A BASIC GUIDE TO PREOPERATIVE ASSESSMENT

What is the preoperative assessment and what is its purpose?

- A consultation performed by an anaesthetist prior to administration of anaesthesia.
- The aim of the pre-operative consult is to minimize perioperative mortality & morbidity and prevent last minute unplanned cancellation through proper assessment and decision-making.

To do this we assess with a history, examination and investigations (Hx/Ex/Ix)

The Anaesthetic History

Issues with previous anaesthetics

- Outcomes and any complications (cardiac, respiratory, anaphylaxis)
- Any rare disease that may run in families (Malignant hyperthermia, Pseudocholinesterase deficiency)
- Postoperative nausea and vomiting

Medical History

Specifically we want to identify whether the global function of the patient is satisfactory and then systematically review individual organ systems for disease severity and stability.

Global function

Exercise tolerance or ability to achieve a certain number of metabolic equivalents

METS and Functional Capacity

- Ratio of work metabolic rate to resting metabolic rate
- Scale defined by the Duke Activity Status index.
- 1kcal/kg/hr (the energy cost of a sitting quietly)
- 3.5mlO_2/kg/hr ro 250ml/min in 70kg 40 yr old male
- https://sites.google.com/site/compendiumofphysicalactivities/home

Examples

1-4 mets: eating, dressing, dishwashing and walking around the house
4 mets: laundry, hanging wash, washing clothes by hand, moderate effort. Stair climbing slow pace
4.3 mets: walking, 5.6kmh, level, brisk, firm surface, walking for exercise
4-10 mets: climbing flight of stairs, walking on level ground at >6km/h, running briefly, playing golf
>10 mets: strenuous sports, swimming, singles tennis, football

How does Functional capacity/METS/exercise tolerance relate to perioperative risk?

- Exercise tolerance is a major predictor of perioperative risk
- Perioperative cardiac and long-term risks are increased in patients unable to meet a 4-MET demand during most normal daily activities
- Physiological response to surgery increases O_2 demand, requiring a subsequent increase in cardiac output.
- In 1 series of 600 consecutive patients undergoing major non-cardiac procedures, perioperative myocardial ischemia and cardiovascular events were more common in patients who reported poor exercise tolerance (inability to walk 4 blocks or climb 2 flights of stairs),
- Even after adjustment for baseline characteristics known to be associated with increased risk
  The likelihood of a serious complication occurring was inversely related to the number of blocks that could be walked ($p<0.006$) or flights of stairs that could be climbed ($p<0.01$).

Systematic review of systems

For each medical condition we use a Hx/Ex/Ix to assess
Stability and **Severity** of each disease.
Further assessment should also reveal to us the
Cause and **complications** of each disease
And any **specialist management/medications** and relevant **complications** of these to gain a detailed picture of the disease

Examples
Ischaemic heart disease
Review hx/ex/ix of angina and MI.
Severity:

- Timing, freq, details of MI and angina episodes including angina grading (Canadian Cardiovascular Society Grading), ECG changes, Echo/stress test findings esp ejection fraction and grade or systolic/diastolic/LV/RV function, Angiography demonstrates which vessels and myocardial region is at risk.
- It is not enough just to state that a patient has a medical condition ie "IHD". There is a huge difference between a patient who has been suffering from angina for 5 years, is stable and only occurs once a week after walking up 3 flights of stairs to one that has new onset angina occurring with minimal exertion.

Stability:

- How often patient has episode

Cause:

- Cardiac risk factors (male, smoker, diabetes, chol, htn), or other pathology – aortic stenosis, periop MI,

Complications:

- Ischaemic cardiomyopathy, incompetent valve, heart block, heart failure

Specialist management:

- Cardiac bypass surgery, stents (drug eluting or bare metal stent), medications (aspirin/clopidogrel, statin, betablocker,)

This format can be completed for any medical condition to gain a thorough picture of that particular disease. EASY!

Medications

Most of a patient's medications are continued in the perioperative period. It is important that we reassure them that even if they are fasting, they can take the meds with a ¼ cup of water. Other health practitioners may inform them to cease all of their meds on the day of surgery but this not the current recommendation.

Meds that may need cessation

Anticoagulants

The need to cease medications will depend on the risk of significant bleeding from surgery (or anaesthesia technique if neuraxial block is performed) and the risk of complications if they are ceased. Often this requires a discussion with the surgeon and physician (cardiologist, haematologist, general med) to ascertain how best to manage.
The common anticoagulants you will encounter are aspirin, clopidogrel, warfarin, enoxaparin and heparin.

General guide

Aspirin
Does not need cessation except for high bleeding risk surgery (neuro/TURP). If so, cease 7 days prior.
Clopidogrel

Cease 5-10 days depending on risk.
Warfarin
Cease 5-7 days and ensure INR normal
Enoxaparin
Prophylactic dose: 12 hrs
Therapeutic dose: 24hrs
Heparin
6 hrs

Diabetic medications

There are a number of different guidelines for this. A reasonable rule would be to omit oral hypoglycaemics (OHG) on the day of surgery.
Patients on insulin are a little more complicated. Refer to the perioperative management of diabetic patients guideline on the hospital intranet. As a general rule

- Continue long acting Lantus and Levemir.
- Morning operation – withhold short and intermediate acting
- Afternoon operation – take ½ dose of short and intermediate acting/premix insulin
- Minimise fasting times (patient 1st on list)
- Monitor BSL 4 hourly pre and post op then QID for 48hrs
- Manage BSL with sliding scale
- **Commence dextrose infusion???**

Allergies

Document each allergy and specifically what the reaction is.
A local rash to
penicillin is will have different consequences compared to true anaphylaxis.
Most 'allergies' are no more than known side effects to drugs, for example vomiting or constipation after an opioid (morphine or oxycodone). While it is worth noting, this is not true allergy.
Local rashes may be allergic in nature but not a type 1 hypersensitivity 'anaphylactic' reaction.
If the patient is unsure of the reaction, ascertaining the context is helpful - whether they needed to go to hospital or ICU, was it life-threatening, or was it at the GP not requiring any medication?

Fasting

The patient should be fasted to avoid the risk of aspiration of gastric contents into the lungs.

Solids	6 hours
Clear fluids	2 hrs
Breast milk	4 hrs

Investigations

The principle of ordering any test is

- How likely is it to show an abnormality?
- Would that abnormality be significant in the perioperative period?

This decision is made by assessing the patient's age, general health, medications and particular operation.

So as a general rule

1. Patients <40 years of age may require no routine investigations
2. Healthy patients between 40-60 years of age may require no investigations or may need an ECG, FBE, UEC depending on extent of surgery.
3. Health patients >60yrs of age are more likely to need a ECG, FBE, UEC and with major surgery a CXR.

For patients with medical comorbidities and on medications, they may need investigations again depending on the extent of surgery.

Full blood examination (Hb, WCC, Platelets)
Hb: Anemia or recent bleeding history or signs, cardiac/renal/hepatic disease, surgery with risk of significant blood loss, cancer, chronic disease (Rheumatoid arthritis).
Meds: bone marrow suppressing meds (prednisolone, methotrexate)
WCC: infection
Platelets: pregnancy, patient with thrombocytopaenic disease (acquired or hereditary), heparin

UEC (sodium, potassium, creatinine, urea, HCO3-)
Cardiac/hepatic/renal disease/intracranial pathology, infection, diabetes, hypertension, dehydration.
Meds: Diuretics, and patient on iv fluids

ECG: Electrocardiogram
Cardiac/resp/renal disease, arrhythmias,

Blood glucose
Diabetes, steroids treatment,

Chest x-ray
Cardiac/resp disease, heavy smoking

COAGs (INR, APTT, fib)
Inherited or acquired coagulopathy, major surgery especially if significant blood loss likely, Liver disease
Meds: on anticoagulants, heparin, warfarin.

Blood group and hold (G&H)
Surgery with possibility of significant blood loss and caesarean sections.

Most blood banks can issue blood very quickly (10mins)
If the blood group detects unusual antibodies are present, then obtaining appropriate blood can take much longer… even days!
Crossmatch blood is needed when there is a high likelihood of transfusion that requires blood immediately
Eg. Ceasarean, liver resections, elective aneurysm operations, cardiothoracic operations, multilevel spinal surgery, extensive burns debridements, long operations, or patients with inherited or acquired coagulopathies.

Liver functions tests
Cardiac/hepatic disease alcoholic, biliary, gastric and large bowel surgery, hepatotoxic drugs, jaundice,

Thyroid function tests
Check prior to thyroid surgery.

Special tests
Cardiac: Echocardiogram, stress test, cardiopulmonary exercise testing, angiogram.
Respiratory: sleep study, respiratory function test.

Be flexible. The basic principles will always apply, but depending on the anaesthetist, the surgeon, the hospital and new evidence, there may be changes to these recommendations

Further reading and references

I have sent these PDF resources to you for reading if you are keen to do so. My document is the bare essentials for you to understand how we approach preoperative assessment but feel free to read in more depth.

- ***Developing Anaesthesia Textbook*** Dr David Pescod
- ***Western Health PAC guidelines*** – preadmission staff 2013
- ***Introduction to Anaesthesia, peri-operative Medicine & pain management for medical students*** by Dr Richard Horton
- ***Pre-operative assessment of the elderly*** by Dodds and Murray 2001 CEPD BJA
- ***ACC AHA 2009 Guidelines on Perioperative Cardiovascular evaluation and Care for Noncardiac surgery***