MEDICAL PRACTICE

Today's Treatment

Use of anaesthesia**Preoperative assessment of patients**

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Anaesthesia is a necessary evil. Necessary because without it surgery would be virtually impossible as would be a considerable number of investigations. Evil because it entails using drugs that make the patient defenceless. Alternative methods such as acupuncture, hypnosis, and electrical anaesthesia are not sufficiently reliable to replace inhaled or injected drugs.

When rendering a patient defenceless the anaesthetist takes on the responsibility of keeping the patient alive and bringing him back to normal function once the operation is over. The safety of modern anaesthesia reflects the skills used. In surveying ten years' operating at Groote Schuur hospital, Harrison¹ reported that with some 240 483 operations anaesthesia had caused death in only 53 patients, an incidence of 1:4537. Anaesthesia for caesarean section is always thought to present additional risks. The latest report on confidential inquiries into maternal deaths² indicated that the death rate from anaesthesia was 1:5933. The causes of death, and presumably of morbidity as well, have been well recognised: problems with breathing, problems with blood volume and cardiac function, and, more rarely, problems of adverse responses to drugs.

The essence of good anaesthetic care is to recognise when problems are likely to occur. Indeed, training may be regarded as taking three stages: in the first the trainee gets into trouble; in the second he learns to get out of trouble; and, finally, he learns to avoid trouble. One of the functions of the anaesthetist when seeing patients before operation is to assess the possibilities of problems and to plan accordingly. The cynic³ may reduce the

assessment to three questions: who is the surgeon, where is the patient going afterwards, and what is the operation. Even so, Fisher³ states that the preoperative examination tells you "how and when." These are vital.

The basis for assessing a patient for anaesthetic and surgery must be to consider the responses likely to be seen with the particular operation for that patient in his state of health. The results will determine the choice of anaesthetic techniques and, perhaps, the planned postoperative management—whether as a day case or in an intensive care unit.

Assessment of fitness for risks of anaesthesia and surgery

It seems logical to expect that the more the patient is incapable of coping with the demands of normal physical activity the more likely he will be at risk from anaesthesia and surgery. One widely used assessment is that of the American Society of Anesthesiologists⁴—(1) normal healthy patient; (2) mild systemic disease; (3) severe systemic disease limiting activity but not incapacitating; (4) incapacitating systemic disease with a constant threat to life; and (5) moribund, not expected to live 24 hours with or without surgery.

In a large series Dripps, Lamont, and Eckenhoﬀ⁵ found that the classification did give a general prediction as to the outcome. Nevertheless, the classification does not always detect the specific risks to the patient. The risks of developing a cardiac complication threatening life have been assessed by Goldman *et al.*⁶ The main hazards that could be assessed before operation were a history of a myocardial infarction within the past six months and the presence of heart failure and any arrhythmia. Remarkably, the presence of angina by itself or hypertension did not predict the development of problems, although their series did not contain patients with severe hypertension. Mill-

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edge and Nunn⁷ looked at patients with chronic obstructive airway disease and found that most did not develop problems apart from those who were in respiratory failure with a high carbon dioxide tension. For liver disease, Pugh *et al* have developed a scoring system⁸ to predict the outcome over the subsequent year, using the presence of encephalopathy, bilirubinaemia, prolongation of the prothrombin time, and a low blood albumin concentration. These types of assessment will become more common for they consider the results of the total effects of surgery and anaesthesia.

Most anaesthetists ask for the haemoglobin concentration to be measured before surgery and will not readily anaesthetise patients if it is less than 10 g/dl. This is not because anaemic patients are more at risk but rather that, in Britain, there must be a cause for this degree of anaemia. Preoperative diagnosis and treatment can restore a normal haemoglobin concentration. Alternatively, if major surgery is imperative blood transfusions before and during surgery can be given.

Specific anaesthetic problems

One can almost construct an alphabet of potential problems for the anaesthetist which can be detected preoperatively.

Airways pose many problems. Difficulties in maintaining a clear airway may be expected in patients with various congenital defects: large goitres, full stomachs, or intestinal obstruction in pregnant patients, and many others.

Anaesthetics—Previous anaesthetics may also have produced their own problems—from postoperative nausea and vomiting through awareness to such major hazards as the development of malignant hyperthermia or hepatic failure. A history of what happened before is necessary as is an inquiry whether other members of the family have had problems.

Breathing or, more strictly, ventilation may cause problems in those with chronic respiratory failure or with muscle or neuromuscular disease, and in some with neurological disorders.

Circulation—This needs both taking a history to assess the risks of myocardial infarction and of rheumatic fever and an examination to detect heart failure and dysrhythmias. The common cause of operative problems is shock. The presence of a blood volume or inadequate cardiac function must be detected.

Drugs that patients take can cause problems, although with most, if the anaesthetist knows what is being taken, there will be no problems. With most antihypertensive regimens the risks of stopping them because of possible dangers during anaesthesia and surgery are less than those of untreated hypertension and of stopping the drugs. Most anaesthetists will now want such treatment continued up to, during, and after the operation.

Endocrine disorders, such as diabetes, may cause trouble. Diabetes in particular needs careful management, especially in the unstable undergoing major surgery. Alberti and Thomas⁹ have reviewed these problems.

Electrolyte disturbances are common in the elderly and in those undergoing elective surgery. The poor renal function association with electrolyte disturbances may affect the elimination of several drugs the anaesthetist uses.

Emergency operations have additional risks. The time to assess a patient may be short and insufficient to return him to his best state. With a major internal haemorrhage from a ruptured spleen or aorta the priority is to stop the bleeding; resuscitation goes on in parallel but need not precede haemostasis.

Fatness produces respiratory impairment in the grossly obese (and increases the technical difficulties for the surgeon). In elective surgery weight reduction beforehand will help everyone. The converse problem of starvation also has its hazards. The most striking examples are in those who have not been able to eat because of oesophageal cancer. Preoperative nutritional support may help them to overcome the metabolic stresses they will encounter.

The alphabet could go on but perhaps it is wisest here to leave it to those more directly concerned.

When and where should patients be assessed?

Traditionally patients are assessed by the houseman on the day of admission. Most anaesthetists now assess their own patients—the night before operation for inpatients and immediately before the operation for day cases. Both systems give problems. The houseman may not have the knowledge of specific anaesthetic problems. The anaesthetist may detect problems that need further investigation or treatment or both and yet he is under some pressure not to disrupt the planned schedule of operations.

With long delays in the admission of many patients an assessment at the time of deciding to perform the operation will miss major problems developing in the intervening months (and years). In such cases Burn¹⁰ developed a preoperative assessment clinic where the anaesthetist sees the patients he is to anaesthetise two weeks later. Problems can be identified, investigations made, and treatment offered. Should the operation not be needed or needs delaying there is time still to arrange another admission.

Value of preoperative assessment

So far I have dealt with the use of a preoperative visit to assess the problems likely to be met with by the anaesthetist in dealing with the patient. There is another gain. One of my teachers of anaesthesia referred to herself as the "patient's friend." It is still surprising how many patients ask what is to be done to them—and why. Perhaps the anaesthetist, appearing late in the afternoon or evening, is less intimidating than the full surgical team, but information about the operation, anaesthetic, and likely postoperative treatment is usually accepted. Preoperative visiting should reassure both the anaesthetist and the patient.

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A yarn store for a tweed mill is maintained at a relative humidity of 65%, the temperature being 70 F. What if any effect could this be expected to have on the health of the yarn store workers?

The combination of relative humidity and temperature quoted would be comfortable for workers carrying out medium activity and wearing light clothing,¹ which presumably would be the case in a yarn store. Sedentary workers in such conditions would probably complain of feeling cold.

¹ Fanger PO. *Thermal comfort*. New York: McGraw-Hill, 1972.