

Overview of anaesthesia and patient selection for day surgery

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Abstract

This article looks at the selection and preoperative assessment of patients for day surgery and includes a discussion of the 'ideal' anaesthetic for day surgery. The NHS has a target of 75% of all elective procedures being performed in the day case setting (defined as stays of under 24 hours) and day case surgery in the UK has grown as a result of economic pressure, limited resources, and modern medical techniques so that the British Association of Day Case Surgery now recommends more than 200 operations as day case procedures. A successful service revolves around selection criteria for patients and procedures, with the correct procedure being coupled to the correct patient. Suitable surgical and anaesthetic techniques must be employed aiming to minimize postoperative morbidity especially postoperative nausea and vomiting (PONV). The use of analgesic premedication, supplemental local anaesthesia, delicate tissue handling, and positive psychological reinforcement will help this, as will using techniques that minimize postoperative pain (including that from airway devices) and have a minimal 'hangover' effect.

Keywords Anaesthetic technique; day case surgery; patient selection; procedures

Introduction

Day case surgery has evolved from minor surgery performed at the patient's home in the early years of the last century, to the present where complex intra-abdominal procedures and even neurosurgery can be undertaken in a day case setting. Advances in anaesthesia, surgery, and new equipment have all made this easier, but defining the specialty itself is difficult and definitions therefore range from 'same day surgery' to 'in-hospital stay of less than 24 hours'. One NHS target is for 75% of elective surgical procedures to be carried out as day cases but, for selected procedures in the UK, this currently stands at only 68%. Other countries have exceeded this target and, despite early promise in

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Learning objectives

After reading this article, you should be able to:

- explain the benefits of day case surgery to patient and healthcare system
- list the types of procedure and which patients are suitable for day case surgery
- outline the functioning of a working preassessment system
- suggest the ideal anaesthetic techniques to achieve good day case results.

the UK, a recent Audit Commission Report indicates that day case centres are not used to full capacity and day case surgery has levelled off (if not declined) in many centres. This may be failure to recognize the potential benefits, but in most cases the reasons are likely to be difficult to establish.

Benefits of day case surgery include:

- in-hospital treatment, but recovery at home
- low or no risk of cancellation
- reduced risks of hospital-acquired infection and venous thrombo-embolism
- highest quality care provided for minor and intermediate surgery while inpatient beds and resources are retained for major cases
- improved throughput, easier booking and reduced waiting times
- cost-effective commissioning (for primary care trusts)
- decreased postoperative cognitive dysfunction in the elderly.

Encouragements for day surgery include the ambition set out in the NHS Plan 2000 '...To achieve a target of treating more patients faster, reduce waiting times, introduce patient choice and for the NHS to "do things differently"...'.

For children, The European Charter of Children's Rights advocates children being admitted only '...if the care they are to receive cannot be provided at home or on a day care basis.'

To achieve these goals, two fundamental principles should be applied: (1) that the surgery is suitable to be performed as a day case procedure and (2) that the patient is suitable to undergo that procedure in the day case setting.

If these two fundamentals are expanded, there are four elements to the day case pathway:

1. Selection and assessment
2. The operation and anaesthesia
3. Discharge
4. Postoperative support.

(For discharge and postoperative support, see pages 153–156, in this issue.)

Selection and preoperative assessment ('preassessment')

Three decisions have to be taken before a patient undergoes successful day case surgery. Is the procedure (and available expertise) suited to this type of care? Is the patient fit for this type of care? Is the home environment suitable for patient convalescence?

What types of surgery are suitable?

The National Audit Committee published a 'Basket of 25 procedures in 2000' (Table 1) ideally listed and undertaken as day surgery; if a patient requires one of these procedures, the question asked should be 'is there justification for admitting this case as an in-patient?' rather than 'is this patient suitable for day case surgery?' The British Association of Day Surgery (BADS) added a 'Trolley' of procedures that should be considered for day surgery (Table 2).

The 'Trolley' has since been updated, and BADS now publish a list of more than 200 procedures that should be considered for day case surgery or 23- and 48-hours stay.

Contraindications to being listed for day surgery are:

- patient refusal (although this is a relative contraindication for very minor surgery)
- procedure deemed unsuitable (either due to it being a complex version of a 'basket' procedure, or due to the lack of available surgical expertise for that procedure).

What patients are suitable?

Appropriate selection of patients improves outcome and efficiency by reducing delays and cancellations, helping control waiting lists and increasing staff and patient satisfaction. To assess how well a unit functions, only three performance markers need be measured.

- Did the patient turn up at the right place, right time, and ready for the procedure? (This indicates effective preassessment and patient information.)
- Was the planned procedure performed? (This shows that surgical planning and preassessment are working correctly.)
- Did the patient go home afterwards? (This is a measure of social assessment, and the quality of anaesthetic and surgical care.)

Effective, thorough preassessment therefore underpins all three markers of quality.

National Audit Committee basket of 25 procedures

- Orchidopexy
- Circumcision
- Inguinal hernia repair
- Excision of breast lump
- Anal fissure dilatation or excision
- Haemorrhoidectomy
- Laparoscopic cholecystectomy
- Varicose vein stripping or ligation
- Transurethral resection of bladder tumour
- Excision of Dupuytren's contracture
- Carpal tunnel decompression
- Excision of ganglion
- Arthroscopy
- Bunion operations
- Removal of metalware
- Extraction of cataract with/without implant
- Correction of squint
- Myringotomy
- Tonsillectomy
- Sub-mucous resection
- Reduction of nasal fracture
- Operation for bat ears
- Dilatation and curettage/hysteroscopy
- Termination of pregnancy

Table 1

British Association of Day Surgery trolley of procedures

- Laparoscopic hernia repair
- Thoracic sympathectomy
- Submandibular gland excision
- Partial thyroidectomy
- Superficial parotidectomy
- Wide excision of breast lump with axillary clearance
- Urethrotomy
- Bladder neck excision
- LASER prostatectomy
- Transcervical resection of endometrium
- Eyelid surgery
- Arthroscopic meniscectomy
- Arthroscopic shoulder decompression
- Subcutaneous mastectomy
- Rhinoplasty
- Dento-alveolar surgery
- Tympanoplasty

Table 2

Preassessment is a process that ensures the patient is medically fit for surgery and anaesthesia, and understands the proposed procedure and the pathway (Figure 1).

It comprises:

- confirmation of the patient's wishes to proceed (consent)
- assessment of patient suitability for the planned surgical procedure
- assessment of the patient's fitness to undergo surgery and anaesthesia
- provision of patient education, oral and written with regards to the procedure and the day case pathway
- identification of any social, cultural or communication needs
- assessment of home support and requirements for safe discharge.

Preoperative clinics should be consultant-led in conjunction with dedicated preoperative assessment teams using protocols or pathways to assist them. Assessment should take place as soon after surgical listing as possible to allow preoperative investigation and, where required, referral for specialist anaesthetic or medical review; ideally it should be between 2 and 6 weeks before the date of surgery.

The location of preoperative assessment is a topic for debate; on the one hand, assessment may be performed by a GP, practice nurse, or over the telephone. On the other hand, holding preassessment on the day surgery unit itself allows the opportunity for familiarization with the environment and, ideally, the opportunity to meet staff involved in their care.

Medical assessment

Selection criteria are based on the patient's state of health at the time of assessment, avoiding use of age, weight or preformatted health categories (that is ASA) as rigid determinants. The goal is to identify patients who will have a good level of postoperative function, and who will be able to eat and drink soon after surgery with minimal postoperative nausea and vomiting.

However, many preassessment clinics use crude health categorizations for the sake of simplicity and ease of use. For example, the American Society of Anaesthesiologists (ASA) classification is often used because it has historical merit, familiarity, and The Royal College of Nursing and Department of Health both suggest using it. In general, patients with ASA scores of I–III are suitable for day case surgery unless there is specific contraindication (see Table 3).

The preoperative assessment process in day surgery

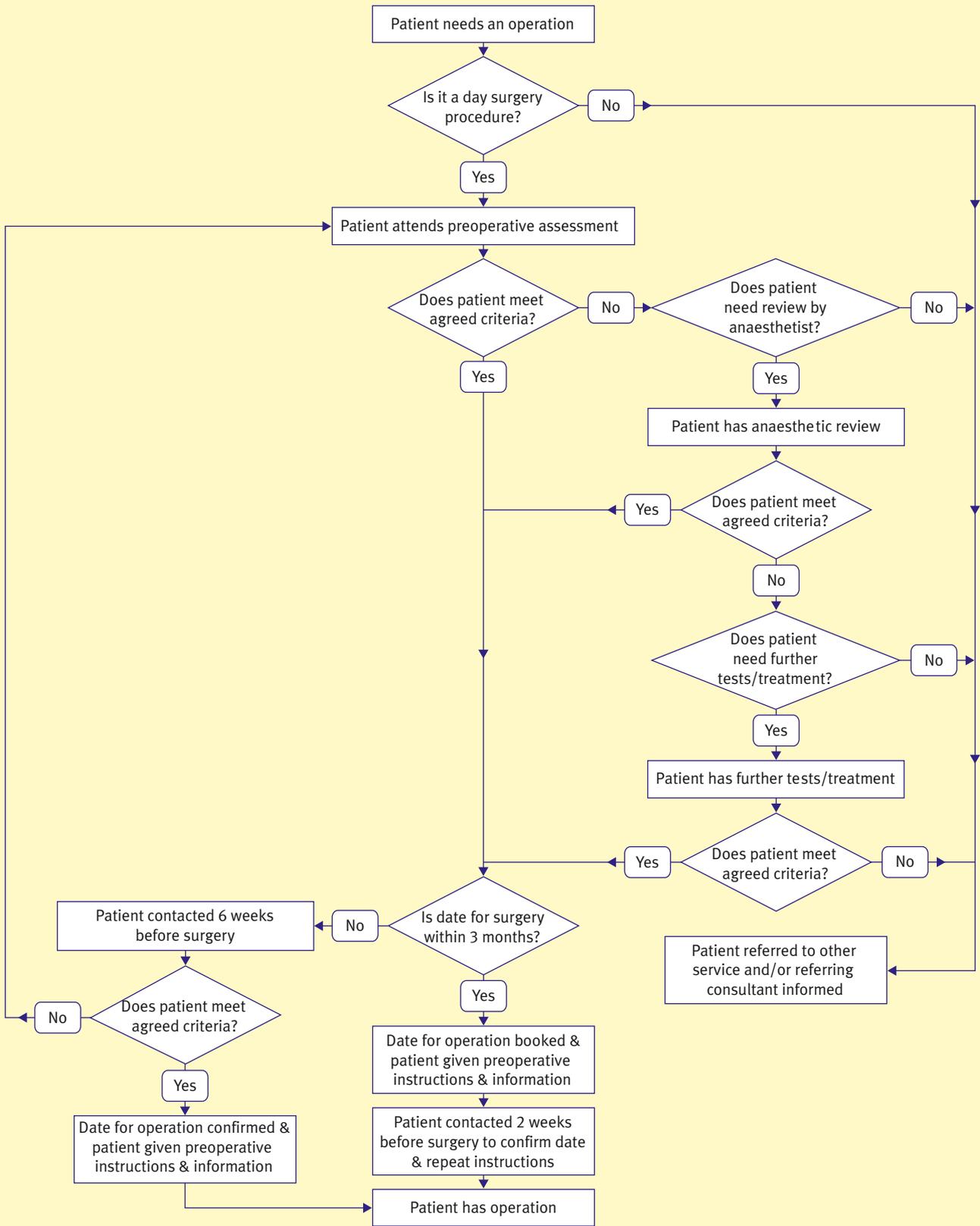


Figure 1

Specific system contraindications (CI) for day case surgery

System	Absolute CI	Relative CI
Respiratory	Marked dyspnoea on mild exertion Exercise tolerance (ET) ≤ 2 metabolic equivalents (METs)	Untreated moderate dyspnoea (outdoor limitation) Poorly controlled asthma
Cardiovascular	Infarct within the past 6 months Angina New York Heart Association class III and IV or ET ≤ 2 METs from any cardiac cause Complete heart block Symptomatic first/second-degree heart block	Patients on warfarin Untreated or poorly controlled angina, mild non-limiting cardiac failure (ET ≥ 3 METs)
Endocrine	Uncorrected Addisonian or Cushingoid disorders	Poorly controlled diabetes (needs careful planning of list with clear fasting and medication instructions)
Renal	Uraemia	Haemodialysis or continuous ambulatory peritoneal dialysis
Liver	Advanced liver disease with deranged clotting	Mild liver disease with elevated enzymes but normal clotting
Gastrointestinal	None	Severe uncontrolled reflux
Neurological	Uncontrolled epilepsy	Stroke or transient ischaemic attack within 1 year, neuromuscular disorders awaiting assessment

Table 3

Weight

Early restrictions on body mass index (BMI) to a maximum of 30 for day case surgery have been abandoned since obese but fit patients do well after day case surgery, and the increasing prevalence of obesity would seriously curtail activity. Subsequent restriction to patients with a BMI of <35 has also largely disappeared, although variation exists between units. It is now accepted that patients with a BMI in the range 35–40 are suitable for most procedures, but there may be limits to what can be offered because of technical surgical difficulties, equipment limitations (that is maximum theatre table or trolley weights) or local manual handling protocols. Although high BMI is not an absolute contraindication, obese patients are likely to have other medical problems such as obstructive sleep apnoea (OSA), which is addressed later.

Age

There is no reason for an upper age limit for day case surgery (in the elderly, biological age is a better guide than chronological age), but most units will have a lower limit, which, in some specialist centres, can be as young as 1 month. Operating on children has its own set of problems; children have a wide range of physiological and mental variation, with different challenges at different ages. Day surgery units should not perform paediatric procedures unless they have the staff training, paediatric equipment, and are set up to manage children. Local protocols can be used to define age ranges for different procedures since a major concern with younger age groups, particularly premature infants, is the risk of post-operative apnoeas. Those with a history of recent apnoeas, infants with cardio-respiratory disease, those of low weight and those who receive opiates as part of their intra-operative analgesia are considered to be at risk. Generally, infants who required ventilatory support as neonates, and premature infants who have not reached 44 weeks post-conceptual age are unsuitable.

Children are particularly suited to day case surgery and ideally should have ASA classification I or II, although this can be difficult to assess in light of chronic stable underlying disorders. The

procedure should also not last more than 1 hour and should have a known low incidence of postoperative complications. The social issues surrounding care are very important. There must be a parent or carer able to understand and implement preoperative instructions, and to be available before, during and for a defined period after the procedure to take responsibility for the child's care.

Mental illness and learning difficulties

Patients benefit from shortened hospital stays, but may need a carer or family member present on induction and recovery.

Drug history

Patients should continue their usual medications, with special attention and advice needed for those on warfarin or insulin. These groups need specific pathways developed in conjunction with the relevant medical specialists. Diabetics should normally be first on a list to minimize risks of hypo/hyperglycaemia (see 'special considerations' below).

Those with chronic pain problems may need referral for acute pain management postoperatively, but are not contraindicated as a group.

Smokers should abstain for at least 6 hours to allow carbon monoxide levels to return to a minimum and patients admitting cannabis use should be advised to stop 24 hours prior to surgery. Those using heroin or methadone require a combined approach with the patient's drug team, GP and acute pain team. Ecstasy (3,4-methylenedioxymethamphetamine or MDMA) should be avoided for 4–5 days preoperatively due to its profound hangover effects and cocaine users may have cardiac comorbidities that can be hard to detect; an electrocardiograph is advisable for the latter group.

Social assessment

Social criteria can be difficult to assess in the hospital setting and other healthcare professionals may need to be contacted to provide appropriate information; the Royal College of Nursing and Association of Anaesthetists of Great Britain and Ireland suggest that:

- the patient must be willing to undergo day surgery
- a responsible adult must stay with the patient for 24–48 hours postoperatively
- the patient and/or carers must have easy access to a telephone (preferably private)
- the patient should live closer than 1.5 hours away, or there should be facilities for a ‘patient hotel’
- the patient’s home must be compatible with postoperative care (that is suitable heating, lighting, kitchen and ablution facilities).

Absolute contraindications from the Department of Health are:

- lack of a responsible adult to manage postoperative care
- lack of access to a telephone
- no availability of GP or nursing back-up on discharge.

(See also ‘special considerations for the elderly’ below.)

Anaesthetic assessment

In addition to the general medical assessment and, as with any preoperative anaesthetic visit, there are specific areas that need to be addressed, including an assessment of postoperative nausea and vomiting (PONV) risk.

PONV risk

It is useful to make a basic assessment of PONV risk based on the four ‘Apfel’ risk factors of female sex, non-smoking status, past history of PONV or travel sickness, and the likelihood of the need for postoperative opiates. This will allow stratification of patients into risk groups and better planning for anaesthesia.

Anaesthetic history

Anaesthetic problems such as suxamethonium apnoea, malignant hyperthermia, other associated comorbidities or family critical incidents, need to be investigated and relevant documentation obtained. Although not absolute contraindications, they do require additional preparation.

Airway

Assessment may vary slightly between different units, but the most common are:

- Mallampati score (often selected pictorially and open to misinterpretation)
- mouth opening or inter-incisor gap
- neck circumference (in relation to OSA risk)
- micrognathia and/or Calder score for jaw protrusion.

Special considerations

Three of the most common problem areas are the elderly, diabetics and those at risk of OSA. All three are increasing in prevalence and deserve a more detailed look.

The elderly

Suitability for day surgery is not limited by chronological age, but with increasing age there is the chance that patients will present with comorbidities that need further investigation and optimization, and some of which will be a direct contraindication to surgery in the day setting.

Social situation must be examined more carefully, focussing on patient independence, mobility, and the potential for familial or social isolation. Some elderly couples are almost totally inter-

dependent and may fail to cope with the added burden of postoperative care. Living standards, transport and availability for appropriate follow-up are also important.

Diabetes

Well-controlled diabetes should not be an exclusion from day surgery, but there is an increased association with other comorbidities so careful patient instruction with regards to fasting times and insulin (or oral anti-hyperglycaemic regimes) must be given. A well-planned list order (usually first on the morning or afternoon lists), an anaesthetic technique that minimizes nausea and vomiting, and effective recovery room management will achieve earlier return to the preoperative regime prior to discharge. The current practice for the majority is to ‘move the sun in the sky’, that is to defer food and hypoglycaemic medication until after short surgical procedures, and then to act as though no time had elapsed. Metformin should not be withheld before surgery, but other oral hypoglycaemic agents should not be given.

Obstructive sleep apnoea (OSA)

Although not unrelated to increasing obesity, OSA and the concomitant risk of postoperative hypoxia is the complication that most concerns anaesthetists caring for the obese patient (survey data – James Palmer, personal communication) and preoperative identification of at-risk groups will help effective resource allocation and minimize unnecessary overnight stays. Many methods for OSA identification exist, but an Epworth questionnaire and simple assessment of SaO₂ on room air followed by a step test for those with a neck circumference over 17" or a BMI >35 will help identify those who may need referral for polysomnography and subsequent nasal continuous positive airway pressure (CPAP). Those already established on nasal CPAP can proceed with day surgery as planned.

The ‘ideal’ day case anaesthetic

No one technique is better than another, although total intravenous anaesthesia (TIVA) has many advantages, but several principles are worth stating.

1. Control of postoperative pain and avoidance of PONV is vital to minimize prolonged recovery and overnight stay.
2. Use of balanced anaesthesia and analgesia with appropriate use of local anaesthesia will reduce use of postoperative strong opiates that exacerbate PONV.
3. The use of analgesic premedication helps reduce the need for strong opiates.
4. Turnover is often high, so simplicity is the key factor in choosing techniques.

After preassessment an ideal anaesthetic would start with oral analgesic premedication, followed by induction with a short acting opioid and propofol, and anaesthesia maintained with a short-acting agent such as sevoflurane or desflurane in oxygen enriched air; a propofol infusion is an alternative if PONV risk is found to be high at preassessment. Airway maintenance with a laryngeal mask airway (LMA) helps reduce the incidence of sore throat, but if tracheal intubation is required then small calibre tubes and careful attention to cuff pressure will minimize sore throat. Local anaesthesia should be administered to

reduce postoperative analgesic requirements and patients should receive intra-operative fluids to reduce PONV and improve postoperative 'well-being'. Anti-emetics should be administered with regard to their efficacy profile for prophylaxis or treatment, dexamethasone (4–8 mg) or cyclizine (25–50 mg) being used for the former, and ondansetron (1–8 mg), prochlorperazine (12.5 mg), or droperidol (0.625 mg) for the latter. To help the smooth running of the unit, protocols for the administration of premedication and intravenous fluids should be in place and guidelines for further anti-emetic and analgesic therapies should be prominently displayed to assist the inexperienced.

Conclusion

Day case surgery will form an increasing part of the clinical workload. It is part of an anaesthetist's training towards completion of the certificate in specialty training, and forms an important part of the syllabus for the Final Examination of the Diploma of Fellowship of the Royal College of Anaesthetists.

Most elective procedures and patient cohorts are suitable for day surgery but some groups require a careful workup and peri-operative planning, and it is important to realize that social considerations are as vital to the successful outcome of day surgery as medical ones.

Fundamental to the safe, efficient and smooth running of a day surgery unit is an effective preoperative assessment,

ensuring that patient selection is matched with an appropriate procedure. ◆

FURTHER READING

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