

## **PREOPERATIVE PREPARATION**

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### **Introduction**

The preoperative preparation and assessment is a vital part of the anaesthetic care given to patients scheduled for both routine and emergency surgery. All patients should be seen and assessed by the anaesthetist who is responsible for the administration of their anaesthetic. This practice not only avoids the chance of mistakes during “hand overs” but ensures continuity and rapport for both the anaesthetist and the patient.

The preoperative preparation of an individual patient will depend on the results of a thorough clinical assessment and on the particular operation to be undertaken. This will allow specific measures to be taken so that the patient is in the best possible condition for both anaesthesia and surgery.

The clinical assessment is best conducted using the standard format of history, examination and then further investigations. The latter will, in the majority of cases, serve to confirm the impression gained from an accurate history and examination, and should not be used to replace a thorough clinical assessment.

### **History and examination**

The history should concentrate on the symptoms that alert the anaesthetist to potential problems during anaesthesia as well as those involving the general condition of the patient. In the majority of cases these will relate to the respiratory and cardiovascular systems.

### **Respiratory system**

Symptoms of respiratory disease that should be

sought are cough, shortness of breath and haemoptysis (blood in the sputum). The production of purulent sputum and the presence of wheeze may also indicate underlying lung disease. The functional ability of the patient can be assessed by questions such as “*how far can you walk before you get short of breath?*” or “*what activities make you short of breath?*”. Valuable information may be revealed about a patient’s cardio-respiratory reserve.

The presence of a productive cough is associated with an increase in postoperative chest complications and if it is of recent onset then consideration should be given to postponement of surgery and the commencement of appropriate treatment with antibiotics and chest physiotherapy. If the patient has a chronic productive cough then elective surgery should be postponed only if the patient has additional signs suggesting an infection. On examination of the chest the presence of altered breath sounds may indicate underlying lung disease. Bronchospasm and increased airway sensitivity are detected by the presence of expiratory rhonchi (wheeze). Fine inspiratory crepitations which do not clear after one or two deep breaths are caused by pulmonary congestion from left ventricular failure; while coarse crepitations indicate excess bronchial secretions. The presence of pleural effusions are indicated by a dull percussion note and reduced or absent breath sounds.

### **Cardiovascular system**

When assessing the cardiovascular system it must be remembered that patients can have heart disease without symptoms or signs. In the developing world valvular heart disease is more common than ischaemic disease and a history of rheumatic fever must always be sought. Mitral stenosis occurs in 60% of patients who have had rheumatic fever but

30% of patients with mitral stenosis give no history of rheumatic fever. Symptoms of valvular heart disease include breathlessness on exertion, paroxysmal nocturnal dyspnoea, palpitations, haemoptysis and dizziness, fainting and angina. With a thorough history and clinical examination the cardiovascular reserve and the degree of stenosis, regurgitation and mobility of the valves can be estimated. The most accurate method of diagnosing the cause of a cardiac murmur is Echocardiography (an ultrasound examination of the heart) if this is available. In general all diastolic murmurs and loud systolic murmurs which are accompanied by a thrill are abnormal and indicate underlying structural heart disease. When the cardiac function is seriously compromised then symptoms and signs of cardiac failure will become apparent.

Signs of left ventricular failure include tachycardia, gallop rhythm, fine basal inspiratory crepitations, evidence of an enlarged heart and displaced apex beat. Right heart failure produces a raised jugular venous pressure wave, hepatic enlargement and peripheral oedema.

Ischaemic heart disease may be silent but is indicated by a history of angina or myocardial infarction. Precipitating factors such as anaemia or valvular heart disease should be sought. Angina associated with breathlessness is indicative of left ventricular dysfunction and a recent history of myocardial infarction (heart attack or coronary thrombosis) is of particular importance, as it increases the risk of perioperative myocardial infarction (MI). See Table 1.

**Table 1.**

Time since MI	Incidence of perioperative MI
< 3 months	36%
3-6 months	16%
> 6 months	6%

The degree of risk of cardiovascular disease can be assessed by using the Goldman Index (Table 2).

A total over 13 gives a poor prognosis (11% life threatening complications) and above 26 has a mortality of 50% and only life- saving operations should be considered. Note that it is almost entirely based upon clinical findings.

### Past medical history

**Table 2**

Risk factor	Score
Third heart sound/gallop rhythm	11
MI within 6 months	10
>5 ventricular ectopics/ min	7
Rhythm other than sinus	7
Age > 70 years	5
Emergency surgery	5
Aortic stenosis	3
Abdominal or thoracic operation	3
Poor general condition	3

Enquiries should be made about previous operations and anaesthetics and any other known diseases should be noted. A history of diabetes, rheumatic fever or sickle cell disease is of particular importance as is epilepsy. A full drug history and details of any allergies should be sought. Particular importance should be paid to drugs that may interfere with anaesthetic agents such as beta blockers (which may cause bradycardias), anti-hypertensive agents, diuretics (hypokalaemia may prolong neuromuscular blockade as well as induce arrhythmias) as well as those such as warfarin that may need dose alteration prior to surgery. Monoamine oxidase inhibitors should be stopped at least two weeks before surgery if at all possible. However the majority of drugs should be continued perioperatively to maintain stability of underlying medical conditions as much as possible.

### Airway assessment

The anaesthetist must assess the airway in every patient prior to anaesthesia. There are various methods of assessing the likelihood of a difficult intubation at the bedside. The airway should be examined with the patient sitting upright with the mouth open as wide as possible. Neck mobility, jaw position, the presence and condition of teeth will all help predict a possible difficult airway or intubation. This topic is to be covered fully in the next edition. If there is a potentially difficult airway it is wise to make a contingency plan in case the airway cannot be secured.

### Further Investigations

It should be remembered that most investigations will merely confirm the clinical impression gained

from a thorough history and examination. The availability of investigations varies widely and they should rarely be performed as primary diagnostic methods. It makes both clinical and economic sense to tailor the number of tests to the individual patient's needs. The value of preoperative investigations as screening tests is debatable. Some suggestions can however be made. Patients over fifty years of age and those scheduled for major surgery should have a haemoglobin estimation and, those at risk, a sickle cell screen. Urea and electrolyte estimations are useful in patients who have been vomiting and/or are clinically dehydrated and in those taking diuretics. The urine should always be tested for blood, protein and glucose and, if positive, further tests of renal function may be necessary. Routine chest radiography is not indicated on clinical or economic grounds. If the patient is short of breath at rest or has overt clinical signs of chest disease, then a chest X-ray may be helpful. Exercise tolerance and simple bedside spirometry are valuable methods of assessing respiratory function. Electrocardiograms are not indicated routinely but should be obtained if possible when there is a recent history of cardiac problems, an irregular pulse or clinical signs of heart failure. They are useful as screening tests in areas, such as Western Europe, where the incidence of ischaemic heart disease is known to be high.

Once the patient has been assessed, the anaesthetist must formulate a plan for the anaesthetic management which involves ensuring that the patient is in the best condition possible. This will include guidelines about fasting times accompanied by an adequate explanation to the patient. When possible correction of anaemia, dehydration and control of heart failure should all be achieved preoperatively as should optimisation of lung function with physiotherapy, bronchodilators and antibiotics. Advice from physicians may be helpful in difficult cases. In emergency cases it is vital to have replaced blood loss with appropriate fluids prior to induction of anaesthesia (see Update 6).

The final area of patient preparation is premedication. The aims of premedication are to decrease patients' anxiety and fear prior to surgery and to facilitate anaesthesia by reducing some of the side effects of the commonly used agents. Benzodiazepines and opioids are the most frequently used premedicant drugs but ultimately the choice will depend on the individual patients' needs and the type of anaesthetic to be administered.

Finally the anaesthetist should assess the risk to the patient. The American Society of Anesthesiologists (ASA) classification groups patients according to their current disease status so that the risk can be standardised. It also allows comparisons between different groups of patients to be made.

Class*	Physical Status
1	Normal, healthy
2	Mild systemic disease
3	Severe systemic disease that limits activity but is not life threatening
4	Severe systemic disease that is a constant threat to life
5	Moribund; Not expected to survive but is submitted to operation in desperation

\*For an emergency operation an E is added to the class number

### Summary

The preoperative preparation of patients should be based on a thorough clinical history and examination. Further investigations, if available, will confirm the clinical findings but should not be used as primary diagnostic methods. A plan of management should be formed before the start of every anaesthetic and the anaesthetist must be satisfied that the patient is in the best condition possible. The decision that the patient is "fit for anaesthesia" is the sole responsibility of the anaesthetist.