

# Patient choice in sedation anaesthesia and recovery room analgesia

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Day surgery, with its unique environment and personalized care provides an opportunity for patients to have more control over their perioperative management. Patient choice for anaesthesia and postoperative analgesia can be offered at the preoperative assessment stage as part of an informed consent procedure. Patient controlled sedation, with propofol as the preferred drug, is an example of a new intraoperative sedation technique, where patients have control of their own sedation. It has been shown to be a safe technique with high patient satisfaction. Further studies in patient control with analgesic drug and route options in the recovery room and home will help define advantages in this area.

Key words: Patient-controlled sedation, propofol, day surgery, choice

## Introduction

Day surgery offers a unique environment in which close communication between patients and staff facilitates patients having more control over their perioperative management. As part of the informed consent, a patient controlled sedation (PCS) technique may be offered. PCS is an intraoperative anaesthetic technique used for sedation with local or regional anaesthesia. Patients also need to select analgesic drug, route and timing of medication in the recovery room and for the discharge period. The advantages of giving patients more control in the perioperative day surgery period are increased patient satisfaction and confidence to manage postoperative pain, with the potential for earlier return to activities of daily living and work.

Control over events is important for both the comfort and safety of the individual. Control over the environment can be said to exist when the outcome is determined by one's responses<sup>1</sup>. Hospitalization and surgery are examples of events over which the patient may feel he or she has little control. Day surgery provides an opportunity to restore control to the patient: privacy and mobility are encouraged with early return to the home environment.

Giving informed patients the opportunity for choice

will increase their confidence to control an event successfully. The desire for control increases when participants have more understanding of the situation they are confronting. Personal differences clearly play a role in the desire for control. 'Locus of control' as described by Rotter<sup>2</sup> is the extent to which patients feel able to control their own health. Patients presenting with an internal locus of control believe that they are solely responsible for their own destiny and enjoy having control. Alternatively, persons who believe that forces beyond their control (i.e. other people, luck) are the reason for their success or misfortune, have an external locus of control. This group of patients feel more comfortable having others control anaesthesia or analgesia. Averill has estimated that 10-20% of the population finds the availability of control and the responsibility for it stress inducing<sup>3</sup>. However, lack of control is much more disturbing to some patients than to others as it significantly increases anxiety. It would therefore seem appropriate to offer a choice of control to the day patient to reduce anxiety during the perioperative period providing the potential for improved day surgical care.

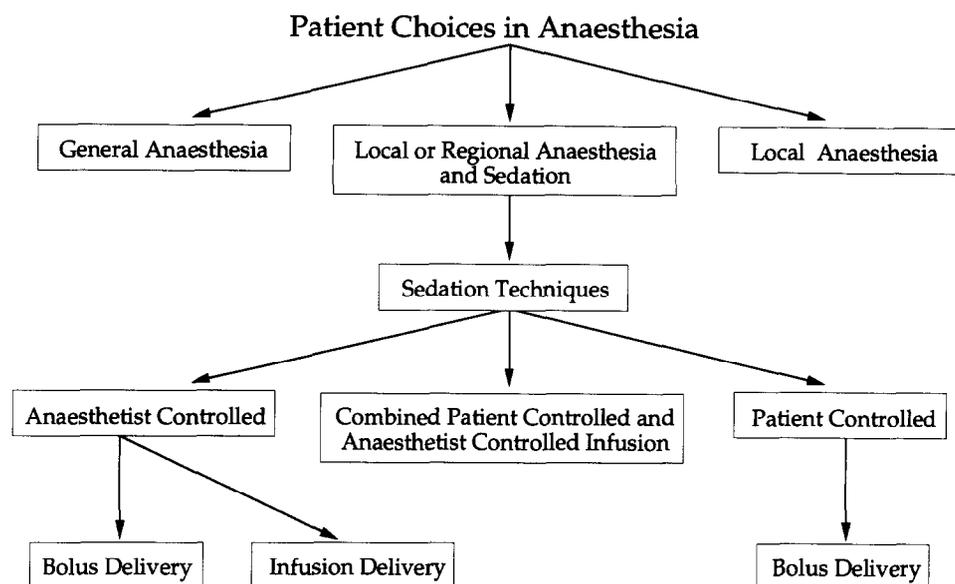
## Preoperative assessment

At the time of preoperative assessment, information and risks pertaining to the patients' anaesthesia should be discussed as part of an informed anaesthetic consent. The incidence of complications for different anaesthetic techniques in specific institutions should be considered prior to discussing anaesthetic options with the patient. A choice of anaesthesia may be possible, particularly if

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**Figure 1.** Patient choices in anaesthesia.

the surgery can be performed under regional or local anaesthetic technique in combination with sedation anaesthesia. PCS<sup>4</sup> may then be an alternative in which behavioural and decisional anaesthetic control is given to the patient during surgery. Potential advantages of local anaesthesia and sedation over general anaesthesia are reduced morbidity and shorter recovery room times for day patients. An outcome study in 1180 oral surgical patients in a major public hospital day surgery unit identified complication rates. There were no complications associated with local anaesthesia and sedation (385 patients), but eight patients suffered major anaesthetic-related complications with general anaesthesia (795 patients)<sup>5</sup>.

In preparation for postoperative pain management, medical or nursing staff should discuss with patients the analgesic drug options and routes of administration. This will give the patient confidence to make a suitable choice and control his/her analgesic requirement postoperatively. There are advantages in discussing these options and other day surgery issues preoperatively as Egbert<sup>6</sup> has shown. Positive preoperative instruction and encouragement reduces the requirements for postoperative analgesia.

### Day of surgery

On the day of surgery, patients often have a number of concerns about surgery and anaesthesia. Some do not want to be awake, see or hear their surgery. Others may be concerned about loss of control, dignity or privacy. Patient fears about their ability to tolerate pain and temporary separation from family or friends also increases anxiety. In an inpatient study of patients using patient control devices for postoperative analgesia, patients with higher anxiety were reported to have higher pain scores and made more frequent patient control demands<sup>7</sup>. Giving anxious patients as much control as

possible during the perioperative period therefore appears to be a sensible approach so the patient can self-medicate to his or her own perceived needs. Reports of patient control for anxiety using a patient control technique, appeared after patient controlled analgesia (PCA) devices became widely used for postoperative analgesia<sup>8,9</sup>. However, advantages of a self-medicated anxiolytic technique for day patients must be weighed up against the extra nursing surveillance and physical space required for premedicated day patients. If anxiolytics with long acting half lives are used as premedicants postoperative drowsiness may delay patient discharge.

### *Anaesthetist administered sedation techniques*

Where procedures can be performed under local or regional anaesthesia, avoiding the risks of general anaesthesia, then a choice of sedation techniques can be provided by the anaesthetist (Figure 1). The anaesthetist can control the sedation technique either by bolus doses of sedative agent or by an infusion technique<sup>10</sup>. In both cases the anaesthetist titrates the sedation drug to the anticipated needs of the patient. An alternative method of sedation is a technique by which the patient may be in control of his own sedation, called PCS. There has been recent interest in this technique worldwide, with published information using differing drugs and patient demand variables<sup>11-14</sup>.

### *Patient controlled sedation*

Patient suitability should be considered preoperatively. The anaesthetist must ensure that there is no communication or language barriers so the patient can understand the simple instructions required to manage the patient demand button. Children may be suitable if they can grasp the concept of the push button. Importantly, the patient must agree to be 'in control'. Patient preoperative

**Table 1.** Sedation scale

1	Fully awake
2	Drowsy
3	Eyes closed but rousable to command
4	Eyes closed but rousable to mild physical stimulation
5	Eyes closed and unrousable to mild physical stimulation

familiarization with the patient demand button increases confidence. A patient information video about the technique shown preoperatively can also assist understanding and streamline the preoperative interview. Patients should be instructed that by pressing the patient demand button, medication will be delivered to make them sleepy and comfortable. If they wish to become more sleepy at any time, they should press the patient demand button again. It is important to emphasize to the patient that they cannot oversedate themselves, and the anaesthetist will be present and will be monitoring him/her continuously during the sedation period.

Loading dose, bolus dose and lockout interval are programmed into the patient demand pump by the anaesthetist. The lockout interval provides a margin of safety for the patient by preventing further drug delivery if patient demands are initiated during this period. However, the most important safety aspect with intraoperative PCS is the presence of an anaesthetist, carefully monitoring the patients' sedation level. Acceptable sedation is up to and including sedation level 3 (see Table 1), where the patient's eyes are closed but he or she is rousable to command. Oxygen via nasal cannula should be administered and pulse oximetry measured continuously during the PCS technique as this will accurately detect any desaturation. From clinical experience, a patient type that should be treated with caution is the obese patient with a history of snoring. Their airway control can become compromised before reaching sedation level 3. This reinforces the importance of careful history-taking preoperatively. PCS should be initiated before the administration of local anaesthesia or commencement of surgery to allow the patient to control their apprehension or anxiety. Patients titrate the sedation drug dose to their own perceived needs.

Set-up for PCS is simple and quickly implemented. Anaesthetists should check the patient demand pump and infusion lines prior to their use. The patient demand pump should deliver the drug through a minimum volume side arm attached to the Y-piece of an infusion set (Figure 2). It is convenient to connect a three-way tap directly to the 50 ml syringe, for ease of drug refilling. The other arm should contain a one-way valve to prevent reflux of drug. For ease of administration it is useful to follow a PCS checklist (Table 2).

Various drugs have been used for the PCS technique, but propofol and midazolam have been most popular. Alfentanil has been used for intraoperative patient-controlled analgesia. It provided comparable analgesia to physician-controlled administration with respect to patient comfort and satisfaction during vaginal ovum

pickup procedures<sup>15</sup>. In a comparative study between midazolam, propofol and alfentanil during surgical procedures under local anaesthesia, Ghouri et al. used background infusion of drug together with self-administered drug using a patient-controlled delivery system. Midazolam and propofol had fewer perioperative problems than alfentanil and were equally acceptable to patients with respect to sedation, discomfort and anxiety<sup>16</sup>. Other studies suggest that propofol may be the drug of choice for PCS with its favourable pharmacokinetic properties and its euphoric effect on mood. For procedures with rapidly changing intraoperative requirements, propofol is the preferred drug<sup>11</sup>. Recovery of memory and mental performance is reported to be faster in patients sedated with propofol than midazolam<sup>17</sup>. This is of practical significance to day patients as they can remember discharge instructions.

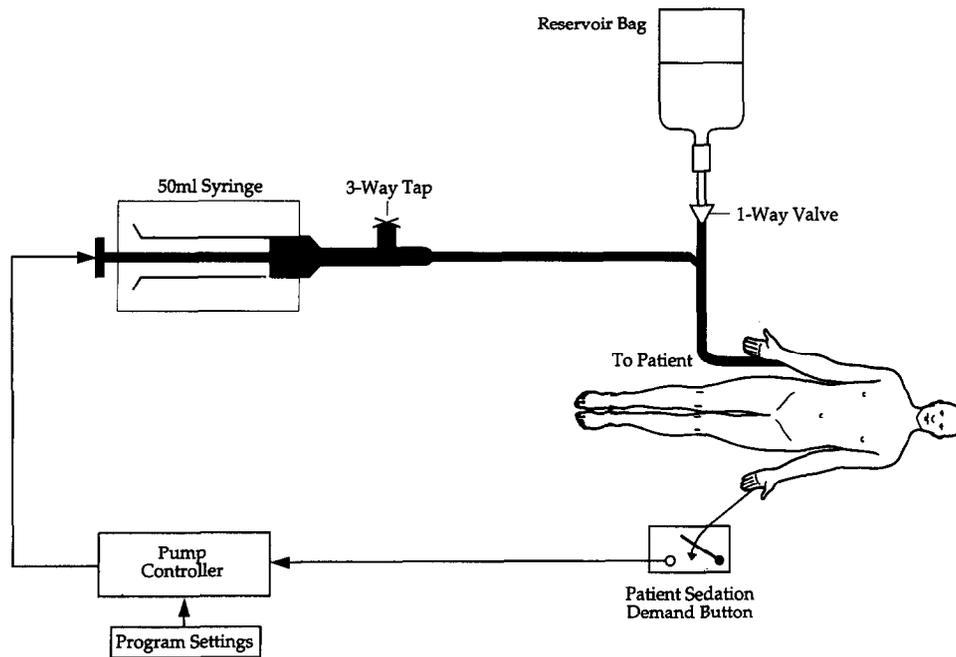
The safety and effectiveness of PCS will be influenced by the sedative drug used and the settings of the patient demand variables. Selection of appropriate settings for different sedative drugs should come from published data and individual clinical experience. One of the limiting factors for the widespread use of the PCS technique has been the availability of a commercial patient demand pump to provide fast bolus infusion rates, such that the bolus drug delivery can be achieved within a short period. Presently available commercial patient demand pumps can provide a maximum bolus infusion rate of only 200 ml h<sup>-1</sup> (Graseby 3300). However, this patient demand pump also has provision for an initial loading dose and a background infusion of drug simultaneously with patient demand bolus doses. This pump facility, allowing a combination of low dose background drug infusion and patient demand dose still offers the advantages of patient control. Further studies with the combination of background infusion and patient demand bolus dose will determine the settings for safe sedation anaesthesia.

The question remains whether sedated patients can competently decide on their need for further sedation or can remember how to trigger their sedation doses. PCS experience with propofol shows that patients do remember how and why they have to press the button and from published data no patient has been oversedated<sup>13,14</sup>.

One of the main advantages of the PCS technique is the high patient satisfaction associated with its use<sup>4,11-14</sup>. When patients are offered the choice of sedation, 95% of patients accept the PCS technique and none have expressed regret after using it. The described effect of propofol on mood<sup>18</sup> may contribute to the increased patient satisfaction but other published studies suggest that patients like the PCS technique itself<sup>13</sup>.

### Recovery room

Studies with inpatients by Donovan and Dillon<sup>19</sup> have shown that patients actually receive less than 25% analgesic medication needed to control postoperative pain. Teske reported poor correlation between nurses' observations of their patients' pain and reports of pain



**Figure 2.** Patient-controlled sedation set-up.

**Table 2.** Suggested checklist for patient-controlled sedation

1. Patient
  - (a) Oxygen administered
  - (b) Monitoring equipment attached
  - (c) Intravenous cannula in situ
2. Before starting PCS the anaesthetist should confirm that:
  - (a) Drug infusion lines are primed and purged of air
  - (b) The infusion lines are purged with drug and the pump itself is primed in order to provide an initial efficacious drug dose
  - (c) Drug infusion lines are connected to the reservoir bag
  - (d) Clips and clamps have been removed from infusion lines
  - (e) Infusion device settings are correct – bolus dose, lockout interval, bolus dose infusion rate and background infusion (optional)
3. Frequently, the anaesthetist should confirm that:
  - (a) Drug infusion lines are connected to the reservoir bag
  - (b) Free flow from the reservoir bag
  - (c) Pump alarms are not active
4. Periodically the anaesthetist should confirm that the supply of drug remaining in the syringe is adequate and the amount of drug infused correlates with the printout of the summated drug delivered.

experienced by the patients themselves<sup>20</sup>. These misconceptions about pain indicate a need to give patients more analgesic control. This is particularly relevant in the day surgery setting where the adequacy of postoperative pain control is one of the determining factors for discharge from the day facility<sup>21</sup>.

Informed patients will very often suggest which analgesic drug suits them best from previous experiences. However, with continued advancements in drug preparations and delivery, we are in a position to provide patients with more choices of analgesic preparations and delivery systems. Commonly used alternatives in day surgery include oral, intramuscular and intravenous routes. Giving patients choice with oral analgesia and encouraging them to decide when next to take their medication, increases the patients' sense of control. How-

ever, the greatest improvements in day surgery postoperative analgesic administration is with patient alternatives in drug delivery systems. EMLA cream (eutectic mixture of local anaesthetics) application has a place in the day surgery setting, as it is a safe and effective topical anaesthetic. Further use of this agent may be extended for postoperative split skin harvesting, insertion of grommets in middle ear surgery and skin lesion excision analgesia<sup>22</sup>. Studies by Karl<sup>23</sup> and Striebel<sup>24</sup> have shown the intranasal route to be an alternative route of administration for midazolam and fentanyl. This may become an important alternative if an appropriate patient demand administration system can be developed.

Intravenous opioids for moderate to severe pain are often used in day surgery. Administration can be either nurse controlled or by patient request, or a combination

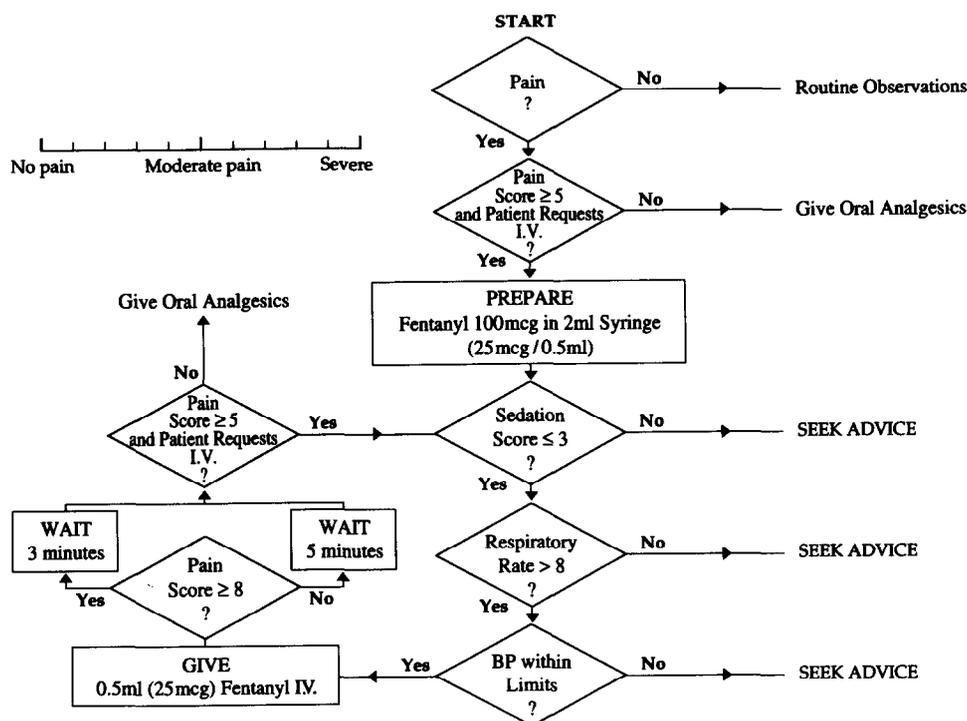


Figure 3. Fentanyl pain protocol.

of both. It is not necessary in this instance to use sophisticated pumps for the patient to have control. A practical method of increasing patient control is to have the patient participate in his own management of intravenous narcotic by means of a fentanyl pain protocol (Figure 3). The use of a visual analogue pain score and patient request allows a degree of patient control over his/her intravenous narcotic, provided there is good communication with the nurse. Extensive experience in the inpatient area using PCA pumps delivering postoperative analgesia has met with great success and patient acceptance. However, there has been no published work with patient demand pumps in day surgery recovery. More work is necessary on the relative outcomes of patient control analgesia with pumps in the day surgery recovery room.

As patients have a continued recovery period at home, it is most important that they feel comfortable with their 'take home' analgesia. As the limits of day surgery continually expand, home options for drugs and delivery systems will need to be more clearly defined, as will home care nursing. Patient demand pumps have been used for day patients in the home setting where small devices have facilitated their use<sup>25</sup>. However, consideration must be given to cost involvement and education for health professionals, patients and their families. The safety aspects of patient demand pumps including the requirement for monitoring is also important. Published data has shown that for cancer patients, there have been lifestyle improvements where patient demand pumps are used in the home setting. However monitoring is necessary, as there have been reports of respiratory depression<sup>26</sup>.

### Conclusion

We are in an exciting era of day surgery, providing care for more patients, less fit patients and more complex procedures. We have an obligation to inform patients preoperatively and to discuss risk management. Choice options are an integral part of this process. Given the unique environment that day surgery offers we have the opportunity to provide improved patient care by giving patients more control over sedation anaesthetic techniques and recovery room analgesia.

PCS provided by the anaesthetist is now a practical alternative for sedation anaesthesia with increased use of short acting drugs such as propofol. For the future if a patient control facility is available on a reliable anaesthetic infusion pump, this sedation technique could be adopted as an integral part of anaesthesia, offering improved patient satisfaction and versatility in anaesthetic practice.

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