The management of pain following day surgery

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Key points

75% of elective surgery will be performed as a day case and will include increasingly invasive and complex procedures

Written information for patients and their carers improves compliance

Taking a drug history is a vital part of day surgery anaesthesia

A multimodal approach to pain relief is necessary

It is important to preload the patient with oral analgesia prior to discharge

Successful day surgery is dependent on the management of postoperative pain. The last 10 years has seen a large increase in interest in the management of postoperative pain for in-patients leading to the development of Acute Pain Teams. However, 75% of elective surgery is expected to be performed as day cases in future and many patients will not benefit from in-patient based pain services. Furthermore, larger and more complicated procedures are being performed so increasing the challenge of ensuring satisfactory analgesia.

Patient expectation is often low. Many expect to experience moderate or severe pain following surgery; indeed they may consider it to be part of the healing process. This, along with a reluctance to take drugs, may reduce compliance with prescribed postoperative analgesics. Therefore, patient education is an important strategy and this should start during the pre-assessment process when the patient receives information about their operation. It can be re-inforced further with both the patient and their carer during their stay on the day of surgery. Written information about supplied drugs has been shown to improve patient compliance with the analgesia regimen. Information should include a description of the drug, when it should be taken, for how long, side-effects and who to contact in the event of problems.

A detailed drug history, including allergies, should be taken at pre-assessment and highlighted in the patient's notes. Many patients are already consuming NSAIDs and paracetamol containing formulations. We should ensure that they have clear instructions on which medication they should take after discharge and avoid dangerous duplication and interactions.

Pain assessment

Pain assessment forms an important part of postoperative management. Suitable scales include the verbal rating scale and the visual analogue scale (VAS). In the verbal rating scale, the patient is asked to choose a word that corresponds closest to the pain. The terms 'none', 'mild', 'moderate' and 'severe' are often used as their meaning is fairly consistent between patients. This is a simple system which can easily be used in first stage recovery.

The visual analogue scale is another widely used pain assessment tool. It is useful both in day-to-day assessment of acute pain and also in research. It consists of a 10 cm line with the words 'no pain' at its start and 'worst pain imaginable' at its end. The patient is asked to put a cross in a position on the line which represents how much pain they are experiencing at that moment. The distance along the line is measured and recorded. A measurement of < 3 cm is often accepted as indicating acceptable analgesia. This technique is less satisfactory in the first stage recovery area as it requires a significant degree of recovery from anaesthesia. However, it can be used reliably in second stage recovery and prior to discharge. Whatever scale is used, it is essential that the measurements are taken and recorded to ensure that the patient is comfortable both on transfer to the ward and prior to discharge. Ensuring adequate analgesia in first stage recovery is the aim. It should be relatively easy for the anaesthetist to prescribe or administer further analgesia at this stage; it becomes more difficult in most units when the patient is in the ward area.

Peri-operative analgesic techniques

As mentioned earlier, it is important to plan the analgesic technique at an early stage – ideally during the pre-assessment process. However, there are certain techniques (*e.g.* regional blocks) that may depend on the skills of a par-

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Table 1 Local anaesthetic techniques suitable for day surgery

Iliohypogastric/ilioinguinal blocks for hernia repair and orchidopexy
Penile blocks for circumcision
Ankle blocks for the foot
Ring blocks for fingers and toes
Brachial plexus blocks
Interscalene approach for shoulder
Axillary approach for forearm and hand
Caudal blocks for orchidopexy and hernia repair in children
Retrobulbar/peribulbar blocks for eye surgery
Mammary plate blocks for breast surgery
Dental blocks for teeth extraction

ticular anaesthetist or the relationship between anaesthetist and surgeon. Because of this, it may not be possible to discuss some techniques at the pre-assessment visit. This must be done on admission, prior to arriving in theatre.

The anaesthetist should use a multimodal approach to the management of intra-operative and postoperative pain. Local anaesthesia, NSAIDs, paracetamol, short-acting opioids (alfentanil, fentanyl) and even longer acting opioids (morphine) may need to be considered. Local anaesthesia should be used if possible. This may be simple topical application, infiltration by the surgeon or more specific blocks performed by the anaesthetist. Examples of suitable blocks are shown in Table 1.

Bupivacaine (maximum dose 2 mg kg^{-1}) is currently the drug of choice because of its duration of action. Careful consideration and patient education is necessary before performing larger nerve and plexus blocks as the prolonged duration of action carries the risk of traumatic damage to the limbs and, in the case of lower limb blocks, mobility may be reduced. Spinal anaesthesia can be used successfully in day surgery. However, mobilisation time may be increased and the recovery of full motor and sensory function must be ensured before discharge. Spinal opioids and other agents such as clonidine are not used on a regular basis in anaesthesia for day surgery, but these techniques will require careful evaluation as the scope of day surgery increases.

NSAIDs should be given whenever possible and, as with local anaesthesia, it is important to discuss these with the patient beforehand. The anaesthetist needs to ensure that there are no contra-indications to their use (*e.g.* history of peptic ulceration, aspirin-induced asthma and renal failure). It is also vital that the anaesthetist informs and obtains consent from the patient if they plan to use the rectal route of administration.

Many day surgery procedures can be managed with short-acting opioids such as alfentanil and fentanyl. However, repeated administration may be necessary to ensure adequate analgesia until oral analgesics take effect. There is much discussion with respect to the place of longer acting opioids. Morphine may increase the incidence of nausea and vomiting, duration of stay and unplanned admission rate. However, many believe that it can have an important role in the management of some procedures, particularly in low dose (0.1 mg kg^{-1}) as part of a multimodal technique.

The multimodal approach to analgesia with early administration of NSAIDs and extensive use of local anaesthesia is used in an effort to ensure patients are discharged with their pain under control. The concept of 'pre-emptive analgesia' as opposed to 'prophylactic analgesia' has deliberately not been discussed in this article. Whether pre-emptive analgesia can be demonstrated in the clinical situation remains controversial.

Discharge analgesia

Oral analgesics are the mainstay of treatment following day surgery and the choice is considerable (Table 2). Diclofenac is a frequently prescribed NSAID. However, other agents offer advantages. Ketorolac is available as an intravenous injection allowing easy administration; diclofenac can be used intravenously, but its use is associated with a greater incidence of phlebitis. Tenoxicam and meloxicam have long half-lives and allow once daily dosing. Meloxicam is also available as a oral dissolving preparation that can be administered without water pre-operatively. NSAIDs appear to have differing side-effect profiles depending on their relative effects on the cyclo-oxygenase enzymes (COX-1 and COX-2). Those with a greater affinity for the COX-1 receptor (*e.g.* piroxicam) appear to be associated with more side-effects and are perhaps best avoided. Oral COX-2 specific NSAIDs (celecoxib, rofecoxib) are now available but their precise place in day care surgery is not yet clear. Water soluble COX-2 specific drugs for intravenous use (*e.g.* parecoxib) are under development.

Table 2 Oral analgesics used in day surgery

NSAIDs	Diclofenac
	Ibuprofen
	Ketorolac
	Meloxicam
	Tenoxicam
Others	Paracetamol
	Paracetamol 500 mg ± dextropropoxyphene 32.5 mg
	Paracetamol 500 mg ± codeine (8 mg, 10 mg or 30 mg)
	Tramadol
	Buprenorphine
	Oxycodone
	Oral morphine preparations

Paracetamol has been used for many years as a simple analgesic and is still useful as part of the multimodal approach to analgesia. It is available in combination with several other drugs (Table 2). Of these, codeine is the most popular and is available in 8, 10 and 30 mg doses per 500 mg of paracetamol. Codeine has some effect on the opioid receptors but approximately 10% is metabolised by O-demethylation to morphine. The enzyme responsible for this (CYP2D6) is absent in some individuals (*e.g.* 7% of the white population) suggesting that these patients derive less analgesic benefit from codeine. Constipation after repeated dosing can be a significant problem and patients need to be warned how to manage this.

Dextropropoxyphene is less popular, offers less flexibility in dosage and the effectiveness of combination preparations are probably no greater than paracetamol alone. Furthermore, it is particularly dangerous when mixed with alcohol or taken in overdose. Tramadol has been used in Europe for many years and is now available in the UK. It appears to have several modes of analgesic action (opioid receptor system and central serotonergic and adrenergic pathways). It is available as an intravenous preparation and as tablets offering the opportunity to administer a loading dose in theatre and prescribe top-up oral doses on discharge. Experience of its use in this context in the UK is still relatively limited and associated nausea and dizziness may limit its use. Buprenorphine is also available in both intravenous and oral preparations. The oral preparation is an absorbable sublingual tablet which avoids first pass metabolism. Buprenorphine has mixed agonist/antagonist activity and has a long half-life and a high receptor affinity allowing dosing at 6–8 hourly intervals. The high incidence of nausea and vomiting in ambulant patients has limited its use in the day care setting.

Morphine is available in both intravenous and oral preparations. It exhibits a high first pass metabolism (bioavailability 30%) and the oral dose may be difficult to titrate in a patient outside hospital, especially if combined with NSAIDs. There is considerable experience in the use of the oral preparation in the management of chronic and cancer pain but less in day care surgery. Oxycodone is a new oral preparation (previously available only as a suppository) and it may have a place. It is an agonist at both μ and κ receptors and, as expected, has the same side-effects as other opioids (nausea, vomiting, sedation, *etc.*). Its bioavailability (60%) is greater than that of morphine. Though metabolised to active metabolites including oxymorphone, these are not thought to contribute greatly to its analgesic activity.

The large choice of drugs available can make differing prescribing practices amongst colleagues a problem. The use of a standard analgesia protocol or analgesia ladder offers advantages such as: (i) the ability of nurses to check drugs and their contraindications with the patients; (ii) ease of prescribing and provision of written information; (iii) allowing audit of outcome; (iv) reducing the number of drugs stored on the day unit; and (v) over a period of time, it should be possible for units to optimise the analgesia regimen for most operations.

The use of an analgesia protocol also ensures that patients are provided with tablets for operations previously thought to be relatively non-painful by some clinicians (vasectomy, hysteroscopy, cystoscopy).

Currently NSAIDs, in association with a paracetamol/codeine combination tablet, are most commonly used in day care surgery. During the recovery process, it is important that the patient receives the first dose of the chosen oral analgesic. They will have already received their NSAID but most will not have had their paracetamol/codeine combination. It is important that these drugs are absorbed before the effect of short-acting opioids or local anaesthesia wear off. It does not make sense to discharge a patient who is comfortable because of local anaesthesia with a supply analgesics to be taken only on the inevitable return of pain.

Paediatric patients

Much of what has been discussed is directly applicable to children undergoing day surgery. However, there are a few points that need special consideration. Pain assessment is generally more difficult in younger children and special charts utilising pictures representing different degrees of pain or discomfort may help. Regional anaesthesia is extremely useful including the use of topical local anaesthesia creams such as EMLA to wounds, *e.g.* after circumcision.

The early administration of oral agents is again important. Paracetamol is the first line agent and initially can be given in higher doses (15–20 mg kg^{-1} orally, 30–40 mg kg^{-1} rectally) than traditional (10 mg kg^{-1}). Regular dosing of up to 90 mg kg^{-1} day^{-1} has been recommended. Drugs that are available in liquid form are necessary for younger patients and the choice includes codeine phosphate and ibuprofen. One or both of these agents can be added to the paracetamol as part of a multimodal approach to pain management. Ibuprofen has the advantage that it is now available without prescription for paediatric analgesia. It is often used following the administration of diclofenac (1 mg kg^{-1}) via the rectal route. Once again, it is important to inform and obtain consent from parents for this route of administration. They should be warned that they may well notice a PR discharge during the first day following surgery.

Distraction therapy has also a major part to play in the management of children and its efficacy should not be underestimated. They should be managed in friendly surroundings with toys and ideally a TV/video unit playing a supply of suitable cartoons.

Post discharge follow-up

Day case patients should be contacted in the days following surgery for assessment of their recovery. Particular attention should be paid to pain scores as part of the audit process of the day unit. The unit should agree targets that are a challenge but also achievable. Standards include: (i) number (%) of patients discharged with analgesics; (ii) incidence of 'severe pain' (verbal pain score) in the first 48 h; (iii) incidence of 'no pain' or 'mild pain'; and (iv) number (%) of patients satisfied with the management of their pain.

It is important to remember that perfect analgesia is not possible for every patient. Indeed, as mentioned earlier, many patients expect to feel pain following surgery and some refuse to take any of the analgesics supplied. Nevertheless, we should continue to strive to improve our patients' experience of pain wherever possible using a combination of education and pain management skills.

Key references

Jakobsson J. Postoperative pain and emesis: a systematic approach. In: Smith I. (ed) *Day Care Anaesthesia*. London: BMJ Books, 2000

Millar JM, Rudkin GE, Hitchcock M. *Practical Anaesthesia and Analgesia for Day Surgery*. Oxford: BIOS Scientific, 1997

Tong D, Chung F. Postoperative pain control in ambulatory surgery. *Surg Clin North Am* 1999; **79**: 401–30

White PF. Practical issues in outpatient anaesthesia: management of postoperative pain and emesis. *Can J Anaesth* 1995; **42**: 1053–5

Wolf AR. Tears at bedtime: a pitfall of extending paediatric day-case surgery without extending analgesia [editorial]. *Br J Anaesth* 1999; **82**: 319–20

See multiple choice questions 27–29.