Preoperative assessment

Introduction

Preoperative assessment of patients scheduled for surgery aims to improve patient care and safety while making the most efficient use of theatre resources and ward beds (Roizen, 1997). Foundation doctors often play a key role in this process. This article summarizes the principles of preoperative assessment and offers clear advice about how to perform well in this role.

General principles

Surgeons will expect the preoperative assessment process to ensure that the proposed procedure remains appropriate – that the presenting complaint still warrants an operation and that the patient has made an informed decision to proceed.

Anaesthetists will expect preoperative assessment to recognize those at high risk of perioperative complications. Early identification of these patients allows time to optimize their pre-existing medical illnesses and plan perioperative management so as to reduce risk.

In addition, preoperative assessment offers an opportunity to perform routine clerical tasks and also to advise patients about fasting, how to manage their routine medications and what will happen on the day of surgery. Preparing patients for theatre in this way means that they can be admitted on the day of surgery – this reduces bed occupancy.

Systems of preoperative assessment

Preoperative assessment of patients before planned admissions often takes place within a dedicated pre-admissions clinic. The organization of such clinics varies greatly between different surgical departments and between different hospital trusts. Foundation doctors may find themselves working alone in these clinics or they may be supported by specialist nurses, senior surgeons or anaesthetists.

Dr Alex James *is Specialty Registrar (Year 2) in Anaesthesia and Intensive Care, Royal Derby Hospital, Derby DE22 3NE and*
Dr Joy Abbott *is Specialty Registrar (Year 2) in Anaesthesia and Intensive Care, Lincoln County Hospital, Lincoln*

Correspondence to: Dr A James

Preparation

It is imperative that foundation doctors are familiar with what is expected of them in their particular pre-admission clinic. An example of the responsibilities at a typical clinic is given in *Table 1*.

A working knowledge of common surgical procedures likely to be encountered is important to ensure that basic questions from patients can be answered.

Senior support

Foundation doctors will often be involved in preoperative assessment without direct supervision from their seniors. In this situation it is important to remember that the final decision to proceed with surgery can be made only between the surgeon, anaesthetist and the patient. Potential problems uncovered during preoperative assessment should be discussed with either the operating surgeon or the most senior anaesthetist assigned to the case. If the issue is of doubtful significance it may be appropriate to seek advice from a direct senior (e.g. specialty registrar) before taking further action.

Clinical judgment

Preoperative investigations

Thorough history and examination are the most important tools for uncovering morbidity during preoperative assessment. Preoperative investigations can themselves cause harm and it is therefore recommended that investigations are only performed when the patient's age, co-morbidities or surgical factors make them appropriate or when there is a specific clinical indication (García-Miguel et al, 2003).

Hospitals and surgical departments will have policies on which investigations should be performed – these guidelines are often based on those issued by the National Institute for Clinical Excellence in 2003.

Sickle cell testing should be performed on all patients with a family history of homozygous disease or heterozygous trait and on any patient from an African or Afro-Caribbean background whose sickle status is unknown.

Identifying high-risk patients

Perioperative morbidity and mortality is often predictable and the following factors are particularly important:

- Age
- Severity of surgical disease
- Relative severity of proposed procedure
- Medical co-morbidities – systemic disease such as stroke, angina or chronic kidney disease are independent predictors of prognosis following surgery (Lee et al, 1999)
- Exercise tolerance – the inflammatory stress response to surgery results in an

Table 1. What might be expected at a typical pre-admissions clinic

Reassess the presenting complaint	Does the patient still want the operation?
	Does the patient still need the operation?
	Does the patient need the operation sooner than planned?
Take a full medical history including systems review	
Examine cardiovascular and respiratory systems and the area for surgery	
Review observations (e.g. arterial saturations, blood pressure, weight)	
Advise about any medications that should be omitted preoperatively	
Complete drug card	
Assess risk of venous thromboembolism and prescribe mechanical and/or chemical prophylaxis if indicated	
Order preoperative investigations	
Decide if there is anything that needs to be discussed with the surgeon or anaesthetist	
Ensure that the results of preoperative investigations will be reviewed	

increased oxygen demand which requires an increased cardiac output. Patients who are unable to sustain relatively light activity (such as climbing a flight of stairs or vacuuming the house) may not have the physiological reserve necessary to raise their cardiac output adequately (Davies and Wilson, 2004).

Thorough assessment of the patient's medical history and aerobic fitness is essential but this can only be interpreted accurately when combined with an understanding of the underlying condition and what the planned operation involves. So, for instance, a patient would have to have severe systemic disease to be at high risk of complications following a simple rectal examination under anaesthetic. In contrast, pancreaticoduodenectomy involves a severe surgical insult and a patient with even mildly impaired exercise tolerance undergoing this procedure would be at substantially increased risk.

Patients thought to be at high risk should be seen before their admission by an anaesthetist. This will allow the patient to receive counseling about these risks and allow the anaesthetist to plan his/her anaesthetic technique and consider whether the patient may require critical care postoperatively. In addition, the anaesthetist is well placed to assess whether medical co-morbidities are being treated optimally before surgery.

Perioperative medications

Which of the patient's usual medications should be continued will depend upon the patient and the planned surgery. The points below offer a guide for the most commonly encountered issues.

Aspirin

Usually stopped 1 week before surgery but may be continued when risk of bleeding from surgery is low.

Warfarin

Usually stopped 5 days before surgery so that prothrombin time is within normal range. Some patients (for instance those with certain mechanical heart valves or recent thromboembolism) may require low-molecular weight heparin or intravenous heparin while they are not taking warfarin.

Clopidogrel

This should usually be stopped at least 7 days before surgery, although clopidogrel should not be stopped in patients who have had drug-eluting angioplastic stents in the previous 12 months without consulting the patient's cardiologist.

Antihypertensives

These should be continued and taken on the morning of surgery. Angiotensin II receptor antagonists and angiotensin-converting enzyme inhibitors, however, are thought by some to cause significant perioperative hypotension and should be withheld.

Hypoglycaemics

Insulin and oral hypoglycaemics should be managed so as to avoid hypoglycaemia during preoperative fasting. Excellent guidance on this issue can be found on the Nottingham Diabetes website (www.nottinghamdiabetes.nhs.uk).

Combined oral contraceptives

These should be stopped 4 weeks before major surgery or lower limb surgery. Alternative contraception should be discussed in advance.

Hormone replacement therapy

This should be stopped 4 weeks before major surgery or lower limb surgery.

Monoamine oxidase inhibitors

These can cause significant drug interactions but discontinuing them may have adverse effects – advice should be sought from the patient's anaesthetist.

Anaesthetic challenges

In most cases anaesthetists are only able to assess their patients on the day of surgery. It is therefore helpful for doctors involved in preoperative assessment to be aware of some specific issues that anaesthetists would appreciate advance warning of:

- Clearly predictable difficulty in securing the airway – patients with very restricted mouth opening and neck movement or those with craniofacial abnormalities (for example Pierre–Robin syndrome)
- Grossly obese patients (body mass index over 35 kg/m^2)
- Personal or family history of significant adverse reactions to anaesthesia – some side effects to anaesthesia are common and relatively benign, for example nausea and vomiting. Rarely, those with a genetic predisposition can have an acute disease of skeletal muscle induced by anaesthetic drugs (malignant hyperthermia). Also, some patients with another genetic predisposition will experience prolonged action of a particular muscle relaxant (suxamethonium). In both of these cases the patient or his/her relatives are likely to have had clinical testing and to be aware of the need to inform the anaesthetist.

Health screening

Preoperative assessment is effectively a health screening programme. Taking a history, examining the patient and reviewing the results of investigations will often identify new pathology or suboptimal treatment of existing medical conditions. For example, a patient may be found to be in atrial fibrillation or thyroid function tests may reveal inadequately treated disease in a patient known to have hypothyroidism. In these circumstances the correct course of action will depend upon the urgency of surgery – this should be discussed with the operating surgeon and anaesthetist.

When health problems are discovered at preoperative assessment these should be clearly communicated to the patient's GP together with the proposed plan for the patient's management. It is important to remember that hospital doctors have at their disposal far greater resources than GPs and every effort should be made to address these issues at the time of preoperative assessment.

Advising patients

Patients may have detailed questions about their surgery and anaesthetic. Familiarize yourself with any appropriate patient information literature and read through this with the patient when necessary. If you are unsure of the answer to a question that the patient has then defer this to the operating surgeon or anaesthetist.

Written consent for a procedure should ideally only be obtained by someone capable of performing that procedure (Department of Health, 2001). Where foundation doctors are asked to do this they should be given guidance by their seniors on which risks and benefits the patient should be informed of.

Before leaving the assessment, ensure that the patient understands the proposed operation, when he/she should attend hospital and what medications he/she should take before their admission. All patients should also be aware of starvation times (*Table 2*).

Smokers should be told that abstaining from smoking – even for just 12 hours preoperatively – can have a beneficial effect on their recovery from anaesthesia (Egan and Wong, 1992).

Unplanned admissions

Patients admitted as a result of acute surgical conditions will often require a surgical intervention. The principles of preoperative assessment are equally important for these patients if not more so as emergency surgery greatly increases perioperative risk. When these patients are listed for surgery their medical history should be reviewed and consideration should be given to the need for preoperative investigations and discussion with an anaesthetist.

Table 2. Starvation times

No solid foods for at least 6 hours preoperatively	This includes cow's milk which forms a solid when mixed with stomach acid
	Breast milk can be given up to 4 hours preoperatively
Clear fluids can be consumed until 2 hours preoperatively	

Conclusions

Preoperative assessment aims to improve outcome following surgery and foundation doctors play a key role in this process. While much of this work could be described as 'routine', the training value of preoperative assessment should not be underestimated. Preadmissions clinics will often present scenarios which require clinical decision making and provide opportunities to learn about surgical procedures and the conduct of anaesthesia. BJHM

Conflict of interest: none.

Davies SJ, Wilson RJT (2004) Preoperative optimization of the high-risk surgical patient. *Br J Anaesth* **93**(1): 121–8

Department of Health (2001) *12 Key Points on Consent: the Law in England.* Department of Health, London

Egan TD, Wong KC (1992) Perioperative smoking cessation and anesthesia: a review. *J Clin Anesth* **4**(1): 63–72

Garcia-Miguel FJ, Serrano-Aguilar PG, Lopez-Bastida J (2003) Preoperative assessment. *Lancet* **362**: 1749–57

Lee TH, Marcantonio ER, Mangione CM et al (1999) Derivation and prospective validation of a simple index for prediction of cardiac risk of major noncardiac surgery. *Circulation* **100**(10): 1043–9

National Institute for Clinical Excellence (2003) *Guidance on the Use of Preoperative Tests for Elective Surgery.* National Institute for Clinical Excellence, London

Roizen MF (1997) Editorial. *J Clin Anesth* **9**: 435–6

KEY POINTS

- Preoperative assessment should ensure that the operation remains appropriate and that patients at high risk of perioperative complications are identified early.
- The decision to proceed with surgery can only be made between the surgeon, the anaesthetist and the patient.
- Preoperative assessment will often pose clinical dilemmas and has a valuable role in the education of junior doctors.