

DAY SURGERY

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Abstract- Day surgery (also called ambulatory or outpatient surgery), the practice of performing surgery without an overnight hospital stay, is not new- indeed it can trace its origins back to the early 1900s- but it only really became popular from about the 1980s. North America, the United Kingdom and Northern Europe were amongst some of the earliest advocates, but the practice has since spread far wider. Experience from North America suggests that 70-80% of all elective surgeries may be possible on a day case basis and the United Kingdom is rapidly approaching these levels.

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Initially, day surgery was seen as a highly selective form of care, limited to the fittest of patients and short, simple surgical procedures. However, some enthusiasts were performing quite ambitious surgery (1-4) and their experience- supported by evidence from North America, which had rapidly embraced day surgery for its economic advantages- showed that the benefits of day surgery were still evident when applied to less healthy patients and more complex surgical procedures.

What operations are suitable for day surgery?

With improvements in surgical technique and pain control, an ever widening range of procedures have become suitable for day surgery. It was previously suggested that operations of about an hour were the longest which could possibly still allow adequately rapid recovery (5), but improvements in modern anaesthesia mean that recovery is still good after three hours or more. The degree of surgical trauma produced during the procedure is more important, but minimally-invasive techniques have greatly reduced muscle damage and blood loss and have allowed advanced day surgery within the abdominal

and thoracic cavities. One of the main limiting factors is postoperative pain, which needs to be manageable with oral analgesia by the time of discharge. There also needs to be no significant continuing blood loss (although patients may be sent home with small surgical drains *in situ*) or requirement for fluid therapy or other forms of specialized postoperative care.

The list of surgical procedures which are amenable to a day surgery approach is considerable and rapidly expanding. For example, laparoscopic cholecystectomy is becoming well established as a day case operation and it should be possible to manage about half of all cases in this way, indeed some surgeons advocate an even higher percentage (6). Other surgeons have concerns that early discharge will prevent the detection of hemorrhage or bile leaks, but this is not evidence-based, as these complications are either evident immediately or within 4-6 hours of surgery, or do not become detectable until several days after surgery (7, 8), by which time even inpatients will have been discharged. Laparoscopic Nissen fundoplication for reflux disease is also becoming established as a day case operation (9).

Our experience is that the techniques and processes used for cholecystectomy can readily be applied to this procedure (10, 11) and we have subsequently taken the same principles even further to allow laparoscopic simple nephrectomy to be

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performed as a day case for the first time in the world (12). Many other British centers are currently pushing the boundaries of day surgery procedures and examples include subacromial shoulder decompression (13), lumbar microdiscectomy (14), fixation of clavicle fractures (15), thyroidectomy (16, 17) and transurethral resection of the prostate gland (18, 19).

What patients are suitable for day surgery?

Previous day surgery selection guidelines often imposed quite selective but rather arbitrary limits on specific criteria such as age, weight or ASA (American Society of Anesthesiologists) status. Selection should really be based on the overall physiological status of the patient (20-22), although any pre-existing conditions should obviously be optimally treated or managed, as the patient is clearly unsuitable for *elective* surgery if they are not. Preoperative assessment is intended to predict adverse outcomes, but day surgery patients may still experience intraoperative problems or complications which can be managed just as they would be for inpatients. Only problems persisting for more than a few hours after surgery, which would prevent or impair the safety of discharge, should be seen as relative contraindications to day surgery. Rather than selecting those patients thought to benefit from day surgery, we should look for specific cases where pre- or postoperative hospitalization would improve the management or outcome, and thus where day surgery may be contraindicated. This default to day surgery option is advocated as best practice by most day surgery experts.

Examples of this approach include both advancing age and obesity. These conditions each present ever greater health challenges in the West, where life expectancy and waist measurements are both rapidly increasing. Older patients experience greater changes in intraoperative hemodynamics, but these do not result in more adverse outcomes after day surgery (23, 24). Similarly, obese patients present numerous problems with airway, breathing, circulation and manual handling, yet these do not persist for more than a few hours after surgery, at least up to a body mass index of about 40 kg/m² (20, 25). Furthermore, both groups may actively benefit

from day surgery, the elderly through a significant reduction in postoperative cognitive dysfunction (26) and the obese through early mobilization and good quality, non-opioid analgesia.

Cardiovascular disease is also common in Western society. Angina at rest or on minimal effort is a contraindication to day surgery, but stable angina which is optimally controlled is acceptable in the absence of other major risk factors. Good exercise tolerance, such as the ability to climb a flight of stairs without symptoms, usually predicts that day surgery will be safe and successful. Previous myocardial infarction, cardiac surgery or revascularization procedures do not preclude day surgery, provided that symptoms are under control, although the patient will be unsuitable in the first few weeks when the myocardium is still unstable. It is imperative that established beta-blockade is continued through the perioperative period (27). While hypertension is a significant risk factor for chronic disease, there is little evidence for an increased risk from day surgery unless blood pressure is exceedingly high or very unstable (28). It may be advantageous to the long-term health of the patient to diagnose and treat hypertension at preassessment, but there is little evidence to support deferring day surgery until treatment has been commenced. Patients with known high blood pressure should continue to take their anti-hypertensive therapy during the perioperative period.

Asthma and other respiratory diseases are not a contraindication to day surgery, provided they are well controlled and the patient has good exercise tolerance. Recent exacerbations or infections should lead to postponement of any form of elective surgery. More severe respiratory disease may be amenable to day surgery under local or regional anaesthesia. Spinal anaesthesia can be very effective, but a low-dose technique is necessary to avoid prolonged immobility which may delay or prevent discharge. A regimen of 5 mg bupivacaine plus 10 µg fentanyl made up to a total volume of 3 ml with saline is effective for most procedures (29).

Patients with diabetes mellitus should be screened for end-organ disease, but may benefit from the minimal disruption to their normal routine that day surgery allows, provided their disease is well-

controlled. Poor control increases the likelihood of perioperative hyper- or hypoglycemia and also encourages wound infection, so patients with unstable or “difficult to control” diabetes are usually unsuitable for day surgery. Simple regimens for perioperative glycaemic control appear as effective as more complex ones (30). Patients should be scheduled first on the operating list, omit their morning oral hypoglycaemic agent or insulin and resume normal diet and medication as soon after surgery as possible (31). Starvation times should be minimized and local or regional anaesthesia are especially desirable as they facilitate early resumption of oral intake after surgery. Recovery after some operations may be too slow (or complicated by too much nausea) to facilitate this approach and not all surgical procedures which are suitable for day surgery in the general population will also be suitable in diabetics.

Patients with a great many other chronic conditions may be suitable for day surgery unless these will significantly interfere with recovery, such as end stage renal failure or severe liver disease, or will be exacerbated or made more difficult to manage by the surgical event. Patients with learning difficulties may be awkward to manage in the day surgery unit but they benefit from the shortest possible length of separation from their normal environment. The majority of chronic medications may be taken before day surgery and some confer particular benefit (*e.g.*, established beta-blockade) and should not be stopped. Oral contraceptives should not be stopped before the majority of operations (the risks from unwanted pregnancies being greater than from remaining on therapy), but may be discontinued for specific procedures or patients at greater risk of thromboembolic disease. Anticoagulant and anti-platelet therapy are not contraindications for day surgery, but the perioperative management needs to be tailored to the individual circumstances, balancing the risks of perioperative bleeding with those of reducing or temporarily suspending treatment (which may be more harmful in some cases).

It is also important to ensure that patients are discharged to safe and acceptable home conditions following sedation or general anaesthesia. It is often

recommended that patients travel for no more than an hour after day surgery, but this may be impractical in isolated communities. Staying with family or relatives may help, but longer journey times are also acceptable if the patient and their carer are well-motivated and if emergency care will be available close to where the patient will be staying. Patients should be accompanied by a responsible, physically able adult who can care for them overnight (occasionally longer) and should refrain from dangerous activities, such as driving, for a minimum of 24 hours after anaesthesia or sedation or until their mobility has recovered enough to allow safe control of the car (which may take several weeks after inguinal hernia repair or lower limb surgery). Patients also need easy access to a telephone so that emergency help can be summoned, if required. The almost universal availability of mobile telephones has helped in this respect.

How is effective day surgery achieved?

Anaesthetic factors

Facilitating even the more complex day case procedures is often a case of doing the simple things well. Adequate pain relief can generally be provided by local anaesthesia infiltrated into wounds and non-opioid analgesics given in a timely manner. Opioids, which are a potent cause of nausea and also increase the incidence of sedation and dizziness, should be avoided or used selectively for “rescue” analgesia. Nonsteroidal anti-inflammatory drugs (NSAIDs) play a major role in pain prophylaxis. Well-established drugs like ibuprofen and diclofenac are preferable, since they are associated with relatively few side effects. The newer, selective cyclooxygenase inhibitors offer no advantages for most patients and their safety remains in doubt after the withdrawal of rofecoxib (32). Our preference is slow-release ibuprofen, given at least half an hour before surgery starts, which provides long-lasting analgesia. A sustained-release preparation of diclofenac is available as an alternative. There is also some evidence that NSAIDs given before surgery starts result in better and more prolonged analgesia than when administered at the end of the operation (33).

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Troublesome symptoms, such as nausea and vomiting, may be reduced by careful anaesthesia and specific antiemetic prophylaxis used selectively in patients at greater than average risk (34). The routine administration of 1–2 liters of intravenous fluid can significantly reduce drowsiness, dizziness and nausea for up to twenty-four hours after day surgery (35) and this simple and inexpensive measure is to be encouraged. Intravenous fluids can also be used to treat postoperative symptoms which might otherwise result in unanticipated hospital admission.

Surgical factors

Technological developments can make day surgery a realistic option. For example, using a laser in place of conventional diathermy reduces bleeding and the need for catheterization after transurethral prostatectomy. This has advantages for all patients, such as reduced blood loss and elimination of the risk of TUR syndrome, but also significantly reduces postoperative stay and may facilitate day surgery (19). Endoscopic techniques have made many operations candidates for day surgery which would have been inconceivable with the open methods which were prevalent 10–20 years ago. Once an operation has made the transition to minimally-invasive surgery, further modification is rarely required to permit day surgery. However, the procedure needs to be performed slickly by a skilful operator. Attention to detail is vital to minimize complications which can prevent discharge or lead to readmission. Fundamental to the success of day surgery is adequate patient preparation and support. Although every member of the multidisciplinary team can play a part by conveying a positive mental attitude, day surgery nurses have a pivotal role in this respect.

Support for day surgery patients

Preparation for successful day surgery starts as soon as the decision to operate is made. Patients need to be given specific information preparing them for their experience, explaining the level of discomfort they will expect and what they can do about it and warning them of what they will and will not be able to do. Day surgery patients frequently comment that the level of information they received was superior

to that associated with inpatient surgery. Patients obviously need adequate support after surgery, but should be encouraged to regain independence and start to resume some normal activities as soon as this is safe, rather than developing a “sick-patient” role. This positive reinforcement requires specialist nursing skills which are not readily available on inpatient wards. Following discharge from the day unit, patients need to be provided with adequate support. Suitable take-home analgesia should be dispensed for the expected duration of moderate pain, typically five days. Written information should be supplied to supplement that given verbally, including advice on medication, bathing, suture removal, resumption of normal activities - including return to work - and follow-up. Support from community nursing services (where these are available) may be useful in developing new day surgery procedures, as well as for the more major operations where postoperative complications remain a potential (albeit extremely rare) risk. Telephone follow-up and 24 hour “helplines” can also provide useful support and advice to supplement written information and ensures that an additional burden is not placed on our colleagues in general (family) practice.

Routine follow-up and audits following the introduction of specific procedures reveal that day surgery patients express a high level of satisfaction with this form of care (11, 36, 37).

Future developments

The conversion of traditional inpatient procedures into day surgery is likely to continue, while others move from day surgery into procedure rooms, the outpatient department or even to the community. Day surgery offers economic benefits to virtually all forms of healthcare system, by ensuring the best possible value for money and efficient use of scarce resources. A “default to day surgery” strategy for an agreed list of surgical procedures- with the requirement to justify why hospital admission is required in specific cases- is the best means to achieve high rates of day surgery. It must be stressed that day surgery also offers excellent care for patients, since quality issues like a rapid recovery, the provision of excellent analgesia and freedom

from troublesome postoperative symptoms are all fundamental to its success. This will most readily be achieved by an enthusiastic group of specialist anaesthetists, surgeons and nurses working as a multidisciplinary team. By practicing rational patient selection and providing effective perioperative care, many more patients could enjoy the numerous benefits of day surgery.

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