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## **Summary of recommendations for the Pre-operative evaluation of the adult non-cardiac surgery patient: Guidelines from the European Society of Anaesthesiology**

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Grades of recommendation are listed in the Table at the end of this document.

### **1. How, when, and by whom should patients be evaluated pre-operatively?**

1. Pre-operative standardized questionnaires may be helpful in improving anaesthesia evaluation in a variety of situations. (grade of recommendation: **D**)
2. If a pre-operative questionnaire is implemented, great care should be exerted in its design (grade of recommendation: **D**), and computer based version should be used whenever possible (grade of recommendation: **C**).
3. Pre-operative evaluation should be carried out with sufficient time before the scheduled procedure to allow for the implementation of any advisable pre-operative intervention aimed at improving patient outcome. (grade of recommendation: **D**)
4. Pre-operative assessment should at least be completed by an anaesthetist (grade of recommendation **D**), but the screening of patients could be carried out effectively by either trained nurses (grade of recommendation **C**) or anaesthesia trainees (grade of recommendation **D**).
5. A pharmacy personnel member may usefully be included in the pre-operative assessment, in order to reduce discrepancies in postoperative drug orders. (grade of recommendation **C**)
6. There is insufficient evidence to recommend that the preferred model is that a patient should be seen by the same anaesthetist from pre-operative assessment through to anaesthesia administration. (grade of recommendation **D**)

### **2. How should pre-operative assessment be performed?**

#### **2.1. Specific clinical conditions where the patients should undergo more extensive testing**

### **2.1.1. Cardiovascular disease**

See the guidelines of the European Society of Cardiology for pre-operative cardiac risk assessment and perioperative cardiac management in non-cardiac surgery, which were endorsed by the European Society of Anaesthesiology ([www.escardio.org/guidelines](http://www.escardio.org/guidelines)).

1. If active cardiac disease is suspected in a patient scheduled for surgery, the patient should be referred to a cardiologist for assessment and possible treatment. (grade of recommendation: **D**)
2. In patients currently taking beta-blocking or statin therapy, this treatment should be continued peri-operatively. (grade of recommendation: **A**)

### **2.1.2. Respiratory disease, smoking, obstructive sleep apnoea syndrome**

1. Pre-operative diagnostic spirometry in non-cardiothoracic patients can not be recommended to evaluate the risk of postoperative complications. (grade of recommendation: **D**)
2. Routine pre-operative chest-radiographs rarely alter the peri-operative management of these cases. Therefore it cannot be recommended on a routine basis. (grade of recommendation: **B**)
3. Preoperative chest-radiographs have a very limited value in patients with established risk factors elder than 70 years. (grade of recommendation: **A**)
4. Patients with obstructive sleep apnoea syndrome should be evaluated carefully for a potential difficult airway and special attention is advised in the immediate postoperative period. (grade of recommendation: **C**)
5. Specific questionnaires to diagnose OSAS can be recommended when polysomnography is not available. (grade of recommendation: **D**)
6. Use of CPAP peri-operatively in patients with OSAS may reduce hypoxic events. (grade of recommendation: **D**)
7. Incentive spirometry pre-operatively can be of benefit in upper abdominal surgery to avoid postoperative pulmonary complications. (grade of recommendation: **D**)
8. Correction of malnutrition may be beneficial. (grade of recommendation: **D**)
9. Smoking cessation before surgery is recommended. It must start early (at least 6 to 8 weeks prior surgery, 4 weeks at a minimum) (grade of recommendation: **B**). A short term cessation is only beneficial to reduce the amount of carboxyhaemoglobin in the blood in heavy smokers (rade of recommendation: **D**).

### **2.1.3. Renal disease**

1. The risk index of Kheterpal et al. [76] is useful for the identification of patients at risk for postoperative renal impairment. (grade of recommendation: **C**)
2. Calculated GFR is superior to SCr for the identification of patients with preexisting renal impairment. (grade of recommendation: **C**)
3. Urine output should be monitored carefully throughout the peri-operative phase and adequate fluid management provided in order to avoid worsening of pre-existing renal failure for patients at risk for postoperative renal impairment. (grade of recommendation: **D**)

### **2.1.4. Diabetes mellitus**

1. Patients with known diabetes should be managed in accordance with guidelines on the management of patients with known or suspected cardiovascular disease. (grade of recommendation: **C**)
2. It is not recommended to test blood sugars routinely at pre-operative assessment. (grade of recommendation: **D**)
3. Pre-operative assessment should include a formal assessment of the risk of a patient having disordered glucose homeostasis. (grade of recommendation: **C**)
4. Patients at high risk of disordered glucose homeostasis should be identified as needing specific attention to peri-operative glucose control. (grade of recommendation: **C**)
5. Patients with long-standing diabetes should undergo careful airway assessment. (grade of recommendation: **D**)

#### **2.1.5. Obesity**

1. Pre-operative assessment of obese patients includes at least clinical evaluation, Berlin or STOP questionnaire, ECG, polysomnography and/or oximetry. (grade of recommendation: **D**)
2. Laboratory examination is indicated in obese patients in order to detect pathological glucose/HbA<sub>1c</sub> concentrations and anaemia. (grade of recommendation: **D**)
3. Neck circumferences  $\geq 43$  cm as well as a high Mallampati score are predictors for a difficult intubation in obese patients. (grade of recommendation: **D**)
4. Use of CPAP peri-operatively may reduce hypoxic events in obese patients. (grade of recommendation: **D**)

#### **2.1.6. Coagulation disorders**

1. If coagulation disorders are suspected, the patient should be referred to a haematologist. (grade of recommendation: **D**)
2. Pre-operative correction of haemostasis decreases peri-operative bleeding. (grade of recommendation: **D**)
3. Routine use of coagulation tests is not recommended unless there are specific risk factors in the history. (grade of recommendation: **D**)

#### **2.1.7. Anaemia and pre-operative blood conservation strategies**

1. Pre-operative iron supplementation may be considered to correct pre-operative anaemia. (grade of recommendation: **D**)
2. There is insufficient evidence to promote the routine use of pre-operative autologous blood donation to reduce peri-operative transfusion requirements. (grade of recommendation: **D**)

#### **2.1.8. The elderly**

1. Risk, not age, should be used to trigger increased assessment and preparation. The likelihood of postoperative mortality and morbidity depends upon background risk interacting with the grade of surgery (grade of recommendation: **B**).
2. Peri-operative care protocols reduce postoperative delirium in patients with fractured neck of femurs (grade of recommendation: **D**).

#### **2.1.9. Alcohol misuse and addiction**

1. For the pre-operative identification of alcohol use disorders a combination of gamma glutaryl transferase and carbohydrate deficient transferrin show the highest sensitivity when using biomarkers only. (grade of recommendation: **C**)
2. For the pre-operative detection of alcohol use disorders a combination of standardized questionnaires and laboratory tests such as gamma glutaryl transferase and carbohydrate deficient transferrin is superior to the sole use of laboratory tests or using a questionnaire alone. (grade of recommendation: **C**)
3. The use of a computerized self assessment questionnaire is superior to the interview by an anaesthesiologist in the identification of patients with alcohol use disorders. (grade of recommendation: **C**)
4. Administration of benzodiazepines for 5 peri-operative days reduces the incidence of alcohol withdrawal syndrome in patients at risk. (grade of recommendation: **D**)
5. Alcohol-abstinence for at least one month prior to surgery reduces the incidence of alcohol use disorders-related peri-operative complications. (grade of recommendation: **C**)

### **2.1.10. Allergy**

1. The pre-anaesthesia evaluation should include a thorough interview for predisposition to allergic risk (grade of recommendation: **A**).
2. Patients at risk for anaphylactic/anaphylactoid reactions during surgical anaesthesia include:
  - patients with a documented allergy to one of the drugs or products likely to be used
  - patients with a history of possible allergic reaction during a previous anaesthesia
  - patients with a history of possible latex allergy, irrespective to the circumstance
  - children having had multiple surgeries, particularly those with spina bifida and myelomeningocele
  - patients with a history suggesting allergy to vegetables, fruits or cereals known for frequent cross reactivity with latex. (grade of recommendation: **B**)
3. In patients with a positive clinical history, the anaesthesiologist should seek a specialized allergy opinion and evaluation when feasible, in order to guide his/her choices (negative as well as positive) for the anaesthesia protocol and other drugs. (grade of recommendation: **C**)
4. Negative skin tests do not guarantee the absence of sensitization to a given substance since they may turn negative with time. (grade of recommendation: **A**)
5. The results of the pre-anaesthesia allergy evaluation should be made visible to all the care providers as well as to the patient. (grade of recommendation: **D**)

## **2.2. How to deal with the following concurrent medication?**

### **2.2.1. Antithrombotic therapy and locoregional anaesthesia**

This topic has been the subject of a separate guidelines task force of the ESA and the reader is therefore referred to these existing guidelines. [227] Guidelines on the perioperative bridging of anticoagulation therapy are discussed in section 2.2.4.

### **2.2.2. Herbal medication**

1. Patients should be asked explicitly about the intake of herbal drugs, particularly those that may cause increased bleeding in the peri-operative period or that have other unwanted interaction/side effect. (grade of recommendation: **C**)  
(Note: other 'over-the-counter' drugs may also have an important impact on platelet function like for example analgesics, anti-inflammatory drugs or drugs taken for a common cold)

2. Herbal medicines should be discontinued 2 weeks prior to surgery. (grade of recommendation: **D**)

3. There is no evidence to postpone elective surgery, but for high risk surgery in 'closed compartments' like neurosurgery on the brain, a postponement of elective cases might be considered when patients take herbal drugs such as ginseng, garlic and ginkgo until the day of surgery (grade of recommendation: **D**).

### **2.2.3. Psychotropic medication**

1. Patients chronically treated with TCA should undergo cardiac evaluation prior to anaesthesia. (grade of recommendation: **D**)

2. Antidepressant treatment for chronically depressed patients should not be discontinued prior to anaesthesia. (grade of recommendation: **B**)

3. Discontinuation of SSRI treatment peri-operatively is not recommended. (grade of recommendation: **D**)

4. Irreversible MAOI should be discontinued at least 2 weeks prior to anaesthesia. In order to avoid relapse of underlying disease, medication should be changed to reversible MAOI. (grade of recommendation: **D**)

5. The incidence of postoperative confusion is significantly higher in schizophrenic patients if medication was discontinued prior to surgery. Thus, antipsychotic medication should be continued in patients with chronic schizophrenia peri-operatively. (grade of recommendation: **B**)

6. Lithium administration should be discontinued 72 hours prior to surgery. It can be restarted, if the patient has normal ranges of electrolytes, is haemodynamically stable and able to eat and drink. Blood levels of lithium should be controlled within 1 week. (grade of recommendation: **D**)

7. In patients undergoing minor surgery under local anaesthesia, continuation of lithium therapy can be considered. (grade of recommendation: **D**)

### **2.2.4. Perioperative bridging of anticoagulation therapy**

1. In high risk patients under oral anticoagulation a bridging management for the peri-operative period is highly recommended in accordance with the existing clinical guidelines. (grade of recommendation: **A**)

2. In minor surgical procedures such as cataract or minor soft tissue surgery continuation of warfarin therapy should be considered instead of instituting bridging therapy. (grade of recommendation: **C**)

### **2.3. *Which preoperative tests should be ordered?***

This question is extensively addressed in the existing guidelines on the use of pre-operative tests for elective surgery from the National Institute for Clinical Excellence. The reader is therefore referred to these guidelines: <http://www.nice.org.uk/Guidance/CG3>

### **2.4. *How should the airway be evaluated?***

1. Screening for difficult mask ventilation (DMV) and difficult intubation (DI) should be conducted, whenever feasible, in all patients potentially requiring airway management for anaesthesia as well as in ICU. This screening includes a history of medical conditions, surgical operations, history of difficult airway management and, if available, examination of previous anaesthetic records. The screening has to be documented in the patients chart. (grade of recommendation: **A**)

2. No single predictive sign for difficult airway management is sufficient by itself and the pre-anaesthesia assessment needs the combination of different validated evaluation criteria. (grade of recommendation: **A**)
3. Potential for DMV should be evaluated and relies on the presence of 2 or more of the following factors: 1) body mass index  $\geq 30 \text{ kg.m}^{-2}$ ; 2) jaw protrusion severely limited; 3) snoring; 4) beard 5) Mallampati III or IV; 6) age  $\geq 57$  yr. (grade of recommendation: **C**)
4. Potential for impossible MV should be evaluated and relies on the presence of 3 or more of the following factors: 1) neck radiation changes, 2) male sex, 3) OSA, 4) Mallampati class III or IV, and 5) presence of a beard. (grade of recommendation: **D**)
5. Systematic multimodal screening for DI should include the Mallampati classification, the thyromental distance, the mouth opening or interincisor distance and the upper lip bite test. (grade of recommendation: **A**)
6. Particular attention to the evaluation for possible DI should be paid in certain medical conditions as 1) obesity, 2) OSA, 3) diabetes, 4) fixed cervical spine, 5) ENT pathologies and 6) pre-eclampsia. Neck circumference  $> 45$  cm is another warning sign. (grade of recommendation: **D**)
7. Difficult videolaryngoscopy is difficult to predict since only few studies have addressed this question so far. (grade of recommendation: **D**)

**2.5. How should the patient be informed about perioperative risks?**

1. The amount of information given to the patient should be based on what they wish to know. (grade of recommendation: **C**)
2. Written information can be safely used to supplement direct consultations. (grade of recommendation: **A**)
3. Written information should not be used in place of direct consultations. (grade of recommendation: **C**)
4. Patients prefer to be given numerical estimates of risk. (grade of recommendation: **C**)
5. Written and video information are effective methods of providing information. (grade of recommendation: **A**)
6. Written and video information are effective methods of reducing anxiety, but the clinical effect is small. (grade of recommendation: **A**)

**Table**

**Grades of recommendation used in the guideline**

- A** at least one meta-analysis, systematic review of RCTs, or RCT rated as **1++**  
AND directly applicable to the target population
- or*
- a body of evidence consisting principally of studies rated as **1+**, directly applicable to the target population AND with an overall consistency of results
- B** a body of evidence including studies rated as **2++**, directly applicable to the target population AND with an overall consistency of results
- or*
- extrapolated evidence from studies rated as **1++** or **1+**
- C** a body of evidence including studies rated as **2+**, directly applicable to the target population AND with an overall consistency of results
- or*
- extrapolated evidence from studies rated as **2++**
- D** evidence level **3** or **4**
- or*
- extrapolated evidence from studies rated as **2+**