**Appendix A - Supplementary material**

**The development of a nurse-led preoperative anaesthesia screening tool**

**Supplementary material (S1) - Systematic Review, Literature search**

Systematic searches of MEDLINE, Scopus, EBSCOhost were performed to identify trials and publications on 5 August 2017.

**PubMed:**

Search ((((("Preoperative Care"[Mesh]) AND ((("Surveys and Questionnaires"[Mesh])) OR "Interviews as Topic"[Mesh])) AND "Risk"[Mesh])) NOT (("Obstetrics"[Mesh]) OR (obstetrics OR obstetric))) NOT (("Cardiac Surgical Procedures"[Mesh]) OR (Cardiac surgery OR heart surgery OR cardiac surgical procedures)) Filters: Humans

Search **((((((((((("Surgical Procedures, Operative"[Mesh]) AND ("Surveys and Questionnaires"[Mesh])) OR interviews) OR "Interviews as Topic"[Mesh]) OR "Nursing Evaluation Research"[Mesh]) AND "Risk"[Mesh]) NOT "Obstetrics"[Mesh]) NOT obstetric\*) NOT "Cardiac Surgical Procedures"[Mesh]) NOT cardiac surgery) NOT heart surgery) NOT cardiac surgical procedure** Sort by: **Relevance** Filters: **Humans**

Took out interview free text:

Search **(((((((((("Surgical Procedures, Operative"[Mesh]) AND ("Surveys and Questionnaires"[Mesh])) OR "Interviews as Topic"[Mesh]) OR "Nursing Evaluation Research"[Mesh]) AND "Risk"[Mesh]) NOT "Obstetrics"[Mesh]) NOT obstetric\*) NOT "Cardiac Surgical Procedures"[Mesh]) NOT cardiac surgery) NOT heart surgery) NOT cardiac surgical procedure** Sort by: **Relevance** Filters: **Humans**

Used pre-op care and not surgical procedure:

Search **((((((((((("Preoperative Care"[Mesh] AND Humans[Mesh])) AND ("Surveys and Questionnaires"[Mesh])) OR "Interviews as Topic"[Mesh]) OR "Nursing Evaluation Research"[Mesh]) AND "Risk"[Mesh]) NOT "Obstetrics"[Mesh]) NOT obstetric\*) NOT "Cardiac Surgical Procedures"[Mesh]) NOT cardiac surgery) NOT heart surgery) NOT cardiac surgical procedure** Sort by: **Relevance** Filters: **Humans**

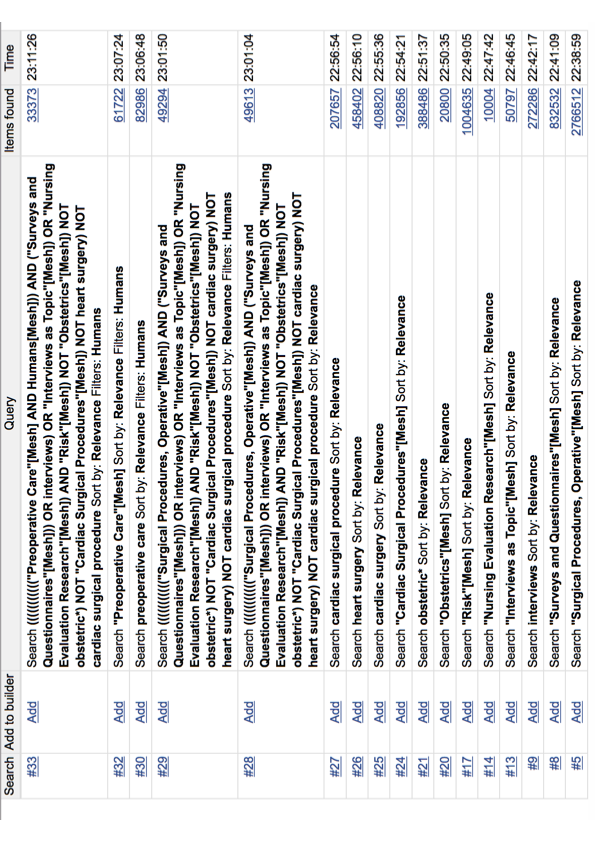
Recent queries in pubmed Search, Query, Items found, Time #42,"Search (((((""Preoperative Care""[Mesh] AND Humans[Mesh])) AND (""Surveys and Questionnaires""[Mesh])) OR ""Interviews as Topic""[Mesh]) AND ""Risk""[Mesh]) NOT (((((((""Obstetrics""[Mesh]) OR obstetric\*) OR ""Cardiac Surgical Procedures""[Mesh]) OR cardiac surgery) OR heart surgery) OR cardiac surgical procedure) AND Humans[Mesh]) Filters: Humans; Adult: 19+ years Sort by: [pubsolr12]",5467,23:56:30 #41,"Search ((((((""Preoperative Care""[Mesh] AND Humans[Mesh])) AND (""Surveys and Questionnaires""[Mesh])) OR ""Interviews as Topic""[Mesh]) OR ""Nursing Evaluation Research""[Mesh]) AND ""Risk""[Mesh]) NOT (((((((""Obstetrics""[Mesh]) OR obstetric\*) OR ""Cardiac Surgical Procedures""[Mesh]) OR cardiac surgery) OR heart surgery) OR cardiac surgical procedure) AND Humans[Mesh]) Filters: Humans; Adult: 19+ years Sort by: [pubsolr12]",5924,23:52:33 #40,"Search ((((((""Preoperative Care""[Mesh] AND Humans[Mesh])) AND (""Surveys and Questionnaires""[Mesh])) OR ""Interviews as Topic""[Mesh]) OR ""Nursing Evaluation Research""[Mesh]) AND ""Risk""[Mesh]) NOT (((((((""Obstetrics""[Mesh]) OR obstetric\*) OR ""Cardiac Surgical Procedures""[Mesh]) OR cardiac surgery) OR heart surgery) OR cardiac surgical procedure) AND Humans[Mesh]) Filters: Humans Sort by: [pubsolr12]",7656,23:49:08 #39,"Search (((((""Surgical Procedures, Operative""[Mesh]) AND (""Surveys and Questionnaires""[Mesh])) OR interviews) OR ""Nursing Evaluation Research""[Mesh]) AND ""Risk""[Mesh]) NOT (((((((""Obstetrics""[Mesh]) OR obstetric\*) OR ""Cardiac Surgical Procedures""[Mesh]) OR cardiac surgery) OR heart surgery) OR cardiac surgical procedure) AND Humans[Mesh]) Filters: Humans Sort by: [pubsolr12]",49294,23:47:34 #38,"Search (((((""Obstetrics""[Mesh]) OR obstetric\*) OR ""Cardiac Surgical Procedures""[Mesh]) OR cardiac surgery) OR heart surgery) OR cardiac surgical procedure Filters: Humans Sort by: [pubsolr12]",733444,23:45:21 #37,"Search (((((""Obstetrics""[Mesh]) AND obstetric\*) AND cardiac surgery) AND heart surgery) AND cardiac surgical procedure) AND ""Cardiac Surgical Procedures""[Mesh] Filters: Humans Sort by: [pubsolr12]",7,23:44:01 #36,"Search (((((((((""Preoperative Care""[Mesh] AND Humans[Mesh])) AND (""Surveys and Questionnaires""[Mesh])) OR ""Interviews as Topic""[Mesh]) AND ""Risk""[Mesh]) NOT ""Obstetrics""[Mesh]) NOT ""Cardiac Surgical Procedures""[Mesh]) NOT heart surgery) NOT cardiac surgical procedure) NOT obstetric\* Filters: Humans Sort by: [pubsolr12]",6878,23:41:33 #35,"Search (((((((((((""Preoperative Care""[Mesh] AND Humans[Mesh])) AND (""Surveys and Questionnaires""[Mesh])) OR ""Interviews as Topic""[Mesh]) OR ""Nursing Evaluation Research""[Mesh]) AND ""Risk""[Mesh]) NOT ""Obstetrics""[Mesh]) NOT obstetric\*) NOT ""Cardiac Surgical Procedures""[Mesh]) NOT cardiac surgery) NOT heart surgery) NOT cardiac surgical procedure Filters: Humans Sort by: [pubsolr12]",7656,23:36:59 #34,"Search ((((((((((""Surgical Procedures, Operative""[Mesh]) AND (""Surveys and Questionnaires""[Mesh])) OR ""Interviews as Topic""[Mesh]) OR ""Nursing Evaluation Research""[Mesh]) AND ""Risk""[Mesh]) NOT ""Obstetrics""[Mesh]) NOT obstetric\*) NOT ""Cardiac Surgical Procedures""[Mesh]) NOT cardiac surgery) NOT heart surgery) NOT cardiac surgical procedure Filters: Humans Sort by: [pubsolr12]",23992,23:31:49 #33,"Search (((((((((((""Preoperative Care""[Mesh] AND Humans[Mesh])) AND (""Surveys and Questionnaires""[Mesh])) OR interviews) OR ""Interviews as Topic""[Mesh]) OR ""Nursing Evaluation Research""[Mesh]) AND ""Risk""[Mesh]) NOT ""Obstetrics""[Mesh]) NOT obstetric\*) NOT ""Cardiac Surgical Procedures""[Mesh]) NOT heart surgery) NOT cardiac surgical procedure Filters: Humans Sort by: [pubsolr12]",33373,23:11:26 #32,"Search ""Preoperative Care""[Mesh] Filters: Humans Sort by: [pubsolr12]",61722,23:07:24 #30,"Search preoperative care Filters: Humans Sort by: [pubsolr12]",82986,23:06:48 #29,"Search (((((((((((""Surgical Procedures, Operative""[Mesh]) AND (""Surveys and Questionnaires""[Mesh])) OR interviews) OR ""Interviews as Topic""[Mesh]) OR ""Nursing Evaluation Research""[Mesh]) AND ""Risk""[Mesh]) NOT ""Obstetrics""[Mesh]) NOT obstetric\*) NOT ""Cardiac Surgical Procedures""[Mesh]) NOT cardiac surgery) NOT heart surgery) NOT cardiac surgical procedure Filters: Humans Sort by: [pubsolr12]",49294,23:01:50 #28,"Search (((((((((((""Surgical Procedures, Operative""[Mesh]) AND (""Surveys and Questionnaires""[Mesh])) OR interviews) OR ""Interviews as Topic""[Mesh]) OR ""Nursing Evaluation Research""[Mesh]) AND ""Risk""[Mesh]) NOT ""Obstetrics""[Mesh]) NOT obstetric\*) NOT ""Cardiac Surgical Procedures""[Mesh]) NOT cardiac surgery) NOT heart surgery) NOT cardiac surgical procedure Sort by: [pubsolr12]",49613,23:01:04 #27,"Search cardiac surgical procedure Sort by: [pubsolr12]",207657,22:56:54 #26,"Search heart surgery Sort by: [pubsolr12]",458402,22:56:10 #25,"Search cardiac surgery Sort by: [pubsolr12]",408820,22:55:36 #24,"Search ""Cardiac Surgical Procedures""[Mesh] Sort by: [pubsolr12]",192856,22:54:21 #21,"Search obstetric\* Sort by: [pubsolr12]",388486,22:51:37 #20,"Search ""Obstetrics""[Mesh] Sort by: [pubsolr12]",20800,22:50:35 #17,"Search ""Risk""[Mesh] Sort by: [pubsolr12]",1004635,22:49:05 #14,"Search ""Nursing Evaluation Research""[Mesh] Sort by: [pubsolr12]",10004,22:47:42 #13,"Search ""Interviews as Topic""[Mesh] Sort by: [pubsolr12]",50797,22:46:45 #9,"Search interviews Sort by: [pubsolr12]",272286,22:42:17 #8,"Search ""Surveys and Questionnaires""[Mesh] Sort by: [pubsolr12]",832532,22:41:09 #5,"Search ""Surgical Procedures, Operative""[Mesh] Sort by: [pubsolr12]",2766512,22:38:59

**Scopus:**

( ( ( TITLE-ABS-KEY ( ( preoperative AND care ) OR ( preoperative AND procedures ) ) ) AND ( TITLE-ABS-KEY ( ( surveys AND questionnaires ) AND ( risk ) ) ) ) AND ( not INDEX ( medline ) ) ) AND NOT ( ( not TITLE-ABS-KEY ( ( cardiac AND surgical AND procedures ) OR ( cardiac AND surgery ) OR ( heart AND surgery ) ) ) AND ( not TITLE-ABS-KEY ( obstetric\* ) ) ) AND ( LIMIT-TO ( EXACTKEYWORD , "Human" ) OR LIMIT-TO ( EXACTKEYWORD , "Humans" ) )

**EBSCOhost:**

( preoperative care OR preoperative evaluation OR preanaesthetic OR preanesthetic OR pre-anaesthetic OR pre-anesthetic ) AND ( surveys OR questionnaires OR interviews OR visit OR screening ) AND ( risk assessment OR risk factors ) NOT Obstetric\* NOT ( cardiac surgery or heart surgery OR cardiac surgical procedures )



**Supplementary material (S2) – PRISMA Flow Diagram for preoperative screening tools.**

Records identified through database search – 5 August 2017

(n = 899)

(n = 899)

Records after duplicates removed  
(n = 865)

Full-text articles assessed for eligibility  
(n = 84)

Studies included for question generation  
(n = 98)

Records excluded  
(n = 781)

Full-text articles excluded, with reasons (n = 19)

…… Foreign language (1)

……. Study replication (1)

…… Cardiac patients (1)

Guideline (2)

Review (2)

……..No tool (4)

Survey (8)

Duplicate questionairre (n=1)

## Eligibility

## Included

## Screening

## Identification

Title and abstract review  
(n = 865)

Screening tools identified through manual searching   
(n = 14)

**Supplementary material (S3) -** List of domains into which the screening items were categorised.

1. Cardiovascular
2. Respiratory
3. Nervous system
4. Blood disorders
5. Endocrine
6. Gastrointestinal
7. Renal
8. Medical
9. Clinical parameters
10. Anaesthetic

**Supplementary material S4 - Recommendations for the Conducting and Reporting of Delphi Studies (CREDES)1**

*Rationale for the choice of the Delphi technique*

1. Justification: A convergence of opinion of real-world issues of anaesthetists practitioners working in varying South African contexts was needed. The Delphi technique is widely used and acceptable. 2

*Planning and design*

2. Planning and process: see pages 4-5  
3. Definition of consensus: see pages 4-5

*Study conduct*

4. Informational input: Information was reviewed by two facilitators prior to each round but not piloted in advance  
5. Prevention of bias: see page 11

6. Interpretation and processing of results. See Supplementary material S9

7. External validation: Not done. External validation will form part of subsequent studies.

*Reporting*

8. Purpose and rationale: see page 3   
9. Expert panel: see page 4  
10. Description of the methods: see pages 4-5

11. Procedure: see pages 4-5, supplementary material S6-9

12. Definition and attainment of consensus: see pages 4-5, supplementary material S9

13. Results. See pages 6-10, supplementary material S7-9  
14. Discussion of limitations. See page 11

15. Adequacy of conclusions. See page 11  
16. Publication and dissemination. See page 11

**Supplementary material S5 – List of scoring tools identified**

**Cardiovascular**

Cardiac Risk Index \*3,4

Gupta Risk Calculator 5,\*6

**Respiratory**

STOPBANG 7, 8

Sleep Apnoe Clinical Score 9

Berlin Questionnaire 7

Maislin Index Score 10

Epworth Sleepiness Scale 11,\*12

**Nervous System**

Anxiety:

Surgical Anxiety Scale 13

Surgical Anxiety Questionnaire \*14, 15

State Trait Anxiety Inventory 16, 17

Depression:

Geriatric Depression Scale 18,\*19

Patient Health Questionnaire 20, 21,\*22

Cognitive Function:

Mini-mental status (MMS) 23,\*24

Mini-Cog 25

Telephone Interview Cognitive Status (TICS) \*26

Six-item screener (6-IS) \*27, \*28

Eight-item screener (8-IS) \*29

Six item cognitive impairment test (6CIT) \*30

Sweet 16 (6-16) \*31

**Endocrine:**

The Western Surgical Concern Inventory-Thyroid: Development and Initial Validation 32

**Gastrointestinal:**

Model for end stage liver disease (MELD) 33, \*34

Child Pugh Score \*33, 35

**Medical:**

Pessimism: In breast cancer surgery 36

Suicide and Substance abuse:

CAGE \*37

Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) 38

Minnesota Multiphasic Personality Inventory—2—Restructured Form (MMPI-2-RF) 39, 40

Frailty:

Simplified frailty score 41

Global function:

Functional Assessment of Cancer Therapy Questionnaire (FACT) \*42

Brief Fatigue Inventory \*43

Activities of Daily Living 14, \*44

Instrumental Activities of Daily Living 14,\*45

Comprehensive Geriatric Assessment 23

Eastern Co-operative Oncology Group (ECOG) performance status \*46

Karnofsky Performance Status 14, \*47

Health Related Quality of Life (HRQoL) 48, \*49

Perioperative Assessment in Elderly Cancer Patients (PACE) 50

Sedentary Behaviour Questionnaire 51

Sports Activity Scale 52

Duke Activity Status Index (DASI) 53,\*54

Metabolic Activity Tasks (METS) 53,\*55

Specific Activity Scale 56

Preoperative fitness score 57

Shuttle walk test 58

Six-minute walk test 59

Nutritional Screening:

Malnutrition Universal Screening Tool (MUST) \*60

Nutrition Risk Screening 2002 61, 62

Mini-nutritional assessment for the elderly \*63

**Anaesthetic:**

American Society of Anaesthesiologists Grading (ASA) 64,\*65

Simplified Airway Risk Index 66

Post operative nausea and vomiting 67, 68

Physiological and Operative Severity Score for enumeration of Mortality and Morbidity (POSSUM) \*69 and P-POSSUM (Portsmouth-POSSUM) 70

North American Quality Improvement Project (NSQIP) 71 \*72

Charlson co-morbidity index 73, 74

Acute Physiology and Chronic Health Evaluation II (APACHE II) 75

Surgical Risk Scale 23, \*76

British United Provident Association (BUPA) grade 23

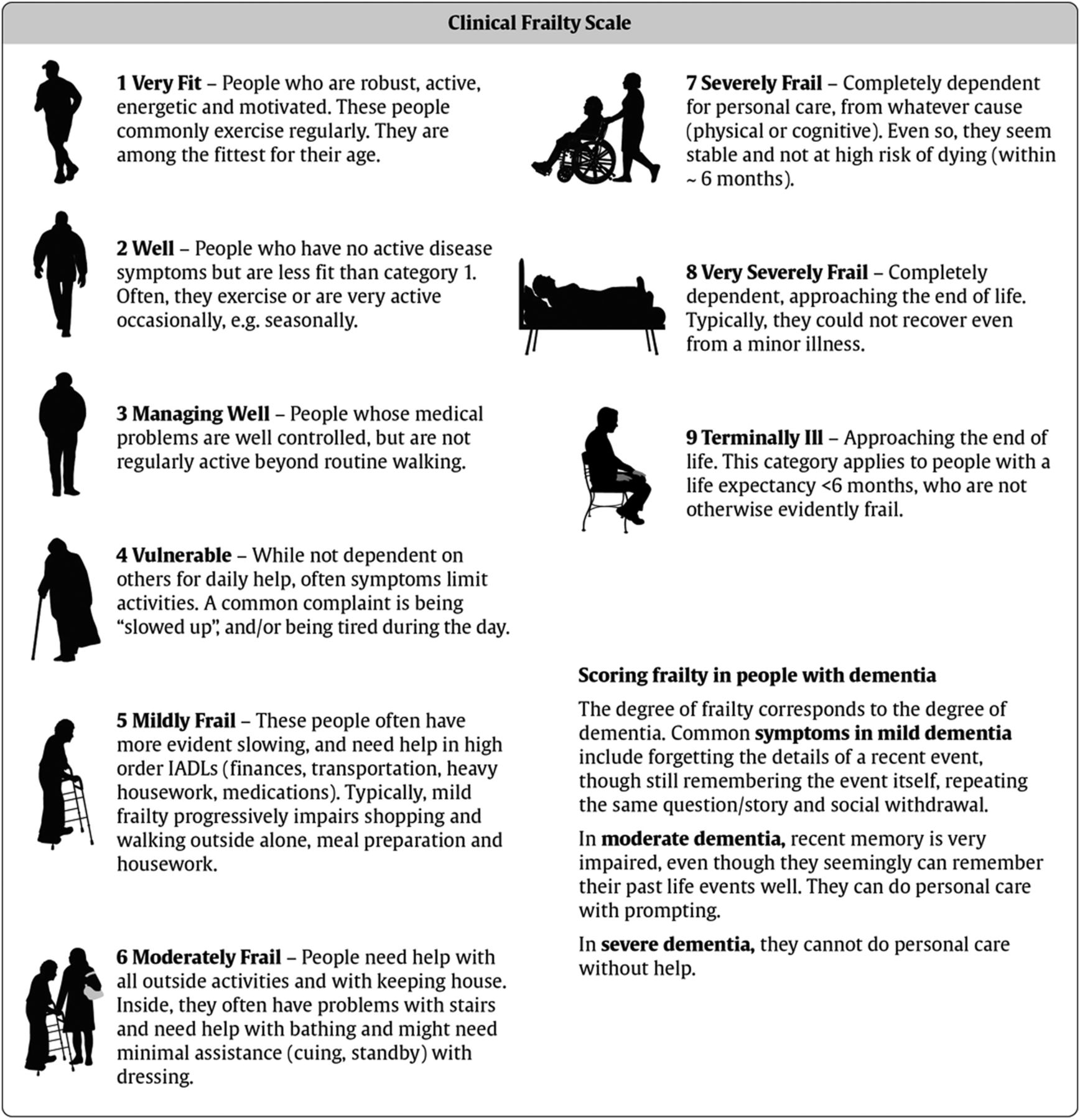
Confidential Enquiry into Perioperative Deaths (CEPOD) grade 23

Computerised score for ASA prediction from multiple variables 77

\* Items identified through further reading (October 2019) but not directly obtained from the original search.

|  |  |  |
| --- | --- | --- |
| **Supplementary material S6 -** List of screening items generated from the systematic review  Have you ever had chest pain, angina or heart attack? 78 | 2 | 2 |
| Have you ever had heart failure or fluid in your lungs? 78 | 2 | 1 |
| Do you have a heart murmur? 78 | 2 |  |
| Did you have rheumatic fever as a child? 78 | 2 |  |
| Have you ever been treated for an irregular heart beat 78 | 2 |  |
| Do you have high blood pressure? 78 | 2 |  |
| Do you have high blood pressure in the lungs (pulmonary hypertension)? 79 | 8 |  |
| Do you have a pacemaker or any implants?80 | 7 |  |
| Have you seen a heart doctor (cardiologist) within the last year?  79 | 8 |  |
|  |  |  |
| Do you ever have difficulty with your breathing? 78 | 2 |  |
| Do you use oxygen at home during the day or at night?  79 | 8 |  |
| Do you have asthma, bronchitis, or emphysema? 78 | 2 |  |
| Do you cough frequently? 78 | 2 |  |
| Do you now or have you recently (within the last year) smoked cigarettes? 78 | 2 | NSQIP |
| Have you ever smoked one or more packs per day? † | M |  |
| Do you SNORE loudly? 8 |  |  |
| Do you feel TIRED, sleepy during the day? 8 |  |  |
| Has anyone OBSERVED YOU STOP BREATHING during sleep?8 |  |  |
|  |  |  |
| Have you ever had a stroke, brain aneurysm, Alzheimer’s disease or dementia, seizures, multiple sclerosis, or brain tumour?  79 | 4 | 6 |
| Do you have numbness or weakness of your arms or legs? 78 | 2 |  |
| Do you have epilepsy, blackouts, or seizures? 78 | 2 |  |
| Myasthenia gravis or muscular dystrophy 79 | 8 |  |
| Do you frequently feel like crying or are unhappy with life?16,17 | M |  |
| In the last 2 weeks have you been bothered by having little interest or pleasure in doing things or feeling down, depressed or hopeless?22 | Modified | |
|  |  |  |
| Do you suffer from anaemia or other blood disorders?80 | 7 |  |
| Do you bruise easily or have bleeding problems?79 | 7 | 4 |
| Have you ever had blood clots in the legs or lungs?80 | 7 |  |
| Do you have haemophilia, sickle cell, or blood cancer?79 | 8 |  |
|  |  |  |
| Do you have a history of thyroid problems? 78 | 2 |  |
| Do you have diabetes? 78 |  |  |
| Have you taken prednisone, steroid medication, or cortisone-like drugs in the past year? 78 | 2 |  |
|  |  |  |
| Do you have liver disease, or a history of jaundice or hepatitis? 78 | 8 | 7 |
| Do you have indigestion, heartburn, or a hiatus hernia? 78 | 2 |  |
|  |  |  |
| Do you have a kidney problem? 78 | 5 | 8 |
|  |  |  |
| If you have or a blood relative been put to sleep for an operation were there any anaesthetic problems? 81,82 |  | 9 |
| Do you have any problems with pain, stiffness or arthritis in your neck or jaw?83 | 2 |  |
| Please list any food, medication or latex allergies that you have 78 | 2 |  |
| Do you have arthritis or pain in your neck or jaw?78 | 5 |  |
| Do you have dentures, capped or loose teeth? 78 |  |  |
| Can you open your mouth more than the width of 3 fingers (4.5cm)? 84 |  |  |
| Have you got any head movement limitations?84 |  |  |
| |  | | --- | | In any of your operations was there any difficulty in placing a tube into your airway? 79 | |  |  |
| Did you experience any major nausea or vomiting after any operation?\*68 |  |  |
|  |  |  |
| Is the patient going for intermediate or high risk surgery? 3 | RCRI |  |
| Are you 80 years of age or older? 79 | 8 |  |
| Do you suffer from any other severe illness? 82 | 7 |  |
| Do you think you may be pregnant? 79 | 2 |  |
| Do you wear contact lenses or a hearing aid? 80 | 2 |  |
| Have you been tested for HIV in the last 1 year? † | M |  |
| Is there anything else that your anaesthetist or surgeon should know? 80 |  |  |
| Have you had an organ transplant? 79 | 8 |  |
| Have you got a cancer that has spread? 72 | M | NSQIP |
| Have you spent a night in hospital (been hospitalised) in the last 6 months? 5 | Gupta 2009 | |
| Have you lost weight in the last 3 months? 62 |  |  |
| Have you been eating less in the last week? 62 |  |  |
| Do you drink more than three drinks of alcohol per day? 78 | 2 |  |
| Do you ever drink more than 6 drinks in one occasion? 85 | Harris 2011 | |
|  |  |  |
| Please list any medications (including a contraceptive pill) you have taken/are taking in the last 6 months 81 | 2 |  |
| Are you taking more than 5 chronic medications † | M |  |
| Are you taking any over the counter (garlic, ginseng, echinacea) medicine? † | M |  |
| Are you taking any traditional medicine? † | M |  |
| Are you on any antidepressants, mood enhancing medicine?† | M |  |
| Are you taking blood thinners now? 79 | 8 | 5 |
| Are you taking any anti-retroviral/ARV medication? † | M |  |
| Do you take narcotic medication not prescribed for you or street (illicit) drugs? 79 | 8 | 12 |
| Do you take long-acting opioids like OxyContin (oxycodone), methadone, or Suboxone (buprenorphine)? 79 | 8 |  |
| Can you climbing one flight of stairs or walk uphill without stopping? Do not answer “yes” if the only reason that you are unable to do this is because of an orthopaedic condition) 79 | 2 | 3 |
| Do you need assistance with getting dressed or washing yourself? \*54 | Modified | |
| Do you need to spend time in bed because of your illness? \*46 | M | modified |
|  |  |  |
| Is the heart rate less than 50? \*69 | m | APACHE |
| Is the heart rate more than 100? \*69 | m | APACHE |
| Is the systolic pressure more than 140mmHg? † | m | APACHE |
| Is the diastolic pressure more than 90mmHg? † | m | APACHE |
| Is the systolic pressure less than 90 mmHg? \*69 | m | APACHE |
| Is the diastolic pressure less than 50 mmHg? † | m |  |
| Is the respiratory rate more than 24 breaths per minute? \*86 | m |  |
| Is the saturation on room air after 5 deep breaths less than 90%? † | m |  |
| Is the body mass index (BMI) greater than 35? \*87 | m | STOPBANG |
| Is the body mass index (BMI) less than 20? 62 | m |  |
| Is the neck circumference more than 40 cm? \*87 | m | STOPBANG |
| Is the creatinine more than 100 mmol/L? † | m |  |
| Is the glomerular filtration rate (GFR) less than 60%? † | m |  |
| Is the urea more than 15 mmol/L? \*69 | m | POSSUM |
| Is the haemoglobin less than 10 g/dL? \*69 | m |  |
| Is the HbA1c more than 7.5 mmol/L? † | m |  |
| Is the White cell count more than 20 or less than 3 X109/L? \*69 | m | POSSUM |
| Is the sodium (Na) less than 126 mmol/L\*69 | m | POSSUM |
| Is the potassium (K) less than 2.9 or more than 5.9 mmol/L\*69 | m | POSSUM |
| clip_image002.png |  |  |
| Is mouth opening less than 4 cm? 84 | Norskov 2014 | |
| Is the Thyromental Distance less than 6.5 cm? 84 |  |  |
| Is there limited neck movement (less than 80 degrees)? 84 |  |  |
| Does the patient have an underbite (cannot protrude their bottom teeth onto their upper lip)? 84 |  |  |
|  |  |  |
| Has the patient scored 3 or less in the six-item screener test? ‡, 28 |  |  |
| Is the patient frail (scores 5 or more on the clinical frailty scale) §, 88 |  |  |

|  |
| --- |
|  |
| \*items identified through manual searches  † items added by facilitators  ‡ three-item recall (e.g., apple, table, penny) and a three-item temporal orientation (day of the week,  month, year).  §  Each correct response earns 1 point for a total of 6 points. Administration time is one minute, not  including the delay for the recall component |



Rockwood K, Song X, MacKnight C, et al. A global clinical measure of fitness and frailty in elderly people. *CMAJ* 2005; **173**: 489-95

**Supplementary material S7**. Newly proposed questions from round 1 and 2.

**Round 1**

Newly proposed questions:

1. Are you chronically using NSAIDS drugs like ibuprofen?
2. Are you HIV positive?
3. Are you on anti-retrovirals?
4. Have you had or been treated for TB before?
5. Are platelets <100 mmol/L?

**Round 2**

Newly proposed questions:

1. Have you ever had a serious reaction to a blood transfusion?
2. Would you refuse a blood transfusion if a doctor thought it was in your best interest or life-saving?
3. Are you on treatment for cancer?
4. Have you had a covid-19 infection?

**Supplementary material S8 -** Table of Results from Delphi Round 1 and 2.

U, unimportant; I, important; C, critical;

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Summary of item | Delphi Round1  n=16 | | | | Delphi Round 2  n=16 | | | | Consensus after Round 2 |
|  | U | I | C | median | U | I | C | median | Y/N |
| **Cardiovascular** |  |  |  |  |  |  |  |  |  |
| Have you ever had chest pain, angina or heart attack? | 0 | 0 | 16 | 9 | 0 | 0 | 15 | 9 | Y |
| Have you ever had heart trouble? | 3 | 2 | 11 | 7.5 | 3 | 1 | 12 | 8 | N |
| Have you ever had heart failure or fluid in your lungs? | 0 | 1 | 15 | 9 | 0 | 0 | 15 | 9 | Y |
| Do you have a heart murmur? | 0 | 4 | 12 | 9 | 0 | 3 | 12 | 8 | Y |
| Did you have rheumatic fever as a child? | 3 | 5 | 8 | 6.5 | 3 | 8 | 5 | 6 | N |
| Have you ever been TREATED for an irregular heart beat? | 0 | 4 | 12 | 8.0 | 0 | 1 | 14 | 9 | Y |
| Do you have high blood pressure in the lungs (pulmonary hypertension)? | 1 | 1 | 14 | 8.0 | 1 | 1 | 13 | 8 | Y |
| Do you have a pacemaker or any implants? | 0 | 1 | 15 | 9.0 | 0 | 0 | 15 | 9 | Y |
| Have you seen a heart doctor (cardiologist) within the last year? | 2 | 7 | 7 | 6.0 | 2 | 6 | 8 | 7 | N |
| **Respiratory** |  |  |  |  |  |  |  |  |  |
| Do you ever have difficulty with your breathing? | 2 | 3 | 11 | 7.0 | 0 | 5 | 11 | 7 | N |
| Do you use oxygen at home during the day or at night? | 0 | 2 | 14 | 9.0 | 1 | 1 | 13 | 9 | N |
| Do you have asthma, bronchitis, or emphysema? | 0 | 6 | 10 | 7.0 | 0 | 4 | 12 | 7 | N |
| Do you cough frequently? | 5 | 7 | 4 | 5.0 | 5 | 9 | 2 | 5 | N |
| Do you now or have you recently (within the last year) smoked cigarettes? | 1 | 10 | 5 | 5.5 | 0 | 11 | 5 | 6 | N |
| Have you ever smoked one or more packs per day? | 2 | 9 | 5 | 5.0 | 4 | 11 | 1 | 5 | N |
| Do you feel TIRED, sleepy during the day? | 0 | 7 | 9 | 7.0 | 1 | 8 | 7 | 6 | N |
| Has anyone OBSERVED YOU STOP BREATHING during sleep? | 0 | 3 | 13 | 7.5 | 0 | 2 | 13 | 9 | Y |
| Do you SNORE loudly? | 0 | 4 | 12 | 7.0 | 0 | 4 | 11 | 7 | Y |
| Do you have high blood pressure? | 0 | 11 | 5 | 6.0 | 0 | 10 | 6 | 6 | N |
| **Nervous system** |  |  |  |  |  |  |  |  |  |
| Do you have myasthenia gravis or muscular dystrophy? | 0 | 3 | 13 | 8.5 | 0 | 1 | 13 | 9 | Y |
| Have you ever had a stroke, brain aneurysm, Alzheimer’s or dementia, seizures, multiple sclerosis, or brain tumour? | 0 | 5 | 11 | 8.0 | 0 | 2 | 14 | 9 | Y |
| Do you have numbness or weakness of your arms or legs? | 4 | 3 | 9 | 7.0 | 1 | 3 | 12 | 7 | Y |
| Do you have epilepsy, blackouts, or seizures? | 0 | 6 | 10 | 8.0 | 0 | 4 | 12 | 8 | N |
| Has the patient scored 3 or less in the six-item screener test? | 0 | 7 | 8 | 7.0 | 2 | 3 | 10 | 7 | N |
| Do you frequently feel like crying or are unhappy with life? | 6 | 9 | 1 | 4.0 | 11 | 4 | 1 | 3 | N |
| In the last 2 weeks have you been bothered by having little interest or pleasure in doing things or feeling down, depressed or hopeless? | 6 | 9 | 1 | 4.0 | 9 | 6 | 1 | 3 | N |
| **Blood disorders** |  |  |  |  |  |  |  |  |  |
| Do you suffer from anaemia or other blood disorders? | 3 | 4 | 9 | 7.5 | 0 | 3 | 13 | 7 | Y |
| Do you bruise easily or have bleeding problems? | 0 | 5 | 11 | 7.0 | 1 | 2 | 13 | 8 | Y |
| Have you ever had blood clots in the legs or lungs? | 0 | 3 | 13 | 9.0 | 0 | 1 | 14 | 9 | Y |
| Do you have haemophilia, sickle cell, or blood cancer? | 0 | 4 | 12 | 8.5 | 0 | 1 | 14 | 8 | Y |
| **Endocrine** |  |  |  |  |  |  |  |  |  |
| Do you have a history of thyroid problems? | 0 | 7 | 9 | 7.0 | 0 | 1 | 14 | 8 | Y |
| Do you have diabetes? | 0 | 4 | 12 | 8.0 | 0 | 1 | 14 | 9 | Y |
| **Gastrointestinal** |  |  |  |  |  |  |  |  |  |
| Do you have liver disease, or a history of jaundice or hepatitis? | 0 | 3 | 13 | 7.0 | 0 | 1 | 14 | 7 | Y |
| Do you have indigestion, heartburn, or a hiatus hernia? | 0 | 11 | 5 | 6.0 | 0 | 7 | 9 | 7 | N |
| **Renal** |  |  |  |  |  |  |  |  |  |
| Do you have a kidney problem? | 2 | 3 | 11 | 7.0 | 0 | 3 | 13 | 7 | Y |
| **Medical** |  |  |  |  |  |  |  |  |  |
| Is the patient going for intermediate or high risk surgery? | 0 | 3 | 13 | 8.5 | 2 | 1 | 12 | 9 | Y |
| Are you 80 years of age or older? | 4 | 4 | 8 | 6.5 | 2 | 4 | 10 | 7 | N |
| Do you suffer from any other severe illness? | 3 | 5 | 8 | 6.5 | 2 | 4 | 9 | 7 | N |
| Is there anything else that your anaesthetist or surgeon should know? | 1 | 7 | 7 | 5.0 | 1 | 10 | 5 | 5 | N |
| Do you think you may be pregnant? | 1 | 10 | 5 | 6.0 | 0 | 6 | 9 | 7 | N |
| Do you wear contact lenses or a hearing aid? | 4 | 11 | 1 | 4.0 | 5 | 11 | 0 | 5 | N |
| Have you been tested for HIV in the last 1 year? | 5 | 10 | 0 | 4.0 | 6 | 10 | 0 | 4 | N |
| Are you taking any anti-retroviral/ARV medication? | 0 | 11 | 5 | 5.5 | 0 | 10 | 6 | 6 | N |
| *Are you on anti-retrovirals?* |  |  |  |  | 2 | 6 | 8 | 7 | N |
| *Are you HIV positive?* |  |  |  |  | 4 | 7 | 5 | 5 | N |
| *Have you had or been treated for TB before?* |  |  |  |  | 2 | 8 | 6 | 6 | N |
| Have you had an organ transplant? | 0 | 2 | 14 | 9.0 | 0 | 0 | 15 | 9 | Y |
| Have you got a cancer that has spread? | 1 | 7 | 7 | 5.0 | 0 | 2 | 14 | 7 | Y |
| Have you spent a night in hospital (been hospitalised) in the last 6 months? | 0 | 11 | 5 | 5.0 | 0 | 10 | 5 | 6 | N |
| Have you lost weight in the last 3 months? | 1 | 12 | 3 | 5.0 | 0 | 14 | 2 | 5 | Y |
| Have you been eating less in the last week? | 9 | 5 | 2 | 3.0 | 12 | 4 | 0 | 3 | Y |
| Do you drink more than three drinks of alcohol per day? | 1 | 12 | 2 | 5.0 | 0 | 12 | 4 | 5 | Y |
| Do you ever drink more than 6 drinks in one occasion? | 3 | 9 | 4 | 5.0 | 3 | 11 | 2 | 5 | N |
| Are you taking blood thinners now? | 0 | 4 | 12 | 8.0 | 0 | 1 | 14 | 9 | Y |
| Are you taking any over the counter (garlic, ginseng, echinacea) medicine? | 2 | 9 | 5 | 5.0 | 0 | 14 | 2 | 5 | Y |
| Do you take narcotic medication not prescribed for you or street (illicit) drugs? | 0 | 7 | 9 | 7.0 | 0 | 3 | 13 | 7 | Y |
| Have you taken prednisone, steroid medication, or cortisone-like drugs in the past year? | 0 | 8 | 8 | 6.5 | 0 | 6 | 10 | 7 | N |
| Are you taking 5 or more chronic medications? | 1 | 8 | 7 | 6.0 | 2 | 8 | 6 | 6 | N |
| Are you on any antidepressants, mood enhancing medicine? | 1 | 11 | 4 | 5.0 | 2 | 11 | 3 | 5 | N |
| Do you take long-acting opioids like OxyContin (oxycodone), methadone, or Suboxone (buprenorphine)? | 0 | 8 | 8 | 6.5 | 0 | 6 | 10 | 7 | N |
| *Are you chronically using NSAIDS drugs like ibuprofen?* |  |  |  |  | 3 | 9 | 4 | 6 | N |
| Can you climb one flight of stairs or walk uphill without stopping? Do not answer “yes” if the only reason that you are unable to do this is because of an orthopaedic condition) | 0 | 3 | 13 | 8.0 | 0 | 0 | 15 | 9 | Y |
| Do you need assistance with getting dressed or washing yourself? | 1 | 2 | 13 | 8.0 | 0 | 1 | 14 | 8 | Y |
| Do you need to spend time in bed because of your illness? | 1 | 6 | 9 | 7.0 | 2 | 3 | 11 | 7 | N |
| Is the patient frail (scores 5 or more on the clinical frailty scale)? | 0 | 4 | 12 | 7.0 | 0 | 1 | 14 | 7 | Y |
| **Anaesthetic** |  |  |  |  |  |  |  |  |  |
| If you have or a blood relative been put to sleep for an operation were there any anaesthetic problems? | 0 | 7 | 9 | 8.0 | 0 | 2 | 14 | 9 | Y |
| In any of your operations was there any difficulty in placing a tube into your airway? | 0 | 1 | 15 | 9.0 | 0 | 1 | 14 | 7 | Y |
| Do you have any problems with pain, stiffness or arthritis in your neck or jaw? | 1 | 6 | 9 | 7.5 | 2 | 1 | 13 | 7 | Y |
| Do you have arthritis or pain in your neck or jaw? | 5 | 7 | 3 | 5.0 | 3 | 10 | 3 | 6 | N |
| Can you open your mouth more than the width of 3 fingers (4.5cm)? | 1 | 9 | 6 | 6.0 | 1 | 8 | 7 | 6 | N |
| Have you got any head movement limitations? | 1 | 8 | 7 | 6.0 | 2 | 6 | 8 | 7 | N |
| Is the Thyromental Distance less than 6.5 cm? | 1 | 10 | 5 | 6.0 | 1 | 11 | 4 | 6 | N |
| Is there limited neck movement (less than 80 degrees)? | 1 | 7 | 8 | 6.5 | 1 | 6 | 9 | 7 | N |
| Does the patient have an underbite (cannot protrude their bottom teeth onto their upper lip)? | 1 | 6 | 9 | 7.0 | 0 | 5 | 10 | 7 | N |
| Is the neck circumference more than 40cm? | 0 | 8 | 8 | 6.5 | 1 | 6 | 9 | 7 | N |
| Do you have dentures, capped or loose teeth? | 2 | 11 | 3 | 5.0 | 0 | 12 | 4 | 5 | Y |
| Do you have any allergies to food, medication or latex? | 0 | 8 | 8 | 6.5 | 0 | 4 | 12 | 7 | Y |
| Did you experience any major nausea or vomiting after any operation? | 0 | 12 | 4 | 5.5 | 0 | 10 | 6 | 6 | N |
| **Clinical parameters** |  |  |  |  |  |  |  |  |  |
| Is the respiratory rate more than 24 breaths per minute? | 0 | 2 | 14 | 7.5 | 0 | 3 | 12 | 8 | Y |
| Is the saturation on room air after 5 deep breaths less than 90%? | 0 | 1 | 15 | 8.0 | 0 | 0 | 15 | 8 | Y |
| Is the heart rate less than 50? | 0 | 6 | 10 | 7.0 | 0 | 4 | 12 | 8 | Y |
| Is the heart rate more than 100? | 1 | 7 | 8 | 6.5 | 0 | 7 | 9 | 7 | N |
| Is the systolic pressure less than 90 mmHg? | 1 | 6 | 9 | 7.0 | 0 | 2 | 14 | 7 | Y |
| Is the systolic pressure more than 140 mmHg? | 2 | 8 | 6 | 6.0 | 1 | 11 | 4 | 6 | N |
| Is the diastolic pressure more than 90 mmHg? | 1 | 9 | 6 | 6.0 | 1 | 11 | 4 | 6 | N |
| Is the diastolic pressure less than 50 mmHg? | 1 | 7 | 8 | 6.5 | 1 | 10 | 5 | 6 | N |
| Is the sodium (Na) less than 126 mmol/L? | 1 | 2 | 12 | 8.0 | 0 | 0 | 15 | 8 | Y |
| Is the potassium (K) less than 2.9 or more than 5.9 mmol/L? | 1 | 1 | 13 | 8.0 | 0 | 1 | 14 | 8 | Y |
| Is the haemoglobin less than 10 g/dL? | 1 | 5 | 9 | 7.0 | 0 | 5 | 11 | 7 | N |
| Is the White cell count more than 20 or less than 3? | 1 | 4 | 10 | 7.0 | 0 | 4 | 12 | 7 | Y |
| Is the urea more than 15 mmol/L? | 1 | 4 | 10 | 7.0 | 0 | 3 | 13 | 7 | Y |
| Is the creatinine more than 100 micromol/L | 1 | 6 | 8 | 7.0 | 0 | 6 | 10 | 7 | N |
| Is the glomerular filtration rate (GFR) less than 60%? | 1 | 4 | 10 | 7.0 | 0 | 5 | 11 | 7 | N |
| Is the HbA1c more than 7.5 mmol/L? | 1 | 8 | 6 | 6.0 | 0 | 9 | 7 | 6 | N |
| Is the body mass index (BMI) greater than 35? | 1 | 7 | 8 | 6.5 | 0 | 6 | 10 | 7 | N |
| Is the body mass index (BMI) less than 20? | 0 | 11 | 5 | 5.5 | 2 | 12 | 2 | 5 | N |

Footnote:

*Italics* indicate newly suggested questions in Round 1.

**Supplementary material S9**

**Table 2. Proposed amendments to items for Delphi Round 3 and consensus results**

|  |  |  |  |
| --- | --- | --- | --- |
| Question | Proposal | Reason for proposal | Outcome of Round 3 |
| **Cardiovascular** |  |  |  |
| *Do you have a heart murmur?* | Re-categorise as IMPORTANT | Other screening questions are likely to identify the symptomatic CRITICAL patient | Immobile patients may not have exertional symptoms. If a murmur is identified then it should be reviewed by an anaesthetist to ensure it is benign. Leave as CRITICAL |
| *Do you have heart trouble?* | Remove | Non-discriminatory. Other screening questions are likely to identify the symptomatic CRITICAL patient | Contextualising and phrasing medical questions is vital. Concerns raised by panel members that population groups who are not medically literature could be missed by excluding this question. Keep  unchanged |
| *Did you have rheumatic fever as a child?* | Categorise as IMPORTANT | Median score 6 | Categorised as IMPORTANT |
| *Have you seen a heart doctor (cardiologist) within the last year?* | Rephrase question | Clarify reason for referral: This question was neither “reassuring” – scheduled visit/follow up of a stable condition or “concerning” – was it for an urgent/unstable condition? | Have you seen a heart doctor (cardiologist) within the last 6 months for an unscheduled or urgent heart problem? Categorised as CRITICAL |
| **Respiratory** |  |  |  |
| *Do you feel TIRED, sleepy during the day?*  *Has anyone OBSERVED YOU STOP BREATHING during sleep?*  *Do you SNORE loudly?*  *Do you have high blood pressure?* | Amalgamate CRITICAL and IMPORTANT items for obstructive sleep apnoea (OSA) screening based on criteria for a polysomnography test. *History of daytime tiredness and the presence of 2 of the 3 items a) snoring b) nighttime apnoea/chocking c) high blood pressure would be considered as CRITICAL.* Presence of any of the symptoms not meeting the criteria for polysomnography testing would be classified as IMPORTANT. | No single item has an appropriate pretest probability of identifying OSA. Combining the items is likely to decrease false positive referrals.89,90 | Agreed |
| *Do you ever have difficulty with your breathing?* | Categorise as IMPORTANT | Median score 7. Probably not discriminatory enough to be CRITICAL. Other questions likely to identify a critical component. | Agreed |
| *Do you have asthma, bronchitis, or emphysema?* | Recategorise as IMPORTANT. Add “*In the last three months have you taken oral steroids (prednisone) tablets or been admitted to the hospital?”* | To avoid categorizing well controlled or minimally symptomatic patients as CRITICAL an extra discriminating question was proposed to identify the patients with sub optimally treated disease who may be at risk of perioperative bronchospasm. | Agreed |
| *Do you cough frequently?* | Categorise as IMPORTANT | Median score 5 | Agreed |
| *Do you now or have you recently (within the last year) smoked cigarettes?* | Categorise as IMPORTANT. | Median score 6 | Agreed |
| *Have you ever smoked one or more packs per day?* | Remove | Similar to above question with a lower median score (5) | Agreed |
| **Nervous system** |  |  |  |
| *Do you have numbness or weakness of your arms or legs?* | Recategorise as IMPORTANT | South Africa has a high burden of diabetes, Human Immunodeficiency Virus (HIV) and degenerative disease which can result in these symptoms. From clinical experience the facilitators felt that many such patients proceed to surgery without further investigation. | Agreed |
| *Have you ever had a stroke, brain aneurysm, Alzheimer’s or dementia, seizures, multiple sclerosis, or brain tumour?* | Separate the question into “*Do you have or ever had -*   1. *Alzheimer’s, dementia, or multiple sclerosis?* 2. *Stroke, brain aneurysm or brain tumour?* | Suggested by a panel member during Round 2 | The panel felt that a history of recent stroke should be separated from the other diseases. The two questions agreed upon were thus: “*Have you had or have Alzheimer’s disease,, dementia, multiple sclerosis, a brain aneurysm or brain tumour?”* Categorised as IMPORTANT and *“Have you had a stroke in the last 3 months?”* Categorised as CRITICAL. |
| *Do you have epilepsy, blackouts, or seizures?* | Recategorise as IMPORTANT. Qualify question *“if new onset seizures or within the last month”* then categorise as CRITICAL | Well controlled epilepsy suffers are unlikely to require significant anaesthetic specialist optimisation. | Agreed |
| *Has the patient scored 3 or less in the six-item screener test28* | Remove | Complexity of question likely to impact on the tool’s implementation. Other questions likely to screen out patient with dementia who may be of an elevated risk because of associated conditions. | Agreed |
| *Do you frequently feel like crying or are unhappy with life?* | Remove | Low discriminatory value | Agreed |
| *In the last 2 weeks have you been bothered by having little interest or pleasure in doing things or feeling down, depressed or hopeless?* | Remove | Low discriminatory value | Agreed |
| **Blood disorders** |  |  |  |
| *Do you suffer from anaemia or other blood disorders?* | Remove | Anaemia is common in the surgical population (30-40%)91 and if categorised as CRITICAL would overwhelm specialist capacity. Adding a question in the clinical parameters *“Is the Hb < 7g/dL?”* may avoid the need for emergency blood transfusions if only detected on the day of surgery. As resources improve and preoperative clinics mature the Hb goals can be adjusted. | Agreed |
| *Have you ever had a serious or life- threatening reaction to a blood transfusion?* | Add as a new question  Categorise as IMPORTANT | Proposed by a panel member in Round 2 | Agreed |
| *Would you accept a blood transfusion if a doctor thought it was in your best interest or lifesaving?* | Add as a new question  Categorise as IMPORTANT | Proposed by a panel member in Round 2 | Agreed to include question but should be categorised as CRITICAL to allow timely discussion of perioperative options |
| **Endocrine** |  |  |  |
| *Do you have diabetes?* | Recategorised as IMPORTANT. Add *“Have you been admitted to hospital in the last 6 months because of your diabetes?”* and categorise as CRITICAL. | 15-20% of the surgical population is diabetic92 Specialists should probably focus on poorly controlled disease. HBA1c not always available. Admission for a diabetic complication may be marker of poorly controlled disease. | Agreed |
| *Do you have a history of thyroid disease?* | Recategorised as IMPORTANT. Add *“If you are on thyroid medication, has it been more than a year since your last thyroid test?”* and categorise as CRITICAL. | Euthyroid patients with stable disease are unlikely to benefit from specialist anaesthetist review. Patients who have not had regular thyroid function assessment are probably more likely to be sub optimally treated. Annual TSH levels may be reasonable in clinically stable patients. 93,94 As preoperative clinics mature the time frame of thyroid function testing can be decreased. | Agreed |
| **Renal** |  |  |  |
| *Do you have a kidney problem?* | Recategorise as IMPORTANT. Add “*Are you on dialysis?”* and categorise as CRITICAL | Initial question considered non-specific. The additional question was suggested to identify patients who are likely to have more severe metabolic and fluid related complications. | Agreed |
| **Gastrointestinal** |  |  |  |
| *Do you have indigestion, heartburn, or a hiatus hernia?* | Recategorise as IMPORTANT | Median score 7. Knowing the information prior to the day of surgery will allow appropriate planning but is unlikely to result in cancellation if patient arrives on the day of surgery. | Agreed |
| **Medical** |  |  |  |
| *Have you got a cancer that has spread?* | Recategorise as IMPORTANT. | Cancer that has metastasized is not a likely reason for cancelling surgery and may well be the reason that surgery is being planned. Other screening question may identify patients who should be classified as CRITICAL. | Agreed |
| *Do you take narcotic medication not prescribed for you or street (illicit) drugs?* | Recategorise as IMPORTANT. | Median score 7. CRITICAL symptoms or clinical parameters are likely be detected by other screening items. | Agreed |
| *Have you had a covid-19 infection?* | Add as a new question  How do we frame CV-19 infection in the screening process? | Proposed by a panel member in Round 2 | *“Have you had an ICU admission because of COVID-19?”* Patients who required an ICU admission were likely to have multi-system involvement. Categorise as IMPORTANT  *Have you had COVID-19 in the last 6 weeks?* Elective surgeryin patients with Covid-19 carries a higher risk. 95 Categorise as IMPORTANT |
| *Is the patient going for intermediate or high-risk surgery?* | Remove | The procedure will be known to the anaesthetist prior to the day of surgery | Recategorise as IMPORTANT |
| *Are you 80 years of age or older?* | Recategorise as IMPORTANT | Other questions are likely to identify a CRITICAL patient | Removed. The age of the patient will likely to be known prior to the day of surgery thus the question was felt to be redundant. |
| *Do you suffer from any other severe illness?* | Remove | Similar to “*Is there anything else that your anaesthetist or surgeon should know?* | Agreed |
| *Is there anything else that your anaesthetist or surgeon should know?* | Categorise as IMPORTANT  Make it the last free text question | Median score 5 | Agreed |
| *Do you think you may be pregnant?* | Recategorise as IMPORTANT | Median score 7. If surgery is warranted and the patient is likely to be pregnant appropriate plans can be made before the day of surgery without necessarily having the patient assessed by a specialist anaesthetist. | Agreed |
| *Do you wear contact lenses or a hearing aid?* | Categorise as IMPORTANT | Median score 5 | Agreed |
| *Are you HIV positive?*  *Have you been tested for HIV in the last 1 year?*  *Are you taking any anti-retroviral (ARV) medication?*  *Are you on anti-retrovirals?* | Decide on a single most appropriate question. Is there anything about HIV infection that is considered critical? | Duplicate questions. | Retain *“Are you HIV positive?”* Categorise as IMPORTANT.  Remove all others. † |
| *Have you had or been treated for tuberculosis (TB) before?* | Categorise as IMPORTANT | Median score 6 | Agreed † |
| *Have you spent a night in hospital (been hospitalised) in the last 6 months?* | Categorise as IMPORTANT | Median score 6 | Agreed |
| *Have you lost weight in the last 3 months?*  *Have you been eating less in the last week?* | Retain  Categorise as IMPORTANT  Remove | Duplicate questions  Median score 5  Median score 3 | Added “unintentionally”  *“Have you lost weight unintentially in the last 6 months?”*  Agreed |
| *Do you drink more than three drinks of alcohol per day?*  *Do you ever drink more than 6 drinks in one occasion?* | Retain  Categorise as IMPORTANT  Remove | Duplicate questions  Median score 5  12 considered it IMPORTANT and 4 CRITICAL  Median score 5  3 considered UNIMPORTANT, 11 IMPORTANT and 2 CRITICAL | Agreed  Agreed |
| *Are you taking 5 or more chronic medications?*  *Are you on any antidepressants, mood enhancing medicine?*  *Do you take long-acting opioids like OxyContin (oxycodone), methadone, or Suboxone (buprenorphine)?*  *Are you chronically using NSAIDS drugs like ibuprofen?*  *Are you on treatment for cancer?* | Categorise as IMPORTANT  Categorise as IMPORTANT  Recategorise as IMPORTANT  Categorise as IMPORTANT  Add as a new question  Categorise as IMPORTANT | Median score 6  Median score 5  Median score 7.  Other screening questions are likely to identify the critical patient.  Median score 6  Proposed by a panel member in Round 2 | The panel decided that the list of questions can be removed and replaced by *“List ALL the medication, including pain treatment that you are currently on”* |
| *Do you need to spend time in bed because of your illness?* | Recategorise as IMPORTANT or Remove | Median score 7.  Non-discriminatory. Other questions likely to identify the critical patient | Remove |
| **Clinical parameters** |  |  |  |
| *Is the sodium (Na) less than 126 mmol/L?* | Add an upper sodium limit of >150 mmol/L | To be consistent with other electrolyte parameters. |  |
| *Is the heart rate < 50 beats/min?*  *Is the heart rate > 100 beats/min?* | Add an upper heart rate limit of 110 beats/min  Remove | To identify patients with significant unexplained tachycardia. | Upper limit was proposed as 120/min to decrease false positives (anxiety, short increase in effort prior to assessment) |
| *Is the systolic pressure > 140 mmHg?*  *Is the diastolic pressure > 90 mmHg?* | *Amalgamate: Is the systolic pressure > 180 mmHg or diastolic pressure > 110mmHg ?*  Classify as CRITICAL  Remove | Definitions in line with ESH definition of Grade 3 hypertension 96 | Agreed  Agreed |
| *Is the diastolic pressure < 50 mmHg?* | Remove | Non-specific and prone to measurement error.  Hypotension is likely to be identified by other clinical parameter questions including *“Is the SBP < 90 mmHg?”* | Agreed |
| *Is the haemoglobin less than 10 g/dL?* | Is the haemoglobin less than 7 g/dL? Categorise as CRITICAL  Is the haemoglobin between 7 and 10 g/dL? Categorise as IMPORTANT | See comments under *blood disorders* and anaemia | Agreed  Agreed |
| *Is the creatinine greater than 100 micromol/L?* | Increase the creatinine value to 177 micromol/L | Consistent with risk scoring literature 3,97, | Agreed |
| *Is the glomerular filtration rate (GFR) less than 60%?* | Remove | More complex, not always available | Agreed |
| *Is the HbA1c more than 7.5 mmol/L?* | Categorise as IMPORTANT | Median score 6 | Threshold was raised to > 8.0 mmol/L in keeping with a an average blood glucose of >10mmol/L. |
| *Is the body mass index (BMI) greater than 35?*  *Is the body mass index (BMI) less than 20?* | Reclassify as IMPORTANT  Decrease the lower limit to 18 | Median score 7  Other screening questions are likely to identify the critical components of patients with an elevated BMI.  More sensitive than 20. | Replace with “What is the BMI?” and categorise as IMPORTANT |
| **Anaesthetic** |  |  |  |
| *Do you have any allergies to food, medication or latex?* | Recategorise as IMPORTANT. | Patients are unlikely to be cancelled on the day of surgery because of an allergy. Knowledge prior to the day of surgery would allow for appropriate planning. | Agreed |
| *Have you taken prednisone, steroid medication, or cortisone-like drugs in the past year?* | Recategorise as IMPORTANT | Median score 7.  Appropriate perioperative plan on the day of surgery is unlikely to result in a day of surgery cancellation. | Agreed |
| *Is the patient frail (scores 5 or more on the clinical frailty scale)?98* | Remove | Median score 9.  Other questions likely to identify the critical components in a frail patient | Do not remove.  Recategorise as IMPORTANT  Considered a useful objective assessment tool |
| *Do you have any problems with pain, stiffness or arthritis in your neck or jaw?*  *Do you have arthritis or pain in your neck or jaw?* | Recategorise as IMPORTANT  Remove | Median score 7.  Unlikely to present a problem on the day of surgery if anticipated but not necessarily seen prior to the day of surgery.  Duplicate question  Median score 6 | Agreed  Agreed |
| *Can you open your mouth more than the width of 3 fingers (4.5 cm)?*  *Have you got any head movement limitations?*  *Is the Thyromental Distance less than 6.5 cm?*  *Is there limited neck movement ( less than 80 degrees)?*  *Does the patient have an underbite (cannot protrude their bottom teeth onto their upper lip)?*  *Is the neck circumference more than 40 cm?* | Create one screening question to prompt the anaesthetist that there may be a difficult airway. *“Do you have limitation with mouth opening”.* Categorise as IMPORTANT.  Remove all other questions | The airway exam can be deferred to the anaesthetist involved in the case on the day of surgery as part of a routine preoperative assessment.  Many of the airway assessment questions are likely to complicate the tool and may not yield an appropriate level of specificity. | Agreed |
| *Do you have dentures, capped or loose teeth?* | Categorise as IMPORTANT | Median score 5 | Agreed |
| *Did you experience any major nausea or vomiting after any operation?* | Categorise as IMPORTANT | Median score 6 | Agreed |

Footnote:

\* See supplementary material S4

† Additional comments from round 3 discussion in supplementary material S6per

ESH = European Society of Hypertension

HbA1c – glycated haemoglobin A

**Additional discussion in round 3 related to tuberculosis (TB) and Human Immuno deficiency Virus (HIV)**

*Do you have tuberculosis (TB)?*

The panel was asked if there are any patients with TB who could be considered as CRITICAL. Issues related to active disease or active phase of treatment arose. Patients with active disease could pose a risk to healthcare workers (HCW) and other patients and should present to hospital for surgery when they are non-infective (usually after 2 weeks of treatment). In the current era of airborne pathogens, HCW have become much more comfortable in wearing appropriate personal protective equipment (PPE) and as such, the greater issue related to TB would be patient safety with a concomitant respiratory disease undergoing surgery. In addition, microbial sensitivity of TB was raised. Would it be critical to know that the patient has a multi- or extreme- drug resistant strain? The view expressed was that the relatively few cases of resistant TB compared to the sensitive strain are generally known to the healthcare system and these cases are specifically referred by the treating physician or surgeon such that it is unlikely that the anaesthetist would only become aware of the resistant TB on the day of surgery. The microbial sensitivity of the TB bacillus was thus decided to be not included in the questionnaire. The group agreed to keep the question unchanged.

*Do you have HIV?*

The group had a robust discussion about the importance of people living with human immune deficiency virus (HIV) presenting for elective surgery. Important, but not critical perioperative aspects related to HIV may include drug interactions, fasting period and risk of mutations if antiviral medication is omitted for a prolonged period. Viral load, CD4 count were considered important but not critical. Thus the group decided to leave the question limited to HIV infection which would be important to know in developing an appropriate perioperative plan.

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