

3. PROVISION OF SAFE AND EFFECTIVE ACUTE PAIN MANAGEMENT

The safe and effective management of acute pain requires the appropriate education of medical, nursing and allied health staff and patients, and attention to the organisational aspects involved in the delivery of pain relief. These include appropriate guidelines for drug prescription, monitoring of patients and recognition and treatment of any adverse effects of pain relief, and in some situations, the provision of an acute pain service (APS). It is recognised that the need for and complexity of these requirements will vary according to the setting in which acute pain relief is delivered (eg hospital, general practice).

Successful acute pain management also requires close liaison with all personnel involved in the care of the patient including anaesthetists, pain specialists, surgeons, physicians, palliative care clinicians, general practitioners, specialists in addiction medicine, nurses, physiotherapists and psychologists.

Equally, if not more importantly, patient participation (ie including the patient as part of the treating and decision-making team, taking into account their values, concerns and expectations) is required if each patient is to get the best treatment. Patients should be provided with accurate and up-to-date information, including risks and likely outcomes of treatment, and be partners in discussions relating to choice of care. They should also have access to other evidence-informed information that explains current treatment recommendations as well as have access to treatment consistent with those recommendations (Duckett, 2009).

3.1 EDUCATION

3.1.1 Patients

Patients and their carers who learn about assessment of pain as well as risks and side effects of treatment, and who are made aware that they should communicate both effectiveness (or otherwise) and the onset of any side effects, will have some control over the delivery and success of their pain relief, regardless of the technique used. There should also be information on treatment options, goals, and likely benefits and probability of success (Macintyre & Schug, 2007; Counsell et al, 2008).

Patient or carer education may take a number of forms — the most common methods are the use of booklets or short videos and specialist one-on-one education. A review of the evidence for any benefit from preoperative education or the best educational technique concluded that it is varied and inconsistent (Oshodi, 2007).

Patients may find that preoperative education is helpful (Shuldhham, 1999) and it may increase patient or carer knowledge about pain and positive attitudes towards pain relief (Chambers et al, 1997 **Level II**; Greenberg et al, 1999 **Level II**; Watkins, 2001 **Level II**; Cheung et al, 2007 **Level II**). Patient knowledge about pain relief was lower in those given verbal (non-standardised) information at the time of seeing the anaesthetist prior to surgery compared with those given written information before they attended the interview; more patients in the latter group felt that the information was thorough and understandable and helped in discussion about postoperative pain management options (Binhas et al, 2008 **Level III-2**).

Others have suggested that in general, structured preoperative patient education may improve patient outcome including pain relief (Devine, 1992 **Level III-2**; Guruge & Sidani, 2002 **Level III-2**; Giraudet-Le Quintrec et al, 2003 **Level II**). Compared with routine and also structured patient information, education using a video about patient-controlled analgesia (PCA) improved both patient knowledge and pain relief (Chen et al, 2005 **Level III-2**).

Some studies have shown no effect of education on postoperative pain or analgesic requirements (Griffin et al, 1998 **Level II**; Greenberg et al, 1999 **Level II**), including PCA (Chumbley et al, 2004 **Level III-1**), although there may be an increase in patient satisfaction (Knoerl et al, 1999 **Level III-1**; Watkins, 2001 **Level II**; Sjolting et al, 2003 **Level III-2**) and less preoperative anxiety (Sjolting et al, 2003 **Level III-2**).

In studies looking at specific types of surgery, there was no evidence that preoperative patient education has any effect on postoperative pain after:

- hip or knee replacement (McDonald et al, 2004 **Level I**);
- cardiac surgery in adults (Shulldham et al, 2002 **Level II**; Watt-Watson et al, 2004 **Level II**) or children (Huth et al, 2003 **Level II**);
- gynaecological surgery (Lam et al, 2001 **Level II**);
- laparoscopic cholecystectomy (Blay & Donoghue, 2005 **Level II**);
- gastric banding (Horchner & Tuinebreijer, 1999 **Level III-1**); or
- spinal fusion in children and adolescents (Kotzer et al, 1998 **Level III-3**).

A systematic review of studies, looking at the benefits or otherwise of preoperative education for orthopaedic patients, highlighted the difficulties of comparing studies of variable methodological quality; while some individual studies may show benefits of preoperative education, the lack of a consistent pattern with regard to effect was confirmed (Johansson et al, 2005 **Level III-2**).

The effect of patient education has also been studied in patients with non-surgical pain. Antenatal teaching about postnatal nipple pain and trauma resulted in reduced nipple pain and improved breastfeeding (Duffy et al, 1997 **Level II**). After an acute whiplash injury, fewer patients shown an educational video in addition to 'usual care' had persistent pain at 3 and 6 months; opioid use and use of health care resources was also lower (Oliveira et al, 2006 **Level II**). Education and counseling regarding pain management, physical activity, and exercise reduced the number of days off work in patients with acute low back pain (Godges et al, 2008 **Level III-1**). In a study of patients with pain presenting to an emergency department, those shown educational videos or printed brochures had greater decreases in self-reported pain than those given no education (Marco et al, 2006 **Level III-1**). Compared with verbal advice, provision of an information sheet to patients with acute chest pain reduced anxiety and depression and improved mental health and perception of general health, but did not alter patient satisfaction with health care or other outcomes such as lifestyle changes or presentation with further chest pain (Arnold et al, 2009 **Level II**).

3.1.2 Staff

Appropriate education of medical and nursing staff is essential if more sophisticated forms of analgesia (eg PCA or epidural analgesia) are to be managed safely and effectively, and if better results are to be gained from conventional methods of pain relief (Macintyre & Schug, 2007). Medical and nursing staff education may take a number of forms — the evidence for any benefit or the best educational technique is varied and inconsistent. Education may also include the provision of guidelines.

Improvements in nursing knowledge and ability to manage epidural analgesia followed the reintroduction of an epidural education program using an audit/ guideline/ problem-based teaching approach, accompanied by practical assessments (Richardson, 2001 **Level III-3**). Pain documentation in surgical wards (Ravaud et al, 2004 **Level III-1**; Karlsten et al, 2005 **Level III-2**) and intensive care units (Arbour, 2003 **Level IV**; Erdek & Pronovost, 2004 **Level III-3**) was also improved by education programs. Implementation of a quality improvement program led to improvements in nurses' knowledge and assessment of pain using pain rating scales; however while the number of patients assessed increased, there was no improvement in pain relief (Hansson et al, 2006 **Level III-2**).

Improvements in postoperative pain relief, assessment of pain, and prescribing practices, can result from staff education as well as the introduction of medical and nursing guidelines (Gould et al, 1992 **Level III-2**; Harmer & Davies, 1998 **Level III-3**). In emergency departments, education of junior medical staff improved patient pain relief (Jones, 1999 **Level III-3**) and implementation of an education program and guidelines for pain management improved analgesia and patient satisfaction (Decosterd et al, 2007 **Level III-2**). Personalised feedback forms given to anaesthetists have been shown to increase the use of PCA, non-steroidal anti-inflammatory drugs (NSAIDs), epidural morphine and nerve blocks (Rose et al, 1997 **Level III-3**).

A number of studies have shown the benefits of education and/or guidelines on improved prescribing patterns both in general terms (Humphries et al, 1997 **Level III-3**; Ury et al, 2002 **Level III-3**) and specifically for NSAIDs (May et al, 1999 **Level III-3**; Figueiras et al, 2001 **Level I**; Ray et al, 2001 **Level II**), paracetamol (acetaminophen) (Ripouteau et al, 2000 **Level III-3**) and pethidine (meperidine) (Gordon et al, 2000 **Level III-3**). Use of an electronic decision-support system significantly improved adherence to guidelines for the prescription of postoperative nausea and vomiting (PONV) prophylaxis for patients at high risk of PONV (Kooij et al, 2008 **Level III-3**).

However, education programs may not always be successful in improving nursing staff knowledge or attitudes (Dahlman et al, 1999 **Level III-3**) or pain relief (Knoblauch & Wilson, 1999 **Level IV**). In rural and remote settings, distance and professional isolation could impact on the ability of health care staff to receive up-to-date education about pain relief. However, similarities between urban and rural nurses' knowledge and knowledge deficits relating to acute pain management have been reported (Kubecka et al, 1996) and a tailored education program in a rural hospital improved the management of acute pain (Jones, 1999 **Level III-3**). An education program delivered to nurses in rural and remote locations and focusing on acute pain, chronic pain and cancer pain, improved understanding of pain management (Linkewich et al, 2007 **Level III-2**).

While the focus of most research has been on the impact of education on efficacy of pain treatments, there remains much work to be done on establishing the role of education in patient monitoring and safety.

3.2 ORGANISATIONAL REQUIREMENTS

It is recognised that patients should be able to access best practice care, including appropriate assessment of their pain and effective pain management strategies (ANZCA & FPM, 2008). However, effective acute pain management will, to a large extent, depend not on the drugs and techniques available but on the systems involved in their delivery (Macintyre & Schug, 2007). Even simple methods of pain relief can be more effective if proper attention is given to education (see Section 3.1), analgesic drug orders, documentation, monitoring of patients and the provision of appropriate policies, protocols and guidelines (Gould et al, 1992 **Level III-3**). In some institutions, the APS will assume responsibility for managing more advanced methods of pain relief such as PCA and epidural analgesia.

3.2.1 General requirements

Guidelines that aim to enhance patient outcomes and standardise analgesic techniques (eg drug and drug concentrations, dose, dose intervals), monitoring requirements, equipment used, and responses to inadequate or excessive analgesic doses and other complications, may lead to consistency of practice and potentially improved patient safety and analgesic efficacy, regardless of technique used (Macintyre & Schug, 2007; Counsell et al, 2008; Macintyre & Scott, 2009).

Marked improvements in conventional methods of pain relief have followed the introduction of guidelines for intramuscular (IM) opioid administration (Gould et al, 1992 **Level III-3**; Humphries et al, 1997 **Level III-3**). However, implementation of guidelines and not their development remains the greatest obstacle to their use. Compliance with available guidelines is highly variable and may be better in larger institutions (Carr et al, 1998 **Level IV**). Resource availability, particularly staff with pain management expertise, and the existence of formal quality assurance programs to monitor pain management are positive predictors of compliance with guidelines (Jiang et al, 2001 **Level IV**).

Professional bodies in a number of countries have issued guidelines for the management of acute pain (Carr et al, 1992; ANZCA & FPM, 2003; ASA, 2004; RCA et al, 2004; ANZCA & FPM, 2007).

3.2.2 Acute pain services

Many institutions would now say that they have an APS. However, there is a very wide diversity of APS structures, no consensus as to the best model, and no agreed definition of what might constitute such a service (Counsell et al, 2008). Some are 'low-cost' nurse-based (Shapiro et al, 2004; Rawal, 2005), others are anaesthetist-led but rely primarily on APS nurses as there may not be daily clinical participation by an anaesthetist (Harmer, 2001; Nagi, 2004), and some are comprehensive and multidisciplinary services with APS nursing staff, sometimes pharmacists or other staff, and daily clinical input from, and 24-hour cover by, anaesthetists (Ready et al, 1988; Macintyre et al, 1990; Schug & Haridas, 1993).

The degree of medical input varies enormously. In training hospitals in Australia, 91% of hospitals accredited for anaesthetic training had an APS run from the department of anaesthesia with daily input from medical staff, although consultant anaesthetist sessions (one session is a half day) varied from zero in 27%, just one or two a week in a further 22%, four to six per week in 22% and ten per week in 15% (Roberts, 2008). A survey in the United Kingdom reported that while 90% of hospitals reported having an APS, dedicated medical staff sessions did not exist in 37%, were limited to one or two per week in 40% and in only 4% were there five or more sessions (Nagi, 2004).

Some APSs supervise primarily 'high-tech' forms of pain relief while others have input into all forms of acute pain management in an institution and will work towards optimising traditional methods of pain relief so that all patients in that institution benefit (Macintyre & Schug, 2007; Breivik, 2002; Counsell et al, 2008). Increasingly, APSs are also called on to deal with much more complex pain management issues (eg acute-on-chronic pain, acute pain after spinal cord injury and other major trauma, and acute pain resulting from a multitude of medical illnesses) and much more complex patients (eg opioid-tolerant patients, older patients) (Counsell et al, 2008).

Given the enormous heterogeneity of APS models and types of patients and pain treated, as well as variation in the quality of published studies, it is not surprising that it is difficult to come up with a meaningful analysis of the benefits or otherwise of an APS. Individual publications have reported that the presence of an APS reduced pain scores (Gould et al, 1992 **Level III-3**; Harmer & Davies, 1998 **Level III-3**; Miaskowski et al, 1999 **Level IV**; Sartain & Barry, 1999 **Level III-3**;

Salomaki et al, 2000 **Level III-3**; Bardiau et al, 2003 **Level III-3**; Stadler et al, 2004 **Level III-3**) and side effects (Schug & Torrie, 1993 **Level IV**; Stacey et al, 1997 **Level III-3**; Miaskowski et al, 1999 **Level IV**; Sartain & Barry, 1999 **Level III-3**).

A review of publications (primarily audits) looking at the effectiveness of APSs (77% were physician-based, 23% nurse-based) concluded that the implementation of an APS is associated with a significant improvement in postoperative pain and a possible reduction in PONV, but that it was not possible to determine which model was superior (Werner et al, 2002 **Level IV**). The authors comment, however, that it is not possible to assess the contribution of factors such as an increased awareness of the importance of postoperative analgesia, the use of more effective analgesic regimens (eg epidural analgesia), the effects of APS visits and better strategies for antiemetic therapy.

Possible benefits of an APS are summarised in Table 3.1.

Although systematic reviews have been attempted (McDonnell et al, 2003; NICS, 2002), the poor quality of the studies looking at the effectiveness or otherwise of APSs, and the many different types of APSs, means that a proper meta-analysis cannot be performed.

In addition, the above studies looked at outcome in terms of immediate pain and side effects in postoperative patients only. It is possible that an APS may benefit patients in other ways.

Combination of an APS with a physician-based critical care outreach team, which systematically reviewed high-risk postoperative patients for 3 days after their return to a general ward, showed a significant improvement in postoperative outcome; the incidence of serious adverse events decreased from 23 events per 100 patients to 16 events per 100 patients, and the 30-day mortality fell from 9% to 3% (Story et al, 2006 **Level III-2**). Finally, members of an APS may also be more likely to recognise the early onset of neuropathic pain associated with surgery, trauma or medical disease, and institute the appropriate treatment (Counsell et al, 2008).

Table 3.1 Possible benefits of an Acute Pain Service

Benefit	References
Better pain relief	Gould et al, 1992; Harmer & Davies, 1998; Miaskowski et al, 1999; Sartain & Barry, 1999; Salomaki et al, 2000; Werner et al, 2002; Bardiau et al, 2003; Stadler et al, 2004
Lower incidence of side effects	Schug & Torrie, 1993; Stacey et al, 1997; Miaskowski et al, 1999; Sartain & Barry, 1999; Werner et al, 2002
Lower postoperative morbidity/ mortality	Story et al, 2006
Management of analgesic techniques that may reduce the incidence of persistent pain after surgery	Obata et al, 1999; Senturk et al, 2002; Gehling & Tryba, 2003

Key messages

1. Preoperative education improves patient or carer knowledge of pain and encourages a more positive attitude towards pain relief **(U) (Level II)**.
2. Video education of patients with a whiplash injury reduces the incidence of persistent pain **(N) (Level II)**.
3. Written information given to patients prior to seeing an anaesthetist is better than verbal information given at the time of the interview **(N) (Level III-2)**.
4. While evidence for the benefit of patient education in terms of better pain relief is inconsistent, structured preoperative education may be better than routine information, and information presented in video format may be better still **(N) (Level III-2)**.
5. Implementation of an acute pain service may improve pain relief and reduce the incidence of side effects **(U) (Level III-3)**.
6. Staff education and the use of guidelines improve pain assessment, pain relief and prescribing practices **(U) (Level III-3)**.
7. Even 'simple' techniques of pain relief can be more effective if attention is given to education, documentation, patient assessment and provision of appropriate guidelines and policies **(U) (Level III-3)**.

The following tick boxes represent conclusions based on clinical experience and expert opinion.

- Successful management of acute pain requires close liaison with all personnel involved in the care of the patient **(U)**.
- More effective acute pain management will result from appropriate education and organisational structures for the delivery of pain relief rather than the analgesic techniques themselves **(U)**.

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