Acute Pain Management:
IV Patient Controlled Analgesia Places the Patient in Control

By Lynne Maxwell, R.N., M.S.N.

Health care professionals have long been concerned about assessing and treating acute pain. Nonetheless, between one-half and three quarters of post-operative patients experience inadequate pain relief following surgery.[4, 9, 15] Scholars, practitioners and researchers specializing in acute pain encourage health care professionals to examine current practises in the light of new knowledge so that ineffective approaches to acute pain management can be identified and corrected.

Acute pain is pain that results directly from noxious stimulation, that is, tissue damage from mechanical disruption, inflammation, and stretching.[5] Potential causes of acute postoperative pain include: surgical incisions with the thoracic, renal, and upper abdominal incisions reported to be the most painful; visceral distention, as with bowel surgery; visceral stimulation, as with surgical procedures of the bladder and uterus; and the presence of catheters and tubes such as urinary catheters and endotracheal tubes. Further, post-operative pain can exacerbate preexisting pain, such as back pain, and may act as a precursor of chronic pain syndrome.[12] Uncontrolled acute pain can lead to complications that increase morbidity and mortality.[1, 4, 12, 14] Acute pain is commonly managed with analgesic drugs and pain ordinarily subsides as the impairment comes under control.[5]

Despite recent pharmacologic advances, traditional approaches to pain management are ineffective in controlling post-operative pain for many adults and children.[4] Health care professionals have documented personal experiences with pain to emphasize the problem of acute pain management. Donald (1976), a Scottish professor of obstetrics and one who recalls his experience of open heart surgery, wrote that his post-operative pain 'defied description'. Another physician/author wrote that his postoperative pain management was 'a cool and callous disgrace'.[9]

Why is this so? The inadequacies of current acute pain management regimens essentially arise from underdosing, delays in administering analgesics and the resultant ineffective serum concentration of these analgesics. Traditional pain management practices, lack of knowledge of the physiology and treatment of pain and myths and biases about pain set the stage for ineffective practice.

Loeser, a physician philosopher, explains the origins of misconceptions about pain by examining the history of medical thought and behaviour. Loeser argues that physicians have been slow to tackle the problem of pain for several reasons:

1. Pain management is not a popular area of concern for physicians since modern physicians are more interested in specialization and technology rather than non-technological problems such as pain.
2. The modern medical model is based on the Cartesian concept of the mind-body dichotomy, however, pain is difficult to explain using this model and is better explained using learning or behavioral models.[6]

Since nursing is traditionally aligned with medicine in its perspective on pain management, nurses can learn from Loeser's musings. McCaffrey, a nurse, agrees with Loeser noting that the science of pain is new. McCaffrey points out that the busy, practising nurse often lacks the skill and knowledge to assess and help the patient in pain.[8]

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Nurses and other health care professionals commonly hold and act upon myths and biases about pain that interfere with the assessment and treatment of acute pain. Some myths and biases commonly held follow with the accompanying corrections.[6, 13]

Myth	Correction
1. Health professionals are the only authorities on pain.	1. Only the patient is the authority on his/her own pain.
2. Patients who use narcotics regularly are likely to become addicted.	2. When narcotics are used to relieve pain there is almost no risk of addiction.
3. Clock watching is an early sign of addiction.	3. Clock watching is a sign of underdosing or incorrect drug choice.
4. Patients should develop a high pain tolerance.	4. Pain tolerance is a unique individual response.

In addition to myths and biases about pain, traditional practices are generally inadequate to treat acute pain. Intramuscular opioids given either 'prn' or as scheduled is the standard for analgesic therapy in acute pain management. With this approach, dosing is based on traditional set patterns (e.g. 75-100 mgs of Demerol q4h PRN) without due concern for patient variability or the patient's subjective experience of pain leading to a tendency by health care professionals to provide inadequate amounts of analgesic medication. The 'prn' order can result in a substantial delay between the time the patient first feels the pain and when the drug is actually absorbed.[12] Further, the administration of intermittent, intramuscular narcotics results in peaks of pain and valleys of sedation as the blood levels of the drug fluctuate in response to the serum concentration of the analgesic drug. Ideally, the patient should be kept in an area of analgesia that is achieved by giving small, frequent, intravenous doses of analgesic. This option is not practical given current staffing and economic realities. However, by employing new techniques such as intravenous patient-controlled analgesia, an effective serum concentration of the analgesic drug can be maintained. [8, 9, 12]

IV patient-controlled analgesia (PCA) is an exciting new technique for acute pain management. With this technique, the patient in pain is supplied with a microprocessor-controlled pump which delivers a predetermined amount of IV narcotic analgesic when activated by a patient-controlled hand-held device. The dose that the patient receives when the pump is activated is ordered by the physician and programmed into the pump by the nurse or physician. The drug the patient receives is stored in this pump in a syringe attached to a motorized device and controlled by the microprocessor which accurately determines the dose administered to the patient. To avoid over-medication, a lock-out or delay interval of between 4-10 minutes is pre-selected by the physician and programmed into the pump by the nurse. All attempts at activating the pump are registered but the narcotic is delivered only after the delay or lock-out period has passed. The pumps have the additional capacity to deliver a continuous background mode in addition to the patient-controlled mode. While the patient has access to the pump by the hand-held device, nurses and physicians access the microprocessor using a security code. If the patient reports that pain relief is inadequate, the microprocessor can be easily reprogrammed by the nurse or physician using the security code to shorten the lock-out period or increase the dose or both.

IV PCA has been shown to be effective and, in fact, is currently used in many American and Canadian hospitals. PCA is effective in the control of acute pain because: PCA allows for self-titration by the patient who is best suited to judge his/her level of pain; PCA allows for more flexible dosing thereby compensating for patient variability; and PCA provides analgesia at lower doses of opioid, thus minimizing side effects.[4,12] IV PCA is gradually being introduced to hospitals throughout British Columbia. A technique such as PCA that places the patient in control of his or her own pain management challenges long-held beliefs and practices of health care professionals and firmly established hospital systems. However, once in place, IV PCA benefits patients, nurses and hospitals.

Benefits of IV PCA to patients, nurses and hospitals are well documented. The benefits to the patient include satisfaction with acute pain management, less anxiety, improved ambulation, less sedation, improved respiratory function and shorter hospital stay.[4, 12, 14] Benefits to the nurse include caring for patients who are comfortable, saved time in preparing injections, a reduced risk of needle-stick injuries and increased patient satisfaction with care. Benefits to the hospital include increased patient and nurse satisfaction and shorter hospital stays.[4, 12, 14] Ready (1990) points out that although there remains a small risk associated with using IV PCA, rigorous education programs and specific guidelines for nurses and doctors render IV PCA a high benefit-low risk technique.

The ordeal of acute pain frequently results in suffering for the patient and frustration for the nurse. By placing the patient in control of his or her own pain with techniques such as IV Patient Controlled Analgesia there are benefits for patients, nurses and hospitals.

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