

Perioperative Patient Assessment and Care

The objectives of the preoperative visit are:

- Meet the patient
- Identify the present problem requiring surgery
- Identify any previous ongoing illnesses which may influence the anesthetic or surgery, in particular cardiac and respiratory diseases. Renal, hepatic, gastrointestinal, endocrine, neurological, and musculoskeletal conditions may also influence perioperative management
- Elicit any possible concerns about previous anesthetics or any family history of problems with anesthetics.
- Any adverse drug reaction and current medications.
- Examine the patient and in particular assess the airway
- Review any investigations and order others needed.
- Plan the anesthetic technique.
- Provide information for the patient and relatives about the anesthetic and postoperative care including pain management.
- Ensure the patient is NPO for 8 hours for solids and 2 hours for clear fluids.
- Order any premedications required and all essential routine medications to be given preoperatively.
- Ensure adequate postoperative care is available e.g. step down/ ICU.

Assessment of the airway

The incidence of difficult intubation is relatively low (~1:65) with a “failure to intubate” rate of ~1:2000. In an attempt to try and identify those patients who may fall into this category a variety of tests have been devised. Unfortunately no single test is ideal.

Causes of difficult intubation include:

- 1) Congenital: e.g. Pierre Robin syndrome.
- 2) Anatomical: Variants of normal e.g. prominent teeth, small receding chin, deep protruding mandible, short thick neck, pregnancy.
- 3) Acquired: e.g. scarring, swelling, malignancy, rheumatoid arthritis.

At the preoperative visit the anesthesiologist can perform a variety of tests to try and identify those who may be a difficult intubation. These include:

- 1) The Mallampati Classification: this involves getting the patient to sit upright, open their mouth, stick out their tongue and say "Aaah". The view of the posterior pharynx falls into four classes:
 - a) Class I - The soft palate, tonsillar fauces and entire uvula are visible.
 - b) Class II - The soft palate, tonsillar fauces and part of uvula visible.
 - c) Class III - Only the soft palate is visible.
 - d) Class IV - Only the hard palate is visible.
 - e) Class III and IV are associated with increasing difficulty to intubate.
- 2) The Thyromental distance: a distance of less than 6.5cm or inability to admit three fingers associated with more difficult intubation.
- 3) The ability to prognath:
 - a) Class I: able to move bottom teeth in front of top teeth = normal
 - b) Class II: able to align bottom set to top set = some difficulty
 - c) Class III: bottom set stays behind top set = difficult to intubate
 - i) Neck mobility: ability to flex the lower cervical spine and extend the atlanto-occipital joint (sniffing the morning air position. This position results in axial alignment of the mouth, pharynx and larynx.

Laboratory Investigations

These tests vary depending on the patient and extent of the surgical procedure, but a few rules can be followed for intermediate and high-risk surgery:

1. Complete blood counts should be performed on all patients who show signs of anemia or have an underlying condition which increases the risk of anemia (e.g. chronic illness, bleeding disorder, excess alcohol consumption, chemotherapy). It should also be done when large blood losses are likely during surgery.
2. Serum Electrolytes should be done on all patients with renal disease, hypertension, diuretic therapy including bowel prep., diarrhoea or vomiting.
3. A Coagulation Screen if there is a history of bleeding disorder or on warfarin therapy.
4. An Electrocardiogram should be done on any patient at increased risk of cardiac disease, have symptoms of cardiac disease, or show signs of cardiac disease on physical examination.
5. A Chest x-ray is seldom required, except in patients with severe or unstable respiratory disease.

All other investigations are ordered if specific problems are identified on history and physical examination.

Premedication

These are given to provide amnesia, anxiolysis, antacid prophylaxis, analgesia, antisialogogue, autonomic control, allergy prophylaxis, and continuation of specific therapy.

Pre-existing illness:

Certain diseases are especially important during anesthesia. These include ischemic heart disease, congestive heart failure, cerebrovascular disease, diabetes mellitus requiring insulin therapy, and significant renal dysfunction.

These conditions, along with the context of high risk surgery (intraperitoneal, intrathoracic, suprainguinal vascular), make up the ***Revised Cardiac Risk Index***:

<https://www.mdcalc.com/revised-cardiac-risk-index-pre-operative-risk>

This risk stratification score is commonly used to assess the 30-day risk of perioperative MI, cardiac arrest, or death.

1) Ischemic heart disease (IHD)

Five percent of over 35yr olds have asymptomatic heart disease. IHD arises from a decrease in the supply:demand ratio for myocardial oxygenation. During anesthesia attempts are made to maximise oxygen supply and limit the oxygen demands of the heart.

Decreased oxygen supply:

O2 content – anemia?

hypoxia

tachycardia

increased preload

hypotension

Increased oxygen demand:

tachycardia

increased preload

increased afterload

increased contractility

Patients with unstable angina, suboptimally controlled angina, or a myocardial infarction within the previous 6 months should not undergo elective surgery. Antianginal medication should continue right up to surgery and can be taken with a sip of water within an hour of surgery starting. This is especially true of b-blockers where there is a risk of rebound hypertension if suddenly withdrawn.

2) Congestive Heart Failure

Patients with impaired ventricular function and congestive heart failure do not tolerate anesthesia and surgery very well. Most anesthetic drugs are negative inotropes and so decrease

the strength of contraction of an already weak muscle. Also the stress of surgery and fluid shifts that can occur during an operation increases the demands on a poorly functioning myocardium. No patient should undergo elective surgery with uncontrolled congestive heart failure.

Hence it is important to recognise these patients preoperatively so their condition can be optimised.

Symptoms include: orthopnea, PND, ankle swelling, poor exercise tolerance.

Signs include: raised JVP, pitting edema of legs, tachycardia, basal crackles, S3 or S4 on auscultation.

3) Hypertension

Poorly controlled hypertension increases the anesthetic risk. It results in overactive cardiovascular responses, poor left ventricular relaxation, cerebrovascular events, myocardial ischemia and infarction, and renal failure. Many patients are hypertensive when first admitted to hospital due to anxiety, so before hypertension is diagnosed a series of elevated readings are needed whilst the patient is as relaxed as possible.

It is important that antihypertensive medication is continued up until surgery to prevent the possibility of rebound hypertension.

4) Reactive Airways Disease

Anesthesia can precipitate life threatening bronchospasm in patients with reactive airways disease (e.g. asthmatics and COPD patients). This can be due to anxiety, anesthetic drugs, and airway manipulation. Anesthetics also worsen mucus trapping by drying secretions and impairing ciliary function. These patients should have their airways disease under optimal control prior to elective surgery and should continue their inhalers and steroids up until the day of surgery. Any patient who has been on steroids in the previous 6 months may need steroid replacement to cover the stress of surgery since there may still be a degree of adrenal suppression. If possible these patients should be done under regional technique (spinal, epidural, peripheral block) to avoid airway manipulation. Unfortunately this is not always possible. Hence patients with pulmonary disease need to have their treatment optimised and surgery postponed if there is any suspicion of infection. Treatment options include stopping smoking, bronchodilator therapy, physiotherapy to mobilise secretions, and antibiotics where appropriate.

5) Diabetes Mellitus

The first thing to assess in this group of patients is their diabetic control. Elective surgery is delayed until hyperglycemia, dehydration and acidosis are controlled. This control is aimed at preventing perioperative hypoglycemia / hyperglycemia. Hyperglycemia can result in delayed

wound healing and increased risk of infection, and hypoglycemia can result in irreversible neuronal damage. The risk of hypoglycemia is increased in those patients on long acting oral hypoglycemic agents or long acting insulin. The stress of surgery causes a reduction in the body's response to hypoglycemia (glucagon, epinephrine) and b-blockade can mask the signs of hypoglycemia. Equally there is a need to prevent hyperglycemia intraoperatively.

The inhalational agents increase the blood sugar levels and the stress of surgery causes a degree of insulin resistance.

The aim intraoperatively is to maintain control of blood sugar levels in the high normal range rather than run the risk of a period of hypoglycemia by aggressive control.

Patients on oral hypoglycemic agents should have these held the morning of surgery. For patients on long-acting insulin, they are usually instructed to reduce their long-acting dose to half or two-thirds on the morning or evening before surgery.

These patients also have a multisystem disease and the complications should be looked for. These include vascular disease, hypertension, cardiomyopathy, nephropathy, neuropathy, retinopathy, and increased risk of infection.