Assessment and management of patients with post-operative pain


Summary
Effective pain management is essential in the post-operative period to ensure that patients do not experience unnecessary distress or suffering and to minimise potential complications. Post-operative pain management strategies should focus on combining pharmacological management and comfort measures to ensure maximum pain relief for each patient.

Introduction
Over the past 30 years, several studies have identified poor clinical practice in the assessment and management of post-operative pain (Schafheutle et al 2001, Manias et al 2005, Dihle et al 2006, Schoenwald and Clark 2006). Although the number of patients who complain about levels of post-operative pain remains low (Carr et al 2005, Schoenwald and Clark 2006), this failing is an issue of concern. The Royal College of Surgeons of England and College of Anaesthetists (1990) published a working document highlighting the failure to effectively assess and manage pain, stating that: ‘The treatment of pain after surgery in British hospitals has been inadequate and has not advanced significantly for many years.’ Subsequently a number of changes to practice were initiated including the establishment of clinical nurse specialists as part of multidisciplinary pain teams, the introduction of standardised pain assessment tools and the increasingly routine use of high technology-based pain management techniques, most commonly patient controlled analgesia (PCA) pumps and epidural infusions. However, in spite of these measures post-operative pain assessment and management continue to be less than ideal (Schafheutle et al 2001).

Aims and intended learning outcomes
The aim of this article is to assist healthcare professionals in the effective assessment and management of pain, following surgical procedures. Reading this article will enable healthcare professionals to review current best practice in post-operative pain management, with a view to introducing practice changes which may lead to improvements in patient care.

After reading this article you should be able to:
- Describe different approaches to pain assessment and the relative advantages and disadvantages.
- Identify different pharmacological methods of managing pain.
- Address the importance of basic comfort measures and effective communication with patients.

Keywords
Assessment tools; Pain management; Pharmacological management; Post-operative pain

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Pain

Pain has long been recognised as a highly personal and subjective phenomenon unique to the individual. The most commonly recognised definition of pain is that of the International Association for the Study of Pain (1979): 'an unpleasant sensory and emotional experience associated with actual or potential damage or described in terms of such damage'. Many factors are known to affect the experience of pain, including gender, age, culture, previous experiences, the meaning the pain has to the individual experiencing it, tempered with a range of psychological factors, the most predominant of which is individual coping skills (Wakefield 1995, Clarke et al 1996, Briggs 2003, Hall-Lord and Larsson 2006, Shaw 2006).

This complex combination of factors means that it is impossible to either pre-judge or identify benchmarks for the likely amount of pain any individual will experience following any surgical procedure. This, when linked to the lack of correlation between tissue damage and physical pain, means that every experience of pain for each person can only be assessed and managed effectively at an individual level (Middleton 2004, Soman et al 2005).

Time out 1

What does pain mean to you? Reflect on your personal experiences of pain and ask yourself the following questions:
- Could you talk about the experience easily?
- If so who could you talk about it to?
- What words did you use to describe the pain?
- How did the pain make you feel?
- How did you get help to relieve the pain?
- Looking back what does the experience mean to you now?

To attempt to simplify the pain experience for scientific and medical purposes, pain has been classified into different types, most commonly acute and chronic pain (McCaffery and Pasero 1999). The key differences between chronic and acute pain reflect the likely duration of pain and its consequent effects. Acute pain usually lasts for a short period of time (less than three to six months), and as a consequence has fewer longer term effects. Chronic pain tends to extend beyond the three to six month period of acute pain, or beyond the normal course of healing, and can have drastic effects, including long-term absence from work, unemployment, consequent loss of income and reduction in social contacts (Shaw 2006). Post-operative pain is associated with the characteristics of acute pain as identified in Box 1.

Assessment of post-operative pain

Inadequate assessment and management of post-operative pain can have profound effects on the patient, causing raised levels of anxiety, sleep disturbances and mobilisation difficulties, restlessness, irritability, aggression, and perhaps most importantly, unnecessary levels of distress and suffering (Sjostrom et al 2000, Macintyre and Ready 2002, Carr et al 2005). Poorly assessed and managed post-operative pain can also have physiological effects on patients, which may lead to complications and delayed discharge, including increases in heart rate and blood pressure, delayed gastric emptying resulting in nausea, vomiting and paralytic ileus, and changes in the endocrine system as a result of increased adrenaline production. Failure to cough and deep breath as a result of poorly controlled pain can result in the development of chest infections, delay in mobilisation and additional problems, such as deep vein thrombosis, and pulmonary embolus (Sjostrom et al 2000, Macintyre and Ready 2002).

Accurate assessment of post-operative pain is essential to ensure that pain is managed effectively. Without assessment it is impossible to identify the nature of pain, the individual characteristics of pain or to gauge the effectiveness of pain management interventions (Sjostrom et al 2000, Schafheutle et al 2004, Heikkinen et al 2005, Mackintosh 2005, Soman et al 2005).

Characteristics of acute pain
- Normally associated with tissue damage, for example, surgery or trauma.
- The cause of pain is easily recognised.
- Pain can be readily treated.
- The duration of pain can be anticipated.
Effective communication is fundamental in the accurate assessment of pain. Healthcare professionals should take time to speak and listen to patients, to respond to them as individuals and to make due consideration for any limitations in communication, which individuals may have, for example, deafness or other language barriers (Gray 2005, Mackintosh 2005). It is all too common for patients not to report pain or wait until it has reached a severe level because they believe that healthcare staff are 'too busy', have more important or seriously ill patients to look after, or because they do not want to cause trouble (Gray 2005, Mackintosh 2005).

Effective pain assessment should identify if the patient has any other conditions that may also be responsible for causing pain. For example, some patients may have underlying conditions such as joint replacements or rheumatoid arthritis, resulting in either chronic or acute pain in addition to that caused by the surgical procedure. If a patient has multiple causes of pain then each of these causes should be assessed and where necessary managed separately. McCaffery and Pasero (1999) identified eight important factors when assessing pain (Box 2). All eight factors should be considered when assessing the individual's experience of pain, and it is good practice to document these in detail to ensure effective communication between the patient and all members of the healthcare team.

### Box 2

**Key pain assessment factors**

- Location.
- Intensity.
- Quality, for example, throbbing, stabbing or shooting pain.
- Onset, duration and variability of pain.
- Words used by the patient to describe pain.
- The patient's preferred method of relieving pain, if known.
- Factors that increase or decrease pain.
- The effect of pain on the patient.

(McCaffery and Pasero 1999)

However, uni-dimensional pain assessment tools should be used with caution as they only focus on one or two aspects of the total pain experience.

Uni-dimensional pain assessment tools may also be subject to misinterpretation. Some patients have difficulty conceptualising their pain as a point on a line, or equating a numerical value to pain intensity. Interpretation difficulties are also present when using the verbal rating scale, for example, what constitutes 'moderate pain'? Also, the use of particular terms may not be understood by patients or have little relevance to individual descriptions of pain (Heikkinen et al 2005, Mackintosh 2005). There is little evidence to support consistency between ratings when reporting levels of pain, for example, a patient may report pain as seven on a numerical rating scale (NRS) and request analgesia. When reviewing the effectiveness of the analgesia the patient may then report that his or her pain has improved, but the pain level may remain at seven on the NRS (Mackintosh 2005).

There is also no evidence of consistency between individuals in rating their level of pain, for example, a rating of seven by one patient may be completely different to a rating of seven by another patient, and may also be interpreted differently by healthcare professionals (Manias et al 2002, Sloman et al 2005). It is important to note that however limited the commonly used uni-dimensional pain tools appear to be, some form of pain assessment is better than no assessment. Provided that all staff using these tools are aware of their limitations and make efforts to supplement pain assessment tools through additional individualised enquiry and observation, for example, using the factors recommended by McCaffery and Pasero (1999), then they can use this as a starting point for a more indepth pain assessment.

When assessing post-operative pain it is also essential to recognise the likely difference between assessing pain at rest and on movement, even limited movement such as deep breathing or

### Time out 3

Reflect on an occasion when you cared for a patient experiencing pain. List the factors that could have affected that patient's experience, then identify how many of these factors were mentioned in the pain assessment tool used in your clinical area and in your documentation of the pain. Consider how you could make your assessment and documentation more comprehensive.

**Pain assessment tools** A range of standardised pain assessment tools are also available and can be used as a framework for assessment. These fall into two main categories: multi-dimensional and uni-dimensional. When assessing post-operative pain, it is rare to find multi-dimensional tools used in clinical practice; this is because these tend to be complex and time consuming, for example, the McGill Pain Questionnaire (Coll et al 2004, Mackintosh 2005). The most commonly used tools are uni-dimensional, focusing specifically on one or two aspects of pain, most frequently the intensity of pain and occasionally the location of pain through the use of a body diagram, which enables the patient to mark where the pain is on an outline body diagram (Coll et al 2004).
coughing. Although pain may be reported as minimal at rest, pain on movement must also be addressed to promote effective post-operative recovery (Mackintosh 2005). Examples of some commonly used uni-dimensional postoperative pain assessment tools are shown in Figure 1.

**Time out 4**

A patient is prescribed an opioid drug for post-operative pain relief but is reluctant to use it because of fears of addiction. How would you reassure the patient, and what information could you provide to encourage him or her to reconsider?

**Management of post-operative pain**

There are two main approaches that can be used when managing post-operative pain; the use of pharmacological interventions and comfort measures. These approaches work best when used together, although there is a tendency in clinical practice to minimise the importance of comfort measures and emphasise the importance of pharmacological and technological interventions.

**FIGURE 1**

Commonly used post-operative uni-dimensional pain assessment tools

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(Mackintosh 2005)

**Pharmacological management**

The principles of pharmacological management of post-operative pain focus on the use of the World Health Organization (WHO) (1996) analgesic ladder (Figure 2), originally designed for use in managing pain in palliative care.

When used for managing acute post-operative pain, rather than starting at the bottom of the analgesic ladder (as in palliative care), it can be used from the top down, starting with strong opioid-based analgesic drugs such as morphine, working down to mild non-opioid analgesics such as aspirin and paracetamol. Morphine is the most commonly prescribed opioid for the relief of severe post-operative pain. It is a safe and effective drug and has minimal side effects, most commonly constipation caused by decreased bowel motility, nausea, vomiting, sedation, pruritus, urinary retention, and in rare cases respiratory depression. It is important to recognise that side effects do not affect all patients and where present can be controlled with the use of anti-emetics and/or laxatives. Morphine is well tolerated by patients, and its analgesic benefits outweigh the inconvenience of its side effects (McCaffery and Pasero 1999, Weetman and Allison 2006).

Morphine is available in a wide range of preparations – oral, subcutaneous, intramuscular, intravenous, and transdermal, as well as slow release preparations, which make it ideal for use in a variety of patients. For post-operative pain management morphine is most commonly used intravenously via a PCA pump, as part of an epidural infusion regimen, or less frequently by the intermittent intramuscular route. It is also increasingly being used by the oral route, provided that the patient is not nil by mouth. There are a number of misconceptions concerning the use of opioid analgesics among the public and healthcare professionals. The most persistent of these concern the threat of addiction. Numerous studies have now indicated that this risk is minimal (Gray 2005), and should not inhibit the use of opioid analgesics, although appropriate patient information may need to be provided first.

Compound analgesics or weak opioids can also be used in the management of post-operative pain. Commonly available drugs include codeine phosphate and dihydrocodeine. These are not commonly used following major surgical procedures, but are increasingly used following day-case or short-stay surgery. They can also be used as a stepping down point for patients moving slowly down the analgesic ladder (WHO 1996). Compound analgesics have a similar side effect profile to morphine, but most drugs are well tolerated by patients and side effects can be readily managed.

The third stage of the WHO (1996) ladder concerns the use of non-opioid drugs, most
commonly aspirin and paracetamol. Although these drugs are at the bottom of the ladder, recent studies have indicated that paracetamol is a highly effective analgesic, in some cases more effective than some compound preparations, and also possesses opioid-sparing capacities (Buvanendran and Kroin 2007, Pyati and Gan 2007, Remy et al 2007). This means that if a patient is prescribed regular doses of paracetamol as well as an opioid, he or she is likely to use less of the opioid drug than a patient who is only given the opioid drug without regular paracetamol. Hence it is now considered good practice to routinely prescribe regular paracetamol, alongside stronger opioid analgesics for effective post-operative pain relief (Buvanendran and Kroin 2007, Pyati and Gan 2007, Remy et al 2007).

At all stages of the WHO (1996) analgesic ladder it is also possible to add some form of adjuvant analgesia such as non-steroidal anti-inflammatory drugs (NSAIDs). NSAIDs provide analgesia as a side effect of their anti-inflammatory properties, helping to reduce the inflammatory response at the site of trauma or surgery. Where patients report minimal levels of pain, they may be effective when used in isolation, but are generally considered most effective for pain relief when prescribed regularly in combination with an analgesic preparation. However, not all patients will be able to tolerate drugs from this group, for example, patients with a history of gastric ulceration. A range of side effects have also been reported from this drug group although most usually occur following long-term use. Side effects may include upper gastrointestinal tract complications, nausea and vomiting, and renal impairment (National Institute for Clinical Excellence 2001).

The use of local anaesthetic agents or sodium channel blockers in the management of post-operative pain is also increasing. These are used in two ways, the first is by infiltration of the wound during the final stages of surgery, ensuring that the wound area will appear ‘frozen’ for some hours after surgery has finished. This technique is most commonly used in day case surgery or following invasive investigative procedures. It is important to be aware that, although the patient may report minimal pain immediately following surgery, the local anaesthetic effect will fade quickly once it starts to wear off and another form of analgesia should be provided before this occurs.

The second common use for local anaesthetics is as part of the solution used in an epidural infusion (Weetman and Allison 2006). Side effects from the use of local anaesthetic preparations are minimal. However, specific issues warrant careful and specific observations when these preparations are used as part of an epidural infusion, for example, hypotension, increased gut motility, motor block, urinary retention and possible toxic effects (Weetman and Allison 2006).

**Time out 5**
Find out if your hospital has any protocols or procedures for the use of patient controlled analgesia pumps or epidural infusions. Are these protocols evidence based? Are they clear? Is the information adequate to provide optimum care for patients in your clinical area? Discuss any questions you may have with the pain team.

**Patient controlled analgesia** The administration of post-operative drugs is becoming more technological, with the routine use of PCA pumps and the increased use of epidural infusions. PCA pumps usually use a solution of morphine, or morphine in combination with an anti-emetic drug, to deliver a small patient controlled intravenous (IV) dose. Because they are self-
administered by the patient it is possible for individuals to titrate the dose much more accurately to his or her pain level, thus overcoming many of the difficulties associated with the subjective and highly variable nature of pain (McCaffery and Pasero 1999). It has been shown that PCA pumps provide improved post-operative pain relief for the majority of patients (Chumblcy et al 1998, Chen et al 2001). However, it is important to remember that a significant minority of around 12% of patients find them difficult to use. This is a consequence of poor understanding, or lack of manual dexterity, and can lead to ineffective pain relief (Chen et al 2001). As a result, patients using PCA devices require routine pain assessment to ensure that the device is working well and that pain relief is effective.

**Epidural infusions** Epidural infusions are only suitable for certain types of surgery, usually involving the lower abdomen and legs. However, for suitable surgical procedures they provide effective analgesia with minimal systemic effects. An epidural has a specific cannula or catheter which is inserted into the epidural space, into which an infusion, usually an opioid analgesic and/or local anaesthetic drug, is infused slowly using an electronic pump. Occasionally the rate of the infusion can be patient controlled, but more routinely the infusion runs at a set rate prescribed by the physician, although this can be altered according to the patient’s need. Analgesia is provided by blocking the transmission of pain relief messages by the spinal nerves and the effectiveness of this can vary depending on the position of the catheter in the epidural space, the prescribed drug combination and rate of infusion prescribed. Patients with epidural infusions require careful monitoring, as although complications are not common, when they occur they can be serious.

The use of epidurals is limited to areas where there are sufficient numbers of suitably trained nursing staff available to provide the frequent monitoring required. Potential side effects are either as a consequence of the drugs being infused or as a result of the epidural and the equipment accompanying it (Weetman and Allison 2006) (Box 3).

**Comfort measures** Comfort measures are important when managing post-operative pain. Generally, a combination of pharmacological interventions and comfort measures will be most effective in relieving the patient’s pain. Comfort measures focus on different strategies, some physical and some psychological, which may provide relief to patients. Reassurance as a means of reducing anxiety is essential for all patients regardless of the nature of surgery. It is important to remember that, for most patients, undergoing surgery is not a routine occurrence and the level of explanation and assurance required may vary. This may also be linked to the need to educate patients about what to do if they have unacceptable levels of pain. Regardless of the method of analgesia

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**References**

comfortably positioned, that IV infusions or care while they are inpatients (Briggs 2003, also be appropriate to provide patients with cold and that wound dressings are adequate. It may drains are not rubbing or pulling at the patient Oliver and Ryan 2004).

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Physical comfort measures should focus on basic nursing care, ensuring that the patient is comfortably positioned, that IV infusions or drains are not rubbing or pulling at the patient and that wound dressings are adequate. It may also be appropriate to provide patients with cold or hot packs and elevate the patient's limbs. Patients with other underlying painful conditions may have alternative comfort-promoting strategies which they routinely use at home and it may be appropriate to incorporate these into their care while they are inpatients (Briggs 2003, Oliver and Ryan 2004).

Managing pain in the postoperative setting. Pain Management Nursing. 6, 1, 18-29.


Pyati S, Gan TJ (2007) Perioperative pain management. CNS Drugs. 21, 3, 185-211.


**BOX 3**

**Complications of epidural infusions**

**Drug related:**
- Hypotension
- Motor block
- Nausea and vomiting
- Respiratory depression
- Pruritus

**Epidural related:**
- Epidural haematoma
- Epidural abscess
- Puncture of the dura mater
- Catheter displacement
- Equipment risks

(Weetman and Allison 2006)

prescribed, patients should be informed that analgesia is available and can be provided on request. It is vital that the individual's pain is well controlled to prevent unnecessary suffering and to minimise possible post-operative complications (Briggs 2003, Oliver and Ryan 2004).

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**Time out 7**

After reading this article, reflect on your own clinical situation and then write a summary of all the key points which are essential to provide best practice for effective pain management. Once you have decided on your criteria for best practice, reflect on the nursing care in your clinical area, highlight any areas of concern, discuss these with colleagues and then consider what action you could take to improve it.

**Conclusion**

Effective pain management is essential in the post-operative period to ensure that patients do not experience unnecessary distress or suffering and to minimise potential complications and promote recovery. Post-operative pain management strategies should focus on pharmacological and comfort measures. Pharmacological management should be appropriate to the patient's needs, using the WHO analgesic ladder for guidance. Good nursing care at all levels is fundamental to provide effective post-operative pain relief and it is a key function of the nurse's role to ensure that unnecessary discomfort is minimised NS.

**Time out 8**

Now that you have completed the article you might like to write a practice profile. Guidelines to help you are on page 60.