

This article appeared in a journal published by Elsevier. The attached copy is furnished to the author for internal non-commercial research and education use, including for instruction at the authors institution and sharing with colleagues.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

<http://www.elsevier.com/copyright>



ELSEVIER

# Documenting and implementing evidence-based post-operative pain management in older patients with hip fractures

Thurayya Eid MNursing, BNursing, RN (PhD Candidate)<sup>a,\*</sup>,  
Tracey Bucknall PhD, GradDipAdvancedNursing, BNursing,  
ICUCert, RN (Professor in Nursing)<sup>b</sup>

<sup>a</sup> School of Nursing and Social Work, The University of Melbourne, Level 5, 234 Queensberry Street, Carlton VIC 3010, Australia

<sup>b</sup> The School of Nursing at Deakin and Cabrini, Victoria, Australia

## KEYWORDS

Post-operative pain;  
Pain assessment;  
Pain management;  
Older adult;  
Documentation;  
Evidence-based  
practice;  
Hip fracture

**Summary** This study describes the type of pain assessment and management received by post-operative patients aged 65 years and over with a hip fracture. A retrospective audit of patients' medical records for the first five post-operative days was used. Forty-three medical records were audited at a large metropolitan hospital in Australia. Charts were eligible for auditing if the patient had a hip fracture surgically repaired and was over 65 years old.

The documentation showed that nurses infrequently assessed pain and rarely used pain assessment tools. Pain interventions were pharmacological, with the most frequently administered analgesics being paracetamol (61.4%) and morphine (8.0%). Non-pharmacological interventions nor pain management education were documented. The findings of this study were similar to previous studies using other populations. It reinforced that nurses' documentation of pain assessment and management was insufficient and failed to contribute to continuity of care. It is recommended that a greater focus on acute pain is required by organizations if pain management is to improve. Feedback to nurses on their practice provides a starting point for practice development.

© 2008 Elsevier Ltd. All rights reserved.

## Editor's comments

Pain assessment and management are undoubtedly of utmost importance in our care of patients. Although many of us would claim to carry out our responsibilities to alleviate unnecessary suffering for patients, this study's findings indicate otherwise. PD

\* Corresponding author. Tel.: +61 3 93474375; fax: +61 3 93474375.  
E-mail address: t.eid@pgrad.unimelb.edu.au (T. Eid).

## Introduction

Hip fracture is a major hazard for adults aged 65 years and over with an increasing incidence internationally reported (Scott, 1990; Stevens and Olsen, 2000; Wilkins, 1999). In Australia, it has been estimated that the number of hip fractures will increase from 18,602 in 2001 to 38,966 in 2031 (Cumming, 2006).

Surgical intervention is the main option to treat hip fracture; as a result older adults are likely to experience pain after surgery. Following surgery patients experience varying degrees of pain ranging from moderate to severe intensity in 35–100% of patients (Chung and Lui, 2003; Klopfenstein et al., 2000; Oates et al., 1994; Tsui et al., 1995; Yates et al., 1998). The pain of post-operative hip fracture experienced by older adults is crucial due to several organs involved such as bone, muscles, tissues and the ageing processes (Bond and Simpson, 2006). Prolonged and inadequate post-operative pain management can lead to physiological and psychological complications. It may result in higher mortality and morbidity, increased length of hospital stay, greater health care expenses, unscheduled re-admissions, and a reduced quality of life (Chung and Lui, 2003; Hall et al., 2000; Jastrzab et al., 2003; National Health Medical Research Council [NHMRC], 1997; Sherwood et al., 2003).

Several health organizations have emphasized implementation of evidence-based practice strategies to provide effective pain management. However, numerous studies reported that, even though evidence-based information and guidelines on acute pain management are accessible to health professionals, many older adults do not receive adequate pain management (American Pain Society, 2003; Pasero et al., 1999; Royal College of Surgeons of England and College of Anaesthetists, 1990; Titler et al., 2003). Nurses are of essence in post-operative pain assessment and management practices (Ferrell et al., 1991; Manias et al., 2002). Evidence-based practice involves evidence-based clinical decision-making which is a process that requires nurses to make clinical decisions using the best available research evidence, their clinical expertise and patient preferences, in the context of available resources (DiCenso et al., 1998).

## Background/literature

Previous studies found that individuals demonstrate varying degrees of pain intensity post-operatively,

even though they have undergone identical surgical procedures (Chung and Lui, 2003; Klopfenstein et al., 2000). The initial step in post-operative nursing management is pain assessment. The NHMRC (1999) recommends assessing pain regularly, at least every two hours for the first 24–48 h post-operatively. Effective pain management depends on a comprehensive assessment of patients' pain (Walker, 2003) involving, location, quality, pattern, intensity, factors aggravating pain, verbal reports, non-verbal behaviours and symptoms associated with pain (Camp-Sorrell and O'Sullivan, 1991). The NHMRC (1999) and APS (2003) recommend health professionals use tools such as the visual analogue scale (VAS), numerical rating scale (NRS) and verbal rating scale (VRS) for assessing acute pain intensity. Using a pain assessment tool helps nurses to monitor and evaluate patients' pain. The effectiveness of analgesia can be monitored through rating the level of pain at each time of assessment, and following the administration of analgesics (O'Neil, 1985). Herr and Garand (2001) demonstrated that the VAS and the verbal descriptor scale (VDS) tools are suitable for older adult orthopaedic patients.

Pain assessment also promotes communication between patients and nurses (Schofield and Dunham, 2003). Although, there is widespread agreement that patients' self-reports of pain are the only reliable measure of pain intensity (Baillie, 1993), this approach may be impaired in the older adult group because of associated co-morbidities, such as dementia and delirium. Milisen et al. (1998) reported that 73.1% of post-operative older adults with hip fractures showed cognitive impairment. In the absence of a patient's verbal report of pain or in conditions that preclude verbal reports, nurses often rely on physiological and behavioural signs. According to Briggs (1995) behavioural signs remain important as they give clues to site and severity of pain.

The management of post-operative pain has been a concern for many decades (MacKintosh and Bowles, 2000) particularly in older adults who may have multiple co-existing morbidities, atypical presentation of disease, cognitive impairment, and are more likely to be on multiple medications (NHMRC, 1999).

Post-operative pain management includes pharmacological and non-pharmacological management. Pharmacological management involves the administration of opioids, non-opioids and combination analgesic therapies (Rossi, 2004; APS, 2003; NHMRC, 1999). The prescription of analgesics may be fixed-order or *pro re nata* (PRN) 'as required'. Opioid analgesics are recommended for

moderate to severe acute pain, except pethidine which is not recommended because of its effects on the central nervous system in older adults (Rossi, 2004; APS, 2003). Opioids can be administered orally (PO), intramuscularly (IM), subcutaneously (SC), intravenously (IV) and through continuous patient controlled analgesia (PCA). However, using PCA requires careful titration due to drug accumulation in the older adult group and patients should be cognitively alert. Older adults are more sensitive to analgesic effects of opioids due to higher peaks and longer duration of pain relief. They are more sensitive to sedation and respiratory depression due to altered distribution and excretion of the opioids (NHMRC, 1999). Common side effects of opioids observed in older adults are urinary retention, constipation, pruritus (itching), nausea, vomiting and delirium (NHMRC, 1999). Non-opioid analgesics include the non-steroidal anti-inflammatory drugs (NSAIDs) such as aspirin and paracetamol. The NSAIDs are indicated for mild to moderate post-operative pain related to inflammation and tissue injury (Rossi, 2004).

Non-pharmacological interventions complement pharmacological management, and involve non-invasive measures such as education, massage, relaxation, distraction (for example; music), pressure application, cold and hot compresses and positioning (Helmrich et al., 2001). Health professionals should provide education for patients and their families, prior to and after surgery, on assessment techniques and approaches for pain management (NHMRC, 1999).

Previous studies have demonstrated inadequate nurses' documentation of pain assessment and management such as the frequency of pain assessment, the tool used for pain assessment, analgesic administration, dosages, routes and side effects, patient education and use of non-pharmacological interventions (Arderly et al., 2003; Briggs and Dean, 1998; Idvall and Ehrenberg, 2002; MacLellan, 1997; Malek and Olivieri, 1996; Manias, 2003; Titler et al., 2003).

MacLellan (1997) audited 136 randomly selected patients' charts in Ireland for the first five post-operative days. In this heterogeneous group of patients, documentation was found to be limited to site and duration, with no pain intensity noted except for the 10% of patients with a PCA. MacLellan (1997) reported that many patients were prescribed more than one analgesic and some up to five different analgesics at any one time. A large percentage (88%) of these analgesics were prescribed PRN, and administered via the intramuscular route. Opioids such as morphine were mainly prescribed on the first post-operative day (41%) while NSAIDs such as diclofenac were mainly pre-

scribed on the second day (46%) (MacLellan, 1997). MacLellan (1997) study does not detail the numbers of analgesics administered and the frequency of patient refusal. Moreover, as a part of documented pain management practices, the side effects of analgesics, non-pharmacological intervention and patient education have not been highlighted by MacLellan (1997).

In Australia, Manias (2003) conducted an audit of 100 medication charts and nurses' notes during the patients' operation day and the first four post-operative days. The sample of the study was limited to gastro-surgical, renal, pancreatic or hepatic procedure. The aim was to examine prescription and administration activities for sedatives and analgesia in post-operative patients. The pain and anxiety audit tool (PAAT) was used for data collection. Four areas of inadequate documentation were found: pain assessment, use of non-pharmacological interventions, use of pharmacological interventions, and outcome of interventions. Manias (2003) found that 43.1% of medical records had patients reporting non-quantifiable pain assessment. However, in relation to comprehensive pain assessments only 16% were documented and 40% were not documented. Manias (2003) reported that the most frequently prescribed analgesics and sedatives were morphine, pethidine, fentanyl, paracetamol and paracetamol with codeine. The prescribed mode of fixed analgesics administered varied from 48% to 65%, while the percentage of PRN analgesics administered ranged from 7% to 17%.

In the United States, Titler et al. (2003) examined documented pain management by auditing 709 medical records of hip-fractured elderly. They reported that Alzheimer's disease was a frequent co-morbidity (26.1%), and paracetamol (28.4%), pethidine (17%) and morphine (12.8%) were commonly administered. 98% of patients received opioids, 90.1% non-opioids and 35.5% combinations at least once during the first 72-hours post-operatively and 56.8% of patients received pethidine. Furthermore, only 22.3% of patients received around-the-clock administration for the first 24 h, 52.2% of patients had IM for analgesics administration even though it is not recommended because of the problems associated with reduced muscle mass (Rossi, 2004) and 27.0% of patients had PCA for morphine administration. In addition, the documented non-pharmacological interventions were repositioning, pressure relief devices, cold applications and massage.

The results reported by Titler et al. (2003) provide a substantive contribution to the planning and development of the present study. Currently there is little knowledge about the assessment

and management of post-operative pain in older Australian hip fracture patients. Thus, the purpose of the research was to describe the documentation of the type of pain assessment and management received by post-operative patients with a hip fracture in an Australian orthopaedic ward.

## Method

A retrospective medical records audit was conducted on 43 patient records at a major metropolitan hospital, Melbourne, Australia. Patients who were consecutively admitted between May and September 2004 for a primary diagnosis of hip fracture were reviewed. All patients were over 65 years of age.

Following a review of NHMRC and APS guidelines and previous research (Titler et al., 2003) the Pain Documentation Audit Tool (PDAT) was developed. The PDAT consisted of two sections: firstly, patient demographic data including diagnosis, associated co-morbidities, type of operation, and type of anaesthesia; secondly, pain assessment, pain management and pain education information. These items were assessed over five consecutive days because they are recognized as being the most painful period post-operatively (Klopfenstein et al., 2000; Oates et al., 1994; Tsui et al., 1995).

The PDAT was piloted to ensure face and concept validity with specialist orthopaedic nurses and other nurse researchers ( $n = 5$ ). Face validity often uses expert opinion to judge the accuracy of an instrument (Schneider et al., 2003). The experts also offered information based on the typical documentation process, clarity of information and usefulness to the objectives of the study. Comprehensive pain assessments were detailed in the note section of the PDAT.

Following approval for the study by The University of Melbourne Human Research Ethics Committee and the hospital to conduct the audit as a quality improvement project, data was collected. No identifying information was collected. The data from the PDAT were analysed using the Statistical Package for the Social Science (SPSS) version 12.1 for Windows.

## Results

### Demographic characteristics

The majority of patients were females (79.1%) with a mean age of 81 years. The summary of demographic data obtained from patients' medical records is presented in Table 1. The leading

**Table 1** Demographic data ( $N = 43$ )

Age	Years
Min	66
Max	101
Mean	81
SD	7.45
<i>Gender</i>	<i>n</i>
Female	34 (79.1%)
Male	9 (20.9%)
<i>Main language spoken at home</i>	
English	35 (81.4%)
Italian	4 (9.3%)
Cantonese	2 (4.7%)
Greek	1 (2.3%)
Vietnamese	1 (2.3%)
<i>Diagnosis</i>	
Femoral neck fracture	30 (70%)
Subcapital neck Fracture	11 (28%)
Other	2 (2%)
<i>Associated co-morbidities</i>	
None	2 (4.7%)
More than one	41 (95.4%)
<i>Anaesthesia type</i>	
General Anaesthesia	29 (67.4%)
Spinal-epidural	14 (32.6%)

co-morbidities were hypertension, ischemic heart disease, Alzheimer's, osteoarthritis, atrial fibrillation and depression.

### Pain assessment

The frequency of pain assessment activities are shown in Table 2. A pain intensity rating was infrequently documented ( $n = 5$ , 11%) in either the vital signs or the progress notes, when pain rates ranged from 5–8 on a 0–10 scale. The most common behavioural signs cited in the documentation were sleep disturbance, agitation, discomfort, restlessness ( $n = 16$ , 66.7%), followed by refusal and reluctance to eat, drink, take medication and follow orders (29.2%) in day 2. Statements indicating the pain intensity, location and pain with activity were found in very few progress notes. Nurses wrote statement such as "nil complaints of pain", "minimal pain", "minimal complaining of pain", "pain on left hip", and "pain on movement".

### Pain management

The most common analgesic ordered was paracetamol, followed by morphine and oxycodone. The



**Table 2** Frequency of documented pain assessment activities

	Documented medical record			Total
	None	Once	>Once	
Pain assessment frequency	28 (65%)	12 (28%)	3 (7%)	43 (100%)
Visual rating scale	33 (77%)	10 (23%)		43 (100%)

majority of analgesics ordered were administered in day two ( $n = 99$ , 30%) and day three ( $n = 66$ , 20%) of the total analgesics ordered.

During the first five post-operative days, 684 doses of analgesia were administered. Most were non-opioids (62.2%), opioids (23.8%), and a combination of therapies (13.9%) (Table 3). In addition, it was noted that of the total analgesics administered ( $N = 684$ ), ( $n = 392$ , 57.3%) were administered during the day (08:00–19.59 h) and ( $n = 292$ , 42.7%) were administered during the night (20:00–

07:59 h). Results showed that the total dose of analgesics administered was less than the maximum dose prescribed (Figs. 1 and 2).

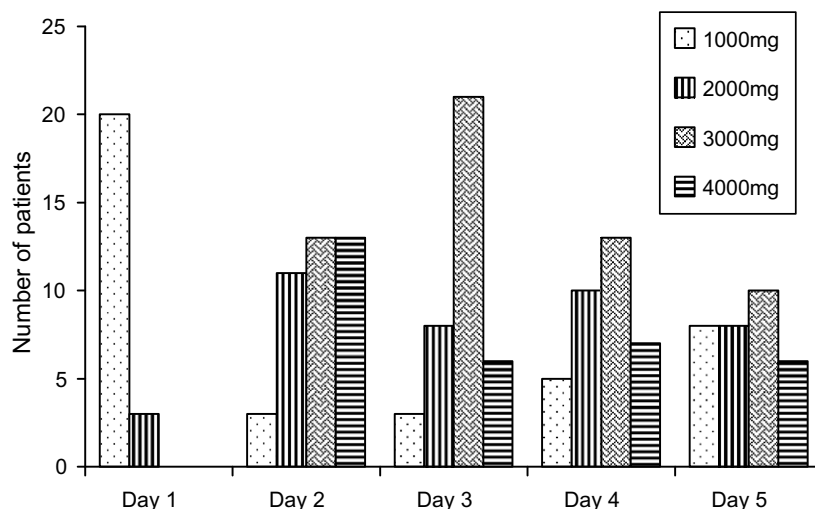
In the first five post-operative days, 316 PRN analgesics were administered (46.2%) and only 368 fixed interval prescriptions analgesics (53.8%) (Fig. 3). Very few patients used PCA in the first five post-operative days ( $n = 6$ ). Analgesics were prescribed via single ( $n = 458$ , 66.9%) or multiple routes ( $n = 226$ , 33%). The audit also showed that nurses do not document in medication charts which route they have used when multiple options for administration are prescribed. Not surprisingly, the oral route is used most frequently, compared to subcutaneous and intramuscular routes in the first five post-operative days.

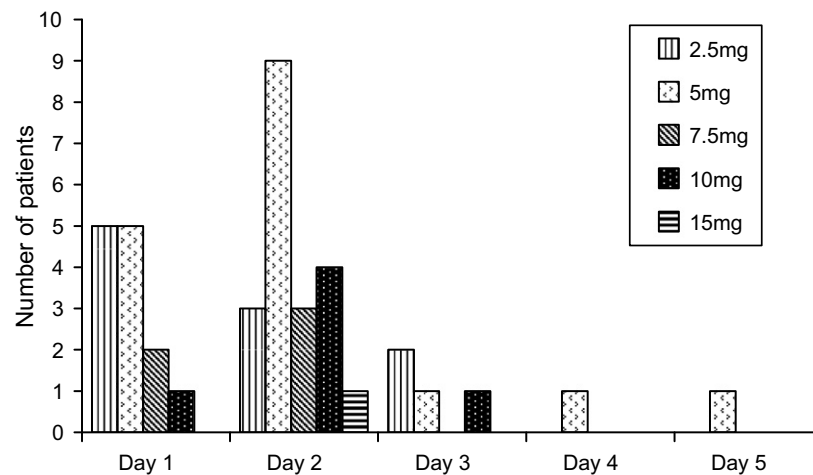
Analgesics with a fixed interval prescription were more likely to be administered to the patient than those ordered PRN. For various unknown reasons, some patients refuse analgesics, patient refusal of analgesics with fixed prescription were ( $n = 36$ , 60%) whereas analgesics with PRN prescriptions were ( $n = 24$ , 40%).

Overall, minimal analgesic side effects were documented. The most common side effects were delirium ( $n = 21$ , 48.8%) followed by constipation ( $n = 7$ , 16.3%), then nausea and vomiting ( $n = 2$ , 4.7%). Nurses only documented an evaluation on

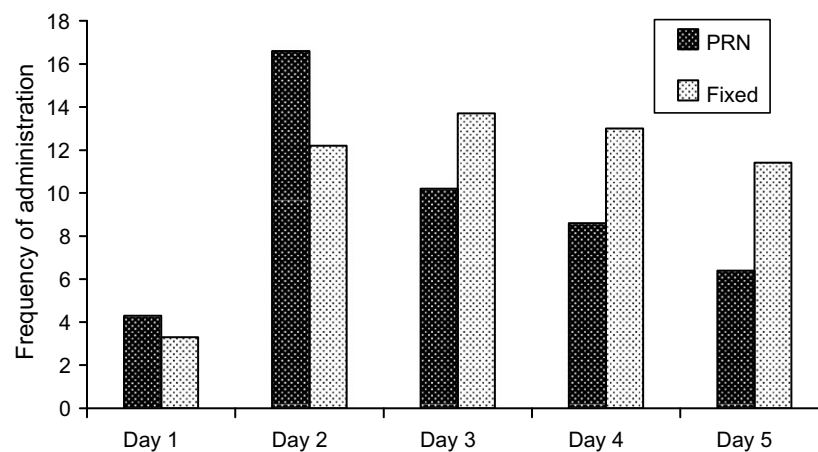
**Table 3** Types and frequency of analgesics during first five post-operative days ( $N = 684$ )

Drug category/type	Administered $n$ (%)
<i>Non-opioids</i>	
Paracetamol	420 (61.4)
Ibuprofen	6 (0.9)
<i>Opioids</i>	
Morphine	55 (8.0)
Oxycodone	56 (8.2)
Tramadol	52 (7.6)
Combined paracetamol with codeine	95 (13.9)
Total administered	684

**Figure 1** Total Paracetamol dosages during first five post-operative days.



**Figure 2** Total Morphine dosages during first five post-operative days.



**Figure 3** Frequency of prescription modes.

the effectiveness of pharmacological management. The most frequent statement they used in the medical progress notes was "analgesic is given with good effect". In relation to non-pharmacological management there was no documented evidence of nurses providing or patients requesting, massage, relaxation, distraction, pressure application, cold, heat, positioning or education.

## Discussion

In Australia, evidence-based guidelines have been available in pain management for more than 10 years. Three main issues emerged in this retrospective audit of pain management documentation; insufficient pain assessment; inadequate pain management and; poor communication between clinicians and patients. Pain assessment was infrequently and inadequately documented, with less

than 50% of audited patients' medical records having documented pain assessment, none showing a comprehensive pain reassessment. Pain assessment is used to determine patients' pain intensity, location, satisfaction with pain management, and to assist nurses to treat and evaluate the effectiveness of pain interventions (Chung and Lui, 2003; Yates et al., 1998). Without pain assessment, these aims are unlikely to be achieved. However, it remains unknown if the nurses did in fact assess pain yet failed to document it. This is a limitation of a retrospective audit that could be clarified with naturalistic observational studies.

In this study, the administered doses of paracetamol did not reach the maximum daily dosage (4000 mg per 24 h) recommended by Rossi (2004), APS (2003) and NHMRC (1999). Opioids were administered 23.8% of the time to older adults. Although the documented pain intensity rating suggested patients experienced moderate to severe pain, they

were treated mainly with non-opioids, such as paracetamol which is recommended for mild to moderate pain. In line with recommended guidelines pethidine was not ordered or administered during the first five post-operative days. Analgesic side effects were rarely documented despite NHMRC (1999) guidelines recommending observation for side effects. There was no incidence of respiratory depression reported in the current study, although this remains a major reason for not administering analgesics (Bell, 2000). Delirium was found to exist in up to 49% of patients in this study, which is also a common analgesics' side effect among older adults reported by Lynch et al. (1998). They reported that post-operative older adults were increasingly at risk for delirium if their pain was under-treated. Thus, patients who had delirium identified in this study may in fact have had inadequate pain treatment.

The NHMRC (1999) recommended that nurses educate patients and provide non-pharmacological interventions to assist patients to cope with their pain. Patients can use these methods in addition to analgesics to produce additional relieving effects on the pain. It has been shown to reduce the amount of opioid medications required, decrease patients' pain and anxiety, and provide patients with some control over their pain management (Cepeda et al., 2007; Koh et al., 2006; Roykulcharoen and Good, 2004). Non-pharmacological interventions were not documented by nurses in this study, which may have been due to a lack of knowledge or perceived lack of time to administer and treat the patients. Observational studies would offer further insight into the context of pain management and the influence on nurses' decision-making.

Although not directly studied, barriers to communication between patients, nurses and other health professionals comprised an issue that emerged in this study. Firstly, communication between patients and nurses is vital for effective pain management. Patient education in pain management provides both essential and basic information to patients and their families to assist them in making informed decisions, and promoting a therapeutic relationship between patients and nurses (Helmrich et al., 2001; Johnston and Vogeley, 1993; NHMRC, 1999). In this study, nurses did not document whether patients received any education in relation to pain management. For this reason, it is unlikely that patients would participate in decision-making on the preferred type of analgesics, the frequency of administration, or alternative non-pharmacological treatments without the background education. This passivity in pain manage-

ment inhibits patient control and promotes under treatment by nurses.

Pain assessment is one way for nurses to communicate with their patients, such as regularly asking patients about their pain, before and after administering analgesia, to detect levels of effectiveness and side effects of treatments. Patients with delirium have impaired attention and memory and, may not be able to report their pain (Jorm, 2001; Milisen et al., 1998). The presence of delirium in this study highlights the need for nurses to be knowledgeable of specific pain assessment tools developed for patients with cognitive problems such as the behavioural pain assessment tool (Kaasalainen and Crook, 2003).

Secondly, communication between clinicians is crucial. In this study, 33% of analgesics were prescribed by multiple routes, yet nurses' choice of route was not documented. This lack of information is important given that different routes have different bioavailability and duration of action. By, using one appropriate route to administer analgesia, it is more likely to maintain the pharmacokinetic action and effect throughout the pain management period (Rang et al., 2003). In contrast to Titler et al. (2003) which reported 52.2% of analgesics were administered via intramuscular injections, nurses in this study did not use this route. Intramuscular injections are not recommended for older adults because they lack fatty tissue and have more muscle wasting; it also has a prolonged and delayed analgesic effect and altered serum levels. Repeated doses of intramuscular injections may also cause toxicity (Herr et al., 2000). Continuous intravenous infusion was rarely used in this study, even though it is recognised as a favourable method for treating pain in older adults. Close monitoring of the infusions will reduce the risk of analgesic side effects (Herr et al., 2000; Titler et al., 2003). Nurses caring for post-operative older adults should encourage physicians to consider prescribing continuous intravenous infusion for their patients and to demonstrate an awareness of the potential side effects and treatments should a problem arise.

This study was limited to a convenience sample in one Australian orthopaedic ward. The documentation of pain management may not fully describe how nurses actually practice in the ward, although as a legal document, all care administered is required to be documented. Some activities that may have been carried out by the nurses may not have been recognized as an intervention, such as patient education, and therefore the nurses did not document it.



## Recommendations

Pain management guidelines such as the NHMRC (1999) recommendations based on scientific evidence, need to be strategically and systematically implemented. Organisations should integrate evidence-based pain management practices in their unit policies, procedures, standards, clinical pathways and documentation system (MacDonald and Hilton, 2001). Nursing opinion leaders in the ward need to assist in the introduction and implementation of evidence-based practice (Titler and Everett, 2001). These opinion leaders are viewed as important and respected sources of influence among their peer group, able to evaluate new information in the context of group norms (Titler and Everett, 2001). Pain management education should be integrated in new employees' orientation and continuing education programs and conducted in the clinical setting to inform nurses of the latest research evidence.

Further observational research is required to examine the difference between nurses' pain management practices in the ward and their documentation of pain management practice. Observation of nurses would provide useful information on the context of their clinical care and the associated documentation. In addition, it would assist researchers to explore clinical decision-making processes and the contextual factors influencing decision-making processes by nurses in post-operative pain management. This research would provide insight into the reasons for insufficient documentation of pain assessment and pain management, as well as an understanding of the gap between practice and documentation.

## Conclusion

The findings in this study support previous research findings that acute pain in older adults continues to be under-treated, and that pain management documentation remains insufficient. Overall the lack of documentation is worrying and possibly indicates a lack of understanding of pain assessment and management practices. Several areas of improvement are indicated, including more comprehensive pain assessments, use of pain assessment tools, review of analgesics used to treat pain, recommended doses to be administered, use of alternative routes, use of non-pharmacological interventions, and the education of patients and their families. By adopting evidence-based guidelines in performing and documenting pain assessment and management, improved pain outcomes are more likely to result.

Thus targeted educational pain management programs and clinician feedback on pain practices should be used to address the lack of knowledge and inadequate documentation practices of nurses.

## Acknowledgement

The authors would like to thank; Ms. Meinir Griffiths (RN), Mrs. Jean Marshall, and King Abdulaziz University Hospital, Jeddah, Saudi Arabia.

## References

- American Pain Society, 2003. Principles of analgesic use in the treatment of acute pain and cancer pain, fifth ed. American Pain Society, Glenview, IL.
- Arderly, G., Herr, K., Hannon, B., Titler, M., 2003. Lack of opioid administration in older hip fracture patients. *Geriatric Nursing* 24, 353–360.
- Baillie, L., 1993. A review of pain assessment tools. *Nursing Standard* 7 (23), 25–29.
- Bell, F., 2000. A review of the literature on the attitudes of nurses to acute pain management. *Journal of Orthopaedic Nursing* 4, 64–70.
- Bond, M.S., Simpson, K., 2006. Pain: its Nature and Treatment. In: Churchill Livingstone. Elsevier, London.
- Briggs, M., 1995. Principles of acute pain assessment. *Nursing Standard* 9 (19), 23–27.
- Briggs, M., Dean, K., 1998. A qualitative analysis of the nursing documentation of post-operative pain management. *Journal of Anaesthesiology* 15, 748–751.
- Camp-Sorrell, D., O'Sullivan, P., 1991. Effects of continuing education, pain assessment and documentation. *Cancer Nursing* 14 (1), 49–54.
- Cepeda, M.S., Carr, D.B., Lau, J., Alvarez, H., 2006. Music for pain relief. *Cochrane Database of Systematic Reviews*.
- Chung, J.W., Lui, J.C., 2003. Postoperative pain management: Study of patients' level of pain and satisfaction with health care providers' responsiveness to their reports of pain. *Nursing and Health Sciences* 5, 13–21.
- Cumming, R., 2006. Hip fracture controlling the epidemic. Paper presented at the Australia's Health 2006. Retrieved June 30, 2007, from [http://www.aihw.gov.au/eventsdiary/ah06/presentations/bob\\_cumming\\_hip\\_fractures.pdf](http://www.aihw.gov.au/eventsdiary/ah06/presentations/bob_cumming_hip_fractures.pdf).
- DiCenso, A., Cullum, N., Ciliska, D., 1998. Implementing evidence-based nursing: Some misconceptions. *Evidence-Based Nursing* 1 (2), 38–40.
- Ferrell, B.R., Eberts, M.T., McCaffery, M., Grant, M., 1991. Clinical decision making and pain. *Cancer Nursing* 14, 289–297.
- Hall, S.E., Williams, J.A., Senior, J.A., Goldswain, P.R., Cridle, R.A., 2000. Hip fracture outcomes: quality of life and functional status in older adults living in the community. *Australian and New Zealand Journal of Medicine* 30 (3), 327–332.
- Helmrich, S., Yates, P., Nash, R., Hobman, A., Poulton, V., Berggren, L., 2001. Factors influencing nurses' decisions to use non-pharmacological therapies to manage patients' pain. *Australian Journal of Advanced Nursing* 19 (1), 27–35.
- Herr, K.A., Garand, L., 2001. Assessment and measurement of pain in older adults. *Clinics in Geriatric Medicine* 17, 457–478.

- Herr, K.A., Titler, M.G., Sorofman, B.A., Ardery, G., Schmitt, M.B., Young, D., 2000. Evidence-based protocol: Acute pain management in the elderly. University of Iowa, Research Dissemination Core of the Gerontological Nursing Interventions Resource Center, Iowa City, IA.
- Ildvall, E., Ehrenberg, A., 2002. Nursing documentation of postoperative pain management. *Journal of Clinical Nursing* 11, 734–742.
- Jastrzab, G., Fairbrother, G., Kerr, S., McInerney, M., 2003. Profiling the 'pain-aware' nurse: Acute care nurses' attitudes and knowledge concerning adult pain management. *Australian Journal of Advanced Nursing* 21 (2), 27–32.
- Johnston, M., Voegelé, C., 1993. Benefits of psychological preparation for surgery: a meta-analysis. *Annals of Behavioral Medicine* 15, 245–256.
- Jorm, A.F., 2001. Dementia: a major health problem for Australia. In: *Alzheimer's Association Australia*. Canberra.
- Kaasalainen, S., Crook, J., 2003. A comparison of pain-assessment tools for use with elderly long-term care residents. *Canadian Journal of Nursing Research* 35 (4), 59–71.
- Klopfenstein, C.E., Herrmann, F.R., Mamie, C., Van Gessel, E., Foster, A., 2000. Pain intensity and pain relief after surgery. *Acta Anaesthesiologica Scandinavica* 44, 58–62.
- Koh, M., Tez, M., Yoldas, O., Dizen, H., Gocmen, E., 2006. Cooling for the reduction of postoperative pain: prospective randomized study. *Hernia* 10, 184–186.
- Lynch, E.P., Lazor, M.A., Gellis, J.E., Orav, J., Goldman, L., Marcantonio, E.R., 1998. The impact of postoperative pain on the development of postoperative delirium. *Anesthesia and Analgesia* 86, 781–785.
- MacDonald, V., Hilton, B.A., 2001. Postoperative pain management in frail older adults. *Orthopaedic Nursing* 20 (3), 63–76.
- MacKintosh, C., Bowles, S., 2000. The effect of an acute pain service on nurses' knowledge and beliefs about post-operative pain. *Journal of Clinical Nursing* 9 (1), 119–126.
- MacLellan, K., 1997. A chart audit reviewing the prescription and administration trends of analgesia and the documentation of pain, after surgery. *Journal of Advanced Nursing* 26, 345–350.
- Malek, C., Olivieri, R., 1996. Pain management: documenting the decision making process. *Nursing Care Management* 1 (2), 64–74.
- Manias, E., 2003. Medication trends and documentation of pain management following surgery. *Nursing and Health Science* 5, 85–94.
- Manias, E., Botti, M., Bucknall, T., 2002. Observation of pain assessment and management: the complexities of clinical practice. *Journal of Clinical Nursing* 11, 724–733.
- Milisen, K., Abraham, I.L., Broos, P.L., 1998. Postoperative variation in neurocognitive and functional status in elderly hip fracture patients. *Journal of Advanced Nursing* 27 (1), 59–67.
- National Health and Medical Research Council, 1997. Clinical practice guidelines: The management of acute pain. National Health Advisory Committee, Canberra, Australia.
- National Health and Medical Research Council, 1999. Acute pain management: scientific evidence. Commonwealth of Australia, Canberra.
- Oates, J.D., Snowdon, S.L., Jayson, D.W., 1994. Failure of pain relief after surgery: attitudes of ward staff and patients to post-operative analgesia. *Anaesthesia* 49, 755–758.
- O'Neil, J., 1985. Nursing assessment of the cancer patient who has protracted pain. *Nursing Practice* 1 (1), 20–25.
- Pasero, C., Reed, B.A., McCaffery, M., 1999. Pain in the elderly. In: Caffery, M., Pasero, C. (Eds.), *Pain Clinical manual for nursing practice*, second ed. Mosby, St. Louis, MO, pp. 674–710.
- Rang, H.P., Dale, M.M., Ritter, J.M., Moore, P.K., 2003. *Pharmacology*, fifth ed. Churchill Livingstone, United Kingdom.
- Rossi, S., 2004. *Australian medicines handbook* (Ed.), Australian Medicines Handbook, Adelaide.
- Royal College of Surgeons of England and College of Anaesthetists, 1990. Commission on the provision of surgical services. Report of the working party on pain after surgery. Royal College of Surgeons of England and College of Anaesthetists, London.
- Roykulcharoen, V., Good, M., 2004. Systematic relaxation to relieve postoperative pain. *Journal of Advanced Nursing* 48 (2), 140–148.
- Schneider, Z., Elliott, D., LoBiondo-Wood, G., Haber, J., 2003. *Nursing Research: Methods*, second ed.. In: *Critical Appraisal and Utilisation* Mosby, NSW.
- Schofield, P., Dunham, M., 2003. Pain assessment: How far have we come in listening to our patients. *Professional Nurse* 18 (5), 276–279.
- Scott, J.C., 1990. Osteoporosis and hip fractures. *Rheumatic Disease Clinics of North America* 16 (3), 717–740.
- Sherwood, G.D., McNeill, J.A., Starck, P.L., Disnard, G., 2003. Changing acute pain management outcomes in surgical patients. *The Association of Perioperative Registered Nurses* 77 (2), 374–395.
- Stevens, J.A., Olsen, S.J., 2000. Reducing falls and resulting hip fractures among older women. In: *CDC Recommendations regarding selected conditions affecting women's health Morbidity and mortality weekly report* 49 (RR-2), 3–12.
- Titler, M.G., Everett, L.Q., 2001. Translating research into practice. *Critical Care Nursing Clinics of North America* 13 (4), 587–603.
- Titler, M.G., Herr, K., Schilling, M.L., Lawrence Marsh, J., Xie, X., Ardery, G., et al., 2003. Acute pain treatment for older adults hospitalized with hip fracture: Current nursing practices and perceived barriers. *Applied Nursing Research* 16 (4), 211–227.
- Tsui, S., Lo, R., Tong, W., Yang, J., O'Regan, A., Ng, K., et al., 1995. A clinical audit for postoperative pain control on 1443 surgical patients. *Acta Anaesthesiologica Sinica* 33, 137–148.
- Walker, J., 2003. Philosophy, knowledge and theory in the assessment of pain. *British Journal of Nursing* 12 (8), 494–501.
- Wilkins, K., 1999. Health care consequences of falls for seniors. *Health Reports* 87 (3), 47–55.
- Yates, P., Dewar, A., Edwards, H., Fentiman, B., Najman, J., Nash, R., 1998. The prevalence and perception of pain amongst hospital in-patients. *Journal of Clinical Nursing* 7, 521–530.