adult hospital level STG, 2012. http://www.health.gov.za/

[xxiii]Midazolam, buccal (children): McIntyre J, Robertson S, Norris E, Appleton R, Whitehouse WP, Phillips B, Martland T, Berry K, Collier J, Smith S, Choonara I. Safety and efficacy of buccal midazolam versus rectal diazepam for emergency treatment of seizures in children: a randomised controlled trial. *Lancet*. 2005 Jul 16-22;366(9481):205-10.http://www.ncbi.nlm.nih.gov/pubmed/16023510

Midazolam, buccal (children): Scott RC, Besag FM, Neville BG. Buccal midazolam and rectal diazepam for treatment of prolonged seizures in childhood and adolescence: a randomised trial. *Lancet*.1999; 353:623–6.http://www.ncbi.nlm.nih.gov/pubmed/10030327

Midazolam, buccal (children): Mpimbaza A, Ndeezi G, Staedke S, Rosenthal PJ, Byarugaba J. Comparison of buccal midazolam with rectal diazepam in the treatment of prolonged seizures in Ugandan children: a randomized clinical trial. *Pediatrics*. 2008; 121:e58–64.http://www.ncbi.nlm.nih.gov/pubmed/18166545

Midazolam, buccal (children): Baysun S, Aydin OF, Atmaca E, Gurer YK.A comparison of buccal midazolam and rectal diazepam for the acute treatment of seizures.*ClinPediatr (Phila*). 2005; 44:771–6.http://www.ncbi.nlm.nih.gov/pubmed/16327963

Midazolam, buccal (children): McMullan J, Sasson C, Pancioli A, Silbergleit R. Midazolam versus diazepam for the treatment of status epilepticus in children and young adults: a meta-analysis. *AcadEmerg Med*. 2010 Jun;17(6):575-82.http://www.ncbi.nlm.nih.gov/pubmed/20624136

Midazolam, buccal (children): European Medicines Agency – Committee for Medicinal Products for Human Use. Assessment report of Buccolam (midazolam), EMA/662938/2011, September 2011. [Online] [Cited November 2014] Available at: http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Public_assessment_report/human/002267/WC500112312.pdf

[xxiv]Diazepam, rectal (children):Chamberlain JM, Okada P, Holsti M, Mahajan P, Brown KM, Vance C, Gonzalez V, Lichenstein R, Stanley R, Brousseau DC, Grubenhoff J, Zemek R, Johnson DW, Clemons TE, Baren J; Pediatric Emergency Care Applied Research Network (PECARN). Lorazepamvs diazepam for pediatric status epilepticus: a randomized clinical trial. *JAMA*. 2014 Apr 23-30;311(16):1652-60.http://www.ncbi.nlm.nih.gov/pubmed/24756515http://www.ncbi.nlm.nih.gov/pubmed/22335736

[xxv] Midazolam, IM (adults): Silbergleit R, Durkalski V, Lowenstein D, Conwit R, Pancioli A, Palesch Y, Barsan W; NETT Investigators. Intramuscular versus intravenous therapy for prehospital status epilepticus.*N Engl J Med*. 2012 Feb 16;366(7):591-600.http://www.ncbi.nlm.nih.gov/pubmed/22335736

STANDARD PAEDIATRIC DOSING TABLES

Different conditions require different dosaging of medication. In children most conditions can use standardised doses. The weight-band dosing tables below are standardised doses of a medicine **for children** for specific conditions (indicated above each table). Where a specific condition is not indicated below, see the main text of the book for the dosing specific to that condition.

ACICLOVIR

1.4 Herpes simplex infections of the mouth and lips.

- Aciclovir, oral, 250 mg/m^2/dose 8 hourly for 7 days.

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp 200 mg/5mL	**Tablet**		
			200 mg	400 mg	
>3.5–5 kg	50 mg	1.25 mL	–	–	>1–3 months
>5–7 kg	80 mg	2 mL	–	–	>3–6 months
>7–11 kg	100 mg	2.5 mL	½ tablet	–	>6–18 months
>11–14 kg	120 mg	3 mL	–	–	>18 months–3 years
>14–25 kg	160 mg	4 mL	–		>3–7 years
>25–35 kg	200 mg	5 mL	1 tablet	½ tablet	>7–11 years
>35kg–55 kg	300 mg	7.5 mL	1½ tablets	–	>11–15 years
>55 kg	400 mg	–	–	1 tablet	>15 years

ACTIVATED CHARCOAL

21.8 Exposure to poisonous substances.

- Activated charcoal, 1 g/kg mixed as a slurry with water.

Weight kg	**Dose** g	**Age** Months/years
>3.5–7 kg	5 g	>1–6 months
>7–11 kg	10 g	>6–18 months
>11–17.5 kg	15 g	>18 months–5 years
>17.5–35 kg	25 g	>5–11 years
>35–55 kg	50 g	>11–15 years
>55 kg	100 g	>15 years

AMOXICILLIN

3.2.1.1 Complicated severe acute malnutrition; 10.9 Measles (initial dose for measles with pneumonia, then refer); 17.3.4.1 Pneumonia in children.

- Amoxicillin, oral, 30 mg/ kg/ dose, 8 hourly for 7 days.

Weight kg	**Dose** mg	**Use one of the following**				**Age** Months/years
		Susp		**Capsule**		
		125 mg/5mL	250 mg/5mL	250 mg	500 mg	
>2–2.5 kg	62.5 mg	2.5 mL	1.25 mL	–	–	>34–36 weeks
>2.5–3.5 kg	75 mg	3 mL	1.5 mL	–	–	>36 weeks–1 month
>3.5–5 kg	125 mg	5 mL	2.5 mL	–	–	>1–3 months
>5–7 kg	175 mg	7 mL	3.5 mL	–	–	>3–6 months
>7–11 kg	250 mg	10 mL	5 mL	1	–	>6–18 months
>11–17.5 kg	375 mg	15 mL	7.5 mL	–	–	>18 months–5 years
>17.5–25 kg	500 mg	–	10 mL	2	1	>5–7 years
>25–35 kg	750 mg	–	15 mL	3		>7–11 years
>35kg	1000 mg	–	–	4	2	>11years

ATROPINE

21.8 Exposure to poisonous substances.

- Atropine, IV, 0.05 mg/kg/dose.

Weight kg	**Dose** mg	**Use one of the following** injections (intravenously)		**Age** months/years
		0.5 mg/mL	1 mg/mL	
>3.5–5kg	0.2 mg	0.4 mL	0.2 mL	>1–3 months
>5–7 kg	0.3 mg	0.6 mL	0.3 mL	>3–6 months
>7–9 kg	0.4 mg	0.8 mL	0.4 mL	>6–12 months
>9–11 kg	0.5 mg	1 mL	0.5 mL	>12–18 months
>11–14 kg	0.6 mg	1.2 mL	0.6 mL	>18 months–3 years
>14–17.5 kg	0.8 mg	1.6 mL	0.8 mL	>3–5 years
>17.5 kg	1 mg	2 mL	1 mL	>5 years

CEFTRIAXONE

2.9.1 Diarrhoea, acute in children; 2.10.1 Dysentery, bacillary; 3.2.1.1 Complicated severe acute malnutrition; 8.4 Urinary tract infection (UTI); 10.1 Fever; 10.16 Viral haemorrhagic fever; 14.3 Arthritis, septic; 15.3.1 Meningitis, acute; 17.2.1 Croup (laryngotracheobronchitis) in children; 17.3.4.1 Pneumonia in children; 21.11.1 Rape and sexual violation; 21.17 Shock.

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose.**

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI)**:			**Age** Months/years
		250 mg/2 mL (250 mg diluted in 2 mL WFI)	500 mg/2 mL (500 mg diluted in 2 mL WFI)	1 000 mg/3.5 mL (1 000 mg diluted in 3.5 mL WFI)	
>2–2.5 kg	190 mg	1.5 mL	0.75 mL	–	>34–36 weeks
>2.5–3.5 kg	225 mg	1.8 mL	0.9 mL	–	>36 weeks–1 month
>3.5–5.5 kg	310 mg	–	1.25 mL	–	>1–3 months
>5.5–7 kg	440 mg	–	1.75 mL	–	>3–6 months
>7–9 kg	625 mg	–	2.5 mL	–	>6–12 months
>9–11 kg	750 mg	–	3 mL	–	>12–18 months
>11–14 kg	810 mg	–	3.25 mL	–	>18 months–3 years
>14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	>3–5 years
>17.5kg	1 500 mg	-	-	5.5 mL	>5 years

CEPHALEXIN

5.4.1 Boil, abscess; 5.4.2 Impetigo; 5.4.3 Cellulitis; 5.8.2 Eczema, acute, moist or weeping; 19.4.1 Otitis, externa.

- Cephalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days.

Weight kg	**Dose** mg	**Syrup** 125 mg/ 5mL	**Syrup** 250 mg/ 5mL	**Capsule** 250 mg	**Age** Months/years
>2.5–5 kg	62.5 mg	2.5 mL	–	–	Birth–3 months
>5–11 kg	125 mg	5 mL	2.5 mL	–	>3–18 months
>11–25 kg	250 mg	10 mL	5 mL	1capsule	>18 months–7 years
>25 kg	500 mg	–	–	2 capsules	>7 years

CETIRIZINE

5.2 Itching (pruritus); 5.8.1 Eczema, atopic; 5.10.4 Papular urticaria; 18.1.1 Conjunctivitis, allergic; 19.1 Allergic rhinitis.

- Cetirizine, oral, once daily

Weight kg	**Dose** mg	**Use one of the following:**		**Age** years
		Syrup 1 mg/ mL	**Tablet** 10 mg	
>12–21 kg	5 mg	5 mL	–	2–6 years
>21 kg	10 mg	10 mL	1 tablet	>6 years

CHLORPHENAMINE

5.2 Itching (pruritus); 5.7.3 Sandworm; 5.8.1 Eczema, atopic; 5.8.2 Eczema, acute, moist or weeping; 5.10.1 Urticaria; 5.10.4 Papular urticaria; 5.11 Pityriasis rosea; 10.3 Chicken pox; 10.9 Measles; 18.1.1 Conjunctivitis, allergic; 19.1 Allergic rhinitis; 20.3 Chronic cancer pain; 21.4.2 Insect stings and spider bites.

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly.

Weight kg	**Dose** mg	**Use one of the following:**		**Age** years
		Syrup 2 mg/5mL	**Tablet** 4 mg	
>12–14 kg	1.2 mg	3 mL	–	>2–3 years
>14–17.5 kg	1.6 mg	4 mL	–	>3–5 years
>17.5–25 kg	2 mg	5 mL	–	>5–7 years
>25–35 kg	3 mg	7.5 mL	–	>7–11 years
>35 kg	4 mg	–	1 tablet	>11 years

CIPROFLOXACIN

2.10.1 Dysentery, bacillary.

- Ciprofloxacin, oral, 15 mg/kg/dose 12 hourly for 3 days.

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months / years
		Susp 250 mg/5 mL	**Tablet**		
			250 mg	500 mg	
>9–11 kg	150mg	3 mL	–	–	>12–18 months
>11–14 kg	200 mg	4 mL	–	–	>18 months–3 years
>14–17.5 kg	250 mg	5 mL	1	–	>3–5 years
>17.5–25 kg	300 mg	6 mL	–	–	>5–7 years
>25 kg	500 mg	10 mL	2	1	>7 years

COTRIMOXAZOLE (PROPHYLAXIS)

11.5 The HIV exposed infant; 11.6 Management of HIV infected children; 11.7 Opportunistic infections, prophylaxis in children.

- Cotrimoxazole, oral, once daily (everyday).

Recommended daily by weight band	**Dose sulfamethoxazole /trimethoprim**	**Susp** 200/40 mg per 5 mL	**Single strength tablet** 400/80 mg	**Double strength tablet** 800/160 mg
3–4.9 kg	100/20 mg	2.5 mL	¼ tablet	–
5–13.9 kg	200/40 mg	5 mL	½ tablet	–
14–29.9kg	400/80 mg	10 mL	1 tablet	½ tablet
>30 kg	800/160 mg	–	2 tablets	1 tablet

DIAZEPAM

15.2 Seizures (convulsions/fits); 15.2.3 Febrile convulsions; 21.20 Status epilepticus.

- Diazepam, rectal, 0.5 mg/kg/dose for convulsions as a single dose.

Weight kg	**Dose** mg	**Ampoule** 10 mg/2 mL	**Age** Months/years
>3–6 kg	2 mg	0.4 mL	<6 months
>6–10 kg	2.5 mg	0.5 mL	>6 months–1 year
>10–18 kg	5 mg	1 mL	>1–5 years
>18–25 kg	7.5 mg	1.5 mL	>5–8 years
>25–40 kg	10 mg	2 mL	>8–12 years

EPINEPHRINE (ADRENALINE)

21.18 Anaphylaxis.

- Epinephrine (adrenaline), 1:1000, IM, 0.01 mL/kg as a single dose.

Weight kg	**Dose** mg	**Injection** 1 mg/mL (1:1 000)	**Age** years
9–12 kg	0.1 mg	0.1 mL	1–2 years
>12–18 kg	0.2 mg	0.2 mL	>2–5 years
>18–40 kg	0.3 mg	0.3 mL	>5–12 years
>40–55 kg	0.5 mg	0.5 mL	>12–15 years
>55 kg	1 mg	1 mL	>15 years

ERYTHROMYCIN

1.1.1 Abscess, dental; 5.4.1 Boil, abscess; 5.4.2 Impetigo; 5.4.3 Cellulitis; 5.8.2 Eczema, acute, moist or weeping;10.9 Measles (comorbid otitis media in children); 17.3.4.1 Pneumonia in children; 19.4.1 Otitis, externa; 19.4.2 Otitis, media, acute; 19.5 Sinusitis, acute, bacterial; 21.4.1 Animal and human bites; 21.11.1 Rape and sexual violation.

- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days.

Weight kg	**Dose** mg	**Syrup** 125 mg/5 mL	**Age** Months/years
>9–11 kg	125 mg	5 mL	>12–18 months
>11–14 kg	150 mg	6 mL	>18 months–3 years
>14–18 kg	200 mg	8 mL	>3–5 years

FLUCLOXACILLIN

5.4.1 Boil, abscess; 5.4.2 Impetigo; 5.4.3 Cellulitis; 5.8.2 Eczema, acute, moist or weeping; 19.4.1 Otitis, externa.

- Flucloxacillin, oral, 12–25mg/kg/dose 6 hourly for 5 days.

Weight kg	**Dose** mg	**Syrup** 125 mg/ 5mL	**Capsule** 250 mg	**Age** Months / years
>2.5–5 kg	62.5 mg	2.5 mL	–	Birth–3 months
>5–11 kg	125 mg	5 mL	–	>3–18 months
>11–25 kg	250 mg	10 mL	1 capsule	>18 months–7 years
>25 kg	500 mg	–	2 capsules	>7 years

FLUCONAZOLE

5.5.2.3 Scalp infections – tinea capitis (for 28 days); 11.8.2 Candidiasis, oesophageal (for 21 days).

- Fluconazole, oral, 6 mg/kg once daily.

Weight Kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp 50 mg/5 mL	**Capsule** 50 mg	**Capsule** 200 mg	
>3.5–5 kg	25 mg	2.5 mL	–	–	>1–3 months
>5–7 kg	30 mg	3 mL	–	–	>3–6 months
>7–9 kg	50 mg	5 mL	1 capsule	–	>6–12 months
>9–11 kg	60 mg	6 mL			>12–18 months
>11–14 kg	70 mg	7mL	–	–	>18 months–3 years
>14–17.5 kg	100 mg	10 mL	2 capsules	–	>3–5 years
>17.5–25 kg	125 mg	12.5 mL	–	–	>5–7 years
>25–35 kg	150 mg	15 mL	3 capsules	–	>7–11 years
>35 kg	200 mg	–	–	1 capsule	>11 years

FUROSEMIDE

4.6.2 Cardiac failure, Congestive children (CCF), children; 8.1 Chronic kidney disease (CKD); 8.2 Acute kidney injury; 8.3.1 Nephritic syndrome; 21.16 Pulmonary oedema, acute.

- Furosemide, IV, 1 mg/kg, over 5 minutes.

Weight Kg	**Dose** mg	**Injection** 10 mg/mL	**Age** Months/years
>3.5–5 kg	4 mg	0.4 mL	>1–3 months
>5–7 kg	6 mg	0.6 mL	>3–6 months
>7–9 kg	8 mg	0.8 mL	>6–12 months
>9–11 kg	10 mg	1 mL	>12–18 months
>11–14 kg	12 mg	1.2 mL	>18 months–3 years
>14–17.5 kg	15 mg	1.5 mL	>3–5 years
>17.5–25 kg	20 mg	2 mL	>5–7 years
>25–35 kg	30 mg	3 mL	>7–11 years
>35 kg	40 mg	4 mL	>11 years

HYDROCORTISONE

17.1.1 Acute asthma & acute exacerbation of COPD; 21.18 Anaphylaxis.

- Hydrocortisone slow IV, 4–6 mg/kg immediately.

Weight kg	**Dose** mg	**Injection** 100 mg/2 mL	**Age** months/years
>11–14 kg	50 mg	1 mL	>2–3 years
>14–17.5 kg	75 mg	1.5 mL	>3–5 years
>17.5 kg	100 mg	2 mL	>5 years

IBUPROFEN

20.1 Pain control; 20.3 Chronic cancer pain.

- Ibuprofen, oral, 5–10 mg/kg/dose 8 hourly with food.

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/years
		Syrup 100 mg/5mL	**Tablet** 200 mg	
>9–11 kg	80 mg	4 mL	–	>12–18 months
>11–14 kg	100 mg	5 mL	–	>18 months–3 years
>14–17.5 kg	120 mg	6 mL	–	>3–5 years
>17.5–25 kg	150 mg	7.5 mL	–	>5–7 years
>25–40 kg	200 mg	10 mL	1 tablet	>7–12 years
>40 kg	400 mg	–	2 tablets	>12 years

LACTULOSE

2.5.1 Anal fissures; 2.8 Constipation; 20.3 Chronic cancer pain.

- Lactulose, oral, 0.5 mL/kg/dose once daily.
  - If poor response, increase frequency to 12 hourly.

Weight kg	**Syrup** 3.3 g/5 mL	**Age** Months/years
>5–7 kg	3 mL	>3–6 months
>7–9 kg	4 mL	>6–12 months
>9–11 kg	5 mL	>12–18 months
>11–14 kg	6 mL	>18 months–3 years
>14–17.5 kg	7.5 mL	>3–5 years
>17.5–35 kg	10 mL	>5–11 years
>35 kg	15 mL	>11 years

LAMIVUDINE

21.11.1 Rape and sexual violation.

- Lamivudine, oral, 4 mg/kg 12 hourly or 8mg/kg daily for 28 days.

Weight kg	**Use one of the following**		
	Solution **10** mg/mL	**Tablet** 150 mg	**Tablet** 300 mg
>3–5 kg	2 mL 12 hourly	-	-
>5–7 kg	3 mL 12 hourly	–	–
>7–10 kg	4 mL 12 hourly	–	–
>10–14 kg	6 mL 12 hourly **OR** 12 mL daily	–	–
>14–20 kg	8 mL 12 hourly **OR** 15 mL daily	½ tablet 12 hourly **OR**1 tablet daily	–
>20–25 kg	15 mL 12 hourly **OR** 30 mL daily	1 tablet 12 hourly **OR** 2 tablets daily	–
>25 kg	–	1 tablet 12 hourly **OR** 2 tablets daily	1 tablet daily

LOPINAVIR/RITONAVIR

21.11.1 Rape and sexual violation.

- Lopinavir/ritonavir, oral 300/75mg/m^{2}12 hourly for 28 days

Weight kg	**Use one of the following**		
	Solution 80/20 mg/mL	**Tablet** 100/25 mg	**Tablet** 200/50 mg
>3–5 kg	1 mL	–	–
>5–10 kg	1.5 mL	–	–
>10–14 kg	2 mL	–	–
>14–20 kg	2.5 mL	2 tablets	1 tablet
>20–25 kg	3 mL	2 tablets	1 tablet
>25–30 kg	3.5 mL	3 tablets	–
> 30–35 kg	4 mL	3 tablets	–
>35 kg	5 mL	–	2 tablets

METRONIDAZOLE

1.1.1 Abscess, dental; 1.3.3 Necrotising periodontitis; 21.4.1 Animal and human bites; 21.11.1 Rape and sexual violation (single dose, prior to referral).

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Suspension 200 mg/5mL	**Tabs** 200mg	**Tabs** 400mg	
> 9–11 kg	80 mg	2 mL	–	–	>12–18 months
>11–14 kg	100 mg	2.5 mL	½ tablet	–	>18 months–3 years
>14–17.5 kg	120 mg	3 mL	–	–	>3–5 years
>17.5–25 kg	160 mg	4 mL	–	–	>5–7 years
>25–35 kg	200 mg	5 mL	1 tablet	½ tablet	>7–11 years
>35–55 kg	300 mg	7.5mL	1½ tablets	–	>11–15 years
>55 kg	400 mg	–	–	2 tablets	>15 years

MIDAZOLAM

15.2 Seizures (convulsions/fits); 21.20 Status epilepticus.

- Midazolam, buccal, 0.5 mg/kg

Weight kg	**Dose** mg	**Injection (buccal administration)** 5 mg/mL	**Age** Months/years
>7–9 kg	4 mg	0.8 mL	>6–12 months
>9–11 kg	5 mg	1 mL	>12–18 months
>11–14 kg	6 mg	1.2 mL	>18 months–3 years
>14–17.5 kg	7.5 mg	1.5 mL	>3–5 years
>17.5–25 kg	10 mg	2 mL	>5–7 years
>25–35 kg	12.5 mg	3 mL	>7–11 years
>35 kg	20 mg	4 mL	>11 years

MORPHINE

20.3 Chronic cancer pain.

- Morphine, oral, 0.2–0.4 mg/kg/dose 4–6 hourly.

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/years
		Syrup 1 mg/mL	**Tablet** 10 mg	
>7–9 kg	2 mg	2 mL	–	>6–12 months
>9–11 kg	2.5 mg	2.5 mL	–	>12–18 months
>11–14 kg	4 mg	4 mL	–	>18 months–3 years
>14–17.5 kg	5 mg	5 mL	–	>3–5 years
>17.5–25 kg	6 mg	6 mL	–	>5–7 years
>25 kg	10 mg	10 mL	1 tablet	>7 years

PARACETAMOL

1.1.1 Abscess, dental; 1.3.3 Necrotising periodontitis; 1.4 Herpes simplex infections of the mouth and lips; 10.1 Fever; 10.3 Chickenpox; 10.8.1 Malaria, uncomplicated (fever in children < 5 years of age); 10.9 Measles; 10.11 Mumps; 10.12 Rubella (German measles); 14.1 Arthralgia; 15.2.3 Febrile convulsions; 15.4 Headache, mild, non-specific; 17.2.1 Croup (laryngotracheobronchitis) in children; 17.3.1 Influenza; 18.1.2 Conjunctivitis, bacterial (excluding conjunctivitis of the newborn); 18.1.4 Conjunctivitis, viral (pink eye); 18.2.1 Eye injury, chemical burn; 18.2.2 Eye injury (blunt or penetrating); 19.2 Viral rhinitis (common cold); 19.4.2 Otitis, media, acute; 19.5 Sinusitis, acute, bacterial; 19.6 Tonsillitis and pharyngitis; 20.1 Pain control; 20.3 Chronic cancer pain; 21.4.2 Insect stings and spider bites; 21.5 Burns; 21.14 Injuries; 21.19 Sprains and strains.

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required.

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
>3.5–5 kg	48 mg	2 mL	–	>1–3 months
> 5–7 kg	72 mg	3 mL	–	>3–6 months
>7–9 kg	96 mg	4 mL	–	>6–12 months
>9–11 kg	120 mg	5 mL	–	>12–18 months
>11–14 kg	144 mg	6 mL		>18 months–3 years
>14–17.5 kg	180 mg	7.5 mL		>3–5 years
>17.5–25 kg	240 mg	10 mL	½ tablet	>5–7 years
>25–35 kg	360 mg	15 mL		>7–11 years
>35–55 kg	500 mg	–	1 tablet	>11–15 years
>55 kg	1 000 mg		2 tablets	>15 years

PHENOBARBITAL

21.20 Status epilepticus.

- Phenobarbitone, oral, crushed and given by nasogastric tube, 20 mg/kg as a single dose.

Weight kg	**Dose** mg	**Tablet** 30 mg	**Age** Months/ years
>2.5–3.5 kg	60 mg	2 tablets	Birth–1 month
>3.5–5 kg	75 mg	2½ tablets	>1–3 months
>5–7 kg	120 mg	4 tablets	>3–6 months
>7–11 kg	180 mg	6 tablets	>6–12 months
>11–14 kg	210 mg	7 tablets	>18 months–3 years
>14 kg	240 mg	8 tablets	>3 years

PRAZIQUANTEL

10.13 Schistosomiasis (Bilharzia).

- Praziquantel, oral, 40 mg/kg as a single dose.

Weight kg	**Dose** mg	**Tablet** 600 mg	**Age** years
>12–17.5 kg	600 mg	1tablet	>2–5 years
>17.5–25 kg	900 mg	1½ tablet	>5–7 years
>25–35 kg	1 200 mg	2 tablets	>7–11 years
>35 kg	1 800 mg	3 tablets	>11 years

PROMETHAZINE

21.18 Anaphylaxis.

- Promethazine IM/slow IV.
  - Children > 2 years: 0.25 mg/kg.

Weight kg	**Dose** mg	**Use one of the following injections:**		**Age** Months/years
		25 mg/mL	50 mg/2 mL	
>12–17.5 kg	2.5 mg	0.1 mL	0.1 mL	2–5 years
>17.5–25 kg	5 mg	0.2 mL	0.2 mL	>5–7 years
>25–35 kg	7.5 mg	0.3 mL	0.3 mL	>7–11 years
>35–55 kg	15 mg	0.6 mL	0.6 mL	>11–15 years
>55 kg	25 mg	1 mL	0.5 mL	>15 years

QUININE DIHYDROCHLORIDE

10.8.2 Malaria, severe (complicated).

- Quinine dihydrochloride, IV **or** IM, 15–20 mg/kg immediately as a single dose and refer urgently.

Weight kg	**Dose** mg	**Injection** 300 mg /mL	**Use one of the following:**		**Age** Months/years
			IM volume of Sodium chloride 0.9%	**IV** volume of Dextrose 5%	
>9–11 kg	180 mg	0.6 mL	2 mL	75 mL	>12–18 months
>11–14 kg	210 mg	0.7 mL	2.5 mL	100 mL	>18 months–3 years
>14–17.5 kg	300 mg	1 mL	3 mL	125 mL	>3–5 years
>17.5–25 kg	360 mg	1.2 mL	4.5 mL	175 mL	>5–7 years
>25–35 kg	510 mg	1.7 mL	7.5 mL	250 mL	>7–11 years
>35–55 kg	750 mg	2.5 mL	10 mL	350 mL	>11–15 years
>55 kg	900 mg	3 mL	10 mL	450 mL	>15 years

ZIDOVUDINE

21.11.1 Rape and sexual violation.

- Zidovudine, oral, 180-240 mg/m^{2}12 hourly for 28 days.

Weight kg	**Use one of the following**		
	Solution 10 mg/mL	**Capsule** 100 mg	**Tablet** 300 mg
>3–6 kg	6mL 12 hourly	–	–
>6–8 kg	9 mL 12 hourly	–	–
>8–14 kg	12 mL 12 hourly	1 cap 12 hourly	–
>14–20 kg	15 mL 12 hourly	2 caps in the morning + 1 cap in the evening	–
>20–25 kg	–	2 caps 12 hourly	–
>25 kg	–	–	1 tab 12 hourly

GUIDELINES FOR THE MOTIVATION OF A NEW MEDICINE ON THE NATIONAL ESSENTIAL MEDICINES LIST

Section 1: Medication details

» Generic name
A fundamental principle of the Essential Drug Programme is that of generic prescribing. Most clinical trails are conducted using the generic name.

» Proposed indication
There will usually be many registered indications for the medication. However, this section should be limited to the main indication which is supported by the evidence provided in section 2.

» Prevalence of the condition in South Africa
This information is not always readily available. However, it is an important consideration in the review of a proposed essential medicine.

» Prescriber level
Here the proposed prescriber level should be included. If more than one level is proposed each relevant box should be ticked.

Section 2: Evidence and motivation

» Estimated benefit
- Effect measure: this is the clinical outcome that was reported in the clinical trial such as BP, FEV, CD_4, VL etc.
- Risk benefit: this should reported in the clinical trial and, in most cases, includes the 95% confidence level (95% CI). Absolute risk reduction, also termed risk difference, is the difference between the absolute risk of an event in the intervention group and the absolute risk in the control group.
- Number Need to Treat (NNT): gives the number of patients who need to be treated for a certain period of time to prevent one event. It is the reciprocal of the absolute risk or can be calculated using the formula on page xxv.

Calculations

	Bad outcome	Good outcome	Total patients
Intervention group	*a*	*c*	*a + c*
Control group	*b*	*d*	*b + d*

Measure	**Equation**
Absolute risk:	[b/(b+d)] – [a/(a+c)]
Number needed to treat	$\frac{1}{[b/(b+d)] - [a/(a+c)]}$
Relative risk	[a/(a+c)] ÷ [b/(b+d)]
Odds ratio	$\frac{[a/(a+c)] \div [c/(a+c)]}{[b/(b+d)] \div [d/(b+d)]} = (a/c) \div (b/d)$

Reference - Aust Prescr 2008;31:12–16)

» Motivating information (**Level of evidence based on the SORT system**)

– The National Essential Drug List Committee has endorsed the adoption of the SORT system for categorising levels of evidence. This system[1] contains only three levels:

Level I	Good quality evidence	Systematic review of RCTs with consistent findings High quality individual RCT
Level II	Limited quality patient orientated evidence	Systematic review of lower quality studies or studies with inconsistent findings Low quality clinical trial Cohort studies Case-control studies
Level III	Other	Consensus guidelines, extrapolations from bench research, usual practice, opinion, disease-oriented evidence (intermediate or physiologic outcomes only), or case series

A: Newer product: for most newer products, level 1 evidence such as high quality systematic reviews or peer-reviewed high quality randomised controlled trials should be identified and referenced in the space provided.

[1] Ebell MH, Siwek J, Weiss BD, et al. Strength of recommendation taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. Am Fam Physician. 2004;69:550-6.

B: Older products: many of these products were developed prior to the wide use of randomised controlled trials. However, there maybe level 1 evidence where the product was used as the control arm for a newer product. If no level 1 evidence can be identified, then level II data from poorer quality controlled trials or high quality observational studies should be referenced in the space provided.

» Cost considerations
  - Where a published reference supporting the review of cost is available comments should be made regarding its applicability to the South African public sector environment.
  - Possible unpublished information that can be included:
    - Cost per daily dose or course of therapy – for long term or chronic therapy such as hypertension the usual daily dose should be calculated (Dose x number of times a day) and converted into the number of dosing units e.g. tablets. This is then used to calculate the cost per day. For medications used in a course of therapy such as antibiotics this is then multiplied by the number of days in the course of therapy.
    - Cost minimisation is used where there is evidence to support equivalence and aims to identify the least costly treatment by identifying all the relevant costs associated with the treatment.
    - Cost-effectiveness analysis is used to compare treatment alternatives that differ in the degree of success in terms of the therapeutic or clinical outcome. By calculating a summary measurement of efficiency (a cost-effectiveness ratio), alternatives with different costs, efficacy rates, and safety rates can be fairly compared along a level playing field.

Where any of these have been performed tick the relevant block and send as an attachment with all the calculations. If possible, the spread sheet should be supplied electronically.

Section 3: Motivator's Details

The receipt of all submission will be acknowledged. In addition, all decisions with supporting arguments will be communicated where appropriate. This section therefore forms a vital link between the motivator and the decision making process.

DEPARTMENT OF HEALTH
Republic of South Africa

Motivation form for the inclusion of a new medication on the National Essential Medicines List

Section 1: Medication details			
Generic name (or International Nonproprietary Name):			
Proposed indication:			
Prevalence of condition (based on epidemiological data, if any):			
Prescriber level			
Primary Health Care 1	Medical Officer 2	Specialist 3	Designated Specialist 4

Section 2: Evidence and motivation			
2.1 Estimated benefit			
Effect measure			
Risk difference (95% CI)			
NNT			
2.2: Motivating information (Level of evidence based on the SORT system)			
A. Newer product: High quality systematic reviews or peer-reviewed high quality randomised controlled trials (Level I)			
Author	Title	Journal ref	
B. Older product with weaker evidence base: Poorer quality controlled trials or high quality observational studies (Level II)			
Author	Title	Journal ref	
2.3: Cost-considerations			
Have you worked up the cost?	YES		NO
	Daily cost	Cost minimisation	Cost-effectiveness analysis
Other relevant cost information if available:			
Author	Title	Journal ref	
2.4: Additional motivating comments.			

Section 3: Motivator's Details	
PTC Title:	**Date submitted:**

GUIDELINES FOR ADVERSE DRUG REACTION REPORTING

National Pharmacovigilance Programme

The Medicines Control Council (MCC) has a responsibility to ensure the safety, efficacy and quality of all medicines used by the South African public. The National Pharmacovigilance Programme is coordinated by the MCC and has a dedicated Unit, The National Adverse Drug Event Monitoring Centre (NADEMC), in Cape Town, which monitors the safety of all registered medicines in South Africa.

What is Pharmacovigilance?

Pharmacovigilance is defined as the science and activities concerned with the detection, assessment, understanding and prevention of adverse reactions to medicines (i.e. adverse drug reactions or ADRs). The ultimate goal of this activity is to improve the safe and rational use of medicines, thereby improving patient care and public health.

What is an Adverse Drug Reaction (ADR)?

The Medicines Control Council (MCC) defines an Adverse Drug Reaction (ADR) as a response to a medicine which is noxious and unintended, including lack of efficacy, and which occurs at any dosage and can also result from overdose, misuse or abuse of a medicine.

Who should report Adverse Drug Reactions?

All health care workers, including doctors, dentists, pharmacists, nurses and other health professionals are encouraged to report all suspected adverse reactions to medicines (including vaccines, X-ray contrast media, traditional and herbal remedies), especially when the reaction is not in the package insert, potentially serious or clinically significant.

What happens to a report?

All ADR reports are entered into a national ADR database. Each report is evaluated to assess the causal relationship between the event and the medicine. A well-completed adverse drug reaction/product quality form submitted could result in any of the following:

» additional investigations into the use of the medicine in South Africa;
» educational initiatives to improve the safe use of the medicine;
» appropriate package insert changes to include the potential for the reaction, and
» changes in the scheduling or manufacture of the medicine to make it safer.

The purpose of ADR reporting is to reduce the risks associated with the use of medicines and to ultimately improve patient care.

Will reporting have any negative consequences on the health worker or the patient?

An adverse drug reaction report does not constitute an admission of liability or that the health professional contributed to the event in any way. The outcome of a report, together with any important or relevant information relating to the reaction, will be sent back to the reporter as appropriate. The details of a report are stored in a confidential database. The names of the reporter or any other health professionals named on a report and that of the patient will be removed before any details about a specific adverse drug reaction are used or communicated to others. The information is only meant to improve the understanding of the medicines used in the country.

Is the event possibly an ADR?

The following factors should be considered when an adverse drug reaction is suspected:

1. What exactly is the nature of the reaction? (*Describe the reaction as clearly as possible and where possible provide an accurate diagnosis.*)

2. Did the reaction occur within a reasonable time relationship to starting treatment with the suspected medicine? *(Some reactions occur immediately after administration of a medicine while others take time to develop.)*
3. Is the reaction known to occur with the particular medicine as stated in the package insert or other reference? *(If the reaction is not documented in the package insert, it does not mean that the reaction cannot occur with that particular medicine.)*
4. Did the patient recover when the suspected medicine was stopped? *(Some reactions can cause permanent damage, but most reactions are reversible if the medication is stopped.)*
5. Did the patient take the medicine again after the reaction abated (i.e. rechallenge). If so, did the same reaction occur again? *(In most situations it is not possible or ethical to rechallenge the patient with the same medicine. If such information is available or if such a rechallenge is necessary, recurrence of the event is a strong indicator that the medicine may be responsible.)*
6. Can this reaction be explained by other causes (e.g. underlying disease/s; other medicine/s; toxins or foods)? *(It is essential that the patient is thoroughly investigated to decide what the actual cause of any new medical problem is. A medicine-related cause should be considered, when other causes do not explain the patient's condition.)*

What types of reactions should be reported?

The following adverse drug reactions should be reported:

- All ADRs to newly marketed drugs or new drugs added to the EDL
- All serious reactions and interactions
- ADRs that are not clearly stated in the package insert.
- All adverse reactions or poisonings to traditional or herbal remedies

Report even if you are not certain that the medicine caused the event.

What Product Quality Problems should be reported?

The following product quality problems should be reported:

- suspected contamination;
- questionable stability;
- defective components;
- poor packaging or labeling;
- therapeutic failures.

How can ADRs be prevented from occurring?

Some ADRs are unavoidable and cannot be prevented. However, most ADRs can be prevented by following the basic principles of rational use of medicines.

How are adverse drug reactions reported?

An Adverse Drug Reaction/Product Quality Report Form is enclosed in this book and should be completed in as much detail as possible before returning it by fax or post to any of the addresses provided below. Additional forms can be obtained by contacting the MCC at these addresses. Report forms may also be accessed via the following website: *http://www.mccza.com*

1. The Registrar of Medicines

Medicines Control Council, Department of Health, Private Bag X828
Pretoria, 0001
Tel: (021) 395 8003/8176; Fax: (012) 395 8468

2. The National Adverse Drug Event Monitoring Centre (NADEMC)

C/o Division of Pharmacology, University of Cape Town,
Observatory, 7925
(021) 447 1618; Fax: (021) 448 6181

ADVERSE DRUG REACTION AND PRODUCT QUALITY PROBLEM REPORT FORM

(*Identities of reporter and patient will remain strictly confidential)*

health

Department:
Health
REPUBLIC OF SOUTH AFRICA

NATIONAL ADVERSE DRUG EVENT MONITORING CENTRE
NADEMC
The Registrar of Medicines
Private Bag X 828
Pretoria 0001
In collaboration with the WHO International Drug Monitoring Programme

PATIENT INFORMATION

Name (or initials): .....
Patient Reference Number: .....

Sex:	**M**	**F**	**Age:**	**DOB:**	**Weight (kg)**	**Height (cm)**
			.....	..... / ...../	.....	.....

ADVERSE REACTION/PRODUCT QUALITY PROBLEM (tick appropriate box)

Adverse reaction ☐ **and/or Product Quality problem** ☐

Date of onset of reaction:
...../...../.....
Time of onset of reaction:

….....hour.....min

Description of reaction or problem (Include relevant tests/lab data, including dates):

1. MEDICINES / VACCINES / DEVICES (include all concomitant medicines)					
Trade Name and Batch No. (Asterisk Suspected Product)	**Daily Dosage**	**Route**	**Date Started**	**Date Stopped**	**Reasons for use**

ADVERSE REACTION OUTCOME (Check all that apply)

	death		life-threatening
	disability		hospitalisation
	congenital anomaly		Other.....
	required intervention to prevent permanent impairment/damage		

Reaction abated after stopping medicine:

	Y		**N**

Event reappeared on rechallenge:

	Y		**N**		**Rechallenge not done**

Recovered:

	Y		**N**

Sequelae:

	Y		**N**

Describe Sequelae:.....

COMMENTS: (e.g. Relevant history, Allergies, Previous exposure, Baseline test results/lab data)

2. PRODUCT QUALITY PROBLEM:

Trade Name	Batch No	Registration No	Dosage form & strength	Expiry Date	Size/Type of container

Product available for evaluation?: **Y** **N**

REPORTING HEALTHCARE PROFESSIONAL:

NAME: .....

QUALIFICATIONS:.....

ADDRESS: .....

.....Postal Code: …… …

TEL: (.....).....

……..…….. ……..
Signature Date

This report does not constitute an admission that medical personnel or the product caused or contributed to the event.

ADVICE ABOUT VOLUNTARY REPORTING

Report adverse experiences with:
- medications (drugs, vaccines and biologicals)
- medical devices (including in-vitro diagnostics)
- complementary / alternative medicines (including traditional, herbal remedies, etc)

Please report especially:
- adverse drug reactions to newly marketed products
- serious reactions and interactions with all products
- adverse drug reactions which are not clearly reflected in the package insert.

Report Product Quality Problems such as:
- suspected contamination
- questionable stability
- defective components
- poor packaging or labelling
- therapeutic failures

Report even if:
- you're not certain the product caused the event
- you don't have all the details

Important numbers:

Investigational Products and Product Quality Problems:
- fax: (012) 395-9201
- phone: (012) 395-9341

Adverse Events Following Immunisation:
- fax: (012) 395 8905
- phone: (012) 395 8914/5

Confidentiality: Identities of the reporter and patient will remain strictly confidential.

Your support of the Medicine Control Council's adverse drug reaction monitoring programme is much appreciated.
Information supplied by you will contribute to the improvement of medicine safety and therapy in South Africa.

PLEASE USE ADDRESS PROVIDED BELOW - JUST FOLD IN THIRDS, TAPE and MAIL

Postage will be paid by the Addressee
Posgeld sal deur die geadresseerde betaal word

No Postage stamp necessary if posted in the Republic of South Africa
Geen posseël nodig nie indien in die Republiek van Suid-Afrika gepos

BUSINESS REPLY SERVICE
BESIGHEIDSANTWOORDDIENS
Free Mail Number: **BNT 178**
Vryposnommer:

DEPARTMENT OF HEALTH
DEPARTEMENT VAN GESONDHEID
REGISTRAR OF MEDICINES
REGISTRATEUR VAN MEDISYNE
PRIVATE BAG / *PRIVAATSAK* X828
PRETORIA
0001

DISEASE NOTIFICATION PROCEDURES

The disease reporting system in South Africa is based on government law (the Health Act, Act No. 61 of 2003), together with regulations on the reporting of specific diseases to the Local, Provincial and/or National Health Department.

Who should notify

The first health care professional to come into contact with a patient presenting with one of the prescribed Notifiable Medical Conditions is required by law to notify. This may include clinic personnel, infection control nurses, other hospital staff or private medical practitioners. In the event of deaths (or cases) in the community, a member of the community is obliged to notify the event.

Which diseases to notify

Currently 33 broad medical conditions are currently notifiable in South Africa (see List of Notifiable Medical Condition). Some conditions (e.g. tuberculosis and viral hepatitis) have been divided into various components, resulting in more than 40 notifiable medical conditions.

Notifiable medical conditions have been sub-divided into two categories according to type of disease:

a) **Category A:** these are medical conditions that require immediate notification to the regional/provincial or national Department of Health by telephone or fax upon initial diagnosis (presumptive or confirmed) with written notification form (GW17/5) to follow within five days.

Any health care professional identifying even a single case of a disease (presumptive or laboratory confirmed) contained in the Category A should make an immediate notification directly to the designated local health officer through fax or telephonically as rapidly as possible (within 24 hours). The local health officer must report to the Provincial health officer and/or to the National Department of Health. Where it is applicable, laboratory confirmation should be obtained at the earliest opportunity and also reported to the designated health office. After reporting through a telephone/fax, it is still required of the health

care provider to send a complete GW17/5 form to the designated local health authority within five days after telephonic reporting.

b) **Category B**: these are medical conditions that require written notification (GW17/5 form) only, within seven days of diagnosis.

The notification system is based on clinical notifications and, therefore, all suspected cases of a notifiable condition must be notified immediately.

Reporting a Notifiable Disease during an outbreak

During an outbreak of a notifiable disease, report all cases by phone, email or fax. Daily reporting by health facilities should be maintained through an Outbreak Case Line Listing Form as well through the notification form (GW17/5) to the local health authority that must report to the provincial health officials and the National Department of Health.

Priority Reporting of MDR & XDR-TB

Tuberculosis (TB) is one of 33 medical conditions, which is notifiable in terms of the National Health Act (Act 61 of 2003). The Directorate: Epidemiology and Surveillance have instituted a priority reporting for MDR and XDR TB. This means that all health care facilities, public and private, including clinics, hospitals, laboratories, general practitioners and private specialist doctors, are required to report all cases of MDR and XDR TB to the Department of Health within 24 hours.

How to notify

The initial notification of a medical condition is done on a case-based form (*GW 17/5*) with the relevant details by the health personnel e.g., clinic personnel, infection control nurses, other hospital staff, public or private medical practitioners. Initial notification makes tracing as easy as possible, since a disease notification demands action (follow-up) at the peripheral level.

The GW17/5 form makes provision for the notification of cases as well as

deaths. Any person contracting a notifiable disease and then dies from the disease should be notified twice: first as a **"CASE"** and then later as a **"DEATH".** This will ensure that when estimating the **"Case Fatality Rate"** (CFR%), all deaths in the numerator are also included in the denominator. Depending on the structural organization of the province, the completed **GW 17/5** forms is sent to the relevant local health authority, district health office or the provincial office.

National Department of Health
Cluster: Health Information, Evaluation & Research (HIER)
Directorate: Epidemiology & Surveillance
Private Bag X828
PRETORIA
0001
Tel: 012 395 8150/1

List of Notifiable Medical Conditions

Category A: *Immediate notification (within 24 hours) of diagnosis by the health care professional (telephone or fax) to the designated district or provincial health officer.*

Acute flaccid paralysis
Anthrax
Cholera
Crimean-Congo haemorrhagic fever
Other haemorrhagic fevers of Africa
Food poisoning
Measles
Meningococcal infection
Plague
Rabies, human
Yellow fever

Category B

Brucellosis
Congenital syphilis
Diphtheria
Haemophilus Influenza type B
Lead poisoning
Legionellosis
Leprosy
Malaria
Paratyphoid fever
Poisoning agricultural stock remedies
Poliomyelitis
Rheumatic fever
Tetanus
Tetanus neonatorum
Trachoma
Tuberculosis primary
Tuberculosis pulmonary
Tuberculosis of other respiratory organs
Tuberculosis of meninges
Tuberculosis of intestines, peritoneum
Tuberculosis of bones and joints
Tuberculosis of genito-urinary system
Tuberculosis of other organs
Tuberculosis miliary
Typhoid fever
Typhus fever (lice-borne)
Typhus fever (ratflea-borne)
Viral hepatitis type A (acute)
Viral hepatitis type B (acute)
Viral hepatitis non-A non-B (acute)
Viral hepatitis unspecified
Whooping cough

USING THE ROAD TO HEALTH BOOKLET

Check and update the Road to Health booklet at each consultation and on each admission and discharge.

The South African Road to Health Booklet is an extremely important document for the child and family,
It is designed to support and integrate the variouschild health strategies such as IMCI, EPI, TB and HIV care and the Integrated Nutrition Programme. It reminds health care workers to look for, respond to, and record important events and care given to the child.

OWNERSHIP OF THE BOOKLET
The Road to Health Booklet is the exclusive property of the parent (primary caregiver) and the child. This is important as the booklet contains information on the child's health including HIV status, and if the booklet is used for other purposes, mothers may hide the booklet or refuse to allow important information to be recorded in it. This can result in the child receiving less than optimal care

USE OF THE ROAD TO HEALTH BOOKLET
Issuing the Road to Health Booklet
At birth all children should be issued with a Road to Health Booklet – in which all vital information is recorded including:

» Name and date of birth – Page 1 (front cover)
» Details of child and family – Page 4
» Neonatal information – Page 5
» Immunisations at birth – Page 6
» PMTCT/HIV information – Page 7

Use at health service contacts

On the cover the booklet states:

> "IMPORTANT: always bring this booklet when you visit any health clinic, doctor or hospital"

To use the booklet effectively the attending nurse or doctor should ask, at each attendance, to see the Road to Health booklet both due to its intrinsic value as part of a child health consultation and to emphasise the importance of the booklet and its use to the mother.

On each visit complete/record appropriately

» Well child visit routine care (incl. growth, TB status, PMTCT HIV status, feeding etc) – Pages 2 and 3.
» Immunisations given – Page 6.
» Information on the HIV status of the mother and child (if HIV-exposed) – Page 8.
» Vitamin A and deworming – Page 9.
» Weight for age, length/height for age and weight for length/height charting – Pages 14–19.
» Any clinical notes (ideally using IMCI classification, treatment and follow up should be made in the clinical notes) – Pages 21–27.
» Any hospital admissions should be recorded – Page 19.

During the health visit certain care given will depend on whether this is a scheduled well child visit, a follow-up visit, or a first attendance for a new illness.

<table>
<tr><th>Well child visit</th><th>Sick child consultation</th><th>Follow up consultation</th></tr>
<tr><td colspan="3">Greet mother and child</td></tr>
<tr><td>Ask why she has come and whether she has any concerns.</td><td>Ask why she has come and what her concerns are.</td><td>Ask how the child is and whether any further concerns have arisen.</td></tr>
<tr><td colspan="3">Ask for Road to Health Booklet and use it.</td></tr>
<tr><td>If the child has an illness, proceed to sick child consultation (IMCI) in addition to the well child consultation.</td><td>Proceed to sick child consultation (IMCI).
Ensure that promotive aspects of IMCI (nutrition, immunisations, HIV and TB status) are covered.</td><td>Carry out the follow-up process from IMCI, but also check the well child consultation.</td></tr>
<tr><td colspan="3">Check and record all due visit items – see above.</td></tr>
<tr><td>Carry out and record the well child visit.
Note and respond to any other problems identified.</td><td colspan="2">Manage the child according to IMCI classification.
Follow up as required.
Carry out and record the well child visit.
Note and respond to any other problems identified.</td></tr>
<tr><td colspan="3">Tell mother what has been done, what was found and what this means.
Ensure the mother knows when to follow up for the next well child visit, and when to come if the child is ill or for other scheduled follow up.</td></tr>
</table>

WHO WEIGHT REFERENCES

WHO Weight-for-Length Reference Card (below 87 cm)										
Boys' weight (kg)						Girls' weight (kg)				
–4 SD	–3 SD	–2 SD	–1 SD	Median	**Length cm**	Median	–1 SD	–2 SD	–3 SD	–4 SD
1.7	1.9	2.0	2.2	2.4	**45**	2.5	2.3	2.1	1.9	1.7
1.8	2.0	2.2	2.4	2.6	**46**	2.6	2.4	2.2	2.0	1.9
2.0	2.1	2.3	2.5	2.8	**47**	2.8	2.6	2.4	2.2	2.0
2.1	2.3	2.5	2.7	2.9	**48**	3.0	2.7	2.5	2.3	2.1
2.2	2.4	2.6	2.9	3.1	**49**	3.2	2.9	2.6	2.4	2.2
2.4	2.6	2.8	3.0	3.3	**50**	3.4	3.1	2.8	2.6	2.4
2.5	2.7	3.0	3.2	3.5	**51**	3.6	3.3	3.0	2.8	2.5
2.7	2.9	3.2	3.5	3.8	**52**	3.8	3.5	3.2	2.9	2.7
2.9	3.1	3.4	3.7	4.0	**53**	4.0	3.7	3.4	3.1	2.8
3.1	3.3	3.6	3.9	4.3	**54**	4.3	3.9	3.6	3.3	3.0
3.3	3.6	3.8	4.2	4.5	**55**	4.5	4.2	3.8	3.5	3.2
3.5	3.8	4.1	4.4	4.8	**56**	4.8	4.4	4.0	3.7	3.4
3.7	4.0	4.3	4.7	5.1	**57**	5.1	4.6	4.3	3.9	3.6
3.9	4.3	4.6	5.0	5.4	**58**	5.4	4.9	4.5	4.1	3.8
4.1	4.5	4.8	5.3	5.7	**59**	5.6	5.1	4.7	4.3	3.9
4.3	4.7	5.1	5.5	6.0	**60**	5.9	5.4	4.9	4.5	4.1
4.5	4.9	5.3	5.8	6.3	**61**	6.1	5.6	5.1	4.7	4.3
4.7	5.1	5.6	6.0	6.5	**62**	6.4	5.8	5.3	4.9	4.5
4.9	5.3	5.8	6.2	6.8	**63**	6.6	6.0	5.5	5.4	4.7
5.1	5.5	6.0	6.5	7.0	**64**	6.9	6.3	5.7	5.3	4.8
5.3	5.7	6.2	6.7	7.3	**65**	7.1	6.5	5.9	5.5	5.0
5.5	5.9	6.4	6.9	7.5	**66**	7.3	6.7	6.1	5.6	5.1
5.6	6.1	6.6	6.1	7.7	**67**	7.5	6.9	6.3	5.8	5.3
5.8	6.3	6.8	7.3	8.0	**68**	7.7	7.1	6.5	6.0	5.5
6.0	6.5	7.0	7.6	8.2	**69**	8.0	7.3	6.7	6.1	5.6
6.1	6.6	7.2	7.8	8.4	**70**	8.2	7.5	6.9	6.3	5.8
6.3	6.8	7.4	8.0	8.6	**71**	8.4	7.7	7.0	6.5	5.9
6.4	7.0	7.6	8.2	8.9	**72**	8.6	7.8	7.2	6.6	6.0
6.6	7.2	7.7	8.4	9.1	**73**	8.8	8.0	7.4	6.8	6.2
6.7	7.3	7.9	8.6	9.3	**74**	9.0	8.2	7.5	6.9	6.3
6.9	7.5	8.1	8.8	9.5	**75**	9.1	8.4	7.7	7.1	6.5
7.0	7.6	8.3	8.9	9.7	**76**	9.3	8.5	7.8	7.2	6.6
7.2	7.8	8.4	9.1	9.9	**77**	9.5	8.7	8.0	7.4	6.7
7.3	7.9	8.6	9.3	10.1	**78**	9.7	8.9	8.2	7.5	6.9
7.4	8.1	8.7	9.5	10.3	**79**	9.9	9.1	8.3	7.7	7.0
7.6	8.2	8.9	9.6	10.4	**80**	10.1	9.2	8.5	7.8	7.1
7.7	8.4	9.1	9.8	10.6	**81**	10.3	9.4	8.7	8.0	7.3
7.9	8.5	9.2	10.0	10.8	**82**	10.5	9.6	8.8	8.1	7.5
8.0	8.7	9.4	10.2	11.0	**83**	10.7	9.8	9.0	8.3	7.6
8.2	8.9	9.6	10.4	11.3	**84**	11.0	10.1	9.2	8.5	7.8
8.4	9.1	9.8	10.6	11.5	**85**	11.2	10.3	9.4	8.7	8.0
8.6	9.3	10.0	10.8	11.7	**86**	11.5	10.5	9.7	8.9	8.1

WHO Weight-for-Height Reference Card (87 cm and above)										
Boys' weight (kg)						Girls' weight (kg)				
–4 SD	–3 SD	–2 SD	–1 SD	Median	Length cm	Median	–1 SD	–2 SD	–3 SD	–4 SD
8.9	9.6	10.4	11.2	12.2	**87**	11.9	10.9	10.0	9.2	8.4
9.1	9.8	10.6	11.5	12.4	**88**	12.1	11.1	10.2	9.4	8.6
9.3	10.0	10.8	11.7	12.6	**89**	12.4	11.4	10.4	9.6	8.8
9.4	10.2	11.0	11.9	12.9	**90**	12.6	11.6	10.6	9.8	9.0
9.6	10.4	11.2	12.1	13.1	**91**	12.9	11.8	10.9	10.0	9.1
9.8	10.6	11.4	12.3	13.4	**92**	13.1	12.0	11.1	10.2	9.3
9.9	10.8	11.6	12.6	13.6	**93**	13.4	12.3	11.3	10.4	9.5
10.1	11.0	11.8	12.8	13.8	**94**	13.6	12.5	11.5	10.6	9.7
10.3	11.1	12.0	13.0	14.1	**95**	13.9	12.7	11.7	10.8	9.8
10.4	11.3	12.2	13.2	14.3	**96**	14.1	12.9	11.9	10.9	10.0
10.6	11.5	12.4	13.4	14.6	**97**	14.4	13.2	12.1	11.1	10.2
10.8	11.7	12.6	13.7	14.8	**98**	14.7	13.4	12.3	11.3	10.4
11.0	11.9	12.9	13.9	15.1	**99**	14.9	13.7	12.5	11.5	10.5
11.2	12.1	13.1	14.2	15.4	**100**	15.2	13.9	12.8	11.7	10.7
11.3	12.3	13.3	14.4	15.6	**101**	15.5	14.2	13.0	12.0	10.9
11.5	12.5	13.6	14.7	15.9	**102**	15.8	14.5	13.3	12.2	11.1
11.7	12.8	13.8	14.9	16.2	**103**	16.1	14.7	13.5	12.4	11.3
11.9	13.0	14.0	15.2	16.5	**104**	16.4	15.0	13.8	12.6	11.5
12.1	13.2	14.3	15.5	16.8	**105**	16.8	15.3	14.0	12.9	11.8
12.3	13.4	15.4	15.8	17.2	**106**	17.1	15.6	14.3	13.1	12.0
12.5	13.7	14.8	16.1	17.5	**107**	17.5	15.9	14.6	13.4	12.2
12.7	13.9	15.1	16.4	17.8	**108**	17.8	16.3	14.9	13.7	12.4
12.9	14.1	15.3	16.7	18.2	**109**	18.2	16.6	15.2	13.9	12.7
13.2	14.4	15.6	17.0	18.5	**110**	18.6	17.0	15.5	14.2	12.9
13.4	14.6	15.9	17.3	18.9	**111**	19.0	17.3	15.8	14.5	13.2
13.6	14.9	16.8	17.6	19.2	**112**	19.4	17.7	16.2	14.8	13.5
13.8	15.2	16.5	18.0	19.6	**113**	19.8	18.0	16.5	15.1	13.7
14.1	15.4	16.8	18.3	20.0	**114**	20.2	18.4	16.8	15.4	14.0
14.3	15.7	17.1	18.6	20.0	**115**	20.7	18.8	17.2	15.7	14.3
14.6	16.0	17.4	19.0	20.8	**116**	21.1	19.2	17.5	16.0	14.5
14.8	16.2	17.7	19.3	21.2	**117**	21.5	19.6	17.7	18.3	14.8
15.0	16.5	18.0	19.7	21.6	**118**	22.0	19.9	18.2	16.6	15.1
15.3	16.8	18.3	20.0	22.0	**119**	22.4	20.3	18.5	16.9	15.4
15.5	17.1	18.6	20.4	22.4	**120**	22.8	20.7	18.9	17.3	15.6

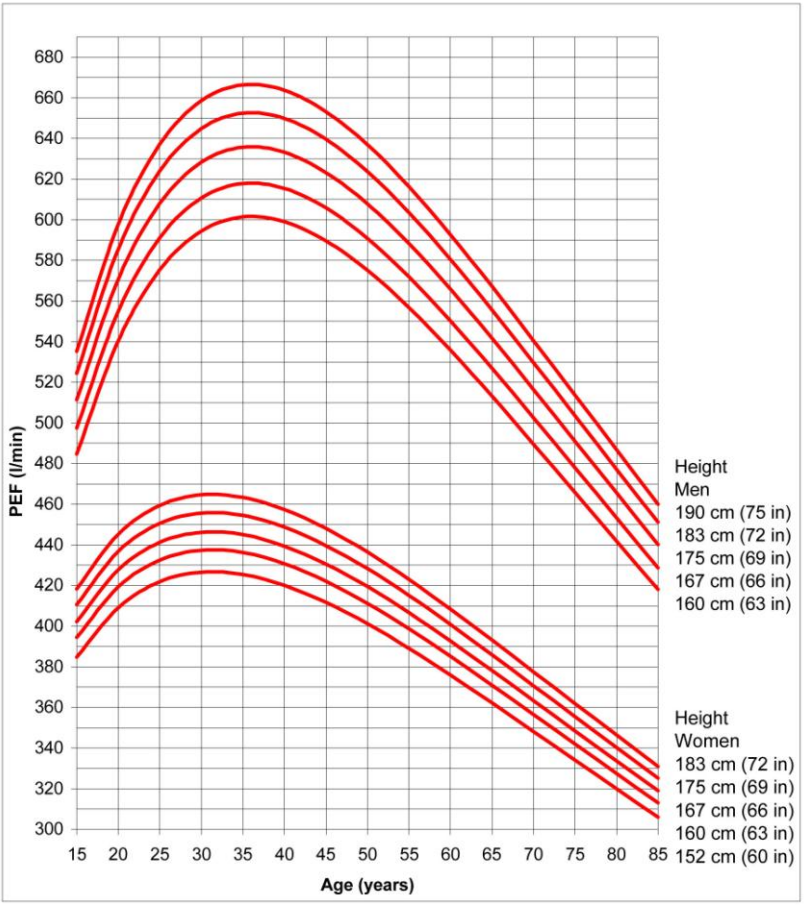
PEAK EXPIRATORY FLOW RATES

Suggested reference peak expiratory flow (PEF) values for children:

Height (cm)	PEF		PEF	
	Caucasian		African	
	Male	Female	Male	Female
100	127	142	120	126
101	131	145	124	130
102	135	149	128	133
103	138	152	131	137
104	142	156	135	140
105	146	159	139	144
106	150	163	143	148
107	154	166	147	151
108	158	170	151	155
109	162	174	155	159
110	166	178	159	163
111	170	182	163	167
112	175	185	168	171
113	179	189	172	175
114	184	193	176	179
115	188	197	181	184
116	193	202	186	188
117	197	206	190	192
118	202	210	195	197
119	207	214	200	201
120	212	218	205	206
121	217	223	210	210
122	222	227	215	215
123	227	232	220	220
124	232	236	226	225
125	237	241	231	230
126	243	245	236	235
127	248	250	242	240
128	254	255	248	245
129	259	259	253	250
130	265	264	259	255
131	271	269	265	260
132	276	274	271	266
133	282	279	277	271
134	288	284	283	277
135	294	289	289	282
136	300	294	295	288
137	307	299	302	293

Paediatric Hospital Level STG, 2013.

Peak expiratory flow in normal adult subjects



Adapted with kind permission from Nunn AJ Gregg I, Br Med J 1989:298;1068-70 and Clement Clarke International.

CALCULATING % PREDICTED PEAK FLOW RATE

- Take the best of 3 of the patient's observed peak flow rate:
  e.g. 200, 180, 190 performed – so take 200.
- Find the patient's sex, age and height predicted value from nomogram or table:
  e.g. 440 for a woman of age 25 years and height 167 cm
- Divide patient's observed peak flow rate over their predicted peak flow rate:
  e.g. 200/440 = 0.45
- Multiply by 100:
  e.g. 0.45X100 = 45%

So, in this example, the patient's observed peak flow rate is 45% of predicted.

CALCULATING PEAK FLOW VARIABILITY

There are a number of methods for calculating PEF variability.

One method is described below:

- Subtract the lowest from the highest reading.
- Divide by the highest reading.
- Multiply by 100.

So, in this example, where a patient has readings of 300 to 400, the variability is 25%. If these readings were taken before and after a test dose of salbutamol, asthma is diagnosed. (See Section 17.1.2 Chronic asthma).

INDEX OF CONDITIONS

INDEX OF MEDICINES

ABBREVIATIONS

3TC	lamivudine
ABC	abacavir
ABCD	Airways, Breathing, Circulation, Drip/Doctor/Drugs
ACE-inhibitor	angiotensin-converting-enzyme inhibitor
ACR	albumin/creatinine ratio
AED	automated external defribillator
AEFI	adverse events following immunisation
AFASS criteria	affordable, feasible, acceptable, sustainable and safe criteria
AIDS	Acquired Immune Deficiency Syndrome
ALT	alanine transaminase
AMI	acute myocardial infarction
ARB	angiotensin II receptor blockers
ART	antiretroviral therapy
ARV	antiretroviral medicine
AST	aspartate aminotransferase
ATV	atazanavir
AZT	zidovudine
BAL	balanitis/balanoposthitis
BCG vaccine	Bacillus Calmette–Guérin vaccine
BIPP	bismuth iodoform paraffin paste
BMI	body mass index
BP	blood pressure
BPH	benign prostatic hyperplasia
C	Celcius
CAB	circulation airways breathing
cap(s)	capsule(s)
CCF	congestive cardiac failure
CD4	cluster of differentiation 4
CHC	community health centres
CKD	chronic kidney disease
cm	centimetre
CNS	central nervous system
CO_2	carbon dioxide
COC	combined oral contraceptive
COPD	chronic obstructive pulmonary disease
CPR	cardiopulmonary resuscitation
CrAg	cryptococcal antigen
CSF	cerobrospinal fluid
CVA	cerebral vascular accident
CVD	cardiovascular disease
CVS	cardiovascular system
d4T	stavudine
ddI	didanosine
DHIS	District health information system
DKA	hyperglycaemia diabetic ketoacidosis
dL	decilitre
DRESS	drug reaction with eosinophilia and systemic symptoms
DR-TB	drug resistant tuberculosis
DTaP	diptheria, tetanus, acellular pertussis
E or EMB	ethambutol
e.g.	example

ECG	electrocardiogram
EE	ethinyloestradiol
EFV	efavirenz
eGFR	estimated glomerular filtration rate
ELISA	enzyme-linked immunosorbent assay
EML	essential medicine list
EMS	emergency medical services
EPI	expanded programme on immunisation
ET	endotracheal tube
FBC	full blood count
FLACC scale	face, legs, activity, cry, consolability scale
FTA	fluorescent treponemal antibody
FTC	emtricitabine
g	gram
GCS	Glasgow coma scale
GN	glomerular disease
GOR	gastro-oesophageal reflux
GORD	gastro-oesophageal reflux disease
GUS	genital ulcer syndrome
GW	genital warts
H or INH	isoniazid
Hb	Haemoglobin
HB	hepatitis B
HbA1c	Glycosylated haemoglobin
HCW	healthcare workers
HDL	high-density lipoprotein
HHS	hyperosmolar hyperglycaemic state
Hib	*Haemophilus influenzae* type b
HIV	human immunodeficiency virus
HMGCoA	3-hydroxy-3-methylglutaryl–coenzyme A
HPV	Human papillomavirus
HR	heart rate
HSV	herpex simplex virus
HT	hormone therapy
IBS	irritable bowel syndrome
IDDM	insulin-dependent diabetes mellitus
IM	intramuscular
IMCI	Integrated management of childhood illnesses
INH	isoniazid
IPT	isoniazid preventive therapy
IPV	inactivated polio vaccine
IRIS	immune reconstitution inflammatory syndrome
IU	international unit
IUD	intrauterine contraceptive device
IV	intravenous
kg	kilogram
L	litre
LABA	long-acting beta2 agonist
LAP	lower abdominal pain
LDL	low-density lipoprotein
LoE	level of evidence

LPC	liquor picis carbonis (coal tar)
LPV/r	lopinavir/ritonavir
MC	molluscum contagiosum
mcg	microgram
MCV	mean corpuscular volume
MDR-TB	mult-drug resistant tuberculosis
mEq	milliequivalent
mg	milligram
MI	myocardial infarction
min	minute
MINI	MINI international neuro-psychiatric interview
mL	millilitre
mm	millimetre
mmoL	millimole
MTB	*Mycobacterium tuberculosis*
MU	million units
MUAC	mid upper arm circumference
MUS	male urethritis syndrome
MVA	manual vacuum aspiration
NAGI	National advisory group on immunization
NAGI	National Advisory Group on Immunisation
NEMLC	National Essential Medicines List Committee
NICD	National institute for communicable diseases
NIMART principles	Nurse Initiated Management of Antiretroviral Therapy principles
NNRTI	non-nucleoside reverse transcriptase inhibitor
NPH insulin	Neutral Protamine Hagedorn insulin
NRTI	nucleoside reverse transcriptase inhibitor
NSAID	non steroidal antinflammatory drug
NSTEMI	non ST elevation myocardial infarction
NVP	nevirapine
OPV	oral polio vaccine
ORS	oral rehydration solution
PCR	protein/creatinine ratio
PCR HIV test	polymerase chain reaction HIV test
PCV	pneumococcal conjugated vaccine
PEF	peak expiratory flow
PEFR	peak expiratory flow rate
PEP	post exposure prophylaxis
pg	page
PHC	primary healthcare
PI	protease inhibitor
PID	pelvic inflammatory disease
PL	pubic lice
PMTCT	prevention of mother to child transmission
PPE	papular pruritic eruption
PPH	post-partum haemorrhage
PPIP	Perinatal problem identification programme
PPROM	preterm prelabour rupture of membranes
PROM	prelabour rupture of membranes at term
PSA	prostate specific antigen
PTL	preterm labour

PTSD	post traumatic stress syndrome
PZA or Z	pyrazinamide
R	rifampicin
Rh	Rhesus
RNA	ribonucleic acid
RPR	Rapid Plasmin Reagin
RSQ	Risk of Suicide Questionnaire
RTHB	road to health booklet
RTUF	ready to use food
RV	rotavirus
SABA	short-acting beta$_2$ agonist
SAM	severe acute malnutrition
sats	oxygen saturation
SC	subcutaneously
SJS	Stevens-Johnson syndrome
sol	solution
SSRI	selective serotonin re-uptake inhibitor
SSS	sugar and salt solution
SSW	scrotal swelling
STD	sexually transmitted disease
STEMI	ST elevation myocardial infarction
STG	standard treatment guideline
STI	sexually transmitted infection
susp	suspension
T4	thyroxine
tab(s)	tablet(s)
TB	tuberculosis
TBSA	total body surface area
Td	tetanus and diptheria
TDF	tenofovir
TEN	toxic epidermal necrolysis
TG	triglycerides
TIA	transient ischaemic attack
TOP	termination of pregnancy
TPHA	*Treponema pallidum* haemagglutination
TPPA	*Treponema pallidum* particle agglutination
TSH	thyroid-stimulating hormone
TST	tuberculin skin test
TT	tetanus toxoid vaccine
UE	ung emulsificans (emulsifying ointment)
UEA	ung emulisificans aqueosum (aqueous cream)
UTI	urinary tract infection
VDS	vaginal discharge syndrome
VHF	viral haemorrhagic fever
VL	viral load
VVM	vaccine vial monitor
WFI	water for injection
WHO	World health organisation
WHZ	weight for height Z score
XDR-TB	extensively drug-resistant tuberculosis
ETAT tool	emergency triage assessment and treatment tool

USEFUL NUMBERS AND URL LINKS

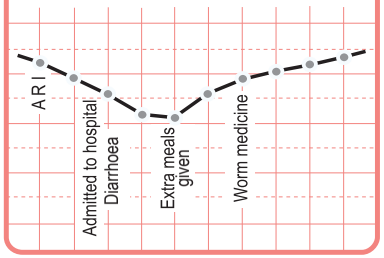
POISONS INFORMATION CENTRES	
Red Cross War Memorial Children's Hospital Poisons Information Service	021 689 5227
Tygerberg Poison Information Centre	021 931 6129
University of the Free State Poison Control and Medicine Information Centre	082 491 0160
COMMUNICABLE DISEASES	
Rabies hotline (NICD)	082 883 9920
Viral Haemmorhagic Fever outbreak hotline (NICD)	082 883 9920
MEDICINE INFORMATION CENTRES	
Medicine Information Centre (Cape Town)	021 406 6829 0861 100531
Amayeza Info Centre	011 678 2332
National HIV Healthcare Worker Hotline	0800 212 506 0214066782
DEPARTMENT OF HEALTH	
National Department Health website	www.health.gov.za
Essential Drugs Programme	www.health.gov.za/edp.php SAEDP@health.gov.za
Third line ART applications	TLART@health.gov.za
Medicine stock availability reporting	stockalert@health.gov.za

Girl's Weigth-for-Age Chart

Write on the chart

- Any illness e.g. diarrhoea, ARI, etc.
- Admission to hospital,
- Solids introduced,
- Breastfeeding stopped,
- Birth of next child, etc.

like this:



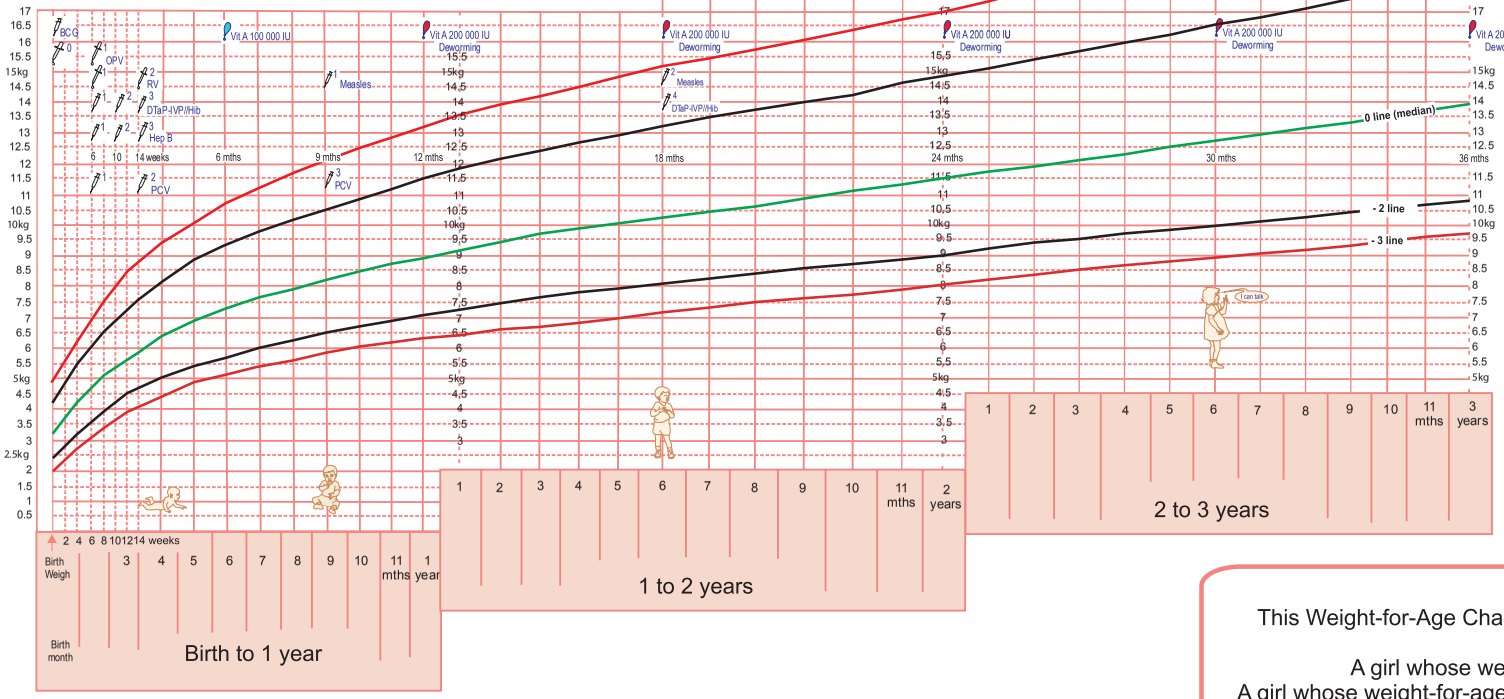
Watch the direction of the curve showing the child's growth:

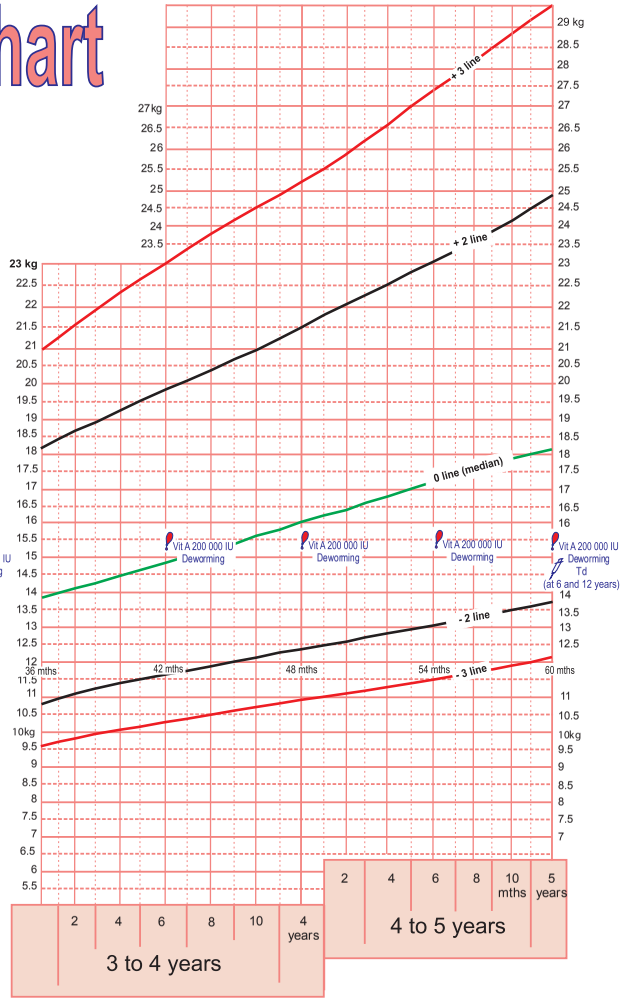
GOOD
Means the child is growing well.

VERY DANGEROUS
Child may be ill, needs extra care.

DANGER SIGN
Not gaining weight.
Find out why.

Refer child to hospital





Interpretation of lines:

This Weight-for-Age Chart shows body-weight relative to age in comparison to the Median (0-line).
A girl whose weight-for-age is below the -2 line, is underweight.
A girl whose weight-for-age is below the -3 line, is severely underweight. Clinical signs of Marasmus or Kwashiorkor may be observed.

If her line crosses a z-score line and the shift is away from the median, this may indicate a problem or risk of a problem.

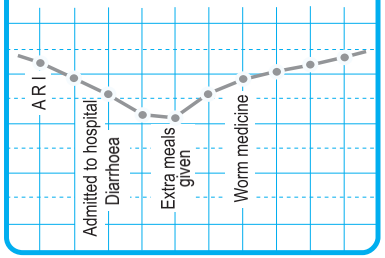
If her line stays close to the median, occasionally crossing above or below it, this is fine.

Boy's Weight-for-Age Chart

Write on the chart

- Any illness e.g. diarrhoea, ARI, etc.
- Admission to hospital,
- Solids introduced,
- Breastfeeding stopped,
- Birth of next child, etc.

like this:



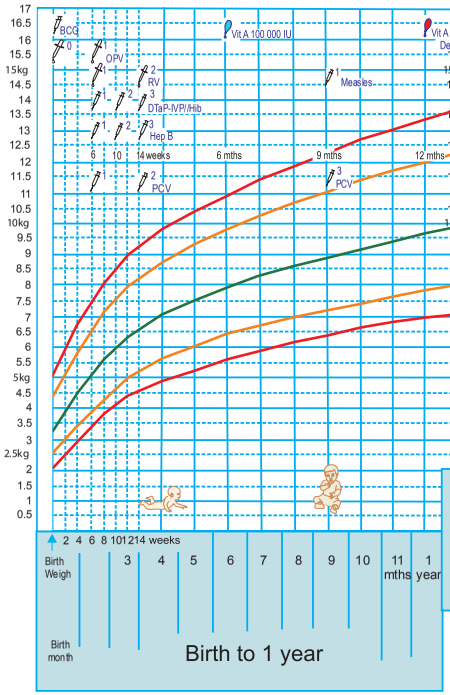
Watch the direction of the curve showing the child's growth:

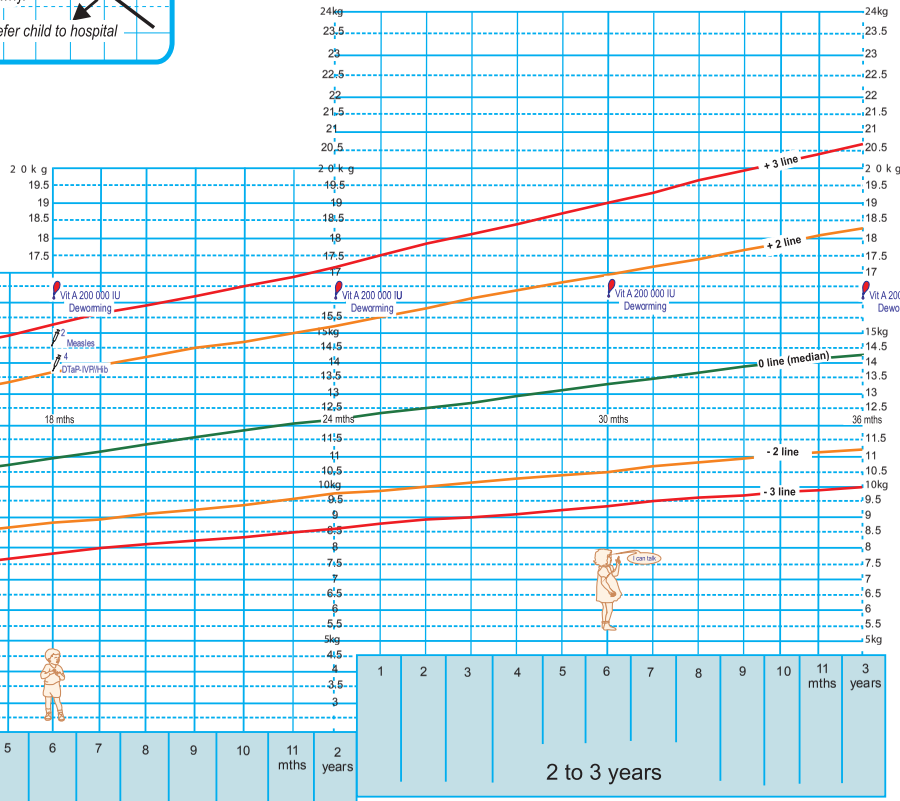
GOOD
Means the child is growing well.

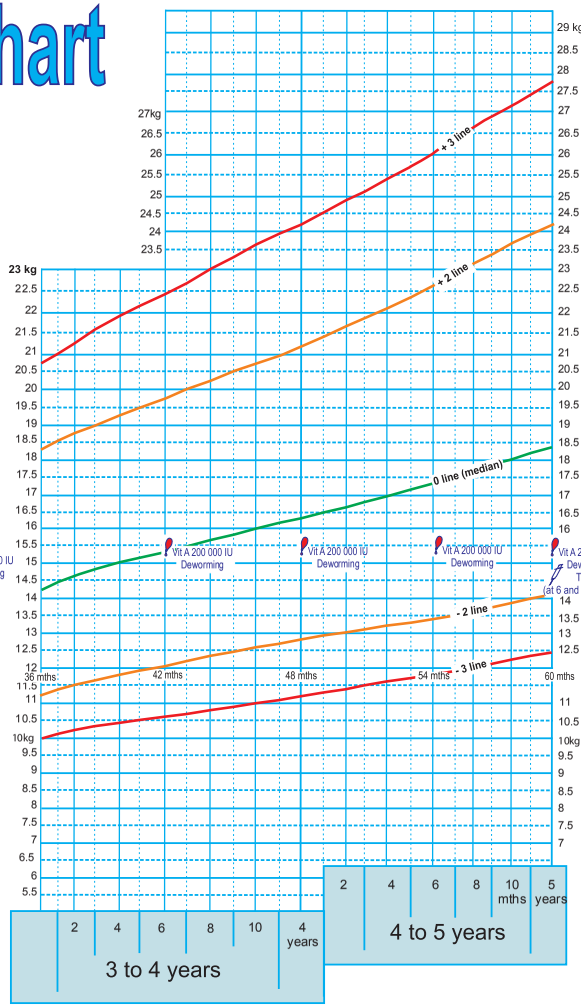
VERY DANGEROUS
Child may be ill, needs extra care.

DANGER SIGN
Not gaining weight.
Find out why.

Refer child to hospital







Interpretation of lines:

This Weight-for-Age Chart shows body-weight relative to age in comparison to the Median (0-line).
A boy whose weight-for-age is below the -2 line, is underweight.
A boy whose weight-for-age is below the -3 line, is severely underweight. Clinical signs of Marasmus or Kwashiorkor may be observed.

If his line crosses a z-score line and the shift is away from the median, this may indicate a problem or risk of a problem.

If his line stays close to the median, occasionally crossing above or below it, this is fine.