THE UNIVERSITY OF HULL

POSTOPERATIVE PAIN: NURSING MANAGEMENT AND ORGANISATIONAL COMMITMENT

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ABSTRACT

Postoperative pain management has been the subject of several national reports (Royal College of Surgeons of England and College of Anaesthetists, 1990; Audit Commission, 1997; Clinical Standards Advisory Group, 2000) that have each made recommendations for practice at ward level and Trust-wide strategies to improve pain management within an organisation. These two areas represent the foci of the work undertaken in this thesis.

The research consisted of two studies; the first surveyed hospital Trusts in the Northern and Yorkshire region (n=35) and the second explored nursing care of 120 patients admitted to four English hospitals (two with an acute pain service) through non-participant observation, patient interviews and examination of nursing documentation. The questionnaire results highlighted increases in funding for pain management, staff education, audit practices and written guidelines compared to previous work by the Audit Commission (1998) but wide variations in the nature of these activities. In the second study, hospital two (without a pain service) achieved the lowest pain scores at rest ($p=0.018$) and on movement ($p=0.013$) but also had one of the lowest rates of analgesic administration and morphine equivalent doses. This ward had the highest number of pain-related interactions ($p=0.004$), entries onto pain assessment charts ($p=0.03$) and documented evaluations in nursing care plans. Data also illustrate the differences between observed and documented care in all hospitals and the low use of pain assessment tools in practice to inform analgesic decision-making.

This study provides an insight into hospital activities aimed at improving pain management and surgical nursing practice across Trusts. Recommendations are made to further enhance pain relief in hospital including the promotion of pain as a quality of care indicator and increasing accountability within organisations.

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The study would not have been possible if patients, nurses and ward staff had not given up their time and welcomed me, either into their working lives or personal experiences of surgery. Sadly, during their postoperative recovery, three patients passed away. May they rest in peace.

Colleagues, friends, family and particularly my parents and my husband have provided support in so many ways, for which I will always be extremely grateful.

DEDICATION

To Steve

who *always* had faith and during the life of this project, has given and given up so much

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ABBREVIATIONS

Term	Abbreviations
Acute pain nurse	APN
Acute pain service	APS
Clinical Standards Advisory Group	CSAG
Commission for Health Improvement	CHI
National Health Service	NHS
Non-steroidal anti-inflammatory drugs	NSAIDs
Numerical rating scale	NRS
Nursing and Midwifery Council	NMC
Patient-controlled analgesia	PCA
Postoperative Pain Management Questionnaire	PPMQ
Pro re nata (as required)	PRN
Royal College of Anaesthetists	RCA
Royal College of Surgeons of England and College of Anaesthetists	RCS & CA
Standard deviation	SD
United Kingdom Cental Council for Nurses, Midwives and Health Visitors	UKCC
Verbal rating scale	VRS
Visual analogue scale	VAS

CHAPTER 1

INTRODUCTION TO THE THESIS

The Latin word *patiens* means one who suffers or the one to whom an act is done. It is not surprising therefore, that pain is often aligned with being a patient and nurses associated with providing pain relief.

Louise Sanchez-Sweatmann, *Nurses and Pain management*

Section 1.1 Background to thesis

After an admission to hospital, MacInnes (1976) described postoperative pain management as "...the grave defect in English hospitals which...is a cruel and callous disgrace." Fourteen years later, the Royal College of Surgeons of England and College of Anaesthetists (1990) suggested that pain management after surgery was still inadequate and had not advanced significantly for several years. This was the first of three national reports which made recommendations to improve practice and subsequent reviews were undertaken by the Audit Commission (1997) and Clinical Standards Advisory Group (CSAG, 2000). Recommendations included auditing practice, providing education, setting standards and forming a specialist multidisciplinary team or acute pain service (APS). These activities were designed to make pain management an organisational concern.

The impetus for this study can be traced back to experiences as an undergraduate nursing student caring for a surgical patient who had recently undergone a leg amputation above the knee joint. During an assessment the gentleman described his pain as very severe and then requested that he be left alone to die. This patient's experience occurred on a ward where nurses documented regular pain assessments and within an organisation that operated an APS.

A literature review revealed a wealth of materials with the potential to inform nursing practice and Kitson (1994) described postoperative pain relief as a major area of nursing research. However, there was little to contradict Bourbonnais's (1981) statement, made over 20 years ago, which suggested there was no evidence available to say whether systematic assessment and management of the patient in pain was part of nursing practice. Academic enquiry was stimulated by the possible gap between theoretical underpinnings and clinical practice in light of organisational changes in postoperative pain management. A research proposal was formulated to explore specific aims and aid the development of research skills. The first study focused on hospital strategies to improve pain management in one National Health Service (NHS) region and the second explored current nursing practice, following the care of 120 patients.

Section 1.2 Organisation of thesis

This thesis is organised into chapters that explore current theoretical knowledge surrounding postoperative pain management, research methods, results and recommendations for practice. Chapter 2 lays the foundation for the work introducing the concept of pain, its effects and the importance of management for surgical patients. Literature surrounding nursing care is reviewed in Chapter 3, demonstrating the volume of published material available but also a lack of insight into current practice, especially across organisations. Chapter 4 reviews the literature on organisational change as a method of improving practice but previous work focuses on hospitals with pain services and contains limited details.

The literature review justifies the work undertaken in this thesis and Chapter 5 outlines the qualitative and quantitative approaches to data collection and analysis, justifying these methods. Chapter 6 describes the results of a regional survey and patients'

experiences in four hospitals in the United Kingdom (UK) and the subsequent chapter considers pain-related interactions, discussing observed and documented care. These results are then placed in context of the literature identifying similarities, differences and areas where the work contributes to new knowledge. Finally, the boundaries of the project are discussed and recommendations for nursing practice, research, education and management are made.

CHAPTER 2

THE EXPERIENCE OF POSTOPERATIVE PAIN

> Nobody will ever understand 'my pain' in the way that I mean it, unless he suffers the same headache, which is impossible, because he is another person. …Just as 'my pain' belongs in a unique way to me, I am utterly alone with it.
>
> Ivan Illich, *Limits to Medicine*

Section 2.1 Introduction

Pain is a universal human experience, the most common reason individuals seek healthcare (Turk and Melzack, 2001; Hawthorn and Redmond, 1998) and a predictable consequence of surgery. This chapter provides a basis for exploring pain management in practice by introducing key areas such as the concept of pain, underlying physiology, the effects of pain and factors influencing perception and expression illustrating the individuality of the experience. Much of this discussion supports the argument for effective management but wider issues regarding accountability, clinical governance, ethical and legal practice strengthen the need for this aspect of postoperative care. Many of these elements represent major domains in pain research and literature reviewed here has been chosen to reflect historical developments and contemporary evidence to provide an introduction to the experience of postoperative pain.

Section 2.1.1 Search strategy

Several sources of literature were used to support this introduction which were located using the following electronic databases:

BIDS ISI	1980-2000
CINAHL	1982-2003
Medline	1966-2003
PsychINFO	1980-2003
Web of Science	1982-2003

Searches were conducted at several points throughout the study employing the following keywords as singular search terms or in combination using Boolean logic (AND, OR, NOT) (Beaven, 2002):

Age
Accountability
Anxiety
Clinical effectiveness
Clinical governance
Culture
Definitions
Effects of pain
Ethics
Gender/sex
Legal
Nociception
Pain
Pain physiology
Pain theories
Psychological effects

Papers were limited to those published in English and relating to human research where possible. They were retrieved if the title indicated relevance or if the nature of the article was unclear from the title and abstract.

Section 2.2 The concept of pain

The word pain originates from the Latin and Greek *poena* and *poine* implying the experience and effect of punishment (Bonica, 1990a). As the study of pain (algology) developed into a specialty in the 20th century, clinicians and theorists sought to define the concept and the International Association for the Study of Pain (1979, p250) proposed a formal definition:

> Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of that damage.

This frequently cited definition reflects the origins of the word, highlights the subjective nature of pain, the sensory and emotional dimensions and the variable relationship with injury. However, it has been criticised because pain is often more than unpleasant and the effects are not limited to two dimensions (Melzack and Wall, 1996).

The National Institutes of Health (1986, p3) offered a holistic description of pain:

> Pain is a subjective experience that can only be perceived by the sufferer. It is a multidimensional phenomenon that can be described by the pain location, intensity, temporal aspects, quality, impact and meaning. Pain does not occur in isolation, but in a specific human being in psychological, economic, and cultural contexts that influence the meaning of the experience and verbal and non-verbal expression.

Nursing literature has often embraced a definition by McCaffery (1972, p8), one of the easiest to operationalise in practice but it has provided little information about the experience.

> Pain is whatever the experiencing person says it is, existing whenever the person says it does.

Definitions of pain, particularly the IASP contribution, have been the recent subject of intense philosophical debate. Anand and Craig (1996) argued that definitions have advanced our understanding of pain but only apply to those who are able to express themselves verbally, essentially the conscious adult human and fail to recognise the experience of neonates, infants, any non-linguistic individuals and animals. This definition and the need for verbal authentication has been implicated in the inadequate treatment of pain by clinicians (Cunningham, 1999; Anand *et al.*, 1999) yet others have disagreed, arguing that few practitioners are aware of the IASP definition and the issue was far more complex (Kopelman, 1999; Rollman, 1999).

Anand and Craig (1996) identified a further weakness of using self-report as the "gold standard," which can depend on context including assessment methods, reasons for eliciting pain and perception of the consequence of expression.

Such debates in the literature encouraged the IASP Taskforce on Taxonomy (2001, p1) to add the following note to their definition:

> The inability to communicate in no way negates the possibility that an individual is experiencing pain and is in need of appropriate pain relieving treatment.

Melzack and Wall (1996) suggested that research has not yet advanced significantly to develop an accurate definition of pain due to the diversity of experiences while Rollman (1999) argued that a definition was not necessary to competently treat patients or conduct research.

Definitions of abstract concepts are inherently debateable as they can be seen as reductionist and lead to conflicting meanings where linked to emotion and values (Cribb, 1998). Wall (1999) even questioned the usefulness of pain as a single word to describe the experience considering the breadth and depth of emotional suffering. However, definitions of pain allow insight into the experience and those presented here are frequently cited but not universally accepted. This continued ambiguity and discordance is logical considering the subjective, diverse and dynamic nature of pain. It also illustrates the need for a further exploration of the cause, meaning, effects and experience of pain for patients admitted to hospital for surgery.

Section 2.3 Physiology of postoperative pain

A basic outline of the physiology of postoperative pain is discussed here to provide a biological perspective on the individuality of pain, even between those undergoing the same procedure.

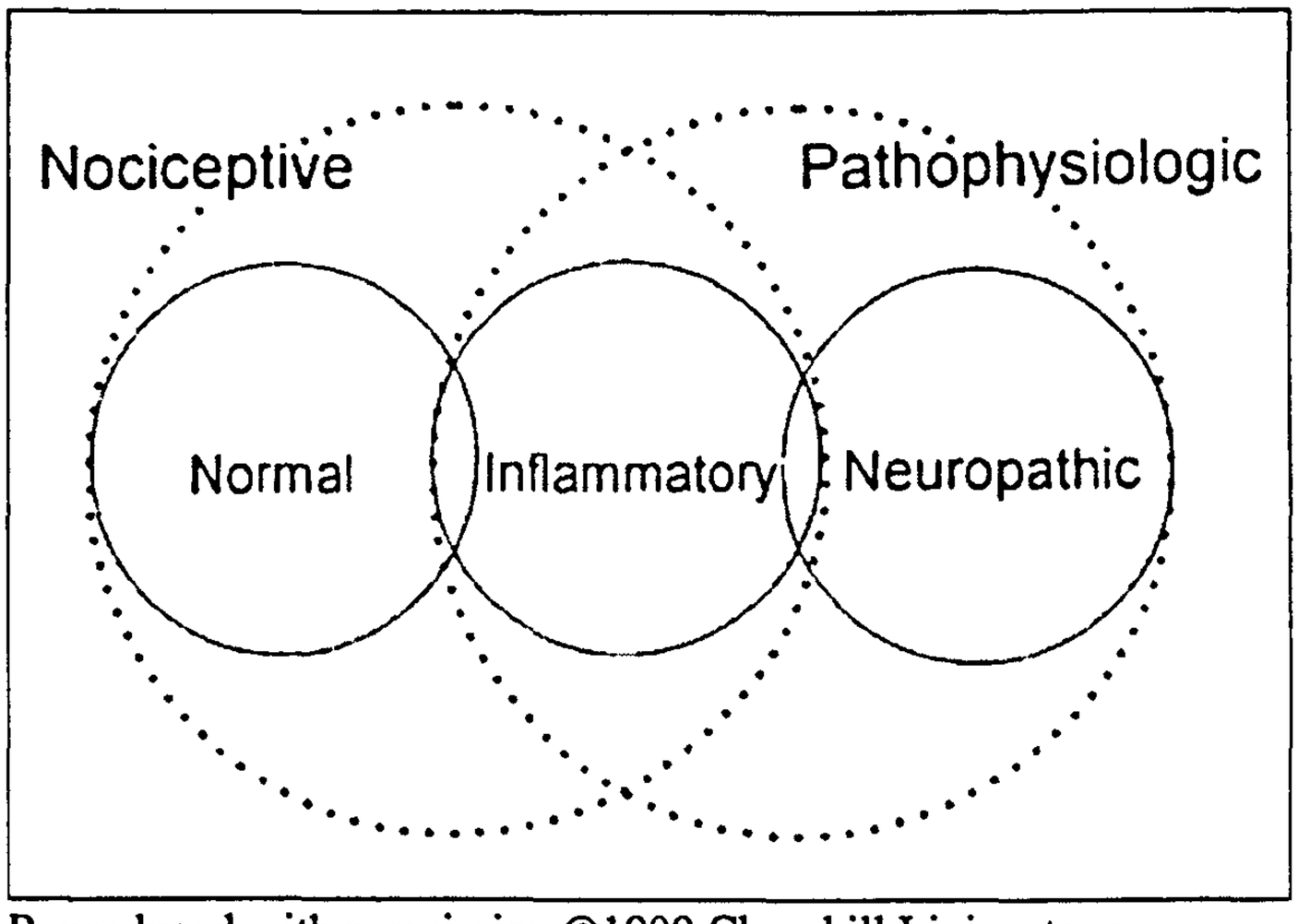
Pain has traditionally been classified into acute, chronic non-malignant and chronic malignant pain. Acute pain is usually associated with tissue damage (surgical or traumatic), subsides with healing and generally lasts less than three months (Bonica, 1990a). Chronic non-malignant pain lasts beyond three to six months, is associated with a pathological process in the nervous system and includes conditions such as arthritis and phantom limb pain (McCaffery and Beebe, 1994). The final category relates to pain arising from cancer.

More recently pain has been categorised into nociceptive, inflammatory and neuropathic types. Nociceptive pain describes the normal process of pain inducing stimuli being transmitted through the nervous system such as a pinprick (Pasero *et al.*, 1999a). Inflammatory pain refers to changes in the peripheral nervous system (PNS: sensory and motor nerves leading to the spinal cord) and central nervous system (CNS: brain and spinal cord) as a result of tissue damage (Devor and Seltzer, 1999). This is described in relation to postoperative pain in Sections 2.31 and 2.32. Neuropathic pain refers to impulses generated at abnormal points in the peripheral nervous system usually due to nerve damage (Devor and Seltzer 1999; Pasero *et al.*, 1999) and is the main mechanism behind many chronic pain conditions.

Classification of pain is problematic as categories of pain are not distinct, individuals may have more than one type contributing to their experience and acute pain may

develop into a chronic pain condition (Perkins and Kehlet, 2000). The model presented in Figure 2.31 aims to clarify some of the issues by representing the possible relationship between nociceptive, inflammatory and neuropathic pain.

Figure 2.3.1. Model of relationship between nociceptive, inflammatory and neuropathic pain (Devor and Seltzer 1999, p 130)



Pain after surgery can be classified as acute pain or nociceptive and inflammatory pain and the physiological process described in four stages: transduction, transmission, perception and modulation (Pasero *et al*,. 1999).

2.3.1 Transduction

Free nerve endings (nociceptors) convert noxious stimuli such as mechanical damage, extremes of temperature and dissolved chemicals into an electrical stimulus in the membrane of the nerve cell. Postoperative pain arises from the stimulation of these fibres located within the skin, deep somatic (muscle, bone etc) and visceral areas (organs) (Cousins and Power, 1999). Cells around a surgical incision release algogenic (pain inducing) chemicals such as bradykinins, histamine, prostaglandins, substance P, and hydrogen and potassium ions. These substances have a number of functions but they further sensitise nerve endings and innocuous stimuli such as light pressure or

movement may now be felt as pain (Raja *et al.*, 1999). This sensitisation in the PNS is the first component of inflammatory pain described in Figure 2.3.1 (Devor and Seltzer, 1999).

2.3.2 Transmission

Depolarisation of two main types of peripheral nerve fibre occurs and their relative properties are presented in Table 2.3.1.

Table 2.3.1. The relative properties of the main nociceptors (Melzack & Wall, 1996)

Fibre	Diameter µm	Speed m/sec	Sheath	Responds to:
A-delta	1-5	6-30	Myelinated	Light pressure Heavy pressure Heat (45 ˚C+) Chemicals Cooling
C	0.25-1.5	1.0-2.5	Unmyelinated	Light pressure Heavy pressure Heat (45 ˚C+) Chemical Warmth

The larger, faster A-delta fibres are largely responsible for transmitting localised sharp pain and smaller C fibres conduct generalised dull or burning pain (Raja *et al.*, 1999). These fibres transmit the signal to an area of the spinal cord called the dorsal horn where the nerve ends.

Neurotransmitters (chemicals that transmit impulses to another nerve or muscle fibres) ensure that impulses travel across the synaptic cleft to inter-neurons in the dorsal horn. This transmission can be modified and in 1965, Melzack and Wall proposed the Gate Control Theory of Pain, a mechanism influencing impulses to the brain and therefore perception of pain. Now a widely accepted concept, the mechanism can be activated ("opening" the gate, allowing stimulation of the dorsal horn neurons) and includes an

inhibitory mechanism (other neurons "closing" the gate by inhibiting the release of neurotransmitters). A simple example of an inhibitory process is the common use of touch and pressure. Rubbing the painful part stimulates A-beta nerve fibres (which only respond to light pressure) blocking transmission of nociception to spinal cord by other fibres effectively "closing the gate" and altering the perception of pain (Melzack and Wall, 1996).

However, while rubbing the painful part may help decrease pain in minor injuries, for surgical patients, such actions may increase pain. The increase of frequency and magnitude of signals from the periphery mean that the central nervous system becomes sensitised to impulses and input from A-beta fibres may be transmitted within the CNS as pain (Devor and Seltzer, 1999). This process is described as central sensitisation and is the second component of inflammatory pain.

If impulses do reach the dorsal horn neurons they continue along the ascending fibres to the thalamic and brain stem regions.

2.3.3 Pain perception

Pain subsequently becomes a conscious experience through the transfer of impulses to the reticular system (evoking motor, sensory and autonomic responses), somatosensory cortex and limbic regions are involved (responsible for emotional responses, memory and past experiences) (Wallace, 1992). The precise location in the brain of pain perception is unknown (McCaffery and Pasero, 1999).

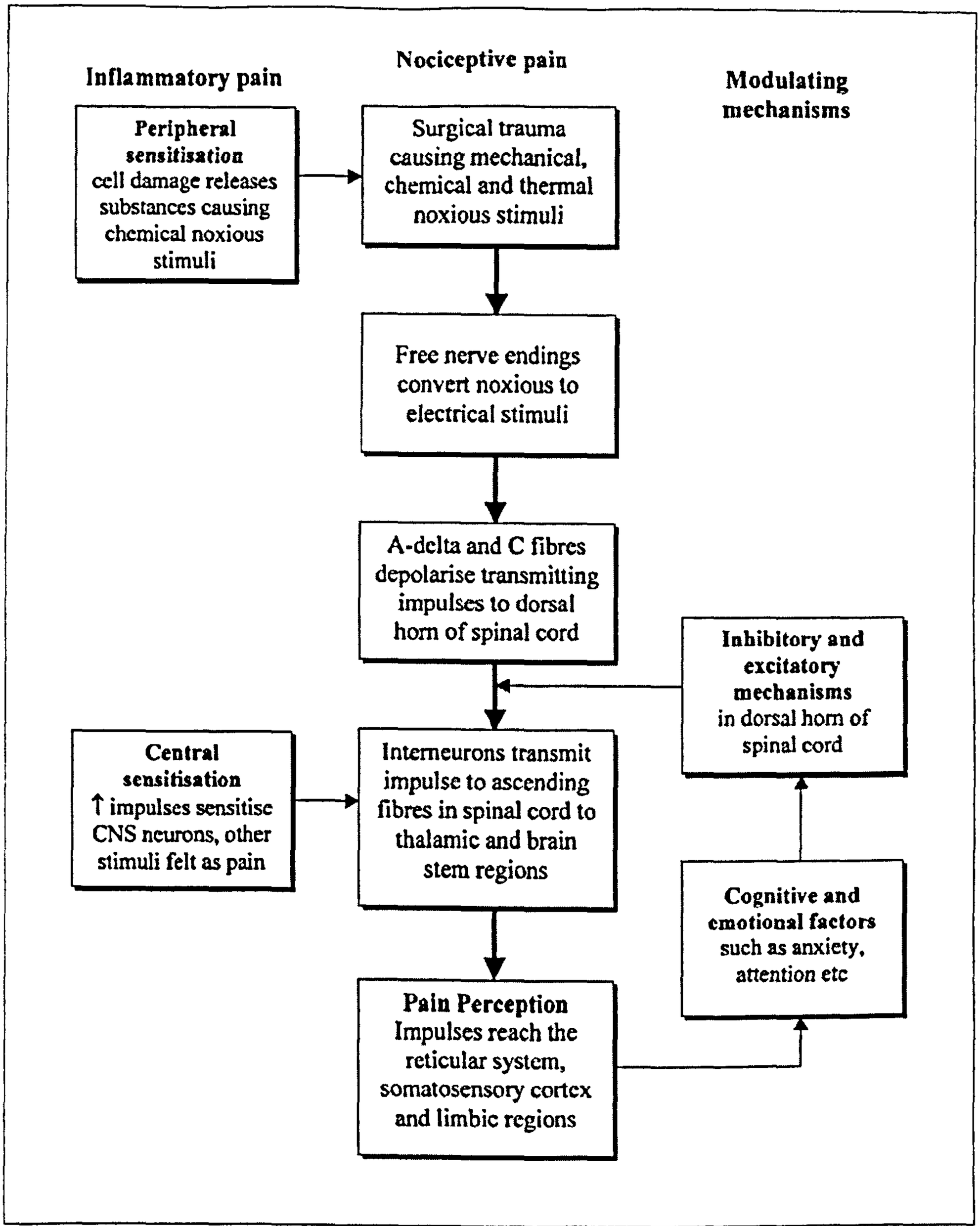
2.3.4 Modulation

Modulation involves changing or inhibiting the impulses transmitting pain such as endogenous or exogenous opioids acting in the central nervous system (Pasero *et al.*,

1999a). A significant modulating mechanism occurs along the descending fibres from the brain to the spinal cord influencing the gating system and perception of pain (Melzack and Wall, 1996). Attention can influence pain perception through distraction especially using other sensory modalities such as visual or auditory stimuli (Villemure and Bushnell, 2002). Emotional factors and other cognitive processes can also modulate pain perception (these variables are discussed in more detail in Section 2.5) although the mechanism is less clear (Rhudy and Meagher, 2001).

Figure 2.3.2 summarises the physiological mechanisms involved in postoperative pain perception.

Figure 2.3.2. Summary of the physiology of postoperative pain



Based on information from Cousins and Power (1999); Devor and Seltzer, (1999); Pasero *et al.*, (1999a).

The physiology of nociception is complex and recent research in this area has demonstrated that it is not a "hard wired" system. The nervous system changes in response to pain even over a short period of time and this plasticity influences an individual's response (Cousins and Power, 1999). The degree of tissue damage and extent of surgery will play a role in pain perception but modulating mechanisms mean

that this is not a reliable predicator of pain intensity. Exploring the physiology of postoperative pain provides an insight into the subjective nature of pain and a basis for understanding the effects of the experience on an individual after surgery.

Section 2.4 Effects of postoperative pain

Acute pain has a biological protective function that warns of impending or actual tissue damage, alerts us to the need for help, prevents harmful movements and may even aid healing (Cousins and Power, 1999). However, while low levels of pain alert our attention enabling appropriate behaviour, at increased intensity levels, action becomes disorganised and inefficient (Craig, 1999). Postoperative pain can have a detrimental effect on an individual's physical, psychological and social well-being and recovery.

2.4.1 Physiological response to postoperative pain

A complex physiological response to pain and surgery occurs disrupting the homeostasis of several systems within the body initiating a metabolic stress response in a similar way that anxiety, hypovolaemia, infection, starvation and dehydration facilitate reactions (Hamill, 1994; National Health and Medical Research Council, 1999). The general effects outlined here have been demonstrated by laboratory studies on acute pain and clinical studies relating to postoperative pain, therefore general responses are highlighted.

Acute pain causes tachycardia, systemic vascular resistance and hypertension. The oxygen demand of the myocardium increases but blood flow to the area is reduced because of the decreased filling time of the heart (Hamill, 1994; Cousins and Power, 1999). These changes in the cardiovascular system increase the risk of complications such as dysrhythmias, ischaemia and myocardial infarction particularly in patients with

existing coronary heart disease (NHMRC 1999). Changes in blood coaguability as a result of pain, the stress response after surgery and reduced mobility mean that patients are at increase risk of thrombus formation leading to deep vein thrombosis or pulmonary embolism (Bonica, 1990b).

Similar to the general stress response, respiratory rate and depth increase as oxygen demands and carbon dioxide production rises. Individuals who have received abdominal or thoracic surgery may experience painful muscle spasms around the surgical incision discouraging deep breathing, coughing and the clearance of secretions (Hamill, 1994; Ballantyne *et al.*, 1998). This may alter ventilation and perfusion rates leading to complications such as hypoxaemia, atelectasis and respiratory infection (Bonica, 1990b). Puntillo and Weiss (1994) demonstrated a higher incidence of atelectasis in those with high pain scores compared to lower scores in a sample of 74 cardiac surgery patients ($p<0.05$). These effects on the respiratory system mean that those with existing pulmonary conditions are particularly at risk of the consequences of unrelieved pain.

The gastrointestinal system increases interstitial fluid and gastric secretions but smooth muscle tone and motility are reduced leading to compromised absorption, bacterial overgrowth, nausea, vomiting, gastric stasis, paralytic ileus and bowel oedema (Bonica, 1990b; Hamill, 1994; Chia *et al.*, 2002b). Opioids can have a similar effect, delaying gastric emptying, decreasing secretions and motility (Pasero *et al.*, 1999b). Therefore, the primary cause of gastrointestinal complications is difficult to assess in postoperative patients receiving opioid analgesics.

There is a marked and complex metabolic and endocrine response to surgery and postoperative pain and a summary is presented in Table 2.4.1.

Table 2.4.1. Metabolic and endocrine response to surgery and pain

System	Response
Endocrine	Increase in catabolic hormones: Adrenocorticotrophic hormone (ACTH), epinephrine, norepinephrine, cortisol, antidiuretic hormone (ADH), growth hormone, catecholamines, angiotensin II, renin, aldosterone, glucagon, tumour necrosis factor, interleukin-1 Decrease in anabolic hormones Insulin, testosterone
Metabolic	Carbohydrate Hyperglycaemia, glucose intolerance, insulin resistance Protein Muscle protein catabolism, increase synthesis of acute phase proteins Fat Increase lipolysis and oxidation
Water & electrolyte flux	Retention of water and sodium, increased potassium excretion, decreased functional extracellular fluid shifts to intracellular compartments

Adapted from Cousins and Power (1999); NHMRC (1999)

Pain can suppress immune function despite an increase in the number of immune cells produced by the body (Leibeskind, 1991; Cheever, 1999). It is also thought that immune cells and their by-products are involved in the modulation of pain at a localised and CNS level although the exact mechanism is unclear (Watkins and Maier, 2000). Research into the effect of pain on the immune system is in its infancy and focuses on animal models, raising questions surrounding the application of results to humans.

Pain after surgery initiates a complex physiological response, which can affect morbidity and mortality, especially in patients who have concomitant medical conditions. The evidence for effective pain management reducing these risks is explored in Section 2.7.4.

2.4.2 Psychosocial response to pain

Post *et al.* (1996) argued that pain and suffering could be separated but most do not subscribe to this overt dualism i.e. separation of the physical and psychological

elements of pain. The psychosocial response is an integral part of experiencing pain and even Post *et al.* (1996) acknowledged a relationship between pain and suffering when the source is unknown, cannot be controlled or is without an end. Each of these may apply to the postoperative patient and even the source may not necessarily be the surgical site (e.g. referred pain, pain from procedures in theatre such as intubation or position). When experienced, postoperative pain can have a profound effect on the psychosocial well being and recovery of an individual but as Craig (1999, p334) explained, "...dynamic, often turbulent flow of feelings, images and thoughts are not readily reduced to descriptive language." However, an exploration of the general psychosocial response allows insight into pain perception and expression helping illustrate the juncture between the mental and physical (Bendelow, 2000).

General behavioural responses include an urge to escape the cause and obtain relief and although the former is difficult for surgical patients, activities that cause or worsen pain may be avoided and the affected area immobilised. Non-verbal expression includes withdrawal, grimacing, frowning, eyes wide open or tightly shut, rigid body position, wincing, bracing, rubbing the painful areas and non-verbal vocalisations (e.g. groaning, gasping and moaning) (Chapman and Turner, 1990).

Acute and postoperative pain evokes a wide range of emotional responses. Paice *et al.*, (1995) found in a sample of 100 general surgical patients, 74% reported that pain had a negative effect on mood. Postoperative pain can cause fear, anxiety, depression, frustration, feelings of helplessness and hopelessness. This heightened emotional arousal can contribute to the physiological stress response and even increase pain and sensitivity to stimuli (Cousins and Power, 1999).

Sleep plays a vital physical and psychological restorative function in humans. Closs (1992b) found that nearly two thirds of patients experienced reduced sleeping patterns following surgery with pain the most frequently cited cause of night-time wakening. Carr (2000) reported similar findings in a group of 85 gynaecology patients and also investigated the impact pain had on activity levels, mood, walking, relationships and life in general up to ten days post surgery. As well as sleep, pain caused the greatest interference with activity and walking on postoperative day two and psychological well-being was most threatened on day four coinciding with the transition from hospital to home.

The psychological and behavioural responses to pain are unique to individuals although a small number of research studies have illustrated the general effect of surgical pain on mood, sleep, activity, psychological well-being and recovery. The individuality of pain responses may be explained by a variety of factors affecting perception and expression.

Section 2.5 Factors affecting the perception and expression of pain

Variables influencing the perception and expression of pain have formed a major area for research but the main factors are briefly discussed here, highlighting areas relevant to surgical patients and further illustrating the individuality of the experience.

2.5.1 Age

Research in the laboratory setting has searched for age-related changes in pain physiology and perception. While some reviewers have concluded that older people have higher pain thresholds (the point at which noxious stimuli causes pain) (Gagliese *et al.*, 1999), there are an equal number of papers which reported no differences between age groups or occasionally reduced thresholds (Pickering *et al.*, 2002). The American Geriatrics Society (2002) concluded that it is not clear how potential age-

related changes demonstrated in the experimental setting can influence an individual's experience and are probably not clinically significant.

In clinical studies, analgesic consumption has been significantly lower in older age groups after surgery (Oberle *et al.*, 1990; Feldt *et al.*, 1998; Celia, 2000; Gagliese *et al.*, 2000; Gagliese and Katz, 2003). Health care professionals administering more analgesics to younger people has been offered as an explanation although older people reported that they were less likely to ask for pain relief in some research (Winefield *et al.*, 1990; Thomas *et al.*, 1998). Studies comparing older and younger people using PCAs showed consistent findings, with older adults consuming less opioid analgesics after surgery (Macintyre and Jarvis, 1995; Gagliese *et al.*, 2000). The research reviewed here has generally found no significant difference in pain intensity between age groups and analgesic results have been attributed to increased sensitivity to opioids in older adults (Gagliese *et al.*, 2000).

Research into age-related changes in pain perception have produced inconsistent results and a comparison between studies is difficult due to differences in methodology and definitions of the older age group. Therefore it may be dangerous to assume that older people perceive pain differently or less intensely (Ferrell *et al.*, 1995) although they may be more reluctant to express pain after surgery.

2.5.2 Sex and Gender

In pain research, the term *sex* refers to the biological distinction between male and female while *gender* is the sex related social role with which people identify in terms masculinity and femininity (Fillingim, 2000). Experimental and clinical research has focused on both these areas to explore differences between men and women.

Riley *et al.* (1998) conducted a meta-analysis of research investigating sex differences and noxious experimental stimuli discovering moderate to large differences in pain threshold and pain tolerance (the point at which pain becomes intolerable). Male participants had higher pain threshold and tolerance and although the exact mechanisms are unknown, a number of factors relating to women have been proposed. These include hormonal influences of the menstrual cycle, increased emotional distress, gender roles and increased awareness of pain in others (Fillingim, 2000; Keogh and Herdenfeldt, 2002; Wise *et al.*, 2002). Wise *et al.* (2002) investigated gender role expectations in relation to pain behaviours (the perception that men are less likely to report pain and women more sensitive and less tolerant) and found that learned gender roles were significant predictors of threshold, tolerance and pain unpleasantness in a group of undergraduate students.

The results of clinical studies are less clear and gender differences are rarely the primary focus of research. Some studies have found no differences in pain intensity between male and female surgical patients (Taenzer *et al.*, 1986; Lynch *et al.*, 1997) yet others reported women experiencing higher pain scores (Puntillo and Weiss, 1994; Yates *et al.*, 1998). Across all these studies men had higher analgesic consumption and Calderone (1990) suggested health care professionals attitudes may influence administration but the same pattern has been found with 2298 Chinese patients using PCA (Chia *et al.*, 2002a).

Experimental studies suggest a relationship between sex, gender and pain experiences but similar to age-related studies, research varies in the induction and measurement of pain and the applicability of results to practice is uncertain. Mixed results from clinical studies suggest that more rigorous research is needed, addressing previous weaknesses

by using a prospective design, similar numbers in each group and comparable types of operation. The influence of sex and gender on an individual's perception and expression of pain after surgery is unclear.

2.5.3 Culture

Human behaviour is often influenced by social and cultural norms and the experience of pain involves a process of socialisation. During infancy pain is a distressing, noxious stimulus, which becomes associated with the words "ouch," "hurt" and later the abstract word "pain." This experience is also associated with parental reactions to the emotional distress, learning permissible pain behaviours and witnessing the reactions of others to pain (Mitchell and Loustau, 1981; Waddie, 1996; Helman, 2000). Culture can determine expectations of pain, how to tolerate it and appropriate public behaviours and verbal expressions (Martinelli, 1987; Waddie, 1996).

Research into the cultural components of pain began over 50 years ago with works by authors such as Zborowski (1952) who observed four cultural groups after surgery. This classic research made broad statements about pain behaviours and culture, although rigour in research design is not explicit and results have been questioned in light of the number of ethnic groups accepted today (Helman, 2000). Some recent research has suggested that African-Americans have a greater sensitivity to experimental pain compared to Caucasians (Edwards *et al.*, 2001) however other research has presented mixed results (Faucett *et al.*, 1994).

Faucett *et al.* (1994) followed 669 individuals admitted for removal of third molars and those reporting European origin experienced significantly less pain than those of African-American and Latino backgrounds (after controlling for factors such as age and

gender). Another study with orthopaedic trauma patients demonstrated that Caucasian individuals received significantly higher amounts of opioids but whether differences lie in requirements or as a result of bias during administration is unclear (Ng *et al.*, 1996).

The cultural meaning of pain has the potential to influence the experience and while some communities may view it as a positive sensation from which lessons can be learnt, others may perceive pain as punishment for wrong doing (Martinelli, 1987; Helman, 2000). Such factors may determine a patient's expression and search for pain relief as well as a clinician's reaction. Hunter (2000) highlighted that differences in cultural background between patient and the nurse that may result in biased judgements such as the perception of "over-reacting" by an individual who is emotionally expressive during pain. Harrison *et al.* (1996) found that nurse and patient ratings of pain were significantly correlated between those who shared a 'mother tongue' compared to nurse-patient dyads that did not share a first language. These results are supported by Calvillo and Flaskerud (1993) who demonstrated that predominantly Anglo-American nurse participants judged patients pain to be more severe for those who were born in the USA, had professional occupations and spoke English.

The results of experimental and clinical research examining cultural differences in pain perception are tentative due to the limited number of studies, sample size differences, inconsistent results and the unexplored potential effect of the researcher's cultural background. In addition, there is the controversial issue of ethnic classification and how this is operationalised in research (Edwards *et al.*, 2001). Social and cultural norms undoubtedly influence the experience and expression of pain and are shaped by childhood experiences but the wider cultural issue is complex. Clinicians and

researchers have to be cognizant of this and the possibility of ethnic stereotyping instead of understanding the individuality of expression (Helman, 2000).

2.5.4 Emotional state and personality traits

The anatomical overlap within the brain and spinal cord of the pathways involved in pain and emotional responses has led to close investigation of the relationship between the two. This large area of research is briefly discussed here focusing on transient emotional states and personality characteristics that may modulate pain perception and expression after surgery.

Meagher *et al.* (2001) studied the effect of mood and evoked emotions (by showing participants photographs associated with fear, disgust or neutral objects) on experimental pain induced by cold water. Fear and disgust reduced pain thresholds but only fear reduced tolerance compared to neutral pictures.

Anxiety has been found to have a significant relationship with pain intensity for patients admitted for surgery (Hayward 1975; Boore 1978; Carr, 2000). Spielberger (1966) described anxiety as having a fixed personality element or *trait anxiety* and a transient aspect stimulated by a particular situation, known as *state anxiety*. The inventory subsequently developed as a measure of the emotion has been used as a "gold standard" in research (Egan, 1994) and as a potentially stressful event, the surgical experience has been closely studied. Higher trait anxiety scores have been associated with higher pain scores in some studies (Chapman and Cox, 1977; Taenzer *et al.*, 1986; Voulgari *et al.*, 1991) although the majority of research discussed here did not find such a relationship.

A number of studies have found that preoperative state anxiety is a significant, often linear predictor of postoperative pain intensity (Scott *et al.*, 1983; Perry *et al.*, 1994; Lynch *et al.*, 1997; Kain *et al.*, 2000) yet others have found a weak or no significant relationship (Johnston and Carpenter, 1980; Seers, 1987; Oberle *et al.*, 1990; Thomas *et al.*, 1998). Interestingly, two classic studies reported a reduction in preoperative anxiety through patient information and this was associated with reduced postoperative pain (Hayward, 1975; Boore, 1978). Postoperative state anxiety has also been found to have a strong relationship with postoperative pain scores (Scott *et al.*, 1983; Seers, 1987; Oberle *et al.*, 1990; Winefield *et al.*, 1990; Nelson *et al.*, 1998; Kain *et al.*, 2000). The mixed results regarding anxiety and pain have been attributed to the difficulties in defining pain and anxiety, differences in measurement tools and possible response bias whilst individuals are anxious (Munafo, 1998; Craig, 1999).

Personality characteristics influencing the experience of postoperative pain have been the subject of a small amount of research. Studies have cautiously concluded that pain scores may be predicted by a tendency towards neuroticism (Taenzer *et al.*, 1986; Parbrook *et al.*, 1973) and extroverted hostility (Voulgari *et al.*, 1991) although conflicting results are available (Cronin *et al.*, 1973). Research in this area is far from conclusive and limited by the small number of studies and lack of recent investigation.

Admission to hospital for surgery can affect autonomous function because of the consequences of surgery and increased dependency levels (Copp, 1993) therefore perceived control over pain management has been explored as a factor that influences intensity perception. Rotter (1966) proposed the personality theory of Locus of Control which has two extremes; internal control (a belief in one's own actions determining outcomes) and external control (where outcomes are perceived as controlled by luck,

fate or other powerful individuals or forces) (Johnson *et al.*, 1971). A number of measurement tools were subsequently developed and although some studies have shown little relationship between locus of control and postoperative pain scores (Wise *et al.*, 1978; Clum *et al.*, 1979; Taenzer *et al.*, 1986; Pellino, 1997), other research has demonstrated that those with an internal locus of control consume less analgesics and have lower pain scores (Johnson *et al.*, 1989; Reynaert *et al.*, 1995; Pellino, 1997). A wide variety of tools have been used in these studies making comparisons difficult and the sensitivity of scales has been questioned (Wise *et al.*, 1978; Mahler and Kulik, 1990).

State anxiety as a result of admission to hospital or experiencing pain appears to be associated with postoperative pain intensity levels and this inter-relationship is widely acknowledged in theoretical models of pain and emotion. Personality influences are less clear due to the limited research and there may be other factors, which have not been explored here such as depression, contributing to the perception and expression of pain.

2.5.5 Summary

A wide range of factors can potentially influence an individual's perception and expression of pain after surgery and this brief review highlights the areas of age, gender, culture, emotional state, and personality characteristics based on the evidence available. Other emotions, past surgical experiences, preoperative pain and coping strategies are areas that may also be involved in the modulation of pain but have not been examined in any depth here.

A difficulty in the clinical application of the research reviewed here arises due to methodological differences in measurement, sampling and a reported propensity to

publish positive research results (Munafo, 1998). Also, studies have not yet addressed the specific neural mechanisms that are involved in the modulation of pain by emotion and other factors (Villemure and Bushnell, 2002). Although more rigorous research is required in specific areas, it is unlikely that the individuality of pain after surgery will be explained by one variable but rather a combination of persistent and changeable physiological, psychological, social, cultural and situational factors.

Section 2.6 Pain management experiences of surgical patients

The process of admission to hospital for elective surgery is widely recognised as a stressful event (Wilson-Barnett, 1979; Biley, 1989) and the experience of pain, one of the greatest patient fears (Carr, 1990; Macario *et al.*, 1999). This individual experience has been highlighted (in relation to the physiological and psychosocial response) but research has also explored the collective experiences of patients, focusing on the prevalence of pain, patient expectations and satisfaction with pain management. Each of these areas is discussed here to illustrate the general experiences of surgical patients.

2.6.1 Prevalence of pain after surgery

A number of studies have reported the prevalence of pain within different surgical inpatient groups and the main results have been summarised in Table 2.6.1.

Table 2.6.1. Studies reporting the prevalence of postoperative pain

Author/s	Date	Sample	Type of surgery	Scale used	Postop. day	Main results and conclusions
Cohen	1980	109	Abdominal	Pain / distress scores	3	75.2% moderate or marked pain/distress score
Weis *et al.*	1983	81	General Major orthopaedic Major gynaecology	VAS with adjectives	24hrs 48hrs	41% moderate to severe pain
Donovan *et al.*	1987	353	Surgical and medical patients	VAS with adjectives	24hrs after admission	58% excruciating or horrible pain
Melzack *et al.*	1987	88	Abdominal Vascular Cardiac	MPQ	Before and 1hr after analgesic	Days 1-4 mean 2.5 Days 5-18 Mean 3.3
Seers	1987	80	Abdominal	VAS with adjectives	1-7	Day 1-21% very bad/agonising pain, 70% very bad/agonising when moving
Balfour	1989	16	Abdominal	VAS VRS	2	62.8% moderate to severe pain
Kuhn *et al.*	1990	101	Hysterectomy Cholecystectomy	VAS with adjectives	1-6	Average pain intensity 60% of maximum
Owen *et al.*	1990	259	General	VRS	24hrs 72hrs	24hrs- 74% moderate, severe or unbearable pain 72hrs- 65% moderate, severe or unbearable pain
Winefield *et al.*	1990	61	Open cholecystectomy	VAS with 0-10 scale	1-3, 6	Day 1 Mean 4.2 (SD 2.4) Day 2 Mean 3.4 (SD 2.4) Day 3 Mean 2.4 (SD 2.3) Day 6 Mean 0.9 (SD 1.1)

Table 2.6.1. ***Continued***

Author/s	Date	Sample	Type of surgery	Scale used	Postop. day	Main results and conclusions
Paice *et al.*	1991	34	Surgical oncology	NRS	1-31	38.2% moderate to severe pain
Tittle *et al.*	1992	100	Abdominal	MPQ VAS	1, 3	Day 1- mean 48.07mm (SD 25.4) Day 3 mean 33.13mm (SD 26.2)
Wilder-Smith and Schuler	1992	164	Hysterectomy	VRS	Postop. night	45% moderate to severe pain
Closs *et al.*	1993	100	Orthopaedic elderly	VRS	3	41% moderate to severe pain
Bruster *et al.*	1994	5150	Surgical and medical patients	VRS	2-4weeks post discharge	61% (3157) had pain, 87% of this group pain was moderate to severe
Lloyd and McLaughlin	1994	2541	All surgical admissions	VRS	Not stated	39% moderate to severe pain
Miaskowski *et al.*	1994	72	Surgical and medical	NRS	Not stated	43% greater 5.0 score Mean pain now scores 4.3 (SD 2.3) Mean worst pain scores 7.6 (SD 2.2)
Oates *et al.*	1994	206	General	VAS VRS	24hrs	80% experienced pain 34.4% moderate to severe pain Mean pain score 4.7cm
Paice *et al.*	1995	100	General	NRS VAS	Not stated	74% in pain at time of interview, 90% in last 72 hrs Mean score 3.16 (SD 2.8) Worst pain mean 5.7 (SD 3.4)
Ferguson *et al.*	1997	43	Cardiac	NRS VAS	8 hourly intervals in 48hrs	Mean pain intensity 3.00-3.74 (SD 2.2-2.5)

Table 2.6.1. ***Continued***

Author/s	Date	Sample	Type of surgery	Scale used	Postop. day	Main results and conclusions
Jamison *et al.*	1997	119	Orthopaedic	VRS	Day of discharge	Pain now-35.3% moderate to unbearable Past 24hrs-57.2% moderate to unbearable Worst pain-94% moderate to unbearable
Kuperberg and Grubbs	1997	20	Cardiac	NRS VRS	2, 4	75% experienced pain Day 2-80% (16) ≥5.0 on NRS last 24hrs Day 4-65% (13) ≥5.0 on NRS last 24hrs
Lynch *et al.*	1997	276	General	NRS	1-3	Day 1-mean at rest 2.6, on movement 4.5 Day 3-mean at rest 2.3, on movement 4.2
MacKintosh and Bowles	1997	'92-100 '95-106	General major	MPQ VRS	48-72hrs	Pain now '92-18% ≥ discomfort '95-4.4% ≥ discomfort Worst pain'92-58% ≥ discomfort '95-28% ≥ discomfort
Thomas *et al.*	1998	91	Major orthopaedic	MPQ	1-5	Mean score Day 1-3.0, Day 2-2.6, Day 3-2.5 Day 4-2.3, Day 5-2.0
Yates *et al.*	1998	205	Surgical and medical	MPQ VAS	Not stated	78.6% pain in last 24 hrs, 33.5 %of this group pain was distressing, horrible, excruciating
Amata *et al.*	1999	90	Major abdominal	VRS	24hrs	90% experienced moderate to severe pain with first 24 hrs
Dahlman *et al.*	1999	80 (2 groups)	Thoracic	VAS	2-6	76% experienced pain Mean score group A-46mm B-43mm

Table 2.6.1. ***Continued***

Author/s	Date	Sample	Type of surgery	Scale used	Postop. day	Main results and conclusions
Vallano *et al.*	1999	967	Abdominal	VAS VRS	1	38.5% moderate to unbearable pain now at 24hrs 69% moderate to unbearable worst pain 14% >50mm at 24hrs now 47% >50mm worst pain
Carr	2000	85	Major gynaecological	NRS	2,4 and 10	Day 2 Least pain: 1.84 Worst pain: 5.73 Day 4 Least pain: 1.72 Worst pain: 4.55 Day 10 Least pain: 1.08 Worst pain: 3.29
CSAG	2000	117	Major abdominal & gynaecological	Not stated	Not stated	43% experienced severe pain
Svensson *et al.*	2000	185	General	VAS	0-72hrs	39% moderate to severe pain at rest 88% moderate to severe worst pain in last 24hrs

Key

MPQ McGill Pain Questionnaire present pain index (0-no pain, 1-mild, 2-discomforting, 3-distressing, 4-horrible, 5-excruciating)
NRS Numerical rating scale e.g. 0-10
SD Standard deviation
VAS Visual analogue scale and 10 cm line with numerical anchors or adjectives
VRS Verbal rating scale e.g. No pain, mild, moderate, severe, very severe.

Based on this research, 74-90% of patients experienced postoperative pain (Oates *et al.*, 1994; Paice *et al.*, 1995; Carr and Thomas, 1997a; Kuperberg and Grubbs, 1997; Yates *et al.*, 1998; Dahlman *et al.*, 1999) with the greatest intensity immediately after surgery and it decreasing on subsequent days in hospital (Melzack *et al.*, 1987; Seers, 1987; Winefield *et al.*, 1990; Tittle *et al.*, 1992; Kuperberg and Grubbs, 1997; Carr, 2000; Svensson *et al.*, 2000). Patients' worst pain experiences have been attributed to postoperative treatment, examination, mobilisation or spontaneous break through pain (Carr, 2000; Svensson *et al.*, 2000).

The results from Table 2.6.1 illustrate that approximately 35-90% of patients experienced moderate or greater pain intensities postoperatively. Although this research has consistently shown a high proportion of patients receiving inadequate pain management, a number of methodological issues make comparisons across studies difficult. Variables include the range of measurement tools used, timing of the interview, sample size; four studies included medical patients and one was based on audit data. The majority of research has focused on measuring pain at rest, which may worsen during movement as illustrated in a study of 80 abdominal surgical patients. Seers (1987) found 21% of participants experienced very bad or agonising pain on the first day at rest and 70% upon movement.

Cultural factors may influence studies reporting pain prevalence (research originates from the UK, USA, Australia, Scandinavia and South American countries) and may reflect differences in health care provision for pain management. The British studies reported 21-63% of patients experiencing moderate to severe postoperative pain at rest (Seers, 1987; Balfour, 1989; Kuhn *et al.*, 1990; Closs *et al.*, 1993; Lloyd and McLaughlin, 1994; Oates *et al.*, 1994; Carr, 2000; CSAG 2000) but in all studies there

is a propensity to focus on patients receiving major surgery rather than the wider surgical population.

Despite the methodological issues, it is widely accepted within the literature that pain after surgery is poorly managed due to the high prevalence of patients who experienced moderate to severe pain. This has been attributed to a variety of factors relating to patients, health care professionals and organisational issues, which are explored further in Chapters 3 and 4.

2.6.2 Patient expectation and satisfaction

Preoperative interviews have demonstrated that the majority of patients expect pain after surgery (Carr and Thomas, 1997a; Jamison *et al.*, 1997) but when anticipated intensity has been compared to actual postoperative experiences, mixed results have been reported. In a small qualitative study, Carr and Thomas (1997a) found that 80% of patients underestimated their pain. Jamison *et al.* (1997) reported 89% (n=119) of patients anticipated moderate-severe pain and 94% experienced it and a few studies have described patients feeling less pain than expected (Nay *et al.*, 1996; Thomas *et al.*, 1998). Differences between expectations of pain and lived postoperative experiences have been explored as a factor influencing patient satisfaction.

The measurement of patient satisfaction has been described as an emerging science (Delbanco, 1996) and is increasingly used as a quality of care indicator (Afilalo and Tselios, 1996; Jamison *et al.*, 1997; Department of Health, 1997; Department of Health, 1999). Investigators have used a wide range of tools to measure opinion but results from several countries have shown high levels of satisfaction (between 60-95% of patients) despite high postoperative pain scores (Donovan, 1983; Miaskowski *et al.*, 1994; Nay *et*

al., 1996; Jamison *et al.*, 1997; McNeill *et al.*, 1998; Thomas *et al.*, 1998; Calvin *et al.*, 1999; Sartain and Barry, 1999; Idvall, 2002; Stockwell *et al.*, 2002). Results have generally been skewed towards high satisfaction and only two studies found small correlations which demonstrated that patients with higher pain intensity scores were most dissatisfied (Miaskowski *et al.*, 1994; Ward and Gordon, 1996).

As individual factors, age, gender, past surgery, perceived helpfulness of staff and time taken to receive analgesics do not correlate with patient satisfaction (Jamison *et al.*, 1997; Devine *et al.*, 1999; Carr, 2000). Thomas *et al.* (1998) defined a number of "high risk" variables as possible predictors of pain intensity and satisfaction in orthopaedic patients; high preoperative pain, previous pain lasting more than six months, high level of expected pain, females and patients under 60 years. Those with a low number of factors tended to have lower pain intensity and a greater satisfaction with pain management. Some may question these factors based on wider evidence on age and gender but the authors recognised the need for further research. Carr (2000) found that the effectiveness of analgesics on day ten after surgery was the only predictor (using regression analysis) of patient satisfaction. Intensity of pain was not related to patient satisfaction during postoperative recovery.

Idvall (2002) interviewed 28 patients who had experienced high pain intensities (8-10 on a 0-10 scale), greater than their own acceptable pain scores, and reported high satisfaction levels. Three themes emerged; the pain (patients expecting to "put up" with some pain), staff (the belief that staff were doing everything they can to help them) and their role as a patient (not wanting to appear troublesome or complaining).

The issue of patient expectation and satisfaction with postoperative pain management is complex and research has started to explore the area in more depth in order to predict high pain intensities or satisfaction with pain management. Results from studies are mixed and do not consistently highlight specific factors associated with patient satisfaction.

2.6.3 Summary

Pain after surgery is anticipated by most patients and based on published research a large proportion experience moderate to severe pain. High pain scores are not necessarily associated with dissatisfaction and due to the complexity of the issue, some have suggested that patient satisfaction is an imprecise indicator of effective pain management (Sartain and Barry, 1999). Research originating from the UK has focused on major surgical patients and the experience of those receiving intermediate and minor procedures has not been explored in depth. All surgical groups are investigated in this thesis.

Section 2.7 Importance of pain management

Primarily, effective pain management is essential for humanitarian reasons highlighted by the detrimental effects discussed earlier. Leibeskind and Melzack (1987, p1) emphasised that "...by any reasonable code, freedom from pain should be a basic human right." This argument has recently re-emerged calling for the right of acute pain management to be upheld in clinical practice and only limited by safety in individual circumstances (Cousins, 2000). Cousins (2002) described a group in South America campaigning for pain relief to be explicitly incorporated into the Universal Declaration of Human Rights of the United Nations. Although humanitarian principles provide

sufficient justification, postoperative pain management also raises issues of ethics, accountability, legality, clinical effectiveness and clinical governance.

2.7.1 Ethical importance of pain management

Health care has been described as having twin goals; alleviating suffering and prolonging life which highlights the moral imperative to provide pain management (Lisson, 1987). The term ethics is described as "...study or practice of what is good and right for human beings" (Thompson *et al.*, 2000, p5). Exploring the ethical issues surrounding pain management incorporates two perspectives, the importance for postoperative patients and the ethical practice of nurses. Discussion commonly centres on the principles of health care ethics, which include autonomy, beneficence, non-maleficence, and veracity.

Autonomy is a principle that supports self-determination and the need for decreased support (Post *et al.*, 1996). Hospitalisation and surgery affect autonomous function and people become dependent on others for basic and intimate needs (Copp, 1993). This may be compounded by the experience of postoperative pain as a result of the severe physical and psychosocial effects and patients may not have the knowledge, skills, resources, perceived control or energy to implement pain management. Health care professionals largely control patient access to pain relief in hospital.

Autonomy can be promoted through patient education, informed consent and involving people in decisions about analgesia (Griepp, 1992; Behrens, 1996). Patient-controlled analgesia (PCA; a self-administered analgesic, usually through an intravenous infusion pump activated by the patient through a handset) may also help preserve autonomy as patients play an active role in their pain management. Post *et al.* (1996) argued that

autonomy might still be affected by severe pain because of the emotional and cognitive consequences.

Beneficence relates to the duty of health care professionals to do good for individuals, provide benefits, protect from harm and rescue from danger (Post *et al.*, 1996). Beneficence has been criticised in nursing and medicine for a propensity towards paternalism (overriding or limiting autonomy through actions based on judging a person's best interest) and creating dependency (Thompson *et al.*, 2000; Cribb, 2002). Nurses determining patients' pain intensity levels and withholding analgesics due to a fear of side effects may be an example of this relating to surgical patients. Thompson *et al.* (2000) suggested that practice does not necessarily have to be paternalistic and duty of care and advocacy were fundamental to the principle. Proactive nursing care in the form of patient education, assessment and effective management of pain are nursing actions that support the principle of beneficence (Griepp, 1992).

The principle of non-maleficence relates to avoiding actions that will cause harm (Swenson, 2002). The action of withholding analgesics is a threat to the principle which may occur for various reasons but a common misconception is the exaggerated risk of opioid side effects such as respiratory depression or addiction (Pasero *et al.*, 1999b). The decision not to administer opioids may be seen by the nurse as avoiding maleficence but pain and its consequences may cause harm through negligence (Copp, 1993). Swenson (2002) advised that care should be taken to ensure that implementing pain management does not cause unnecessary pain such as administering an injection when an oral equivalent is effective. Nurses must work with patients to achieve safe and effective pain relief, balancing analgesia and managing common side effects such as itching or nausea (Griepp, 1992; Carr and Thomas, 1997b).

Confidentiality, privacy and honesty describe the ethical principle of veracity which can be supported by fulfilling promises to return with an analgesic and giving patient information about painful experiences and procedures (Copp, 1993; Carr and Thomas, 1997b). Privacy can be promoted through quiet discussions with patients rather than asking about pain in an open ward, which may not elicit a full response (Herr and Mobily, 1991).

Justice (the principle of universal fairness) relates to equality in pain management regardless of age, gender, ethnic origin, religion or background (Copp, 1993; Carr and Thomas, 1997b; Thompson *et al.*, 2000). The principle should also apply to those who are unable to verbalise pain. Morrison and Siu (2000) found that in a sample of older adults receiving surgery for a hip fracture, cognitively intact patients received triple the amount of analgesics in the first 48 hours postoperatively, compared with those with advanced dementia.

Using the principles of health care ethics as a framework highlights key areas of discussion but does not represent the whole of ethical thinking or underlying theories (Cribb, 2002). In pain management, ethical issues have received relatively little attention and Rollman (1999) calculated that it has been the subject of 0.5% of papers published over a 10-year period. However, Post *et al.* (1996) described a *prima facie* or conditional obligation of health care professionals to relieve pain; actions which ought to be done unless another obligation relating to that person takes precedence. Inadequate pain management is considered by some authors as not fulfilling a duty of care, therefore an act of moral and professional negligence (Cherny and Catane, 1995; Hunter, 2000). This brief exploration of the ethical principles of health care demonstrates how they may be threatened by postoperative pain, the importance of

effective management and how the principles can be supported by the actions of nurses and professionals caring for surgical patients. Pain management is a fundamental element of ethical practice where nurses clearly have a role and responsibility.

2.7.2 Accountability

Accountability within pain management has been discussed since the late 1960's and continues to be a relevant issue (McCaffery and Beebe, 1994). The Nursing and Midwifery Council (NMC, 2002a, p1) gave the following description of the concept:

> Accountability is fundamentally concerned with weighing up the interests of patients and clients in complex situations using professional knowledge, judgement and skills to make a decision and enabling you to account for the decision made.

Dimond (2002a) described four arenas of accountability relating to the patient, employer, profession and the public. Table 2.7.1 illustrates the mechanism of enforcing accountability in these areas, which have separate processes but may be related (e.g. a criminal conviction may result in removal from the professional register).

Table 2.7.1. The four arenas of accountability (Dimond 2002a)

Arena of accountability	Mechanism of enforcement
Patient	Civil law Civil courts
Employer	Contract of employment Employment tribunal
Profession	Code of Professional Conduct Nursing & Midwifery Council Professional Conduct Committee
Public	Criminal law Criminal courts

Effective pain management relies on contributions from a multidisciplinary team of nurses, doctors, pharmacists and other health care disciplines. Nurses have the most

contact with surgical patients and are ideally situated to assess, manage and evaluate pain. Sofaer (1998) suggested that accountability includes forming a partnership with the patient and sharing decisions in pain management.

Difficulties arise when patients remain in pain and specific members of the team are not seen as directly accountable (Max, 1990; Winefield *et al.*, 1990). Inadequate pain management may arise from a combination of events and professional involvement such as inadequate prescription from doctors, nurses not administering the fully prescribed dose or limited availability of analgesics from pharmacy. Nurses do have a central role in the process and as McCaffery and Beebe (1994) pointed out, the omission of an antibiotic is more likely to be questioned than an omission of an analgesic. The NMC (2002b) Code of Professional Conduct emphasises that nurses are personally responsible for their actions or omissions regardless of direction and advice from other disciplines.

The increasing recognition of accountability to the patient in pain through civil action is explored later but accountability in the three other arenas identified by Dimond (2002a) has not been widely discussed unless a criminal offence has occurred. Nearly 30 years ago Strauss *et al.* (1974) suggested that there would not be improvements in pain management without full accountability and the issue becoming an organisational concern.

2.7.3 Legal issues

The legal perspective of pain management has seen increasing attention in published literature over the past decade, particularly in America. Pain and suffering are a significant component of claims for medical negligence although misdiagnosis and

treatment are usually the primary foci (Furrow, 2001). The Bolam test, laid down after a case in 1957, is used as a basis to evaluate reasonable standards of care (Dimond, 1995; Hodgson, 2002). Dimond (1995, 2002b) suggested that if a patient was able to demonstrate harm has resulted from failure to take reasonable actions to reduce suffering and care fell below reasonable standards with regard to the wait for or lack of pain relief, then a claim for compensation may be successful. Pain has been the centre of lawsuits for terminally ill patients in the USA and Australia where the right for aggressive pain control was upheld and a multi-million dollar claim for compensation awarded when carers failed to administer analgesics (Cushing, 1992; Sanchez, 1998; Rollman, 1999; Cousins, 2000). Foster (2002) advised caution when drawing comparisons between countries and claims for negligence because of the significant differences in legal systems.

However, Jurf and Nirschl (1993) described a general era of heightened consumer awareness, which forces health care providers to become more accountable. In the USA many national organisations and professional bodies have published standards for pain management which may become an issue of liability if they are not upheld (Sanchez, 1998; Furrow, 2001). Admission to hospital for surgery is an area of health care where pain is predictable and policies, protocols, guidelines and standards have also been developed within local NHS Trusts in the UK. From a legal perspective, practitioners need to demonstrate that these documents were largely followed and deviations can be supported by competent professional opinion (Dimond, 2002a).

Furrow (2001) described the overall threat of malpractice due to inadequate pain management as low; yet a powerful external force that may exert pressure on professionals and institutions to ensure that pain management is effective. This

suggestion raises many issues, in particular, whether the threat of litigation should be the drive to ensure adequate pain management.

In the last few years the number of claims brought for health care negligence has rapidly increased in the UK (Foster, 2002). Pain has been an integral part but its unique importance, as a fundamental part of health care, has received increasing recognition. Exploring the legal issues of pain management raises concerns regarding individual accountability as well as organisational commitment. Policies, guidelines and standards may be developed for postoperative care as methods of supporting, monitoring and improving practice but claimants may also use them to try to demonstrate negligence.

2.7.4 Clinical effectiveness

The promotion of clinical effectiveness in the NHS largely began in 1996 with a Department of Health (p6) publication that described the concept as:

> The extent to which specific clinical interventions when deployed in the field for a particular patient or population do what they are intended to do i.e. maintain and improve health and secure the greatest possible health gain from the available resources.

In relation to postoperative pain, clinical interventions can be regarded as providing pain management, usually through assessment and pharmacological methods, which provide optimum relief, minimise the negative consequences and promote recovery. Adequate pain management is associated with short-term physiological benefits such as reduction in thrombo-embolic events, respiratory complications and paralytic ileus (Ballantyne *et al.*, 1998; Huang *et al.*, 2001). The quality of evidence in this area is varied and due to ethical implications, adequacy of pain management and postoperative complications are rarely the foci of research.

The effect of pain management on long-term outcomes such as reduction in hospital stay remains inconclusive which has led to examination of techniques which reduce the overall stress and pain response after surgery (Kehlet, 2000; Huang *et al.*, 2001; Adams *et al.*, 2002). Routine analgesics (opioids and non-steroidal anti-inflammatory drugs, NSAIDs) have limited stress reducing effects but systematic reviews and meta-analyses revealed epidural and spinal anaesthesia techniques can significantly moderate the response reducing morbidity and mortality. Randomised controlled trials have demonstrated that these methods reduce the incidence of deep vein thrombosis, pulmonary emboli, respiratory and wound infections (Ballantyne *et al.*, 1998; Rodgers *et al.*, 2000).

For some surgical patients, pain continues and becomes a chronic condition and the incidence is particularly high after amputation, thoracic and breast surgery (Perkins and Kehlet, 2000). In one study, postoperative pain severity was the only significant predictor of pain experienced one month after orthopaedic surgery (Thomas *et al.*, 1998). Perkins and Kehlet (2000) conducted a review of 107 studies in this area and concluded that the severity of postoperative pain is a significant predictor of chronic pain after surgery and effective management may help prevent this. Chronic pain can have serious consequences on the lifestyle, personality and functional ability of individuals (Hawthorn and Redmond, 1998) who may have an increased need for health and social care resulting in financial and resource implications.

Although the relationship is unclear based on current research, the management of postoperative pain may minimise the risk of complications that increase morbidity and mortality. In the long term, chronic pain may also be prevented; a condition that would

have serious implications for the individual and is associated with increased costs for health and social care.

2.7.5 Clinical Governance

Postoperative pain management has been established as part of nursing quality assurance and improvement programmes for some time in the USA (e.g. Ferrell *et al.*, 1991; American Pain Society Quality of Care Committee, 1995; Lee *et al.*, 1992; Dietrick-Gallagher *et al.*, 1994) and standards for pain management have been issued by organisations involved in the accreditation of hospitals (Joint Commission on Accreditation of Healthcare Organisations, 2001). In England, pain management has been the subject of at least three national reports that made recommendations relating to monitoring pain as a quality of care indicator (RCS and CA, 1990; Audit Commission, 1997; CSAG, 2000).

In 1997, the Department of Health introduced the concept of clinical governance into the NHS and it was later defined as:

> A framework through which NHS organisations are accountable for continuously improving the quality of their services and safe guarding high standards of care by creating an environment in which excellence in clinical care will flourish. (Department of Health, 1998, p32)

Therefore clinical governance focuses on quality improvement, risk management and clear systems of accountability and responsibility through key activities outlined in Figure 2.7.1.

Figure 2.7.1. Key elements of clinical governance (Royal College of Nursing, 1998)

- Ensuring health professionals have the right to education, training, skills and competencies to deliver the care needed by patients
- Ensuring that processes which improve the quality of care are in place throughout the organisation
- Using techniques to anticipate and prevent potential problems
- Using techniques which monitor and improve existing practices
- Recognising and acting upon poor performance-providing a framework which allows clinical staff to learn from mistakes
- Facilitating the implementation of good practice.

Clinical governance was described in one government publication as a possible method of addressing identified weaknesses in postoperative care (Department of Health, 1998). However, the extent to which pain management has subsequently been the focus of clinical governance within individual hospitals is unclear.

More recently, national pain forums have been asked by the Department of Health to develop benchmarks (standards) for acute and chronic pain (Royal College of Nursing Pain Forum, 2002) with the aim of introducing national standards for pain management in the future.

Pain management is increasingly being seen as an important indicator of quality of care within UK hospitals and may feature as a key component of clinical governance relating to postoperative patients. The organisational commitment to effective pain management is explored in more detail in Chapter 4.

2.7.6 Summary

Earlier sections have described the experience of pain, outlining the humanitarian reasons for its management. As a result, calls are growing for it to be recognised as a basic human right along with discussions of the wider importance regarding accountability, legality, clinical effectiveness, ethical nursing practice and clinical

governance. Individually, these areas represent a valid argument for effective pain management but they are not separate spheres of health care practice and are each closely related. Collectively these issues demonstrate the overwhelming importance for the management of pain in postoperative patients.

Section 2.8 Chapter summary

Despite the universality of the human experience of pain, the concept lacks an accepted definition that captures its diverse and dynamic nature along with its multidimensional effects. Some authors have questioned the necessity of agreement between theorists (Rollman, 1999) and current debates have not hindered research into the cause, meaning and experience of pain for patients admitted for surgery.

The surgical incision and subsequent tissue damage cause complex nociceptive and inflammatory pain responses that are eventually perceived as pain. It is widely recognised that a modulating mechanism (first described by Melzack and Wall, 1965 proposing the Gate Control Theory of pain) has the potential to decrease or magnify pain perception. Variables causing modulation include endogenous or exogenous opioids, emotional response and attention (Rhudy and Meagher, 2001; Villemure and Bushnell, 2002). Other persistent and changeable elements have formed major areas of research in attempts to explain the variation in pain perception. Some factors such as age and gender have shown differences between groups in experimental settings (Riley, *et al.*, 1998; Gagliese *et al.*, 1999) but the results of clinical research are less clear (Gagliese *et al.*, 2000; Lynch *et al.*, 1997). Preoperative and postoperative state anxiety emerges as an emotional factor which has a strong, often linear relationship with postoperative pain intensity (Scott *et al.*, 1983; Perry *et al.*, 1994; Seers, 1987; Nelson *et al.*, 1998; Kain *et al.*, 2000).

The complexity of pain perception and expression caused Watkins and Maier (2000, p30) to conclude, "a person's perception of pain may have little to do with the actual intensity." Exploring the physiological, psychosocial and cultural parameters help illustrate the variable relationship pain has with injury and the individuality of the experience.

Most patients expect pain after surgery (Carr and Thomas, 1997) and studies have demonstrated that a significant number of patients experience moderate to severe pain but still report high levels of satisfaction with pain management. Many of the studies focus on patients undergoing major surgery and the recent experience of all surgical groups in UK hospitals needs further exploration.

Pain is an undesirable postoperative outcome due to the complex physiological and psychological response it initiates that may increase complications after surgery, morbidity in the long term (Hamill, 1994) and severity is a significant predictor of chronic pain after surgery (Perkins and Kehlet, 2000). Many of the potential consequences of pain are considered preventable with effective management. Humanitarian reasons provide the strongest arguments for optimum pain management but it is increasingly recognised as an issue of professional accountability, legality, ethical nursing practice, clinical effectiveness and clinical governance in the NHS.

An exploration of the patients' experience of postoperative pain and the importance of effective management has provided a basis for reviewing the nursing management of pain and identified the need for a more recent examination of patient experiences across surgical groups.

CHAPTER 3

LITERATURE REVIEW OF THE NURSING MANAGEMENT OF POSTOPERATIVE PAIN

Pain is an emergency for the person experiencing regardless of the underlying pathology. I believe we must apply the science and art of pain relief as though life depended on it. Certainly the quality of life does.

Judith A. Spross, *Cancer Pain and Suffering*

Section 3.1 Introduction

The International Council of Nurses (2000) identified the alleviation of suffering as one of the four fundamental responsibilities of nurses. As part of a multidisciplinary team, nurses are likely to have the most contact with patients in a ward environment where pain is a predictable and preventable consequence of surgical intervention. Therefore nurses have a central role in the management of pain including assessment, administration or management of analgesic techniques, documentation and evaluation. This chapter highlights the theoretical background in each of these areas and reviews current knowledge of nursing practice to provide a rationale for work undertaken in this thesis.

3.1.1 Search Strategy

Searches of the following electronic databases identified the majority of published sources used to support this literature review:

BIDS ISI	1980-2000
CINAHL	1982-2003
Cochrane Library	2003/3
Index to Theses	1970-2001
Medline	1966-2003
National Research Register	2003 Issue 3

PsychINFO	1980-2003
Web of Science	1982-2003

Searches were conducted at various points throughout the study and the final enquiry conducted six weeks before submission of this thesis. The keywords were employed as single phrases or in combination using Boolean logic (AND, OR, NOT) and truncation (use of an asterisk to locate keywords based on a root, Beaven, 2002):

Administration
Analges*
Assessment tools
Documentation
Epidural
Measurement
Non-pharmacological
Nurs*
Nursing practice
Opioids
Pain
Pain assessment
Pain assessment charts
Patient-controlled analgesia
Pharmacolog*
Surg*

Papers and theses relating to adult in-patient surgery were limited to those published in English and retrieved if the title indicated relevance or the nature of the work was unclear from the title and abstract. References from papers were selected using the same procedure and the Internet aided the location and retrieval of government papers and publications from professional organisations.

Section 3.2 Assessment of postoperative pain

Estimating another person's experience of pain, interpreting accurately what a person feels is problematic and complicated by the variable nature of pain (Harrison, 1991). No objective measurement exists and in assessing and managing pain, nurses face one of the most significant cognitive tasks relating to patient care (Roberts *et al.*, 1995). This

section outlines the main methods of pain assessment and explores their use in surgical nursing practice. Some authors distinguish between pain measurement and pain assessment; the former has been described as the precise quantitative measure of intensity that is frequently used in research. The broader process of pain assessment is emphasized here, which explores many aspects of the pain experience (including intensity) to inform clinical judgements (McGuire, 1992; Donovan, 1992; Jorgensen-Dick, 1995; Turk and Melzack, 2001).

3.2.1 Methods of pain assessment

Similar to any other nursing intervention, assessment is the cornerstone of effective treatment and management. Rowlingson (1994) identified the main aims of pain assessment, presented in Figure 3.2.1.

Figure 3.2.1. Main aims of pain assessment (Rowlingson 1994)

- To identify what the current pain experience means to the patient
- To lead to a diagnosis of the cause of pain based on the information collected
- To provide appropriate therapy
- Once treatment is provided, effectiveness may be assessed repeatedly

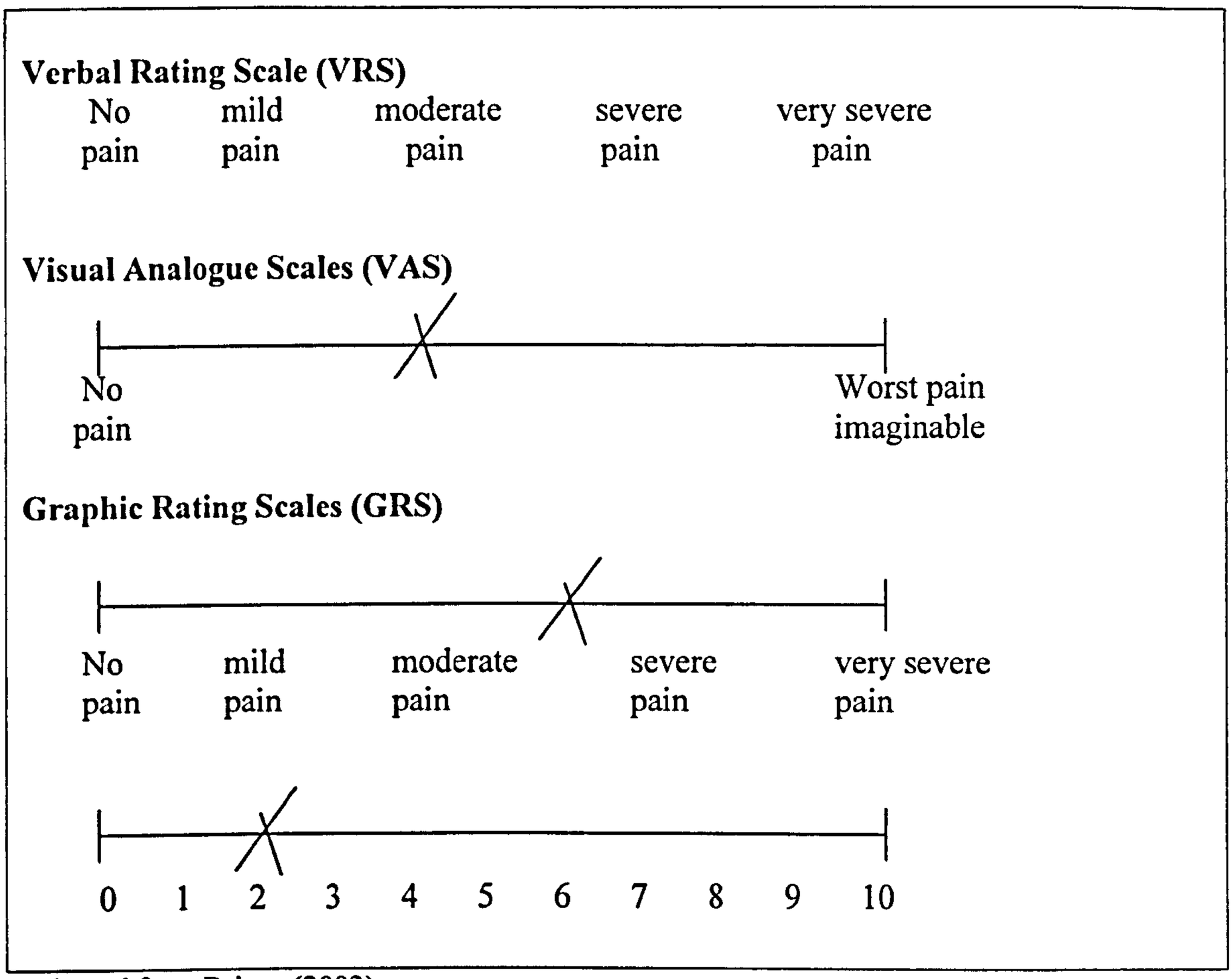
Assessment may also help to identify patient goals such as acceptable pain intensities or relate to an activity level (e.g. to be able to walk to the bathroom comfortably) (Briggs, 2003). A formal pain assessment also means that pain has been recognised, quantified, documented and the patients have a more active role in their care (McGuire, 1992; Rowlingson, 1994; Thomas, 1997).

The multidimensional nature of pain has been highlighted in the previous chapter and a similar assessment process is required. Key areas of assessment include location, intensity, quality (type of pain), onset, duration, factors affecting pain, effects of pain and established methods of relief (Latham, 1994; Rowlingson, 1994; Jorgensen-Dick,

1995; Thomas, 1997; Hawthorn and Redmond, 1998; McCaffery and Pasero, 1999; Jensen and Karoly, 2001). These aspects will help identify the cause of the pain (which may not be the surgical site), inform analgesic choices and allow insight into the patient's experience. Within a trusting nurse-patient relationship, these areas can be assessed through effective communication and sensitive questioning (Briggs, 2003) although a range of tools has been developed to aid consistent assessment.

Multidimensional assessment tools such as the McGill Pain Questionnaire (Melzack, 1975) and Brief Pain Inventory (Cleeland and Ryan, 1994) examine sensory, affective, evaluative aspects or impact of pain as well as intensity. Such tools have been widely used in research, practice, translated into many languages and condensed versions (Melzack, 1987; Melzack and Katz, 2001). Despite the availability of shortened instruments, completion times mean that they are employed more frequently in chronic pain situations. The theory and practice of acute surgical pain assessment has focused on unidimensional tools that measure intensity of pain and Figure 3.2.2 illustrates some of the common instruments available.

Figure 3.2.2. Common pain assessment tools



Adapted from Briggs (2003)

The verbal rating scale (VRS) requires an individual to choose from a list of adjectives representing graduations of pain intensity. The scale may be between four and 15 categories, is relatively easy to administer and is understood by most individuals (Grossi *et al.*, 1985; Jensen and Karoly, 2001). Construct validity has been demonstrated in clinical practice along with highly positive correlations with other assessment tools such as the visual analogue scale (range r=0.70-0.89) (validity of scales are often assessed according to the degree of agreement with another tool measuring the same construct, referred to as criterion-related validity; Polit *et al.*, 2001; Ohnhaus and Adler, 1975; Ready *et al.*, 1982; Briggs and Closs, 1999). VRSs have been criticised because categories may not represent equal intervals of pain, patients may be unable to choose a word accurately representing the experience or have different understanding of the

words (Ohnhaus and Adler, 1975; Wewers and Lowe, 1990; Donovan, 1992; Ho *et al.*, 1996; Jensen and Karoly, 2001).

Numerical rating scales (NRS) require the patient to rate intensity of pain on a scale of 0-10, 0-20 or 0-100. These scales are easy to administer, have shown good validity, are highly correlated with other pain measures and the higher number of response categories means they are more sensitive to changes in pain (Jensen *et al.*, 1986; DeLoach *et al.*, 1998; Hartrick, 2001; Jensen and Karoly, 2001).

Figure 3.2.2 illustrates the most common version of the visual analogue scale (VAS); a horizontal, 10cm line labelled with extremes of pain as each end. The individual is asked to rate their intensity of pain by marking the line with a cross and the result is measured in millimetres. Research has demonstrated the instrument's construct validity and reliability including use in postoperative settings (Revill *et al.*, 1976; Rose *et al.*, 1997; Jensen *et al.*, 2002). The VAS does require abstract thought; visual perception, muscular co-ordination and careful patient education (Grossi *et al.*, 1985; Revill *et al.*, 1976). Chapman and Syrjala (1990) estimated that between 7-11% of the adult population would have difficulty using the scale due to conceptualisation or dexterity. Figure 3.2.2 also shows graphic rating scales (GRS) that represent adaptations of the VAS to include other measures such as a numerical rating.

Pain after surgery can increase upon movement, therefore it should be assessed during rest, movement, deep breathing or coughing (Agency for Health Care Policy and Research, 1992; Jorgensen-Dick, 1995) and tools may be used again to monitor the effectiveness of analgesic interventions. Alternatively, pain relief measures ascertain the percentage of relief achieved or employ graduated descriptions of relief between "no

relief" and "total pain relief" along a 10cm line (Seers, 1987; Donovan, 1992). However, pain relief may be associated with other aspects of the experience such as unpleasantness or quality of pain rather than a change in intensity (Jensen *et al.*, 2002).

There are many published variations of the tools described here and others that measure different elements of the experience (e.g. Gerson and Gerson, 1980; Grossi *et al.*, 1985; Oden, 1989; Swanston *et al.*, 1993). Unidimensional assessment scales were originally designed for research in laboratory settings (Ho *et al.*, 1996) and the assessment needs of research and practice may differ. Donovan (1992) highlighted the desirable characteristics of tools in each arena, shown in Table 3.2.1.

Table 3.2.1. Desirable characteristics of pain assessment tools for research and practice (Donovan 1992)

Research	Practice
Precise/standardised method High reliability/validity Able to assign numbers (interval / ratio) Objective Comprehensive Complex/multidimensional Independent factors Uncontrolled variables omitted, controlled, limited Computer compatible	Method that suggests intervention to use Moderate reliability/validity Able to rank ratings (ordinal) Subjective Focused/individualised Multidimensional/brief/easy All factors assumed to be interrelated Uncontrolled variables accepted as inevitable Able to clearly and consistently shared among colleagues

The choice of assessment tool for use in practice also depends on the elements of pain considered important in clinical areas, individual capability and comprehension, completion time and client group (McGuire, 1992; Ho *et al.*, 1996; Cartwright, 1985; Jensen *et al.*, 2002). Those outlined here have been widely used in both clinical practice and research with postoperative patients.

In proportion to the volume of literature on pain measurement, there is very little guidance on the timing or frequency of assessment with postoperative patients except

for broad recommendations of "regular assessment, according to the individual" (e.g. Schofield, 1995; Thomas, 1997). Guidance for patients receiving opioid infusion devices (e.g. PCA) is clearer due to increased patient monitoring to detect side effects such as hypotension and respiratory depression and is often recommended to coincide with other frequent postoperative observations (Audit Commission, 1997; NHMRC, 1999). A North American national report published specific guidance for all surgical patients, which is presented in Figure 3.2.3.

Figure 3.2.3. Timing and frequency of pain assessment (AHCPR 1992, p13)

1) Preoperatively
2) Routinely at regular intervals postoperatively, as determined by the operation and severity of pain (e.g. every 2 hours while awake to 1 day after surgery)
3) With each new report of pain
4) At suitable intervals after each analgesic intervention (e.g. 30 mins after parenteral drug therapy and 1 hour after oral analgesics

More recently pain assessment is being promoted in the USA as the "fifth vital sign" following blood pressure, pulse, temperature and respiration (Californian Board of Registered Nurses, 2000; Lynch, 2001). In California, assessment has been written into law as part of a health and safety code and a rating of 2 out of 10 or less on a 0-10 scale, fulfils the requirements of the regulations (Californian Board of Registered Nurses, 2000). Guidance from UK sources is not comprehensive or part of any statutory requirements but the Pain Society and Royal College of Anaesthetists (PS and RCA, 2003) have recently recommended that acute pain intensity should be regarded as a vital sign and recorded as regularly as other nursing observations.

The experience of pain is multidimensional and assessment should reflect these areas in the pursuit of measurement and documentation. It is widely recognised that there is no isomorphic (identical and consistent) relationship between tissue damage and perception of pain; therefore subjective self-report measures are the main methods of assessment

(Turk and Melzack, 2001). With such an extensive theoretical development of pain assessment techniques over the last 30 years, it is important to explore their actual use during the care of surgical patients.

3.2.2 Pain assessment in nursing practice

Pain assessment has become a vast research area and several major themes have developed including nursing knowledge, attitudes, comparative ratings of pain intensity between nurses and patients, descriptions of practice and documentation. Each of these areas has contributed to our understanding of pain assessment by nurses yet this review illustrates that despite the size of the research base, there has been little objective research into the natural occurrence of postoperative pain assessment. These themes are explored in light of the work undertaken in this thesis with the emphasis on descriptions of practice and documentation.

3.2.2.1 Nursing knowledge and attitudes

Research into the knowledge and attitudes of nurses towards pain assessment and management has employed a range of measurement tools, and shown both similar and mixed results. Hamilton and Edgar (1992) and Watt-Watson (1997) found that the majority of nurses in their sample (90.6% and 97% respectively) agreed that the severity and duration of pain were not related to the stimulus or type of operation; implying an acceptance of the individuality of pain. In a group of studies, 61-100% of those surveyed agreed that the patient, rather than the health care professional, is the authority on their pain along with the importance of believing their reports (Van-der-Does, 1989; Hamilton and Edgar, 1992; Lloyd and McLaughlin, 1994; Brunier *et al.*, 1995; Ferrell *et al.*, 1995b; Hunt, 1995; Clarke *et al.*, 1996; Thorn, 1997; Schafheutle *et al.*, 2001).

Conversley, Brunier *et al.* (1995) found that 44% agreed with the statement, "estimation of pain by a physician or nurse is more valid than the patient's self-report."

Researchers have generally described positive attitudes towards the process of pain assessment and its perceived importance (Fox, 1982; Nash *et al.*, 1993; de Rond *et al.*, 2001). Eighty-three per cent (n=269) of nurses in Lloyd and McLaughlin's (1994) study and 85% (n=50) in Hunt's (1995) research believed that pain scales were useful and led to a more accurate assessment. Taylor *et al.* (1984) presented nurses with vignettes describing a patient in pain and from a list of ten pain relief measures, obtaining more information from the patient was ranked the highest priority. Behavioural or physiological cues did not indicate an absence or presence of pain for most nurses in some studies (MacKintosh, 1994; Clarke *et al.*, 1996; Schafheutle *et al.*, 2001) although a third of participants believed these aspects verified pain (Hamilton and Edgar 1992; Thorn, 1997). Eighty-seven per cent of nurses surveyed were aware that pain is consistently underestimated by nurses (Scott, 1992; MacKintosh, 1994) and 98% disagreed with the statement that patients will always inform nurses of their pain (MacKintosh, 1994; Clarke *et al.*, 1996). Such results may indicate an awareness of the nurse's role in pain assessment and 99.4% of the sample in one study felt continuous assessment was important (Schafheutle *et al.*, 2001).

Attitudes and knowledge towards pain assessment on the whole appear positive but when asked about the ultimate goal of pain management, consistently, one third to one half of those surveyed did not believe that a pain free state was possible (Saxey, 1986; Winefield *et al.*, 1990; Lavies *et al.*, 1992; Scott, 1992; Willson, 1992; Brunier *et al.*, 1995; Brydon and Asbury, 1995; Thorn, 1997; Dalton *et al.*, 1998; Howell *et al.*, 2000; Schafheutle *et al.*, 2001). "As much as possible" or "enough so that pain was not

distressing" were favoured by most participants (Cohen, 1980; Weis *et al.*, 1983; Saxey, 1986; Ketovuori, 1987; Ballie, 1993; Schafheutle *et al.*, 2001). The surveys discussed here also examined knowledge of pain management techniques, therefore despite some positive aspects, most conclude that nurses have moderate or inadequate knowledge, mixed attitudes or attitudinal barriers (Saxey, 1986; Winefield *et al.*, 1990; Hamilton and Edgar, 1992; Lavies *et al.*, 1992; Lloyd and McLaughlin, 1994; MacKintosh, 1994; Brunier *et al.*, 1995; Hunt, 1995; McCaffery and Ferrell, 1997b; Thorn, 1997; Heath, 1998; Brown *et al.*, 1999; Coyne *et al.*, 1999; de Rond *et al.*, 2001; Puls-McColl *et al.*, 2001; Green and Tait, 2002).

A number of factors influence the interpretation of results from these studies including the type and variety of instruments used, where reliability and validity were not always reported (e.g. Fox, 1982; Weis *et al.*, 1983; Watt-Watson, 1987; Jacques, 1994; Hamilton and Edgar, 1992; Scott, 1992; Lavies *et al.*, 1992; Lloyd and McLaughlin, 1994; MacKintosh, 1994; Hunt, 1995; de Rond *et al.*, 2001; Green and Tait, 2002). Most have closed questions and difficulty in choosing categories has been attributed to poor responses to some instruments (Brunier *et al.*, 1995). Only four studies were based in the UK (Lloyd and McLaughlin, 1994; MacKintosh, 1994; Hunt, 1995; Thorn, 1997) and six exclusively involving surgical nurses (Lloyd and McLaughlin, 1994; MacKintosh, 1994; Hunt, 1995; McKinley and Botti, 1991; Puls-McColl *et al.*, 2001; Watt-Watson *et al.*, 2001). It is widely recognised that attitudes are malleable, inconsistent and can be a poor predictor of specific behaviours (Bandura, 1986; Ajzen, 1988). Also, the validity of attitudinal measures and structured interviews are frequently questioned due to the potential for participants to give socially desirable responses (Ajzen, 1988). This research gives a useful insight into the knowledge and attitudes surrounding pain assessment and pain management but may not reflect actual practice.

A small number of studies have tried to explore the link between knowledge and practice more closely. Dalton *et al.* (1998) measured participants' perceived intention to change practice before and after a pain management education programme but the research fails to investigate actual practice and care given by participants. In an earlier study, Dalton *et al.* (1996) surveyed nurses using the Cancer Pain Knowledge Inventory and reviewed documentation as a measure of change in knowledge and behaviour at several time intervals. Six months after the programme, 83% of participants reported regularly conducting in-depth pain assessments. However, the authors acknowledged that increases in documentation relating to intensity, location, type of pain and use of scales may be skewed by participants collecting their own data. The credibility of these results may be severely affected by the Hawthorne effect (behaviour changes due to the knowledge of being included in a study, Polit *et al.*, 2001).

Watt-Watson *et al.* (2001) assessed the knowledge of 94 nurses and 225 of their assigned patients who had received a coronary artery bypass graft. The Toronto Pain Management Inventory was used (consisting of 23 VASs) and only weak trends were observed between nurses' knowledge and patients' worst pain scores ($r=0.20$, $p=0.07$) and present pain on movement ($r=0.21$, $p=<0.06$). Also, knowledge was not associated with assessment or analgesic administration. The VASs included in the inventory allowed for a greater number of response categories than previous research yet the tools measured much wider constructs than knowledge including experience (e.g. how often do patients ask you voluntarily for analgesics?), attitudes (e.g. how often do you agree with patients' statements about their pain?) and behaviours (e.g. how often do you use a rating scale?). The authors did not acknowledge this but report that the minimal relationship between nurses' knowledge and patient intensity rating might reflect the lack of validity within the instrument.

Research into nurses' knowledge and attitudes surrounding pain assessment has attempted to gain an insight into practice and most surveys have described some positive aspects of nurses' attitude despite conflicting results in some areas. However, knowledge and attitudes are poor predictors of specific behaviours (Ajzen, 1988) and may be influenced by a variety of factors in the environment in which they are usually practiced. Recent attempts to review the link between knowledge and practice are limited because of methodological weaknesses and previous research in this area does not provide an objective measurement of pain assessment in practice.

3.2.2.2 Nurse and patient ratings of pain in practice

The assessment of pain in practice has also been investigated through comparisons of nurse and patient ratings of pain intensity. Research from a variety of clinical areas, predominantly employing a VAS, has consistently shown that there are significant differences between nurse and patient ratings (Graffam, 1981; Zalon, 1993; Bowman, 1994; Stephenson, 1994; Field, 1996a; Sjöstrom *et al.*, 1997; Hovi and Lauri, 1999). Sjöstrom *et al.* (1997) found a mean rating of 6.1cm (± 1.1) by patients and 4.9cm (±1.2) by nurses, a common margin of difference in this group of studies (based on Iafrat's (1986) study, congruence is considered as ± 1cm on a VAS). Correlations of nurse and patient VAS scores have either demonstrated no relationship (Paice *et al.*, 1991; Olden *et al.*, 1995) or a significant but weak correlation (Choiniere *et al.*, 1990; McKinley and Botti, 1991; Zalon, 1993; Paice *et al.*, 1995; Ferguson *et al.*, 1997).

A few studies investigating nurse and patient ratings of pain have also attempted to describe practice. In one American study over 20 years ago, researchers were present on the ward until informed by the nurse that a patient reported pain at which point intensity ratings would be conducted. Graffam (1981) reported that nurses' assessment of pain was minimal and 29 nurses did not evaluate pain relief following analgesic

administration. There are no details given regarding methods used to measure these behaviours or the time scale involved.

McKinley and Botti (1991) asked nurses in a variety of settings to rank 12 statements on determining the patient's pain level. "What the patient said" and "patients' report of the severity of pain" were always ranked first or second by participants. Only 42% of nurses in Sjöstrom's *et al.* (1997) study reported that they assess pain through verbal communication; 31% on how the patient looks or signs of discomfort and only one nurse described the use of an assessment scale.

Research in this area has shown clear discrepancies between patients' and nurses' rating of pain, a logical result considering the subjective nature of pain. The results do illustrate the need for patient self-reports and consistent measurement using a tool. Studies have often used these results to suggest that poor pain assessment contributes to inadequate pain management (Graffam, 1981; McKinley and Botti, 1991; Paice *et al.*, 1995) yet the effectiveness or natural occurrence of assessment has not been the subject of investigation. Descriptions of practice arising from these studies may also be influenced by the Hawthorne effect, as participants were aware of the research topic.

3.2.2.3 Further descriptions of practice

Much of the research previously discussed here has attempted to describe practice following an intervention such as an educational programme or nurse-patient rating of pain. A number of studies have simply investigated the natural practice of nurses using a range of quantitative and qualitative techniques.

Dalton (1989) devised a questionnaire which was distributed to oncology and community hospital nurses in USA (n=78). Seventy-five per cent of respondents would

ask a direct question to determine whether an individual was experiencing pain and 80% would observe the patient's behaviour. When presented with the open question "What is your response to pain?" 50% (n=39) would ask a question such as "where is your pain?" and 41% would administer an analgesic. All participants reported assessing the meaning of pain approximately two thirds of the time. Willson (1992) reported similar results in 51 English surgical nurses with 88% assessing pain verbally, 81% taking into account the patient's appearance and only 17% considering the patient's type of operation. More recently, Schafheutle (1999) conducted a national survey of British vascular and urology nurses who reported pain questioning during drug rounds and routine postoperative observations. Participants reported largely using closed question about pain (73.7%) and this was supported by the researcher's observations of practice (discussed in detail later). However, "ok/alright?" were included in the analysis, therefore it is unclear how many questions directly related to pain.

Multiple-choice questionnaire results have been supported by nurses' free responses in semi-structured interviews. Saxey (1986) interviewed 35 surgical nurses who in addition to the questions the posed to patients, used unreliable factors such as physiological responses and 14% employed intuition to inform pain assessments.

An unstructured approach was taken by Nielsen *et al.* (1994) during interviews of eight recovery and surgical nurses in a Danish hospital. Participants considered the assessment and management of pain a primary concern and inherent part of professional activities. Surgical nurses reported assessing pain during nursing activities (such as providing hygiene, changing position or serving food) asking if they felt any pain, although they were not sure if they conducted this regularly. Nielsen *et al.* (1994) described the factors affecting practice but made broad conclusions suggesting that the

priority of pain management depended on the status of the nurse within an organisation, which was not supported with interviewees comments in the text.

Using phenomenography (a qualitative approach similar to phenomenology but focusing on differences in descriptions of phenomena), Sjöstrom *et al.* (1999, 2000) interviewed ten critical care nurses in a Swedish surgical unit before and after three different pain assessments with patients. Four approaches to pain assessment emerged; how the patient looks (movements, grimaces, clinical observations); what the patient says; the patients way of talking (how the patient expresses pain and using it to validate nurses observations) and how it usually is (experience). These themes identified by qualitative approaches are supported by the focus group work of Nash *et al.* (1999) with 19 registered nurses working in a variety of Australian health care settings. Participants emphasised the pivotal role of nurses in pain management, the physical assessment of the patient (considering diagnosis and physiological signs) and the positive influence of assessments scales:

> We use postoperative assessment tool; every time we do their observations, we assess their pain and their nausea...we used to never ask then how they were feeling pain-wise. I think it has alerted people a lot more. p184.

However the physical assessment is mentioned more often than the use of the patient's report and use of a scale. This apparent need to validate the patient's verbal reports of pain or have a more objective measurement of the experience is a recurring theme within literature in this area.

Nurses taking part in the study by Yates *et al.* (1999, p524) also commented on the frustration of pain management by colleagues:

> The nurse will say 'Have you got any pain?' and (the patient) will say 'No' and so the nurse will say 'Ok we won't give you anything' instead of saying 'Well we'll give you some analgesia to *stop* the pain from coming'...and the patient doesn't know and the nurse doesn't know that it's a good idea to prevent the pain.

The authors acknowledged that voluntary participants might have had a keen interest in pain management, influencing the theme development.

Interviews have allowed a deeper and richer exploration of pain assessment practices although they have included specialised nursing areas where the needs of patients are unique (such as intubation and sedation hindering communication) or staffing levels may be greater due to higher patient dependency.

A small number of studies have interviewed patients regarding nurses' practice of pain assessment and 45% of American medical or surgical patients (n=353) recalled discussing pain with nursing staff (Donovan *et al.*, 1987). Carr (2000) interviewed 85 patients on their second postoperative day discovering that 81% had been asked how their pain was or offered analgesics but only four patients had rated their pain intensity using a scale. These interactions had occurred on a drug round (41%) or whilst receiving nursing care (28%). Accurate recall of events when recovering from an anaesthetic, experiencing pain or anxiety is the greatest criticism of this research. Twelve per cent of patients in Carr's study did not remember being asked about pain and 17% could not recall the timing of the assessment. For this reason, nurses descriptions of their own practice has been the focus of most research.

The results yielded from questionnaire, interview and focus group research cannot illustrate the actual practice of nurses working in these clinical areas. From all the studies cited in this chapter thus far, only four (McKinley and Botti, 1991; Nash *et al.*, 1993; Hamers *et al.*, 1997; Green and Tait, 2002) acknowledged that practice may differ from results presented. Recognising this, a small number of researchers have attempted to describe practice using observational methods.

Using observation, Bird and Wallis (2002) evaluated nursing skills when caring for patients with epidural analgesia. Eighty Australian nurses participated in assessing an actor who was trained to mimic a patient with lumbar epidural and atypical symptoms of pain relief. An observational tool was designed to assess several areas, including the identification of pain scores, giving a maximum score of 43. The overall mean was 32.5 or 75.6% (SD 5.42) and 70% utilised a NRS in their assessment. Nearly all participants (95%) ascertained that the patient had no pain at rest and 81% assessed pain on movement. These are positive results and it is the only study identified that examined care using analgesic modalities such as epidural analgesia. However, the researcher was a nurse consultant in pain management known to participants, the validity or reliability of the tool was not considered and the scenario is a hypothetical situation and may not represent the complexities of clinical practice.

Two studies have employed a participatory approach to examine the care of surgical patients. Willson (2000) used an ethnographic approach including participatory observation and interviews to explore pain management of three patients following repair of a hip fracture. The researcher identified time, organisational issues, shifts, multidisciplinary team, concerns over opioid use and information giving or collecting as recurring themes. However, the degree of participation, nurses' awareness of the project

topic and the role of the researcher as an acute pain nurse were not acknowledged. The impact of such factors needs to be discussed in relation to the credibility of qualitative research results (Cutcliffe and McKenna, 1999).

Participatory research in the Netherlands (Francke *et al.*, 1996) examined the care of cancer patients on two medical and two surgical wards spending around ten days on each unit (a total of 44 days). Findings suggested that nurses were concerned with the patient's pain, striving to provide relief but assessment was not conducted regularly and there were large intervals between analgesics. There are very few details of the method or data analysis reported in this study and results are not supported with field notes. Terms such as "regularly" and "seemed very concerned" are not clarified and conclusions relating to ineffective analgesia are inappropriate in the absence of patient interviews.

A further two studies have taken non-participatory approaches including Manias *et al.* (2002) who followed the care provided by 12 registered nurses in an Australian surgical ward. Two hourly periods were chosen (04.00-06.00, 08.00-10.00, 12.00-14.00, 14.00-16.00, 18.00-20.00, 21.00-23.00) to be included twice and Figure 3.2.4 illustrates the data collection schedule used in the study.

Figure 3.2.4. Data collection schedule used by Manias *et al.* (2002)

1. Describe the patient's appearance, and provide details of verbal and non-verbal communication
2. Describe the activities relating to pain by referring to assessment and treatment
3. State clearly what bed number is involved when conversation occurs at the bedside
4. State the time every 10 minutes
5. State the time when the nurse is visiting the patient for the first time
6. Record the time when the nurse offers analgesics and the time when the patient receives it
7. In conversations relating to pain, use direct quotes wherever possible
8. Describe the total set of activities relating to pain, for example, mobilising a patient postoperatively and completing a wound dressing
9. If the nurse administers a treatment for pain, ensure that the intent is clear
10. At the end of the observation period, document demographic details of the patients and the observed nurse

Analysis of field notes relating to 41 pain activities resulted in identification of four major themes. The first is "nurses responses to interruptions" when carrying out pain activities and the delay between patient requests and administration of analgesics. The second theme, "nurses attending to pain cues," illustrated that nurses were very attentive to pain when carrying out clinical observations and authors described nurses responding to verbal, non-verbal and behavioural cues. Situations did arise where patients expressed pain, this was acknowledged by nurses but no further action was taken. "Nurses interpretation of pain," the third theme, highlighted the focus of assessing incisional pain rather than other sources of discomfort such as urinary catheters. The final theme relates to decision-making activity and addressing the competing demands of other nurses, doctors and patients. The researchers suggested that experienced nurses were more likely to request a change in medication but this seems a general statement in light of the small sample size (n=12).

Manias *et al's.* (2002) study provides a useful insight into the care provided by surgical nurses but the work has a number of limitations. For largely qualitative work, there is limited discussion of the trustworthiness of the data although observer bias is one aspect

that is briefly addressed. One observer was present throughout the study but other authors were in attendance during initial observations to ensure the research assistant used appropriate skills. The impact of numerous researchers is not considered beyond an acknowledgement that in theory, the participant's awareness decreased with time. Nurses were closely followed and an audio recorder with a head mounted microphone was used to record observations rapidly but details of when or where this was used were not reported. These techniques may have adversely affected nurse or patient behaviours.

Schafheutle (1999), a pharmacist, was the first to employ observation in the postoperative setting in the UK to examine nurses' pain management on a large scale, firstly using an unstructured approach and then an observational schedule in the main study. Initially, 20 drug rounds were observed and nurses later interviewed regarding their practice. The results revealed some information regarding questioning practices such as frequency on drug rounds and use of single questions such as "Are you in pain?" Following nurses for short periods in the main study demonstrated 402 patient interactions and 156 relating to pain. These were broadly categorised into "general," "pain," "analgesia," "offer painkillers" and 44.4% (n=52) were asked a follow on question regarding pain but very few details regarding these interactions are given. Schafheutle's work allows insight into questioning and pharmaceutical management of postoperative pain and the strength of the work lies in the comparison of observations to a national survey of nurses' opinions of their practice. However, a number of weaknesses limit the application of these observational data. Nurses were closely followed, aware that medication practice was under investigation while patients and ward sisters knew the true focus of the study. Wearing a white coat, completing documentation in front of participants, may have emphasized the researcher's presence and the reduction of the Hawthorne effect was described as "not an option." The author

later concluded that there was no effect on nurses' behaviour. There was no theoretical framework that informed methods used or analysis of qualitative data and the rigour of the study may be questioned when some measures (such as drugs received in some instances and age of nurse participants) were presented as estimates.

As a group of studies, observational research into pain assessment and management practices has a number of limitations, which highlights the need for further investigation. Most research has occurred outside of the UK, is restricted to one institution and has provided a "snapshot" of care given by one registered nurse to a group of patients rather one patient who receives care from a range nurses and other professionals. Health care assistants and student nurses may play a significant role in the process of pain assessment. Participants were also aware of the topic under investigation, which has the potential to significantly change behaviour. Juhl *et al.* (1993) conducted semi-structured interviews with patients to explore their experience of postoperative pain and two weeks later sent a questionnaire to nurses on the ward. Despite the fact that staff behaviours were not being directly measured, 75% were aware of the first study and felt that it had improved the pain management routine. The influence of the Hawthorne effect in previous observational research may have severely affected results.

Summary

Over the last 30 years there has been an increasing emphasis on the need to assess pain using the patient's self report and instruments that have proven validity and reliability for measuring the construct. As one of the most significant cognitive tasks during the care of patients (Roberts *et al.* 1995), pain assessment has developed into a popular area for nursing research. Studies examining knowledge and attitudes have all attempted to gain an insight into practice and many report positive attitudes towards the process of

assessment and its importance (Fox, 1982; Nash *et al,.* 1993; Lloyd and McLaughlin, 1994; Hunt, 1995; Schafheutle *et al,.* 2001) although the overall goal may not be a pain free state for patients (Saxey, 1986; Winefield *et al,.* 1990; Scott, 1992; Willson, 1992; Bruner, 1995; Brydon and Asbury, 1995; Dalton *et al,.* 1998; Howell *et al,.* 2000; Schafheutle *et al,.* 2001). However, attitudes are malleable and a poor predictor of specific behaviours (Bandura, 1986; Ajzen, 1988) and knowledge has not been rigorously investigated to suggest a relationship with pain management activities. This area of research along with comparative nurse and patient ratings of pain may not be reflective of pain assessment in practice. Further descriptions of practice have been dominated by studies examining nurses' perceptions of their care through interviews, questionnaires and focus groups. Results have suggested that assessment is based on patients' verbal descriptions, use of assessment tools and other factors such as behaviours, physiological parameters and even intuition (Saxey, 1986; Dalton, 1989; Willson, 1992; Neilson, 1994; Sjöstrom *et al.*. 1999, 2000). It is also unclear whether results from these studies reflect actual nursing practice and there is a need for more objective methods.

A small number of observational studies have attempted to observe practice but participatory methods have been inadequately described or the impact of researchers as clinical nurse specialists is not discussed (e.g. Francke *et al.*, 1996; Willson, 2000; Bird and Wallis, 2002). Other observational research (Schafheutle, 1999; Manias *et al.*, 2002) followed nurses for short periods gaining some insight into pain management activities but there is little consideration of the Hawthorne effect particularly in relation to recording techniques in front of participants. Nurses and patients in previous research have been aware of the pain management or medication focus of the studies and the extent to which this influenced behaviours is unclear. There is a need for research in UK

hospitals that addresses each of these issues and follows individual patients' experience of pain assessment and subsequent management.

Section 3.3 Analgesic provision in practice

The assessment of pain and subsequent decisions surrounding analgesic provision are intimately linked but have been artificially separated here to allow detailed discussion of both areas. Pharmacological and non-pharmacological analgesic methods are briefly outlined here with critical discussion of previous research into nursing practice.

3.3.1 Non-pharmacological methods of analgesia

Pharmacological agents are the main methods of analgesia for postoperative patients but many non-drug techniques may support pain management including imagery, distraction, relaxation, music therapy, trans-electrical nerve stimulation (TENS), use of cold packs and acupuncture (McCaffery and Pasero, 1999). These techniques are believed to have a diverse mechanism of action to produce analgesia, which is beyond the scope of this work to describe. The extent to which these techniques are used in practice has not been investigated in any depth. Carr (2000) interviewed patients after surgery and a few reported low pain scores due to positive attitudes, preadmission course of acupuncture or use of herbal remedies such as arnica. Whether nurses employ or encourage patients to use non-drug techniques has not been addressed in previous research.

3.3.2 Pharmacological methods of analgesia

A wide range of pharmacological agents is available for acute pain management and commonly used drugs are presented in Table 3.3.1.

Table 3.3.1. Commonly used drugs in acute pain management

Opioids	Non-opioids	Compound analgesics
• Codeine phosphate • Dextropropoxyphene hydrochloride • Diamorphine hydrochloride • Dihydrocodeine tartrate • Fentanyl • Meptazinol • Morphine sulphate • Pethidine hydrochloride • Tramadol hydrochloride	• Diclofenac sodium • Ibuprofen • Ketorolac • Paracetamol	• Co-codamol 8/500 • Co-codamol 30/500 • Co-drydramol • Co-proxamol

Based on British Medical Association and Royal Pharmaceutical Society of Great Britain (2002)

These medications may be prescribed and administered through several routes including oral, intravenous, intramuscular, subcutaneous, epidural and patient-controlled analgesia. The RCS and CA (1990) recommended the widespread use of newer analgesic techniques such as PCA and epidural analgesia for controlling postoperative pain and supervision by multidisciplinary members. The nursing role includes patient education, monitoring analgesia, side effects and infusion device operation (Tye, 2000) but studies that explore the execution of this role and associated decision-making could not be identified. Research has focused on the administration of analgesics forming two distinct approaches; the review of prescribed and dispensed medication using drug charts and nurses' analgesic choices using hypothetical patient scenarios.

Prescription and analgesic administration have been investigated in an attempt to explore the reasons for poor pain management and UK research forms the focus of work discussed here to eliminate differences in drug availability in other countries. Drug chart examination has demonstrated that most patients (82.4%-97%) are prescribed more than one type of analgesic usually on a *pro re nata* (as required, PRN) basis (MacLellan, 1997; Carr, 2000). The highest number of doses are given on the first day after surgery,

diminishing on subsequent days (Closs, 1992a; MacLellan, 1997). MacLellan (1997) reported that 41% of surgical patients (n=136) had received morphine and 31% papaveretum on the first postoperative day. A NSAID (diclofenac) became the most widely used drug on the second postoperative day. Comparisons between the maximum prescribed dose and administered dose have illustrated the low percentage of analgesics received. Between 4-41% of maximum doses were administered over the first five days in MacLellan's study and 20-25% of patients reported by Closs (1992a) depending on the type of analgesic. Oates *et al.* (1994) linked prescribed and administered analgesics to the patient's pain score (shown in Table 3.3.2).

Table 3.3.2. Prescribed and administered analgesic doses according to pain scores (Oates *et al.*, 1994)

Pain score	Mean doses prescribed	Mean doses administered	Percentage of prescribed doses administered
1-2	4.5	0.7	17
1-5	6.3	1.7	28
6-10	9.0	3.3	36
9-10	9.3	3.5	37

Perhaps as expected, the results demonstrated that those with higher scores received greater number of analgesics, although only 37% of the maximum dose is the highest analgesic rate.

Each of these studies has examined the timing of analgesics but a clear picture does not emerge. Closs's (1992b) research revealed peak administration times between 08.00-12.00 and 20.00-00.00 and the least number of analgesics were administered at night. The greatest numbers were administered at this time in MacLellan's (1997) study and Oates *et al.* (1994) reported 12.00-14.00 and 21.00-23.59 as peak periods. Differences may be partially explained by the different time periods used for analysis, which include two, four and eight hour units.

These studies allow insight into the outcome of clinical decisions regarding pharmacological pain management but do not address the factors that may influence these decisions. The process of decision-making in pain management is complex and is described by Albrecht *et al.* (1992) as having several phases; identifying appropriate cues; interpreting them accurately; considering all the available options reflecting on reasons to do or not to do an activity and selecting an intervention, action or response. Fifty-three nurses in Ferrell *et al's* (1991a) study described the decisions they made, which included how much pain the patient had (77% of respondents), when to give medication (75%), what medications to give (72%) and if the patient had pain (66%). A range of factors has the potential to influence the decision-making process regarding analgesic choices.

Nurses' pain management decisions have been explored using vignettes given to two groups where only one factor differs between the two scenarios. McCaffery and Ferrell (1991) presented nurses (n=456) with patient descriptions with the same pain score but only one was displaying pain behaviours. Fifty-four per cent of participants with the grimacing patient would increase the opioid dose compared to 32.8% for the smiling patient. Similar research has examined age as a factor (McCaffery and Ferrell, 1994), ventilator status of critical patients, time after surgery (Gujol, 1994), care of a sibling compared to a patient (McCaffery and Ferrell, 1997a), vital signs in critical care patients (Chuk, 1999), and the original research has been repeated (McCaffery and Ferrell, 1997b; Heath, 1998). These studies largely present descriptive statistics with little analysis. This research highlights some of the factors that may affect decision-making but could be described as a normative approach i.e. evaluates how good a judgement is without considering how it is made in the real world (Thompson and Dowding, 2002). Vignettes deny participants the opportunity to gather further information and the rigid representation of a patient hinders comparisons to the practice of nurses.

A small group of studies have surveyed or interviewed nurses to ascertain factors influencing decisions and consistently identified type of surgery, number of postoperative days, prescription and last medication given although they were not ranked equally between studies (Cohen, 1980; Murray, 1992; Field, 1996b; Willson, 2000). Only Murray (1992) included patients' verbal expression in a list of options for participants where it was ranked third and fifth out of six options used in a questionnaire and vignette. Lander (1990) observed that there had been very little research into the patients' contribution to the pain management process as if they were regarded as passive recipients of care. The author's comments remain relevant and studies into the verbal interactions that contribute to nurses' decisions are limited. Previous research has explored some factors influencing administered analgesics or choices in hypothetical situations but there is a need to focus on the verbal interaction between nurses and patients in practice, recognising the patient's contribution to the process. With increasing emphasis in the literature on the need to assess pain accurately using self-report measures, it is unclear whether this has translated into practice and if pain ratings influence analgesic decision-making.

Section 3.4 Nursing documentation of pain management

The NMC (2002c) consider record keeping a fundamental part of professional practice that promotes high nursing standards, continuity of care, communication between professionals, provides an accurate account of care planned and delivered and aids the detection of potential problems. Documentation also has legal implications and the process of pain management may help to formalise the assessment and subsequent treatment (Camp and O'Sullivan, 1987). Following a national report in anaesthesia and pain services (Audit Commission, 1997), the Audit Commission published a booklet for nurses on managing pain after surgery (Audit Commission, 1998a). Recommendations

for documentation included the use of assessment tools and charts along with individualised care plans that contained pain levels; details of pain relief administered, the effect of analgesics including side effects and information provided to the patient. This section explores current knowledge of nursing documentation for pain management, justifying the need for further study in this area.

A number of studies have retrospectively investigated the documentation of pain in a range of settings, discovering that pain was identified in 47-79% of nursing records (Albrecht *et al.*, 1992; Clarke *et al.*, 1996; Ward and Gordon, 1996). Ascertaining the frequency of pain assessment from these studies has produced mixed results. Clarke *et al.* (1996) and Malek and Olivieri (1996) reported a high proportion of patients without pain assessment documentation (79% and 80.3% respectively) yet Ward and Gordon (1996) found 90% (n=112) of nursing records showed evidence of pain assessment. The operational definitions of "evidence" are unclear from these studies and may account for the stark difference in results.

There are four prospective studies that have made a significant contribution to the knowledge in this area. Camp and O'Sullivan (1987) examined the documentation of 90 patients in 19 different units (including 30 surgical patients from seven units). The authors waited on the ward until a patient reported pain to nursing staff, who alerted the researcher. The nurse was allowed ten minutes to conduct a pain assessment before the patient was interviewed to ascertain the maximum information available. This information was compared to documentation and a ratio calculated to determine congruence level. The main results for surgical patients are presented in Table 3.4.1.

Table 3.4.1. Comparison of surgical patient response and nurses' documentation of pain assessment (Camp and O'Sullivan, 1987)

Category	Patient response		Nurse recorded		Nurse congruent	
	n	%	n	%	n	%
Location	30	100.0	13	43.3	11	36.6
Quality	29	96.6	5	17.2	2	6.9
Pattern	29	96.6	0	0.0	0	0.0
Increase	17	56.6	2	11.8	2	11.8
Intensity	26	86.6	3	11.5	1	3.8
Verbal	30	100.0	26	86.6	4	13.3
Non-verbal	9	30.0	0	0.0	0	0.0
Symptoms	9	30.0	0	0.0	0	0.0

The results illustrated that nurses documented some areas elicited by researchers but this information was not always congruent with the patient's response. The authors concluded that nurses document less than 50% of what patients report but this may be misleading as the statement relates to the researcher's assessment of the patient's pain. Camp and O'Sullivan did highlight that it is unclear whether nurses failed to assess pain adequately, document findings or a combination of both factors. The influence of the researcher's presence and participant's awareness of the study were not acknowledged in the publication.

Idvall and Ehrenberg (2002) described the findings from 172 Swedish postoperative records illustrating that 93% (n=160) of patients had been assessed on one occasion yet only 14% had one pain assessment per nursing shift. A scale was used with 102 patients but this only occurred once per shift for 17 patients suggesting Swedish nurses are conducting and documenting assessments but not on a regular basis. During data collection, nurses caring for the participants were asked if "the documentation concerning the patient's pain and treatment concurs with current regulations and guidance;" such questioning may have increased the salience of the project and influenced results. Also, extracts from the nursing records such as "aches from the

wound" and "aches badly" highlight the difficulties in translating results into English along with potential differences in health care provision and record keeping.

In 1994, Briggs and Dean (1998) interviewed 65 postoperative orthopaedic patients in a UK hospital and conducted a qualitative analysis of documentation. Only 22 (34%) of care plans identified pain as a problem yet 91% of patients reported pain to the interviewer. Table 3.4.2 indicates the main results from care plans analysed using content analysis.

Table 3.4.2. Documentation of pain in nursing care plans (Briggs and Dean, 1998)

Area of care plan	n	%
Goal of care (n=22)		
Reduce or alleviate pain	10	45
Be pain free	4	18
Patient to report they are pain free/comfortable	2	9
Keep comfortable	2	9
Maintain normal standards of pain control	1	5
Determine cause	1	5
Interventions (n=22)		
Give prescribed analgesia PRN/as required	21	95
Nurse in comfortable position	18	82
Monitor effects of analgesia	17	77
Encourage patient to express pain	16	73
Use diversional/distractional therapy	15	68
Evaluate pain as expressed	8	36
Attempt to promote a calm environment	5	23
Assess and record pain levels	5	23
Give information about event/procedure	2	9
Use pillows and warmth	1	4.5
Involve members of the multidisciplinary team	1	4.5
Review analgesia if effective	1	4.5
Give analgesia regularly	1	4.5
Evaluation (n=65)		
Analgesia given as per chart	48	74
Settle and slept	25	38
No complaints of pain	23	35
Comfortable at the time of report	23	35
Analgesia given with good effect	17	26
Satisfactory post op night	9	14
Slept for short periods	7	11
Complaining of pain	5	8
Patient in some degree/great deal of pain	3	5
Patient states that he is only slightly comfortable	1	1.5
Pain improving	1	1.5

The paper also highlighted the negative use of terms "complained of pain" that frequently appeared in documentation. Despite the low number of patient records that identified pain management as a goal, all included an aspect of pain management in the evaluation section of the care plan. Briggs and Dean's work gives an interesting insight into this element of practice but the authors acknowledged that documentation might not reflect actual care given and inter-rater reliability is not discussed.

Schafheutle (1999) also examined documentation of 188 patients on urology and vascular surgical wards presenting similar results to Briggs and Dean (1998) although there are fewer details of the nature of the documentation or categories revealed. The unique position of the researcher (who observed some aspects of care and subsequently examined documentation) was not optimised. The author makes one comparison of an interaction and documentation with little further discussion, therefore the relationship between actual and documented care remains unexplored.

Studies investigating the documentation of pain management have focused on care in one hospital and there have been limited number conducted in the UK. More importantly it is unclear whether documentation is representative of actual care provided by nurses. The NMC (2002c), emphasising the legal aspect of record keeping, suggested that an absence of documentation indicates a lack of care in this area but documentation may decline as workload increases (Briggs and Dean, 1998). After interviews with nurses (caring for patients who had experienced a myocardial infarction or fractured neck of femur) and retrospective analysis of case notes, Hale *et al.* (1997) concluded that there were too many discrepancies between reported and documented care. Based on the assumption that nurses accurately reported their activities, records were not considered a valid source of data to describe nursing interventions. Authors have acknowledged that observation is the only method that could provide an accurate picture of nursing care that could be linked to pain documentation (Hale *et al.* 1997; Briggs and Dean, 1998).

3.5 Summary

As part of the multidisciplinary team, nurses have a central role in all aspects of pain management including detection, assessment, administration and management of

analgesic techniques, documentation and evaluation. An extensive body of literature is available to inform practice and it is a popular area for nursing research (Kitson, 1994). Studies have examined nurses' knowledge, attitudes, nurse-patient pain ratings and descriptions of practice, contributing to the overall body of knowledge but these results may not reflect actual practice and its complexities. Research into analgesic administration and documentation has provided information on other elements of the jigsaw but the complete pain management process from detection to evaluation has not been explored. Previous observational research has provided a "snapshot" of care given by one registered nurse, failing to recognise the contribution of patients, health care assistants, student nurses and other professionals to the process. Participants have been aware of the pain or medication focus of the study and most authors do not discuss or attempt to limit the Hawthorne effect. One major study has occurred in the UK (Schafheutle, 1999) but the work has a number of weaknesses that restricts the application of results. The author's position as a pharmacist, an "outsider," may have been a strength in terms of pre-existing assumptions but it served as a weakness in the discussion where standards of expected or received nursing care cannot be reflected upon in any depth.

Much of the previous research has focused on analgesic administration and the nursing care of patients with PCA or epidural analgesia has not been explored. Similarly, there is little information on the non-pharmacological methods nurses use to support analgesia. These gaps in an otherwise well-researched area provide the rationale for the current investigation. Furthermore, pain management has not been investigated across organisations in the UK taking into consideration the institutional factors that may influence nursing care.

CHAPTER 4

LITERATURE REVIEW OF THE ORGANISATIONAL COMMITMENT TO POSTOPERATIVE PAIN MANAGEMENT

> There will be little improvement in pain [management] until it becomes a matter of collective concern and organisational accountability. This…is likely to come about after considerable nationwide discussion.
>
> Strauss, Fagerhaugh and Glaser
> *Pain: an organisational-work-interactional perspective*

Section 4.1 Introduction

Inadequate postoperative analgesia has been attributed to a number of organisational factors that influence the care delivered by health care professionals. Furrow (2001) suggested that pain was not recognised as a valid indicator of suffering within organisations compared to pyrexia, which is objectively measured and aggressively treated. Other proposed barriers include lacking a common language for the assessment and documentation of pain (Pasero *et al.*, 1999), absence of written guidelines in the form of policies, procedures or standards, and the presence of controlled drug policies stipulating that two nurses must administer opioids (which may result in delays, reluctance to administer analgesics and be compounded by inadequate staffing levels; Slack and Faut-Callahan, 1991; Mann and Redwood, 2000; Furrow, 2001).

Strauss *et al.* (1974) were the first to propose that elements of service delivery within an organisation may form barriers to adequate pain management yet it was a further two decades before postoperative pain in hospitals received nationwide discussion. The major impetus for organisational change in the UK was the *Report of the Working Party on Pain After Surgery* by the Royal College of Surgeons of England and College of Anaesthetists (RCS and CA 1990) which made recommendations to improve staff

education, documentation, audit, the widespread use of newer analgesic techniques and formation of multidisciplinary specialist teams referred to as acute pain services (APSs). This chapter discusses organisational commitment, a term that describes a hospital or group of hospitals that form an NHS Trust and the strategies in place to improve pain management, such as those proposed by the RCS and CA (1990). The review focuses on developments within the UK to provide a rationale for the work undertaken in this thesis.

4.1.1 Search strategy

Sources of literature were predominantly traced through searches of the following electronic databases conducted at various points during the study (the final enquiry conducted six weeks before submission of this thesis):

BIDS ISI	1980-2000
CINAHL	1982-2003
Index to Theses	1970-2001
Medline	1966-2003
National Research Register	2003 Issue 3
Web of Science	1982-2003

The keywords below were employed as single phrases or in combination using Boolean logic (AND, OR, NOT), a "wildcard" (use of a question mark to detect alternative spellings of words) and truncation (use of an asterisk to locate keywords based on a root, Beaven, 2002):

Acute pain management
Acute pain service
Acute pain team
Barriers
Institutional commitment
Organi?ation*
Organi?ational commitment
Pain
Pain services

Papers and theses were limited to those published in English and were retrieved if the title indicated relevance or the nature of the work was unclear from the title and abstract. References from papers were selected using the same procedure and the Internet aided the location and retrieval of government papers and publications from professional organisations.

Section 4.2 Organisational commitment to improving pain management

From 1990 onwards, pain after surgery was the subject of several national reports in the UK (RCS and CA, 1990; Welsh Office NHS Directorate, 1992; Scottish Office Department of Health, 1996; Audit Commission, 1997; CSAG, 2000) and abroad (Agency for Health Care Policy and Research, 1992; Wulf *et al.*, 1997; National Health and Medical Research Council, 1999) each making recommendations at an organisational level to improve pain management for patients. This section examines the organisational changes following reports published in the UK including the provision and effectiveness of pain services.

4.2.1 Organisational changes relating to postoperative pain management

The RCS and CA (1990) report highlighted the prevalence of postoperative pain consistently shown by research, the lack of development in practice (despite availability of new analgesic techniques) and the need for professionals at all levels of an organisation to take responsibility for pain management. Figure 4.2.1 illustrates the report's major recommendations to improve pain management in British hospitals.

Figure 4.2.1. Major recommendations from the RCS & CA (1990) report

- Improve hospital staff education and challenge traditional attitudes to postoperative pain relief
- Assess and record pain systematically, involving the patient wherever possible
- Responsibility for the management of pain relief policy after surgery in each hospital given to a named member of staff
- Establish acute pain teams in all major hospitals
- Audit and continuous appraisal of activities
- Establish appropriate facilities for the provision of adequate postoperative pain relief in all hospitals
- Provide properly trained staff and resources for these services

Around this time the Welsh Office NHS Directorate (1992) published a series of *Protocols for Investment in Health Gain*. The *Pain, Discomfort and Palliative Care* protocol set a standard for the proportion of patients in severe postoperative pain to be less than 20% by 1997 and 5% by 2002. This is the only published report to set specific targets for pain management but to date, it is unclear whether these have been met within the Welsh population admitted for surgery.

Following the RCS and CA (1990) publication, a number of national surveys investigated the extent to which hospitals had implemented the report's recommendations and the main results are presented in Table 4.2.1

Table 4.2.1. Results from national surveys following the RCS & CA (1990) report

Year of research / Recommendation	1990 n	1990 (%)	1994 n	1994 (%)	1994 n	1994 (%)	1996-97 n	1996-97 (%)*	1997† n	1997† (%)*	2000† n	2000† (%)
Final sample (overall response rate)	354	(72.2)	354	(72.2)	221	(78.6)	291	(95.4)	153	(69)	226	(85.6)
Hospitals with APS	10	(2.8)	151	(42.7)	97	(44.0)	173	(57)	220	(88)	190	(84.1)
Named clinician responsible for pain management	20	(5.7)	230	(65.2)			226	(74)	152	(99.3)	199	(89.4)
Minimum of one clinical nurse specialist for acute pain	8	(2.3)	139	(39.3)	62	(28.1)	173	(57)	114	(81)	--	
Consultant session devoted to acute pain management	14	(3.9)	81	(22.9)	36	(16.3)	128	(45)	134	(93)	--	
Funding available for pain management	--		--		18	(8.5)	--		29	(20)	--	
High dependency unit available	77	(21.9)	122	(34.5)	--		137	(45)	--		--	
Guidelines/protocol for pain management	51	(14.4)	273	(77.1)	--		268	(88)	137	(95)	214	(96)
Education for health care professionals	35	(10.1)	187	(52.8)	--		182	(60)	--		206	(91.2)
Regular assessment of pain and sedation	25	(7.1)	210	(59.3)	192	(86.8)	--		124	(87)	90.3	(204)
Ward round by APS	5	(1.4)	111	(31.4)	--		186	(61)	--		--	
Audit of pain management	14	(4.0)	200	(56.5)	--		204	(67)	128	(89)	202	(89.4)
Conduct or participate in research	15	(4.2)	104	(29.4)	--		--		--		--	
Publication	Windsor *et al.* (1996)		Windsor *et al.* (1996)		Harmer *et al.*, (1995)		Audit Commission (1997)		CSAG (2000)		McDonnell *et al.* (2003b)	

*Percentages quoted are based on number of responses to each question and rounded up by authors
†Results relate hospitals with an APS only

Windsor *et al.* (1996) sent a questionnaire to directors of anaesthetic services four years apart and results demonstrated a vast increase in all of the organisational indicators shown in Table 4.2.1. A few years later, Austin (2002) investigated the provision of epidural analgesia in NHS hospitals and reported 236 (92%) acute pain services in the UK but no other elements of organisational commitment were assessed. Results have generally indicated an increase in organisational activity, particularly in relation to the number of hospitals with an APSs, use of assessment tools or pain documentation and audit of care. However, direct comparisons between studies are hindered because of the possible differences in research instruments (very few details of the questionnaires are given), sampling methods and professional backgrounds of the recipients. Also, CSAG's (2000) and McDonnell's *et al.* (2003b) results in Table 4.2.1 only relate to hospitals with pain services; those without an APS may have implemented many of the recommendations from key reports.

National surveys have mainly reported the presence or absence of key indicators such as audit but research has yet to ascertain the nature of provision in terms of written policies for pain management, audit areas and content and frequency of staff education. There is widespread recognition that hospitals need to develop individual programmes to meet local needs (RCS & CA 1990; Audit Commission 1997; Association of Anaesthetists of Great Britain & Ireland and The Pain Society, 1997) but wide variations in provision between NHS Trusts may influence patient care.

Seven years after the RCS & CA (1990) report the Audit Commission published *Anaesthesia Under Examination: The Efficiency and Effectiveness of Anaesthesia and Pain Relief Services in England and Wales.* The main recommendations, which built upon previous reports, are presented in Figure 4.2.2.

Figure 4.2.2. Major recommendations of the Audit Commission report (1997)

- Include specific standards about pain relief in contracts between health authorities and general practice (e.g. Welsh Office NHS Directorate, 1992)
- Include a statement of aims towards pain relief in the Trust's quality strategy, agreed at board level; these aims should be translated into specific standards, policies and guidelines for staff to follow
- Identify one doctor with specialist knowledge of pain relief to promote good practice
- Achievements against pain relief targets need regular audit with pain scores being one of the key quality indicators
- Develop evidence based guidelines on effective analgesic therapies, following these with frequent pain scoring
- Develop a coordinated approach stemming from a clear agreement on how the anaesthetists will work with surgeons and other staff to ensure patients do not suffer unnecessary pain
- Acute pain teams should provide written information and guidelines, co-ordinate and educate staff, provide leadership and a focus for improved teamwork; Trusts that do not wish to take a formal team approach will need some other mechanism to ensure that these activities take place
- Develop a programme of continuing education in pain management for trainee doctors and nurses. This should include training on how to incorporate pain relief in the nursing care plan.

Following publication, the Audit Commission appointed external auditors to conduct a 30-day local review of all NHS Trust anaesthesia services; the auditors often identified pain management in the first few days as an area for further investigation. An individual Trust report was written, identifying priority areas and objectives to be met within an agreed timescale and directors of hospital services were later contacted to ensure that these had been achieved (Balfe, 1999). The information regarding individual hospitals or a national perspective on the outcome of the review is not in the public domain. However, as a consequence of the process, postoperative pain management and anaesthesia services have been under close scrutiny in acute hospital Trusts in England and Wales.

Pain after surgery may also be the focus of organisational activity as a result of clinical governance highlighted in Section 2.7.5. Many of the organisational changes proposed by national reports on pain mirror the key elements of the governance agenda identified

in Figure 2.7.2; this includes the right to staff education, monitoring current practice, patient experiences and ensuring a process of improving the quality of care. In April 2000, the Commission for Health Improvement (CHI) was established to review the care provided by NHS bodies in England and Wales and monitor the implementation of clinical governance (CHI, 2002). A brief review of the reports published by CHI for individual acute NHS Trusts reveals that postoperative pain management has been described as an area of notable practice in some hospitals and an area for improvement for others (e.g. CHI, 2001a; CHI, 2001b). However, pain after surgery was not reviewed for every organisation therefore the extent to which it has been the subject of specific clinical governance targets is unclear.

The implicit aim of national reports and review processes is to promote the organisational commitment and accountability that Strauss *et al.* (1974) described and research has highlighted the increases in organisational activity in UK hospitals over the last 13 years. Specific details of activities such as audit, education and guidelines have not been ascertained by research, published work has simply identified the presence or absence of these key indicators. At an organisational level, statutory bodies such as the Audit Commission and CHI may have also reviewed anaesthesia services and pain management although specific details have not been published. Organisational changes have the potential to influence patient care at ward level but the main vehicle for increasing commitment, advocated by national reports and professional bodies, is the formation of a multidisciplinary specialist team or acute pain service.

4.2.2 Acute pain services

The widespread concern for inadequate pain relief and the introduction of new analgesic techniques such as PCA and epidural analgesia, gave rise to the formation of multidisciplinary teams for acute pain management. First described in Germany in 1986

(Rawal *et al.*, 1998) and USA (Ready *et al.*, 1988), APSs in the UK were largely introduced following the RCS and CA (1990) report. Team members may include, clinical nurse specialists, anaesthetists, surgeons, pharmacists and physiotherapists (Audit Commission, 1997) whose role is outlined in Figure 4.2.3.

Figure 4.2.3. The role of the acute pain service based on the RCS and CA (1990) report

- Responsibility for the day-to-day management of acute pain after surgery
- Organisation of services so that the level of care and monitoring is appropriate both for the clinical condition of the patient and the technique employed
- Provision of in-service training for medical and nursing staff involved in pain management. This should include establishment of programmes for the diagnosis and management of complications and hazards of particular forms of treatment
- Audit of the beneficial and detrimental outcomes of existing methods of treatment and evaluation of new techniques
- Clinical research into the relief of acute pain.

The service or team should provide impetus for change, leadership, promote consistent standards across wards, act in a trouble shooting capacity and a source of expert advice (Hughes, 1994; Audit Commission, 1997; NHMRC, 1999; Mackrodt, 2001). Patients who are potential candidates for PCA and epidural analgesia, should be preoperatively assessed by a member of the team and postoperatively reviewed on a regular basis (Royal College of Anaesthetists, 2000; Mackrodt, 2001). Services in some hospitals also have a remit for trauma and acute conditions on medical wards (Audit Commission, 1997). The PS and RCA (2003) recently published further objectives relevant to all acute pain services (presented in Figure 4.2.4).

Figure 4.2.4 Objectives of acute pain services (Pain Society and Royal College of Anaesthetists, 2003, p5)

- Establishment of a system of regular assessment for the individual treatment of acute pain.
- Provision of specialist care and advice for difficult acute pain problems such as occur in patients already taking strong analgesics for cancer pain or chronic non-cancer pain, and for patients who are problem drug users.
- Seamless liaison with other healthcare teams responsible for the shared care of patients with acute pain.
- Provision of back-up arrangements, education programmes and appropriate guidelines or protocols to ensure that there is continuous cover for acute pain management round the clock, seven days a week.
- Information, education and reassurance for patients presented in a way that they understand
- Education for nursing, medical staff and other allied healthcare professionals leading to an increased awareness of the consequences of unrelieved acute pain and of the techniques available to relieve pain.
- Continuing audit and evaluation of the service and needs of patients.

Several models of APS have emerged including an anaesthetist-led team favoured in countries with a fee-for service reimbursement such as North America (Ready *et al.*, 1988; Ready, 1997). Criticised for focusing on patients with PCA and epidural analgesia, Harmer (1991) and Rawal (1997) argued that an acute pain nurse based service is a more appropriate model for European, state-run health care providing optimum pain management for all patients through education, audit and implementation of policies. This model is also advocated by professional groups in the UK (Association of Anaesthetists of Great Britain & Ireland and The Pain Society, 1997) although there is no national or international agreement on the optimal structure of a pain service (Sanders and Michel, 2002). Later research by Rawal *et al*, (1998) across Europe found four models of staffing for APSs; acute pain nurse and anaesthetist; one anaesthetist for acute pain management only; a junior anaesthetist supervised by a consultant and an anaesthetist with "on call" responsibilities for acute pain.

Two national bodies were commissioned to evaluate pain services in British NHS Trusts around the same time and the research undertaken during 1996-1997 (Audit

Commission, 1997; CSAG, 2000). The Audit Commission (1997), which examines value for money in public services and promotes clinical effectiveness, responded to a request from Trust chief executives to examine anaesthesia services. The Clinical Standards Advisory Group were commissioned by UK Health Ministers to "...advise on standards of clinical care and access and availability for services for NHS patients with acute and chronic pain" and *Services for Patients with Pain* was published in 2000. Research methods for both studies included postal surveys, interviews and focus groups with patients, staff and commissioners of health care, consultation with professional organisations and close examination of service provision in a small number of NHS Trusts. The results further illustrated variations in APS organisation in the UK. Most surveyed by the Audit Commission (1997) undertook regular postoperative ward rounds but 11% had no patient contact, limiting their role to advice, staff education and development of guidelines. Hughes (1994) supported this latter model, describing day-to-day pain management as the responsibility of ward staff. CSAG (2000) described some Trusts as having "token" services with team members having other health care responsibilities, few formal guidelines and limited arrangements for the use of epidurals in ward areas. Stamer *et al.* (2002) even suggested that the term APS was a convenient label in some hospitals for the conventional organisation of pain management supported by professionals "on-call."

Overall, pain management is seen as an area that is given low priority and inadequate funding (Mann and Redwood, 2000). Interviews with commissioners of health care revealed perceptions of limited added value for funding pain management activities and higher priority given to other local, political or central NHS initiatives. Only 20% of pain services surveyed had an identified budget and funding for the rest of the sample was described as "unclear" (CSAG 2000).

The RCA (2000) published recommended audit areas and standards proposing that every hospital should have an APS. The organisation, structure, role and management of pain services will naturally differ between hospitals and NHS Trusts depending on resources and funding available but a key member of most current services is the clinical nurse specialist.

4.2.3 Role of the Acute Pain Nurse (APN)

CSAG (2000) investigated the professional groups involved in 152 services discovering that 95% of respondents named a consultant anaesthetist as lead clinician working an average 5 hours per week in this capacity. Other professionals worked between 3-7 hours a week (e.g. physiotherapists, pharmacists) but 81% of services had appointed an acute pain nurse who worked 38 hours per week on average. Clinical nurse specialists clearly have a central role in the organisation and delivery of a pain service.

A range of clinical grades and titles have been allocated to nurses working in acute pain services including clinical nurse specialist, pain relief sister and nurse practitioners graded E-I (Cambitzi, 1996; Pain Society, 2002). The CSAG (2000) report highlighted the typical duties of nurse specialists (n=117) who spent approximately 40% of their time providing hands on pain management, 35% training and supervising staff, 10% educating patients and 11% conducting audit or research. APNs (n=52) responding to the survey of Nursing Focus in Pain Management Working Party of the Pain Society (Pain Society, 2002) described a higher clinical input (55%) and 12% devoted to managerial and administrative work. As part of their role, APNs have also reported working in a trouble shooting capacity, developing and implementing policies although variations exist; 11 nurses (12.5%) in Cambitzi's (1996) study did not have patient contact and 43% were involved in chronic pain management.

Clinical nurse specialists essentially support and educate nurses to help them care for patients (Castledine, 2002). Similar to any other post associated with higher level practice, some authors have suggested that APNs have the potential to "de-skill" surgical nurses and the management of pain or infusion devices may not be seen as the responsibility of ward staff (Carr, 1997; Lawler, 1997; Duncan, 1999). However, there has been little research into this area.

Despite the variations in nurse specialist provision and issues surrounding advanced practice, APNs have a pivotal role in the delivery of pain services and research has attempted to evaluate the effectiveness of the post (e.g. Coleman and Brooker-Milburn, 1996; Gabrielczyk and McGonagle, 1997; MacKintosh and Bowles, 1997). Within these studies the appointment of an APN coincided with the introduction of other elements of service provision, therefore the wider effectiveness of pain services is considered.

4.2.4 Effectiveness of acute pain services

At the time of the RCS and CA (1990) report, there was little rigorous research to indicate whether APSs were effective methods of promoting organisational commitment and reducing the incidence of unrelieved pain. However, monitoring clinical effectiveness has been promoted as an integral part of service delivery through audit or research based on pain scores, patient satisfaction, adverse events and staff knowledge or attitudes as outcomes measures (Gabrielczyk and McGonagle, 1997; Mackrodt, 2001). Adverse events and side effects such as nausea, sedation and respiratory depression are potentially important elements of the patient's experience but there is little evidence available to allow firm conclusions regarding the effectiveness of APSs in these areas (Werner *et al.*, 2002). This discussion focuses on the main outcome measurements of pain intensity, satisfaction and staff attitudes.

Before and after studies have examined outcome measures, relating to the introduction of a pain service, interviewing groups of patients up to 72 hours after surgery. Services had been established between 12 weeks and three years but found reductions in pain scores at rest (Gould *et al.*, 1992; Coleman and Brooker-Milburn, 1996; MacKintosh and Bowles, 1997; Gabrielczyk and McGonagle, 1997; Afilalo and Tselios, 1996; Tighe *et al.*, 1998; Sartain and Barry, 1999; Bardiau *et al.*, 1999; Salomaki *et al.*, 2000) and during movement, deep inspiration or worst pain episodes (Gould *et al.* 1992; Coleman and Brooker 1996; Mackintosh and Bowles 1997; Sartain and Barry 1999; Salomaki *et al.* 2000). One Canadian study (Pesut and Johnson, 1997), found no change in pain scores but retrospective scores documented by ward nurses were used rather than patient interviews.

Nurses' knowledge and attitudes towards pain management may affect their interaction with patients so it is useful to briefly review literature surrounding the influence of an APS. The limited number of studies examining staff attitudes and knowledge following service introduction has produced mixed results. McLeod *et al.* (1995) compared staff attitudes in a unit with and without access to an APS and demonstrated more positive attitudes towards pain relief on the ward with an APS. Misconceptions surrounding PCA and risk of drug dependency also showed a significant difference ($p=<0.001$). MacKintosh and Bowles (2000) found an increase in knowledge, acceptance of verbal reports of pain intensity and more positive attitudes towards pain assessment tools four years after service inception. Most of these results did not reach significance level except the surprising increase (13% to 40%) in nurses believing that "patients should expect to suffer some pain." Similar to other research relating to nurses' attitudes and knowledge it is unclear how changes affect actual practice.

Despite assorted models of APS across countries, general results from British studies (Gould *et al.* 1992; Coleman and Brooker-Milburn, 1996; MacKintosh and Bowles, 1997; Gabrielczyk and McGonagle, 1997; Lanigan and Luffingham, 1998; Tighe *et al.*, 1998) are congruent with research from other countries, demonstrating improvements in pain intensity scores (Sartain and Barry, 1999; Bardiau *et al.*, 1999; Salomaki *et al.*, 2000). However in all cases, results are unique to each institution because they have reported different elements of service introduction, which makes generalisations difficult. Also, the majority of studies evaluate changes over a relatively short period of time (3-9 months) and whether these changes are sustained is unclear.

Seven of the 12 studies which have examined patient outcomes (Coleman and Brooker-Milburn, 1996; Pesut and Johnson, 1997; MacKintosh and Bowles, 1997; Gabrielczyk and McGonagle, 1997; Lanigan and Luffingham 1998; Miaskowski *et al.*, 1999; Salomaki *et al.*, 2000) focused predominantly or exclusively on patients undergoing major surgery or using PCA and epidural analgesia. This represented only 10.3% of the surgical population in Lanigan and Luffingham's (1998) study. This area of research has not investigated the potential benefits of services for the wider surgical population and it could be argued that the research evaluates the effectiveness of introducing and supporting these modalities rather than the service as a whole.

Some studies have reported improvements in the pain scores of all surgical patients after the introduction of an APS or elements of service provision (Harmer and Davies, 1998; Tighe *et al.*, 1998) although the severity of operations were not reported. Two have attempted to classify surgical procedures into major, intermediate and minor operations and reported pain scores accordingly. Gould *et al.* (1992) introduced sequential changes as part of an APS which included the use of a pain assessment chart, algorithm for

administration of opioids, wound infiltration during surgery, patient information sheets and PCA use. Statistically significant improvements were observed in all patients' pain at rest, on movement and deep inspiration although this was less prominent in intermediate and minor surgical patients. For major and minor surgical patients, reductions in pain scores at each stage were not significant beyond the second intervention (use of an algorithm) and this was prior to the widespread use of PCA. Interestingly, Sartain and Barry (1999) in an Australian study included all types of surgery (n= 605) but they only found a significant improvement in pain scores in major surgical patients (p=0.001); the authors attributed this to an increased use of epidural analgesia. Overall, results from the small number of studies that stratified the sample according to surgical group paint a mixed picture.

Three studies offer an insight into effectiveness of APSs across organisations. Harmer and Davies (1998) introduced elements of service provision into 15 UK hospitals including a programme of staff education, pain assessment and observation chart, algorithm for analgesia, standard guidelines and prescription chart labels for an opioid (morphine), an anti-emetic and an antagonist for respiratory depression (naloxone). The baseline audit repeated 4-6 months later in each hospital demonstrated decreases in the number of patients with moderate to severe pain at rest (32% vs. 12%), on movement (76% vs. 53%) and during deep inspiration (41% vs. 22%). Results were not subject to statistical analysis due to the open audit methodology and a formal pain service did not exist within the hospitals. Similarly, Traverner (2003) reported audit results from fourteen hospitals in one NHS region and suggested that pain scores were higher in the two hospitals without a pain service. However, data or inferential statistics comparing the two types of hospital were not presented in the publication.

Miaskowski *et al.* (1999) studied 5837 patients across 23 hospitals in North America which included 12 hospitals with an APS. The modality of analgesia between the two groups of hospitals significantly differed and PCA and continuous epidural were most frequently used in hospitals with a service. No differences were found for patients' least pain scores but worst pain scores were statistically significant (6.8cm Vs 7.1cm; p=0.0001) although perhaps not clinically significant (Miaskowski *et al.*, 1999). Differences between fee-for-service reimbursement and state-run health care such as the NHS need to be recognised when considering these results.

Two authors have recently attempted to review published research to evaluate the effectiveness of acute pain services. Werner *et al.* (2002) concluded that the percentage of patients who experienced moderate to severe pain was reduced by 0-27% at rest and 19-24% upon movement following the introduction of a service. However, the reviewers do not give a definition of moderate pain and it is unclear how they reached these statistics due to the variations in data presentation and pain scales used. McDonnell *et al.* (2003a) conducted a systematic review of published research on APSs in England, which illustrated the wide variation in quality of research, elements of pain service introduced and differences in outcome measurements. The authors also attempted a meta-analysis of pain scores at 24 hours postoperatively but only four studies could be entered into the analysis and this included Pesut and Johnson (1997), which relied on documented scores by nurses. McDonnell *et al.* (2003a) acknowledged the limitations of both the systematic review and the meta-analysis and concluded that there is insufficient robust research to assess the effectiveness of acute pain services on patient outcomes.

Researching the effectiveness of APSs is complex because both the phenomena of pain and changing practice are multifaceted and influenced by many intervening variables. As Stamer *et al.* (2002) pointed out, the randomised control trial of the APS is difficult to achieve. However, some improvements in pain management have been illustrated by published audit data in individual hospitals which, has been supported by more rigorous research using before and after designs (Gould *et al.* 1992; Sartain and Barry 1999; Bardiau *et al.* 2000) and studies across institutions (Harmer and Davies 1998; Miaskowski *et al.* 1999). Results should be interpreted in light of the research's limitations, such as the different models of service, the quality of study, the propensity to focus on major surgical patients and the limited data available on the long-term effect of these changes. There is need for research to examine the experience of all surgical groups across several institutions in the UK.

Section 4.3 Summary

Institutional structures, procedures, routines and the absence of documentation or written policies have been proposed as barriers to the adequate management of postoperative pain (Slack and Faut-Callahan, 1991; Pasero *et al.*, 1999; Mann and Redwood, 2000) but the major stimulus for organisational change in the UK has been the *Report of the Working Party on Pain After Surgery* (RCS & CA 1990). Subsequent reports (Welsh Office NHS Directorate, 1992; Scottish Office Department of Health, 1996; Audit Commission, 1997; CSAG, 2000) and the number of peer reviewed publications means that the topic has received the "considerable nationwide discussion" that Strauss *et al.* (1974) felt was required to improve pain management. The "organisational accountability" the authors discussed may have been promoted through the process of clinical governance and external review bodies such as the Audit Commission and CHI but few details of these processes are available.

National surveys have indicated a general increase in organisational activity especially in relation to the number of hospitals with pain services, use of pain assessment tools, documentation charts and the audit of care (Harmer *et al.*, 1995; Windsor *et al.*, 1996; Audit Commission, 1997; CSAG 2000). These surveys simply indicate the presence of key indicators rather than details or variation in areas such as written policies, staff education and audit practice. Whilst these are positive changes there is a general assumption that they translate directly into improvements in practice. There is a need for research to investigate both the details of organisational activity and the care of patients at ward level.

Previous research has also explored the implementation of recommendations by hospitals from the RCS & CA (1990) publication but there has been limited research after the Audit Commission (1997) report. CSAG (2000) criticised eight of the NHS Trusts it reviewed for failing to implement Audit Commission targets yet CSAG's research was carried out at a similar time as the Audit Commission investigation. There is a need to explore organisational changes following the Audit Commission report and 30-day review in each hospital.

The Royal College of Anaesthetists (2000) and Pain Society and Royal College of Anaesthetists (2003) advocated APS development in every UK hospital and Brodner *et al.* (2000, p566) described services as the "gold standard for the management of pain after [surgery]." Multidisciplinary teams with responsibility for introducing new analgesic techniques, education of staff, development of guidelines, policies, audit and research are seen as the panacea for inadequate pain management. Before and after studies have illustrated improvements in pain intensity scores for individual hospitals but there is limited data on effectiveness across institutions in the UK.

Finally, the Audit Commission (1997) suggested that Trusts without a formal pain service have a mechanism in place to ensure that their recommendations are implemented. Little research attention has been paid to hospitals without a formal service to explore whether this has been achieved and the influence on patient care. The possibility of optimum pain management without an APS has not been investigated and comparing patient outcomes in hospitals with and without pain services has not been explored sufficiently in the UK.

Collectively, the limitations of previous work relating to organisational commitment and investigations into postoperative pain management in hospital provide the rationale for work undertaken in this thesis.

CHAPTER 5

METHOD

Section 5.1 Introduction

This chapter describes the research process and methodological decisions surrounding the work undertaken in this thesis, which explored organisational influences on patient care and the nursing management of postoperative pain. The study was designed to address the following research aims:

- Examine the organisational commitment to improving pain management that may influence nursing care
- Explore patients' pain management experience on the first postoperative day
- Examine nursing care provided in hospitals with and without a pain service.

Carter (1998, p86) reflected upon the complex nature of pain research and the potential to lose richness, complexity and reflexivity; the author described pain as "always more than the sum of its parts." Careful methodological design aimed to minimise these potential losses which may have occurred in previous research that employed individual techniques (questionnaires, interviews, observation, documentation) using qualitative or quantitative approaches. This investigation required a combination of approaches to adequately explore the identified aims encompassing the breadth and depth of the subject. However, the use of mixed methods has prompted much academic debate.

Section 5.2 Methodological issues

The philosophy underpinning a research project is referred to as a paradigm, describing beliefs that guide action and was first proposed by Kuhn in 1970 (Guba and Lincoln, 2003). Paradigms consist of three elements or questions; ontology (form and nature of reality and how do we know the world?); epistemology (what is the relationship

between the enquirer and the known?); methodology (how can we gain knowledge about the world? Carter, 1998; Guba and Lincoln, 2003). The answers to these questions differ between paradigms that have been portrayed as either being quantitative or qualitative in approach. Table 5.2.1 illustrates the differences between the major paradigms.

Table 5.2.1. Major differences between dominant paradigms (adapted from Oakley 2000, p 26-7)

	Quantitative "Positivism" "logical/post positivism" "scientific"	**Qualitative** "Naturalistic" "interpretivist"
Aims	Testing hypotheses/generalising	Generating hypotheses/describing
Approach	Top down	Bottom up
Research strategy	Structured	Unstructured
Stance	Reductionist/hypothetico-deductive/outcome orientated/ orientated towards prediction and control	Expansionist/exploratory/ inductive/rational and intuitive and orientated towards understanding
Method	Counting and controlled measurement (e.g. surveys experiments, case-controlled studies, statistical records)	Observing (e.g. participant observation, in-depth interviewing, action research, focus groups)
Instrument	Physical device/pencil and paper	The researcher
Researcher's stance	Outsider	Insider
Data	Hard, reliable, replicable	Rich, deep, valid
Quality criterion	Rigor/proof/evidence/statistical significance	Relevance/ plausibility/ responsiveness to subjects' experience

This dichotomy of research philosophy has lead to academics in many disciplines arguing separatist positions and creating a paradigm war (Tashakkori and Teddlie, 1998; Oakley, 2000). It is a common belief that once a perspective has been chosen, researchers are bound to the philosophy and its assumptions, including methods. Many authors have suggested that this view is oversimplified and the schism is not as wide as suggested by purists (Corner, 1991; Hammersley, 1992; Clark 1998; Holloway and Wheeler, 2002; Guba and Lincoln, 2003). Clark (1998) argued that tables such as Table

5.2.1 continue to fuel the distinction between paradigms and it is widely recognised that existing research does not neatly fit either of these espoused positions (Hammersley, 1992; Bonell, 1999; Oakley, 2000). Indeed Hammersley (1992, p172) warned of the dangers of division:

> The prevalence of the distinction between qualitative and quantitative tends to obscure the complexity of the problems that face us and threaten to render our decisions less effective than they might otherwise be.

Nursing research has been described as a neophyte discipline that has traditionally looked towards other specialties for guidance but efforts to find a dominant paradigm have become interminable and impractical (Corner, 1991; Warms and Schroeder, 1999). The complexity of human phenomena and health care requires increased flexibility and methodological pluralism is offered as a solution (Corner, 1991; Hammersley, 1992; Mason, 1993). Foss and Ellefsen (2002) argued that using a combination of approaches contributes both general knowledge and deeper insight; micro and macro levels of interaction between the individual and society and help prevent the propensity to draw oversimplified conclusions.

The combination of qualitative and quantitative philosophies at the paradigmatic level has been rejected by authors (Powers, 1987; Sandelowski, 1995, 2000) but mixed methods within paradigms or techniques across paradigms are seen as realistic. Increasingly, theorists within nursing and other disciplines are advocating that methods or techniques used should depend on the research question not paradigmatic commitments (Goodwin and Goodwin, 1984; Hammersley, 1992; Clark, 1998; Tashakkori and Teddlie, 1998; Heath, 1998; McPherson and Leydon, 2002). There are calls for researchers to have an awareness of all approaches (Clarke, 1998) and an

acceptance that "all data collection techniques have a place in our tool bags" (McPherson and Leydon, 2002, p230). Greene *et al.* (1989) highlighted that methods may be combined for five purposes outlined in Figure 5.2.1.

Figure 5.2.1. Rationale for mixed methods (Greene *et al.*, 1989)

- TRIANGULATION: seeks convergence, corroboration, correspondence of data from different methods to examine the same phenomena
- COMPLEMENTARITY: seeks to clarify, explain or elaborate on results relating to overlapping but different facets of a phenomenon
- DEVELOPMENTAL: seeks the use of results of one method to help inform the other e.g. the sequential use of qualitative then quantitative methods
- INITIATION: seeks the discovery of paradox and contradiction by recasting questions or results from one method to another
- EXPANSION: seeks to extend the breadth and range of enquiry by simultaneously using different methods for different enquiry components

This research project uses quantitative and qualitative approaches concurrently in keeping with Greene *et al.*'s "complementarity" and "expansion" purpose and methodological decisions were based on the need to address the research aims.

Some would describe the use of mixed methods as the pacifist's solution to the warring paradigms (Powers, 1987) yet others link it to the paradigm of pragmatism (Tashakkori and Teddlie, 1998; Warms and Schroeder, 1999). Tashakkori and Teddlie (1998) described pragmatists as those who consider the research question as having priority over method, accepting the choice of inductive and deductive logic and are guided by personal values and the utility of the research. This description reflects this research project but the term pragmatism appears to be associated with research that does not neatly fit into other paradigms and a practical approach rather than the main elements of the original philosophy.

The research presented here has been developed without allegiance to a specific paradigm; not as an act of pacification or sitting on the paradigmatic fence but rather a

need to address the research aims with breadth and depth. This approach does not mean that the research is atheoretical, as Powers (1987) highlighted; values and assumptions are embedded in research methods and those employed were guided by their principles of use (which may be associated with one or more paradigm). The use of mixed methods was not unproblematic but decisions and their influences are made explicit throughout this chapter. Table 5.2.2 summarises the research methods used. Hereafter, the terms qualitative and quantitative are used to describe types of data (e.g. numerical, narrative) and analysis techniques (e.g. inferential statistics, content analysis).

Table 5.2.2. Research methods used in the study and associated qualitative and quantitative elements

Research method	Data collection	Type of data	Data analysis	Broad approach
Survey	Postal questionnaire	Open questions Closed questions	Content analysis Descriptive and inferential statistics	Qualitative Quantitative
Non-participant observation	Observation Schedule	Narrative Field notes Numerical	Content analysis Descriptive and inferential	Qualitative Quantitative
Nursing documentation	Documentation data collection tool	Free text Numerical	Content analysis Descriptive and inferential	Qualitative Quantitative
Patient interviews	Structured schedule	Free response Closed questions	Content analysis Descriptive and inferential	Qualitative Quantitative

Section 5.3 Research design

The research was exploratory and descriptive consisting of a regional hospital survey and non-participant observation in surgical units with and without the support of a pain service. The main data collection period took place between 1999-2001 and Figure 5.3.1 illustrates the overall study plan.

Figure 5.3.1. Study plan

Postal questionnaire to 38 hospitals in the North and Yorkshire NHS region

↓

Non-participant observation in four hospitals in the Northern and Yorkshire and Trent NHS regions (n=120 patients)

Patient interviews

Examination of nursing documentation

↓

Qualitative and quantitative analysis of data

Section 5.4 Samples

5.4.1 Postoperative pain management questionnaire (PPMQ)

The PPMQ was sent to health care professionals working in acute hospitals in the Northern and Yorkshire NHS region. Eligible hospitals were identified from a directory of NHS trusts (Beechwood House Publishers, 1999) and included acute hospitals with over 80 beds performing inpatient surgical procedures. This number of beds was based on a figure used by the Audit Commission (1997, 1998b) to exclude smaller community hospitals and its use allowed the comparison of results in some areas. An individual unconnected to the study repeated the selection process to assess potential biases in the procedure but the same hospitals were identified from the directory. Two community Trusts with large general hospitals listed were telephoned to ascertain whether inpatient surgical services were provided.

Anaesthetic or surgical directors were telephoned to seek permission to send the questionnaire directly to them or a suitable respondent with an interest in pain management. If another potential respondent was identified, he or she was contacted and the aims of the research explained. Thirty-eight questionnaires were sent to health care professionals across the Northern and Yorkshire NHS Region.

5.4.2 Management of postoperative pain in British hospitals

Information from the PPMQ was used to select four hospitals as research sites for an observational study and follow the care of 120 patients on their first day after surgery. The hospitals were purposely selected to have between 300-400 inpatient beds, similar surgical specialities and number of procedures per annum. Two hospitals with an acute pain service and two without were chosen from the Northern and Yorkshire NHS region. One of the two hospitals without a pain service later described plans to establish a team and no other hospitals in the region matched the inclusion criteria. Therefore, a hospital in the Trent NHS region was identified and a member audit department completed the PPMQ to ensure that inclusion criteria were met and organisational information was available.

Thirty patients admitted onto each surgical unit provided a convenience sample and a random number table was used to select patients from preadmission or theatre lists. The sample was also divided into groups of major, intermediate and minor surgical procedures based on the work of Gould *et al.* (1992), which has been used elsewhere (Sartain and Barry 1999) and is presented in Appendix 2. Patients were recruited until a quota of ten individuals from each surgical group was achieved. If the required number of patients had been reached in a category or the person had refused to participate, the table was used again to identify another potential participant. Patients were included if they fulfilled the criteria presented in Figure 5.4.1.

Figure 5.4.1. Patient inclusion criteria

- Aged 18 years or over
- Able to read, speak and understand English
- Able to give written consent
- Admitted for elective surgery onto a general surgical ward
- Returned to the ward following surgery

Power analyses are increasingly being used to determine sample size based on previous research and statistical principles (Martin and Thompson, 2000) but are largely associated with quasi-experimental approaches and randomised controlled trials. Given the exploratory and descriptive nature of this work, this was considered inappropriate and sample size decisions were based on gaining a representative sample from the surgical population in each unit to allow comparisons between hospitals.

193 registered nurses (RNs), health care assistants (HCAs), student and cadet nurses were invited to participate prior to patient recruitment. All permanent staff were included along with temporary bank staff and Table 5.4.1 gives a breakdown of staff according to role.

Table 5.4.1. Staff invited to participate according to hospital

	Hospital 1	**Hospital 2**	**Hospital 3**		**Hospital 4**		
	Ward 1	**Ward 2**	**Ward 3A**	**Ward 3B**	**Ward 4A**	**Ward 4B**	**Total**
RNs	19	16	20	21	18	11	105
HCAs	7	7	11	10	9	4	48
Student Nurses	6	7	5	6	3	0	27
Cadet Nurses	0	0	0	0	1	0	1
Bank RNs	1	0	0	0	2	1	4
Bank HCAs	3	3	0	0	1	1	8
Total	**36**	**33**	**36**	**37**	**34**	**17**	**193**

The research took place in two hospitals with an acute pain service (hospitals 1 and 4) and two without formal arrangements (hospitals 2 and 3). Unexpected circumstances in hospitals 3 and 4 led to two wards in each hospital being involved in the study. Hospital 3 organised general surgical care into a female (3A) and male ward (3B). Data collection began on ward 3a but there was increasing funding for elective gynaecological surgery and ward 3B was included to ensure that 30 patients could be recruited in a similar time span to other hospitals. Fifteen patients from each ward participated, five from each surgical category.

In hospital 4, a short-term surgical ward was opened two weeks into data collection on ward 4A. This meant that minor and some intermediate patients were no longer admitted to the ward. Staff from the new unit (4B) were invited to take part in the study and ten minor and five intermediate surgical patients were recruited. The remaining participants, five intermediate and ten major patients, were recruited from ward 4A.

A total of six surgical wards were involved in the study and further details of each unit can be found in Appendix 9.

Section 5.5 Data collection tools, procedures and pilot studies

This section describes the main data collection techniques including a postal questionnaire, non-participant observation, patient interviews and examination of nursing documentation. The rationale for each is given; issues of reliability, validity, trustworthiness and credibility of data are discussed and the pilot work for each stage described.

5.5.1 Regional survey of organisational commitment to postoperative pain management

The report of the Working Party on Pain After Surgery (RCS and CA, 1990) was the main stimulus for organisational change in British hospitals and subsequent surveys have simply highlighted the presence of key indicators such as number of pain services and whether audit or staff education takes place (e.g. Harmer *et al,*. 1995; Windsor *et al.,* 1996; Audit Commission, 1997; CSAG, 2000) rather than a detailed account of activities. A questionnaire was designed to assess institutional strategies to improve pain management in detail, focusing on the key recommendations from national reports. The PPMQ addressed the areas shown in Figure 5.5.1 and the full instrument is available in Appendix 1.

Figure 5.5.1. The key areas addressed in the PPMQ

- Presence and structure of APS
- Sources of funding for pain management
- Frequency and nature of staff education
- Standards, guidelines and policies or protocols relating to pain management
- Frequency and nature of audit
- Assessment and documentation of pain management
- Clinicians involved in acute pain management organisation

After specifying the information to be sought, the design process followed the common stages of instrument development outlined by McColl (1993); decisions on the type of questionnaire and its administration; question content; appropriate forms of response; question wording, sequence, format and layout, pilot testing and revisions where necessary.

5.5.1.1 Reliability and validity of the Postoperative Pain Management Questionnaire

The reliability of an instrument relates to the consistency with which an attribute is measured (Polit *et al.*, 2001) and can be threatened by ambiguous, leading, hypothetical or double negative questions (Parahoo, 1997). Careful consideration was given to the layout of the questionnaire, presenting a logical flow of clear questions that only measured one aspect of the topic. Respondents' interpretation of instruments and questions was also tested during pre-pilot and pilot stages described in Section 5.5.1.3.

Three formal measures of reliability are available; test-retest (administration of the instrument on two occasions to assess stability); alternative form test (asking questions in two forms without altering the meaning) and split-half test (a measure of internal consistency where items measuring the same attributes are split into two tests and scores compared; Parahoo, 1997; Polit *et al.*, 2001). The PPMQ was designed largely to elicit descriptive data and does not measure abstract concepts such as anxiety. Therefore enhancing reliability focused on presentation, wording of questions and clear instructions rather than formal tests that are more suitable to attitudinal measures or may have frustrated respondents.

Validity refers to the degree to which an instrument accurately measures a phenomenon under investigation and may be divided into content, criterion-related and construct validity (Eby, 1993). Content validity is the representativeness of a questionnaire in relation to the topic under investigation and research questions (Polit *et al.*, 2001). An expert panel assessed the validity of the PPMQ; three academics (two had a specialist interest in pain management) and two clinical nurse specialists working in acute pain areas were asked to consider whether the questionnaire adequately addressed the research aims. Members felt satisfied with the questionnaire but made some helpful

suggestions relating to the introduction and layout. Content validity was further tested during the pilot stage of the research.

A weak form of content validity, face validity, aims to assess the accuracy of questions, identify areas of misunderstanding and is usually carried out by a lay-person (Eby, 1993). This was undertaken as part of the pre-pilot work and minor changes in sentence structure were made.

Criterion-related validity describes the examination of the same phenomenon using two instruments to establish a relationship between the two (Gibbon, 1995). This assessment was excluded because of an absence of alternative measure. Finally, construct validity is referred to as the most theoretical and difficult type of validity involving the evaluation of abstract concepts and their inter-relationships (Eby, 1993). Due to the descriptive, precise nature of the questionnaire, this assessment was deemed inappropriate.

5.5.1.2 Procedure

Suitable respondents were telephoned to explain the purpose of the study and allow participants to ask questions about the research (see Appendix 1). This personal contact aimed to increase the response rate which is traditionally low with postal questionnaires (Newell, 1993; Wilson and McClean, 1994). The questionnaire was sent with a covering letter to respondents with a deadline for its return and a stamped addressed envelope. If the deadline expired and the questionnaire had not been returned, a second letter and questionnaire was mailed with a renewed deadline. Upon receipt of the questionnaire, a letter of thanks was issued with details of when results would be available.

5.5.1.3 Pilot study

A pilot study allowed the assessment and evaluation of the instrument and research design. Ten PPMQs were sent to anaesthetic or surgical managers from randomly selected hospitals in the North West NHS region. Six questionnaires were returned, only five were complete and analysed.

As a result of the pilot study, modifications were made to the final version of the questionnaire and data analysis methods. An open question was broken down into two questions and filter questions and their instructions were made clearer by using bold type. Problems with data analysis were highlighted and subsequent coding revisions made.

5.5.2 Management of postoperative pain in four British hospitals

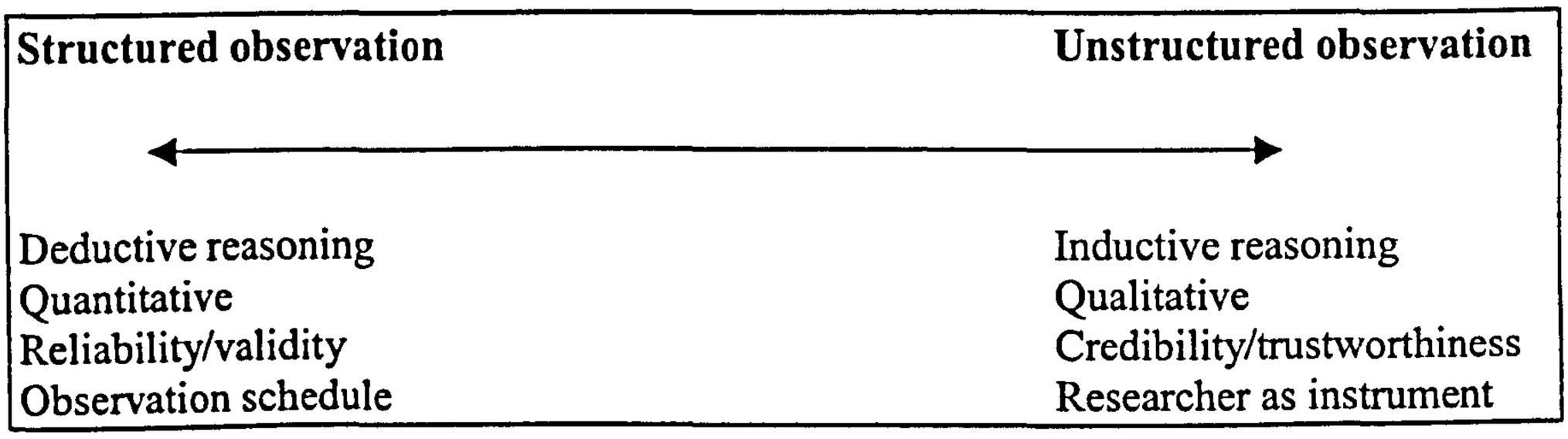
The care of 120 patients was explored using non-participant observation, examination of nursing documentation and patient interviews. These methods are described, highlighting issues relating to instrument development and a reflexive account of the data collection procedure and pilot study are given in this section.

5.5.2.1 Observation of nursing practice

As a method of investigating practice, tape recording or videoing participants offers the advantage of permanent playback during analysis but may have been more obtrusive than an observer, restrict the visual field and present difficulties in a busy, potentially noisy environment. Ethical issues may also escalate if inappropriate or unsafe practice were to be recorded (Carr, 1988; Endacott, 2001). Therefore non-participant observation was chosen to explore pain management after surgery.

Traditionally, methodologists have described observational techniques as either structured (pre-determined schedule or units using a deductive, quantitative approach) or unstructured (an inductive qualitative approach where the observer usually becomes a participant to understand a culture or group; Parahoo, 1997; Pontin, 2000; Polit *et al.*, 2001). Foster (1996) described this division as artificial and a combined approach is often used in social research yet the use of both methods has received very little discussion in nursing research. Methods of structured and unstructured observation could be represented as a continuum (see Figure 5.5.2) and for exploring postoperative pain management, a combined approach offered many advantages. This research placed slightly greater emphasis on quantification and therefore could be placed centre left on the proposed continuum.

Figure 5.5.2. Proposed continuum of observational research types



Chapter 3 highlighted the theoretical development associated with pain assessment techniques and recommendations for practice. This existing knowledge and experience in practice was used to develop an observation schedule to allow the systematic and rapid documentation of key areas. The schedule aimed to summarise and quantify nurse-patient communication relating to pain in terms of content and outcome; areas included aspects of the pain experience discussed (e.g. location, intensity, quality), assessment tools, timing of the interaction and clinical decision or outcome. The full schedule is available in Appendix 4 along with operational definitions for each category.

Reliability and validity of the observation schedule

As a newly developed instrument, reliability and validity were important elements to explore and during pre-pilot work six patient scenarios were filmed with three senior student nurses acting as a staff nurse or patient. A brief patient background was given but no script written and those acting as RN were asked to explore the patient's pain experience with or without the use of an assessment tool and make an appropriate clinical decision.

These scenarios were used to test intra-rater and inter-rater reliability. Also known as stability-over-time measures, intra-rater reliability assesses the possibility of 'observer drift' i.e. whether coding patterns change over time (Gibbon, 1995; Cavanagh, 1997). All scenarios were coded after the pilot study and every month during data collection two scenarios were randomly chosen and coded again. The proportion of agreement between the two scores was measured using Cohen's Kappa and although no set guidelines exist, a coefficient of 0.6-.75 is considered good and above 0.75 excellent (Gibbon, 1995; Robson, 2002). The percentage agreement between the original coding, monthly intervals and the final coding 14 months later ranged between 95.8-100.0% (K = 0.91-1.00) illustrating a high degree of stability.

In studies where there is only one observer, exploring inter-rater reliability can give an additional indicator of validity of a tool (Robson, 2002). A surgical nursing colleague was given training on the use of the instrument by employing six written, hypothetical interactions and then coded the six videoed scenarios. Agreement across the scenarios ranged from 89.3 to 95.8% and Kappa values 0.80 to 0.91. This suggests a high inter-rater reliability and an indication of the schedule's validity. The full range of intra and inter-rater reliability scores are available in Appendix 6.

Two academic members of staff (one with an interest in pain management), two clinical nurse specialists in acute pain and a staff nurse working in a surgical unit assessed the content validity of the observation schedule in the pre-pilot stage. Minor changes or additions to operational definitions were made as a result of feedback.

Qualitative elements of data collection procedures

Work undertaken in the pre-pilot stages revealed that the observation schedule alone would yield limited data and not adequately reflect the context in which nurse–patient interactions occur, associated non-verbal communication or help facilitate reflexivity in relation to observer-participant interaction. There were many aspects of the pain management process that were unknown and required a less structured, qualitative and inductive approach. Therefore reflexivity (a key component of qualitative research) became an important tool throughout the research process and is used here to describe data collection procedures.

As a researcher in the field and a RN, there was familiarity with hospital environments and postoperative care but not necessarily with specific research sites or routines. Professional knowledge and experience can serve as a disadvantage in relation to existing beliefs about pain management but an acute awareness of potential biases allowed a conscious effort to suspend assumptions with the emphasis placed on learning during data collection (as suggested by Holloway and Wheeler, 2002).

Negotiating access required approval from Local Research Ethics Committees (LRECs), directors of nursing or NHS Trust research committees, ward managers, surgical consultants and nursing staff before patient recruitment began. Managers of surgical wards were approached to discuss the communication focus of the study and identify

ward staff members. They were also asked to higlight any ward issues that may make it inappropriate to be included in the research but none were forthcoming and most were reassured that individuals could decide to participate. All managers were happy to take the proposal forward to the next ward meeting for staff to discuss and they were telephoned 2-4 weeks later to identify any further questions and negotiate starting dates.

Ward staff and surgical consultants were sent an information sheet and consent form to be returned by a deadline (usually 3 weeks) in a sealed envelope and responses were placed in a box in a staff communal area. A notice was also placed on a staff board inviting them to participate and identifying two sessions when I would be available on the ward to answer specific questions. Spending time in the field of observation without conducting research is a recommended method of increasing researchers' familiarity with the environment and acceptance into a social group (Hammersley and Atkinson, 1995; Foster, 1996). Throughout the study, time spent on the ward recruiting patients and not conducting observation also served this purpose.

Staff who had not returned their forms by the deadline were given a duplicate form to complete and temporary or bank staff were given an information sheet and consent form at the beginning of a shift. Temporary employees were made aware that other staff had received more time to consider participating but they may still ask questions, accept or refuse to participate. Patients were recruited before their surgery at the earliest opportunity usually the evening before or during a preadmission clinic. The study was explained and I returned an hour later to answer any further questions and collect consent forms.

On the day of the study, the care of one patient was observed on their first postoperative day for one of two time periods; 07.30-14.30, 14.30-21.30 (chosen roughly to coincide with early and late nursing shift patterns). The shift for each patient was randomly chosen for patients undergoing major and intermediate surgery but minor surgical patients have a shorter hospital stay. Therefore largely early shifts had to be completed.

The observation period always began by asking staff for permission to be present in a particular six-bedded area although later on, staff would ask "where are you today?" Very occasionally staff would ask which patient was being observed and this information was never refused but generally not offered unless requested. The study was explained and verbal permission sought from the other five patients in the room and a discrete seated position was taken in the area away from the patient.

Pontin (2000) highlighted that data need to be recorded as soon as possible to aid recall and suggested that writing in front of participants is acceptable when they are aware of the research in progress. However, it was felt this may have raised suspicions and made participants feel uncomfortable, therefore notes were made after each event by making frequent trips to a quiet area such as the changing room or lavatory. The back of the observation schedule was used to record the following information in the form of field notes:

Figure 5.5.3. Areas recorded in field notes

- Verbatim conversations relating to pain or comfort
- Extra linguistic behaviours such as loudness, speaking rates, interruptions
- Location
- Participants involved and physical position
- Behaviours and actions
- Timing and sequence

After each shift, field notes were expanded and a reflective diary written to document progress and relationships with participants.

Using observational methods, fatigue is a common threat to the reliability and validity of results (Robson, 2002). However, interactions relating to pain management were often brief and detailed observation was only required for very short periods. Fatigue was also minimised by taking two 20-30 minute breaks usually after a pain-related interaction or while staff caring for the patient were taking their own break; this reduced the risk of interactions occurring during these break times.

Participants may wish to present a desirable image and change behaviour accordingly (Foster 1996; Mulhall, 2003) therefore a number of steps were taken to minimise the Hawthorne effect or reactivity to the presence of an observer. Careful consideration was given to the role of the researcher and the process of "impression management" described by Hammersley and Atkinson (1995).

Researchers using observation may take on a variety of roles in the research field, which are often represented on a continuum from complete observer to complete participant (using covert methods). Gold (1958) based on the work of Junker (1952) identified two further categories; participant as observer (where participants are aware of the field relationship) and observer participant (a more formal relationship with brief one off visits). A largely observational position was undertaken but one that does not neatly fit into Gold's typology. A non-participant role was required to prevent disruption of behaviours of interest but up to 12 weeks was spent on each unit and building a relationship, particularly with staff participants, was considered important. Engaging in

minor activities that did not disrupt potential interactions between staff and patients was a way of making a small contribution and building further relationships. Helping to make a bed or cup of tea for staff were often discussed as an indicator of how busy the shift had been (comments such as "we were so busy, Emma had to make us a cup of tea" were overheard on a few occasions). Small responsibilities such as "keeping an eye on the drug trolley" were taken as a minor sign of acceptance by staff although occasional requests to engage in any patient care were politely declined.

Personal appearance and behaviours are important in shaping relationships with the aim of becoming an acceptable marginal member (Hammersley and Atkinson, 1995). Wearing smart but casual clothing helped to create a separate identity from ward staff and prevent role confusion for participants and other health care professionals. Two badges were worn; a name badge with the title "nurse researcher" on it and a formal photo identity badge. Demonstrating your honesty, trustworthiness, friendliness and sensitivity are also key elements of impression management (Foster, 1996). Time outside the observation periods or staff initiated conversations were used to build relationships discussing neutral topics and areas of common ground. Still working as a staff nurse and having a keen interest in ward based nursing appeared to increase my credibility with staff who enquired about these aspects, but the overall impression of needing to learn about patient experiences was given. Certain fixed characteristics may influence relationships such as gender, age and ethnicity (Robson, 2002). Age and being employed in a post outside of practice may have helped to give the impression of a learner or "acceptable incompetent" that Hammersley and Atkinson (1995) described as necessary for acceptance.

Participants' lack of awareness of the specific topic under investigation and building relationships were the main methods of minimising observer reactivity and there were further signs of acceptance as the study progressed. This included offers of drinks and invitations to join nurses in the staff room; use of staff changing and toilet facilities; being asked clinical advice; comments about forgetting my presence and being included in conversations about colleagues or unit politics. Invitations to ward social events (which were politely refused) were interpreted as a high degree of acceptance. Ethnographers have concerns over "going native," which involves an over identification with participants to the detriment of data collection or analysis (Hammersley and Atkinson, 1995; Foster, 1996). This was not a serious risk, largely due to the non-participant nature of this research where the role remained static throughout and focused in the *etic* (outsiders) perspective. Traditional ethnographers pursue the *emic* (insiders) view employing questioning and interview techniques to explore the meaning behind actions (Rossman and Rallis, 1998).

Observers often experience undesirable labels of "critic" or "expert" whilst gaining acceptance (Hammersley and Atkinson, 1995). Both stereotypes emerged during the course of this research and required careful management. One ward manager reportedly said to staff that "this research could be used to find out what was wrong on this ward." Two staff nurses relayed this information and I reassured them that this was not the objective of the project. We worked together to quietly dispel this myth amongst ward members and extra time prior to starting on the ward was allowed to answer concerns from staff. A domestic assistant in another ward continually referred to me as "the spy" teasing staff about my presence. This was resolved a few days later after a chance meeting where the purpose of the study could be explained more fully.

The label of expert contradicts the recommended impression of a learner or acceptable incompetent needed to achieve acceptance (Hammersley and Atkinson, 1995). On one level, to converse using professional jargon and understanding establishes credibility yet to appear as an expert may influence people's behaviour if they feel they are being judged. The following conversation is an example of such a label.

CHARGE NURSE: A relative came in with a patient that has just been admitted, says he has ecklomania, ever hear of it?
EB: Er no, I'm afraid I haven't.
CHARGE NURSE: (*Erupts into laughter and turns to other staff).* Even Emma hasn't heard of it. It can't exist!

Denying knowledge of a particular topic or suggesting sources of further information was the usual response to these situations.

Ending relationships made during the research was seen as equally important as building them. The subsequent stages of the project were described to nurse and patient participants along with access to results. The precise aims of the study and initial findings were presented to ward managers and available staff. This debriefing also served as a method of verifying results with participants, a process known as member checking (Holloway and Wheeler, 2002). Cutcliffe and McKenna (1999) debated this process, highlighting its usefulness but questioning the depth at which it should occur. The authors suggested that one participant will have contributed to a portion of the data therefore may not be able to verify the entire emerging theory. Initial findings were not disputed by those participants consulted and because of the scale and nature of the project, this level of verification was deemed appropriate.

5.5.2.2 Patient interview

Following the observation period, patients' pain experiences were briefly explored using a short structured interview focusing on acceptable, current and worst pain scores along with patient satisfaction. The interview schedule (presented in Appendix 7) enabled a consistent approach to questioning but was also relatively brief because of the recovery stage of patients. Previous research has not necessarily suggested the use of a particular pain assessment tool (Briggs and Closs, 1999; Jenson and Karoly, 2001) although two different scales (e.g. VRS) are frequently used in one study. As previously highlighted, some individuals can have difficulty using tools such as the visual analogue scale (Chapman and Syrjala, 1990), therefore, a VRS and VAS were employed to ensure a high completion rate and allow comparison of ratings between the scales.

Ratings from the two tools have consistently demonstrated strong correlations suggesting construct validity and coefficients have ranged from 0.70-0.91 ($p < 0.001$) (Ohnhaus and Adler, 1975; Kunst *et al*, 1996; Thomas *et al,* 1998; Briggs and Closs, 1999; Breivik *et al*, 2000; Bolognese *et al*, 2003). Very few studies have explored the reliability of these tools, illustrated by Jensen's (2003) review of 164 papers on cancer pain measurement, revealing only 9.8% had assessed the reliability of intensity measures using test-re-test methods. Table 5.5.1 outlines studies that have included this approach.

Table 5.5.1 Reported reliability co-efficients of VAS and VRS for measuring pain

	VAS		VRS	
Publication	**Coefficient**	**p value or confidence interval**	**Coefficient**	**p value**
Chang *et al*. (2000)	0.79	<0.0001	--	--
Rosier *et al*. (2002)	0.84	<0.001	0.76	<0.001
Tamiya *et al*. (2002)	0.84	95%, 0.78-0.88	--	--
Clark *et al*. (2003)	0.98	95%, 0.97-0.99	0.89	<0.01

Table 5.5.1 generally shows very good reliability scores for both scales but comparisons between these studies are hindered because data relates to both experimental and clinical pain and includes specific groups such as those experiencing cancer pain or rheumatoid arthritis. There were also small variations in the adjectives used for the VRS and anchor words on the VAS. Wewers and Lowe (1990) highlighted the difficulties in determining the time intervals using the test-retest method; too short and participants may easily recall their last rating and dynamic phenomenon such as pain may change between longer intervals (those in the table re-assessed pain between five minutes and two hours after the initial assessment).

In this study patients were asked to describe an acceptable pain level (level at which they are most comfortable, beyond which they would need painkillers), pain now both at rest and on movement (i.e. during coughing or touching the other side of the bed) and worst pain intensity in the last 24 hours using the VAS. The verbal rating scale was used from Closs and Briggs (2002), which incorporates adjectives to describe pain at rest and on movement, and patients were asked to rate the intensity of acceptable, pain now and worst pain scores. Figure 5.5.4 illustrates all the scales used in the study.

Figure 5.5.4 Pain assessment and patient satisfaction scales used in the study

Visual analogue scale (VAS)

No Pain

Worst Pain imaginable

Verbal rating scale (VRS)

0-No Pain
1-No pain at rest, slight pain on movement
2-Slight pain at rest, moderate pain on movement
3-Moderate pain at rest, severe pain on movement
4-Severe pain at rest and on movement

Patient satisfaction scale

Very dissatisfied	Dissatisfied	Don't know	Satisfied	Very satisfied

A range of tools have been developed to measure patient satisfaction including numerical scales (0-10), whole questionnaires and summated rating scales (Likert) (Miaskowski *et al.,* 1994; Calvin *et al.*, 1999; Carlson *et al.*, 2003). A five-item Likert scale was chosen due to ease of administration and the scale has been widely used elsewhere (Miaskowski *et al.*, 1994; Ward and Gordon, 1996; Dawson *et al.*, 2002; Carlson *et al.*, 2003).

5.5.2.3 Nursing documentation of pain management

Nursing documentation and anaesthetic records were examined following the patient interview to capture information surrounding pain management activities. If the patient remained in hospital until their second postoperative day, documentation was reviewed again to record activities up until midnight of day one.

The Documentation Data Collection Tool developed is presented in Appendix 5 and includes a section for pain assessment charts that mirrors observation schedule categories, drug chart information and assessment, planning and evaluation sections associated with the nursing process. The reliability and validity of the data collection instrument was assessed using six sets of hypothetical documentation based on the video scenarios (described on p116). Intra-observer reliability (stability-over-time) at monthly intervals during the data collection period was between 96.5-100% agreement (K=0.91-1.00).

A surgical colleague was instructed on the use of the tool and coded all six sets of patient documentation achieving 93.6-99.0% agreement (K=0.84-0.95), suggesting a very high level of inter-rater reliability and indication of the tool's validity. Appendix 6 contains a full breakdown of intra and inter-rater reliability scores. Content validity was assessed at the same time as the observation schedule but no issues were forthcoming and validity was further explored during the pilot study stage.

5.5.2.4 Summary

The care of 120 patients that underwent major, intermediate and minor surgical procedures was explored in hospitals with and without acute pain services. Figure 5.5.5 provides a summary of stages involved in gaining access, recruitment and data collection.

Figure 5.5.5. Summary of the major stages of gaining access, recruitment and data collection in each hospital

Gaining access	LREC approval ↓ Hospital committee/Director of Nursing approval ↓ Ward manager and surgical consultant approval
Recruitment	↓ Ward staff recruitment ↓ PREOPERATIVE PERIOD Patient recruitment
Data collection	↓ DAY OF SURGERY Patient operation day (no contact with participant) ↓ POSTOPERATIVE DAY 1: Observation period (07.30-14.30 or 14.30-21.30) Patient interview Examination of nursing documentation and anaesthetic records ↓ POSTOPERATIVE DAY 2 Nursing documentation reviewed for entries up until midnight for previous day

5.5.2.5 Pilot study

Conducting a pilot study enables a researcher to gain experience of data collection, test research design, instruments used, acceptability for participants and provides an opportunity to analyse data (Porter and Carter, 2000). For this research, the pilot study also tested nurse and patient participant recruitment systems. The care of ten surgical patients was followed in a surgical unit separate from the main research sites. This work flagged up the importance of position in the room as interactions appeared more consistent and relaxed the further away I was from the patient involved in the study. Initial results suggested that the research design was feasible, addressed the aims of the project and sufficiently tested instruments used. The documentation tool was expanded to include information from anaesthetic records such as analgesics given in theatres and recovery and the time the patient returned to the ward. Alterations were also made to coding systems and data entry into programs used for analysis.

Both staff and patients were invited to give verbal and/or written feedback on the process of being involved in the research and although no formal feedback was given, comments made implied acceptability from both parties.

Section 5.6 Ethical considerations

McGarvey *et al.* (1999) outlined the task facing researchers concerning the need to balance meaningful data but respect the vulnerability of patients. Protecting research participants forms the basis for ethical review in nursing research (RCN Research Society, 1998) and their dignity, rights, safety and well-being are given priority at all times (Department of Health, 2001).

The PPMQ was reviewed by a chair of a LREC who decided that full ethical review was not required because of the autonomy of staff, who were not necessarily considered a vulnerable group. Subsequent guidance on research governance (Department of Health, 2001d) places more emphasis on the role of staff in research and formal approval may now be required. However, the questionnaire raised few ethical issues, and focused on ensuring anonymity, confidentiality and compliance with the 1998 Data Protection Act (names and addressed were listed on paper and could not be connected to the research data by external individuals) (Office of the Data Protection Register, 1998). Therefore, the observational research forms the basis of the discussion here surrounding informed consent, maintaining confidentiality and the role of the researcher. Four LRECs gave permission for the study to proceed in the main and pilot research sites.

5.6.1 Informed consent and maintaining confidentiality

Informed consent is central to sound ethical research (Department of Health, 2001) and gaining voluntary agreement should be based on the principles of autonomy, (including

the right to withdraw at anytime), privacy, anonymity, confidentiality, fair treatment and the right to be protected from harm (Byrne, 2001).

Participants received an information sheet and consent form to complete (see Appendix 3). This sheet gave as much information as possible highlighting the observation of communication and nursing care provided but not revealing the pain management focus of the research for fear of adversely effecting behaviours and accentuating the Hawthorne effect. The decision to withhold this information was made whilst considering the Declaration of Helsinki (World Medical Association, 2000) and the United Kingdom Central Council for Nursing (1992) Code of Professional Conduct (the research took place before the NMC's second edition). In addition, guidance from the British Psychological Society (1999) Code of Conduct was used and the main points are summarised in Figure 5.6.1.

Figure 5.6.1. Guidance on obtaining consent from the British Psychological Society Code of Conduct (1999)

- Always consult experienced professional colleagues when considering withholding information about an investigatory procedure and withhold information only when it is necessary in the interests of objectivity or the future of professional practice.
- Where it is necessary not to give full information in advance to those participating in an investigation, provide such full information retrospectively about the aims, rationale and outcomes of the procedure.

Essentially, withholding information about the specific topic area was not considered harmful and may be compared to participants being unaware of whether they are receiving a placebo or an active drug in a randomised controlled trial. Other health care professionals working in the ward environment were made aware of the study and the broad research aims. Occasionally, pain-related interactions occurred between

practitioner and patient and the frequencies of these were noted but content was not reported, as consent had not been requested.

All nurse and patient participants were given the opportunity to receive a written report of findings and nurses participating were given the full aims and early findings as soon as the project was complete in each hospital.

Anonymity of participants was preserved through a simple numerical system allocated to patients and names were not recorded on data collection sheets. Consent forms were kept in a locked cabinet away from other project materials and will be destroyed two years after completion of the project.

5.6.2 Role of the researcher

The wider role of the researcher was discussed in Section 5.5.2.1 but a number of ethical issues have the potential to arise from observational research. An early decision was made to intervene on practice that could be harmful to patients, reflecting duties under the UKCC's (1992) Code of Professional Conduct. Only one minor incident occurred where a confident junior student asked a patient who had received major surgery how he was feeling. She then documented a full set of observations associated with his epidural management without any physical measurements. Concerned for the patient's welfare, this was quietly mentioned to her mentor and she was asked to deal with it in a manner that did not suggest where the information came from.

Two urgent situations occurred when a registered nurse was not present, one involving a patient in the study whose blood oxygen saturation kept falling and the monitor alarming. The second incident concerned a patient that was not involved in the study but

had become drowsy and his pallor had changed dramatically. On both occasions I politely asked a RN to review the patient. These events had two distinct reactions to data collection; the first incident seemed to serve as a reminder of my presence and it was another two hours before the patient interactions became more relaxed and in keeping with previous observations involving this staff nurse. I was repeatedly thanked for highlighting the second incident and there was no marked behaviour change.

During patient interviews, participants occasionally disclosed information that was not communicated to staff including feelings of pain, nausea or anxiety. On every occasion they were strongly advised to speak to staff and asked if they wished to have this information relayed to them. Also, patients occasionally sought advice about an aspect of their recovery and as an act of reciprocity (where participants also gain from the research relationship, Hand, 2003) questions were answered as far as possible. They were advised to seek confirmation from ward staff and a patient who wished to make a complaint about his care through the research was given the name of the appropriate person to contact.

Section 5.7 Data analysis

The research generated qualitative and quantitative information and the major techniques of data reduction and analysis are described below.

5.7.1 Quantitative data

Quantitative data arose from the PPMQ, observation schedule, documentation tool and patient interview. A coding scheme was developed and data analysed using the Statistical Package for Social Scientists (SPSS Version 11.5.0), accepting a significance level of $p<0.05$. This section describes the rationale behind the inferential analysis of data.

5.7.1.1 Testing for differences

In both phases of the research project nominal level data (categorical) was generated such as frequency information or age group categories. Differences between these unrelated categories were analysed using a Chi-square test for one sample (e.g. gender in the group) or two or more samples (e.g. two types of shifts completed in each hospital). Chi-square was also employed to analyse some ordinal level data (categories that can be ranked) because of the nature of results. Patient satisfaction was skewed towards higher levels of satisfaction and only three out of the five categories on the Likert scale were used. Therefore responses were treated as categorical data to compare results between hospitals and those receiving different types of surgery. In a small number of cases exact tests or the Monte Carlo statistics for Chi-square were used where some cells had an expected count of less that five (Bryman and Cramer, 2001).

A range of interval and ratio level data was created by the second phase of the research project (data with equal intervals but no absolute zero e.g. temperature or ratio data with an absolute zero and mathematical procedures are possible e.g. height; Fowler *et al.*, 2002). Interval data were analysed to explore the differences between mean scores (related and unrelated t-tests; one-way analysis of variance, ANOVA) or the mean rank (Mann- Whitney U-test; Kruskal-Wallis one-way analysis of variance).

Data has traditionally had to fulfil three criteria to employ parametric statistical tests; interval or ratio scaling, normal distribution and equal variance of both variables (Bryman and Cramer, 2001; Burns and Grove, 2001). Normal (Gaussian) distribution refers to a theoretical distribution of scores which forms a symmetrical bell shaped curve when plotted on a graph and the mean, median and mode are equal (Clegg, 1992). A perfect Gaussian distribution is rare but visual inspection on a histogram or

statistically analysing the data can detect deviations. The Kolmogorov-Smirnov test was used to assess whether data such as age, pain scores and morphine equivalent doses deviated significantly from a normal distribution. The equal variance (homogeneity of variance) assumption refers to a measure of dispersion and both variables are required to have a similar spread of scores for parametric tests (Clegg, 1990). Non-parametric tests are generally employed if data violates any of these assumptions but some authors have questioned this approach. Bryman and Cramer (2001) described studies where data was deliberately manipulated to ensure that one assumption was violated and tests were robust enough to withstand these deviations and produced similar results. The authors recommended that caution should be exercised and non-parametric tests used where sample size is small (n=<15), both distributions are non-normal or the size of the sample and variances are unequal. Urdan (2001) also discussed sample size when highlighting the Central Limit Theorem. Outlining the theorem, he suggested that in a reasonably large sample size (n=>30) scores would probably be normally distributed.

The distribution and variance of all interval or ratio data was explored before performing a parametric test. If an assumption was violated for one or both of the variables, non-parametric and parametric tests were performed but in each case, results were similar. For these statistics, parametric results have been presented in subsequent chapters. Non-parametric tests were chosen based on the guidance of Bryman and Cramer (2001). For example, major patients' pain scores were assessed according to each hospital using the Mann-Whitney U-test due to the low numbers in each group (n=10).

Unrelated or independent t-tests were used to assess differences in interval level data between two groups. This included age, pain scores and morphine equivalent doses according to gender and presence of a pain service. Related t-tests were used to look for

potential differences between pain ratings given by the same participants. When data did not meet the criteria previously discussed, the Mann-Whitney U-test was used as the t-test's non-parametric equivalent.

ANOVA was used to explore interval data when there were more than two categories. Age, pain scores and morphine equivalent doses were assessed according to categorical data such as type of surgery and each hospital. The F-statistic produced does not indicate where a significant difference lies between the groups and post-hoc tests are needed (Fowler *et al.*, 2002). Tukey's Honestly Significantly Difference (HSD) was chosen, a stringent test that compares the mean of each individual group to other groups (Burns and Grove, 2001; Urden, 2001). From the various ANOVAs performed, two variables in separate calculations were not normally distributed but ANOVA is robust enough to deviate from this assumption (Urdan, 2001). When homogeneity of variance was not demonstrated, the Kruskal-Wallis one-way analysis of variance was used to assess the pain-related interactions according to hospital.

5.7.1.2 Testing for correlations

Inferential analyses were also used to explore potential relationships between interval level data such as pain scores and morphine equivalent doses. Independent variables that illustrated a normal distribution, similar variances and a linear relationship were suitable for the Pearson product-moment correlation (r) (Clegg, 1990; Burns and Grove, 2001). Ordinal data or scatterplots that suggested a slight curvilinear relationship were assessed using the Spearman Rank-order Correlation Coefficient (ρ).

5.7.2.3 Issues surrounding data analysis

Specific issues arise when considering the handling of two types of data; visual analogue scores, which has been discussed in the literature and calculating morphine equivalent doses, which has received very little critical attention.

The VAS is perceived as a continuous scale compared to a verbal rating scale (e.g. no pain, mild, moderate, severe) but some believe that both should be treated as ordinal data because of a lack of evidence supporting the interval level assumption with VASs (Kunst *et al.*, 1996). Wewers and Lowe (1990) reviewed the literature in this area, concluding that even if data did not meet criteria for parametric testing, both types of analysis gave similar results. These authors' conclusions were based on data from the field of psychology, which used the VAS to measure various constructs. However, Kunst *et al.* (1996) found similar results with 22 postoperative patients using epidural analgesia who gave a total of 130 ratings of their pain experiences. Myles *et al.* (1999) surveyed 52 postoperative patients with VAS scores of less than 50mm asking them to indicate on a new VAS where they felt twice as much pain would be. In addition, those requesting analgesics were given intravenous fentanyl and asked to mark on a VAS when their pain had halved. Analysis revealed that the VAS used did show properties consistent with a linear scale but the authors acknowledged that "no pain" and "worst pain imaginable" might not be the absolute limits of perception and extremes of pain may be non-linear. The small amount of literature available seems to suggest that VAS can be treated as interval level during analysis but as a precaution both parametric and non-parametric tests were run on data arsing from this study. Results consistently showed similarities; for example, the difference between men and women and pain now on movement scores were analysed using a t-test ($t=0.135$; $p=0.88$) and a Mann-Whitney U-test ($U=1663.0$; $p=0.92$). Therefore, parametric test results are used in the results chapters.

Data relating to analgesic administrations were analysed in a number of ways. At a basic level, the mean number of doses and amounts were presented comparing prescribed and administered drugs from the preoperative period to midnight on the first postoperative day. Morphine equivalent doses were also calculated to allow

comparisons across hospitals and a variety of equianalgesia tables (illustrating two drugs providing the same amount of pain relief) have been published (e.g. Agency for Health Care Policy and Research, 1992; Coniam and Diamond, 1994; Bostrom *et al.*, 1997; NHMRC, 1999). These were initially created to help clinicians calculate equivalent doses when rotating opioids in patients with cancer pain but few authors have supported figures by citing original research. However, the concept of equianalgesia is increasingly used in acute pain research to compare groups of patients or new analgesics to a 10mg parenteral dose of morphine sulphate. A literature review identified randomised controlled trials with surgical patients that compared two opioid drugs and studies were excluded if equianalgesic rates were declared but pain scores differed significantly between groups. Table 5.7.1 summarises the results of the review and ratios chosen for analysis.

Table 5.7.1 Summary of research investigating analgesia equivalency to morphine sulphate (10mg, parenteral) in surgical patients

Drug	Author/s (date)	n	Route	Equi-analgesia dose (mg)	Dose used in analysis (mg)
Codeine	Stoneham *et al.* (1996)	30	IM	120	120 IM 200 Oral*
Diamorphine	Robinson *et al.* (1991)	40	IV PCA	5	5
Fentanyl	Watt and Soulsby (1995) Woodhouse *et al*, (1996) Claxton *et al.* (1997)	30 55 58	IV PCA IV PCA IV	0.2 0.1 0.15	125
Pethidine	Harmer *et al.* (1983) Bahar *et al.* (1985) Stanley *et al*, (1996) Woodhouse *et al.* (1996)	40 48 40 55	IM PCA IV PCA IV PCA IV PCA	116 110 94 100	100
Tramadol	Vickers and Paravicini (1995) Stamer *et al*, (1997) Hopkins *et al*, (1998) Naguib *et al.* (1998) Pang *et al.* (1999) Silvasti *et al.* (2000)	523 180 40 100 80 60	IV PCA IV PCA SC PCA IV IV PCA IV	110 120 200 120-140 110 110	110

IM=Intramsucular
IV=Intravenous
SC=Subcutaneous
*No evidence found relating to oral route, therefore guidance taken from (NHMRC, 1999)

Equianalgesia for codeine and diamorphine has not been widely researched but the remaining studies in Table 5.7.1 show a range of doses for surgical patients. A direct comparison between studies is difficult; some lacked a control group, one study relates to one-off doses and there are variations in methodology, size of study and route of analgesic. These criticisms have also been noted with published data relating to opioid equivalency and cancer pain management (Gordon *et al.*, 1999; Anderson *et al.*, 2001). In light of the low numbers and variations between studies, the morphine equivalent doses chosen for data analyses were conservative and epidural analgesia was excluded due to a lack of evidence in this area (even though it has been proposed that PCA opioid requirements are approximately five times greater than epidural analgesia; Chrubasik *et al.*, 1993).

Despite the difficulties surrounding equianalgesia, using a standard formula to convert medications administered does allow comparisons across hospitals. In the results chapters, the integrity of the original data is also maintained by presenting mean doses of individual analgesics.

5.7.2 Qualitative data

Qualitative data lends itself to a variety of analysis methods that are often closely linked with one particular paradigm or research method (such as grounded theory or phenomenology; Ryan and Bernard, 2003). Therefore, many techniques were not appropriate for the aims of the study or nature of the data, which were generated from both phases of the research through the open-ended questions on the PPMQ, field notes and documented interactions. Data from the questionnaire and observational study were analysed using content analysis although the emphasis was slightly different during the

two stages of the project. This section describes how the technique was used to analyse qualitative data.

The process of content analysis was described and defined by Downe-Wambolt (1992, p314):

> ...a research method that provides objective means to make valid inferences from verbal, visual or written data in order to describe and quantify specific phenomena.

The following stages of the method are advocated and summarised in Figure 5.7.1.

Figure 5.7.1 Stages involved in content analysis

1. **Identifying units of analysis**-words, phrases, space and time, whole texts
2. **Creating and defining the category system-** based on research question and previous data
3. **Pre-testing the category system**-trial coding ensuring rules are clear and unambiguous
4. **Assessing reliability-** Inter-rater and intra-rater (stability over time)
5. **Assessing validity-** Face or content validity based on previous work, expert opinion or comments from participants
6. **Revising coding rules if necessary**
7. **Pre-testing revised coding scheme if necessary**
8. **Coding all data**
9. **Reassessing reliability and validity**

Adapted from Downe-Wambolt (1992) and Cavanagh (1997)

The PPMQ contained a number of questions where participants could make additional comments or open questions on the nature of education, audit, pain service objectives and major changes in pain management. The units of analyses included, words (e.g. surgical specialities), themes (e.g. staff education topics) and time (e.g. "once a month"). An academic member of staff assessed content validity and used the coding

system following pre-testing and main data analysis. Since the author was the sole coder, inter-rater reliability was used here as an indirect indicator of coding validity and assessed using Cohen's Kappa (K=0.92, 0.96 respectively). The results suggest a high level of agreement and validity of categories that emerged. Intra-rater reliability (stability-over-time measure) was assessed by coding data on two further occasions at monthly intervals (K=0.97-0.98). The PPMQ questions were designed to allow free, unprompted responses but the main aim in presenting this information was to identify themes and produce frequency data. Here the emphasis has been on quantification but content analysis has a much wider remit.

This method of analysis has been described as more than a counting exercise and should focus on inferences about meaning, intention and consequences in the context or environment that the data were generated (Krippendorff, 1980; Weber, 1985; Downe-Wamboldt, 1992). Studies using this method should also employ both quantitative and qualitative operations, bringing together these modes of analyses (Weber, 1985). The guidance in Figure 5.7.1 was followed to identify units in field notes and pain-related interactions including words, themes, phrases, timing and sequence. Similar to the method used for the PPMQ, a codebook was created detailing the description of codes with inclusion criteria and examples of each category (following guidance from Cavanagh, 1997 and Ryan and Bernard, 2003). Data could then be cut and pasted into separate documents to allow comparisons between categories and organisation into the emerging themes. However, retaining the integrity of the original data and the patient's 'whole' experience during the observation period was important, particularly when comparing observed and documented care. Assessing reliability and validity of the coding process using statistical methods was considered less appropriate for this part of the data analysis because of the unique position as an observer. The fullest description

possible was documented after every pain-related interaction but a second coder might not have insight into the context or environment in which the interaction occurred. Credibility and trustworthiness focused on auditability (establishing rules and keeping a record of decisions to enable external scrutiny; Burns and Grove, 2001), building a logical chain of evidence and looking for cases that did not fit the theme or suggested new connections (Ryan and Bernard, 2003).

A number of computer programmes are available to aid qualitative data management and content analysis (Robson, 2002; Ryan and Bernard, 2003) but using such tools may have hindered comparisons between pain-related interactions and field notes, removed the conversations from the context in which they occurred and reduced learning about data analysis procedures. Data were coded by hand and Appendix 8 illustrates the themes and categories that emerged and examples from the coding process.

5.8 Summary

The work undertaken in this thesis comprised two studies investigating the organisational commitment to improving pain management and the nursing care provided in four hospitals, two with and two without an acute pain service. The initial study examined activity in one NHS region through a postal questionnaire and the second focused on care at ward level. Non-participant observation, examination of health care records and patient interviews were employed to explore the process of pain management with 120 patients. Data collection methods gave rise to both quantitative and qualitative information and subsequent chapters present descriptive data, inferential statistics and the results of content analyses.

CHAPTER 6

RESULTS

ORGANISATIONAL COMMITMENT AND PATIENTS' POSTOPERATIVE EXPERIENCES

Section 6.1 Introduction

This chapter presents quantitative and qualitative results that address the following research aims described in Chapter 5:

- Examine the organisational commitment to improving pain management that may influence nursing care
- Explore patients' pain management experience on the first postoperative day
- Examine nursing care provided in hospitals with and without a pain service.

Responses to the Postoperative Pain Management Questionnaire provided insight into the organisational commitment to improving pain management in hospitals based in one NHS region, highlighting activities that may influence nursing care at ward level. The investigation of pain management in four of these hospitals addressed the remaining research aims and patient experiences are discussed here in terms of pain scores, analgesics prescribed and administered and patient satisfaction. The subsequent results chapter focuses on observed and documented nursing care in participating hospitals.

Section 6.2 Postoperative Pain Management Questionnaire

Questionnaires were sent to staff in 38 hospitals from 25 acute NHS Trusts in the Northern and Yorkshire region. Thirty-three (86.8%) were returned (one uncompleted) and respondents were made up of nurse specialists (n=15; 46.9%), other staff members (n=5; 15.6%), anaesthetists (n=4; 12.5%) and directors of surgical or anaesthetic services (n=3; 9.4%). Five respondents did not identify their background.

Table 6.2.1 illustrates the range of hospital size in which respondents were employed (median values are presented due to one extreme value that distorted the mean) although this information was not given by every respondent.

Table 6.2.1. General profile of hospitals in the sample

Variable	Responses	Median	Min-Max
Number of inpatient beds	26	512.5	84-1050
Number of surgical beds	21	160	72-500
Approximate number of surgical procedures per annum	20	12000	700-125000

Variations were also evident in the type of surgical specialities, which ranged between two and 12 areas in each hospital (see Table 6.2.2).

Table 6.2.2. Number of surgical services provided in the sample (n=32)

Surgical Area	n	%	Surgical Area	n	%
General	31	96.9	Paediatrics	22	68.8
Day surgery	29	90.6	Ear, nose and throat (ENT)	16	50
Gynaecology/obstetrics	29	90.6	Plastic surgery	8	25
Orthopaedics	28	87.5	Other (burns, spinal, trauma, ophthalmics)	8	25
Urology	25	78.1	Neurosurgery	6	18.8
Vascular	23	71.9	Cardiothoracic	5	15.6

Respondents reported using a range of analgesic techniques within their organisation and they were asked to rank each one according to the estimated frequency of use. Table 6.2.3 shows that NSAIDs/oral analgesics and intramuscular and intravenous opioids were most frequently ranked first.

Table 6.2.3 Most commonly occurring rank for each analgesic method

Method of analgesia	Mode	n	%
Intravenous / Intramuscular opioids	1	11	34.4
Non-opioid/NSAIDs	1	11	34.4
Patient-controlled analgesia	3	11	34.4
Epidural analgesia	4	13	40.6
Non-pharmacological methods	5	15	46.9
Other	6	3	9.4

The remaining results from the Postoperative Pain Management Questionnaire are described in three main sections; organisational commitment to pain management, hospitals without pain services and hospitals with formal teams.

6.2.1 Organisational commitment to improving postoperative pain management

The PPMQ assessed key indicators of organisational commitment to improving postoperative pain management based on the recommendations of the RCS & CA (1990) and Audit Commission (1997) reports (shown in Figures 4.2.1 and 4.2.2). Seven areas were assessed; a named clinician with overall responsibility for pain management; education for health care professionals; statement about pain management in the quality strategy of the Trust; written guidelines on at least one aspect of pain management; audit; presence of an acute pain service; use of assessment tools and pain documentation. Only eight (25%) hospitals in the region had made all of these changes although 56.3% (n=18) had implemented five or six key areas. One hospital had implemented only one recommendation (written guidelines) and another had not followed any national guidance.

The Audit Commission made their regional results available to allow comparisons with their research, which took place three years earlier. Therefore, the PPMQ assessed changes that had occurred since the publication of the report and subsequent 30-day local audit of anaesthetic services. Table 6.2.4 summarises the regional results from the two research projects.

Table 6.2.4. Key indicators of organisational commitment including a comparison between (Audit Commission, 1998b) and PPMQ results

Indicator	Audit Commission		PPMQ		Statistical analysis	
	n	%	n	%		
Named clinician with overall responsibility	25	71.1	28	87.5	χ^2=1.73; p=0.18	NS
Statement in Trust quality strategy	--	--	15	46.9	--	--
Funding[1]						
Main purchasing authority	1	2.8	1	3.1		
Trust (internal funding)	14	40.0	8	25.0		
Anaesthetic/surgical directorate	3	8.6	10	31.3		
> one funding source			4	12.5		
Total	18	51.4	23	71.9	χ^2=2.15; p=0.14	NS
Staff education	20	57.1	25	78.1	χ^2=3.49; p=0.06	NS
Regular audit	20	57.1	24 [2]	75.0	χ^2=0.95; p=0.33	NS
Standards			9	28.1		
Policies			16	50.0	--	--
Guidelines	34	97.1	27	84.4		
Documentation						
Pain assessment charts	--	--	24	75.1	--	--
Documented on TPR Charts	--	--	2	6.3		
Pain service						
Established service	17	51.0	21	65.6	χ^2=5.04; p=0.02	S
Currently forming service	--	--	4	12.5		
Hospital covered by other APS	--	--	2	6.3		
No service	--	--	5	15.6		
Informal network/group for hospitals without APS (n=7)	--	--	5	71.4	--	--

Northern and Yorkshire regional results are presented here with permission from the Audit Commission (see Appendix 9)

[1]Audit Commission results relate to funding of acute pain nurse post only

[2] 4 respondents also described irregular audit of care relating to pain management

NS=Not Significant

S = Significant

Compared with the Audit Commission results, there has been a general increase in the number of hospitals implementing organisational recommendations. The majority of hospitals in the region (87.5%) had a named clinician with overall responsibility for pain management, usually an anaesthetist (n=18; 64.3%), or joint responsibility was held between anaesthetists and acute pain nurses (n=9; 32.1%). Only one APN in the

region was the named clinician despite several respondents describing their role in the day-to-day running of the service.

Funding is a major indicator of commitment to pain management and this too had shown an increase although the source of funding may have changed slightly. One hospital continued to be funded by the health authority (the research took place before the formation of strategic health authorities), more pain activities appear to be directly supported by anaesthetic or surgical directorates and four hospitals had several sources of funding. Comparative results should be interpreted with caution as the Audit Commission research relates to funding of APN posts only. Interestingly, two hospitals with acute pain services had no specific funding and two hospitals without services have money allocated for resources.

Identifying pain management as part of the Trust quality strategy, a specific recommendation from the Audit Commission (1997) report, illustrates organisational commitment at the highest level. Fifteen Trusts (46.9%) had implemented this at the time of the survey.

The PPMQ also explored the nature of pain education offered to nurses in 25 hospitals (21 with an APS and four without). Teaching sessions were delivered by a wide multidisciplinary group including; acute pain nurses (n=18; 72.0%), anaesthetists (n=8; 32.0%), pharmacists (n=6; 24.0%), nursing staff (n=5; 20.0%) and other individuals such as physiotherapists and pharmaceutical sales representatives. Many hospitals used two or more professionals to teach; however, 50% of the acute pain nurses and 25% of anaesthetists were responsible for all pain education within the hospital.

Respondents were asked to outline the content of teaching sessions and five core areas emerged. Less than half of hospitals covered basic areas such as the anatomy and physiology of pain (44%) and pain assessment and documentation (48%). Around two-thirds taught general methods of analgesia (60%), management of patients using patient-controlled analgesia (60%) and epidurals (60%). Nineteen other areas were described including non-pharmacological methods (24%), opioids (8%), nitrous oxide and oxygen use (Entonox, 8%), postoperative nausea and vomiting (8%), and chronic or palliative pain management (8%). Three respondents also outlined their involvement in teaching outside the Trust on National Vocational Qualification or pre-registration nursing courses.

The frequency of teaching sessions varied between hospitals from when clinicians felt that they were needed (n=4; 16.4%) to regular sessions up to five times a week (n=5; 20.0%). Commonly, teaching sessions were delivered monthly, (n=13; 52.0%) but often occurred at variable times depending on the topic e.g. "pain management and PCA workshop every three months, epidural workshop 5-6 times a month" (respondent 15). Many respondents commented on the difficulties of delivering sessions due to time constraints and workload.

Thirty (93.8%) hospitals in the region had written standards, policies or guidelines relating to postoperative pain management. Respondents were asked to identify whether these existed for pain assessment, prescription of opioids; prescription of NSAIDs/non-opioids; care of patients using PCA; care of patients using epidural/epidural PCA; or other areas of pain management. Nine (28.1%) hospitals had at least one standard, 16 (50.0%) had policies and 27 (84.4%) had written guidelines on pain management. Two hospitals did not have any written protocols to guide practitioners. Further details are

presented in Table 6.2.5 and "other areas" described included nitrous oxide and oxygen, intravenous opioid use and paediatric pain management.

Table 6.2.5. Standards, policies and guidelines relating to pain management (n=32)

Area	Standards	Policies	Guidelines	Don't know
Pain assessment	8	5	18	1
Prescription of opioids	3	4	18	2
Prescription of NSAIDs/non-opioids	3	3	17	1
Care of patients using PCA	6	11	17	1
Care of patients using epidural/epidural PCA	6	12	15	2
Other areas relating to pain management	3	3	5	5

Despite the low number of hospitals with formal standards, 75% (n=24) described regular audit of patient care relating to postoperative pain management and a further four respondents outlined irregular auditing. A wide range of audit areas were described although the most common were pain assessment/patient comfort or satisfaction (n=12; 46.2%), patient use of PCAs (n=6; 23.1%), and epidurals (n=7; 26.9%). Other areas included side effects or complications associated with specific analgesic modalities, postoperative nausea and vomiting, acute pain service activity and staff attitudes, knowledge or education. Although details of the interval between audits were not specifically requested, participants described reviews occurring bi-monthly, monthly, annual or on two-year cycles.

Respondents to the questionnaire described where ward nurses documented care relating to pain management; a question principally used to identify whether specific documentation existed, increasing the visibility of pain during nursing care (Evans-Faries *et al.*, 1991;Gordon, 1996). Seventy-five per cent of the sample (n=24) employed a specific assessment chart to document pain scores and two hospitals used a general

nursing observations chart (or temperature, pulse and respiration chart). The remaining respondents described documentation of pain management activities in the nursing care plans.

The PPMQ assessed several indicators of organisational commitment to improving pain management in hospitals across one NHS region. Where possible, comparisons were made with regional results from Audit Commission (1998b) work but in this small sample, the only change that reached statistical significance was the increase in the number of hospitals with acute pain services. The following sections explore the difference between hospitals with and without services, highlighting the activity in each.

6.2.2 Hospitals without acute pain services

Seven (21.9%) of the responding hospitals did not operate an APS (two of these hospitals were covered by a service in another hospital). Table 6.2.6 illustrates that these were smaller hospitals with fewer surgical beds and procedures per annum.

Table 6.2.6. Comparison of hospitals with and without acute pain services

	APS Median	No APS Median
In patient beds	618	348
Surgical beds	195	117
Surgical procedures per annum	14,423	7,500

Lack of funding, management issues or hospital size were reasons cited for not having a pain service but multidisciplinary groups existed in five of these hospitals. These informal networks with an interest in pain management consisted of anaesthetists, nurses and pharmacists, a similar group of practitioners in a formal APS. The role of these individuals or the group was not explored in detail but some hospitals had implemented up to five recommendations from national reports. Three had a named clinician responsible for pain management; four ran teaching sessions and four audited

pain management regularly. Six hospitals had standards, policies or guidelines and six had specific documentation for pain assessment. Statistical analyses comparing hospitals with and without APS were not performed because of the low number of hospitals without services.

Despite the absence of a formal pain service, some hospitals illustrated a degree of organisational commitment to improving pain management by arranging an informal network of practitioners and implementing many of the recommendations from national reports.

6.2.3 Hospitals with acute pain services

The Audit Commission (1997) illustrated that hospitals in the Northern and Yorkshire region had the lowest number of acute pain services compared with other regions in the UK. This figure of 51% (n=17) had risen to 65.6% (n=21) of hospitals and four (12.5%) were currently developing a service or team, a statistically significant increase (χ^2=5.04; p=0.02). Hospitals developing services were asked to answer the questionnaire as far as possible, in light of the new team. Therefore, the results of the two groups are considered together.

The pain services in the region ranged from those that were newly created (three months) to well-established services that had been running for over ten years (mean 3 years and 9 months). Most served one hospital, although nine teams operated across two or more hospitals within NHS Trusts. Three respondents made additional comments relating to the limited cover in other hospitals and the difficulties in providing assistance because of the physical distance between hospitals.

One hundred and thirty-two practitioners contributed to 25 pain services in the region. Thirty-nine clinical nurse specialists were employed in 23 services (up to four in each Trust) working between 8-40 hours per week. This was an average whole time equivalent (WTE) of 0.87; nearly half the national 1.62 WTE quoted for hospitals by the Audit Commission (1998b). Most commonly, one or two anaesthetists in each hospital contributed regularly to the APS although in some, all anaesthetists were considered members of the service. Fourteen pharmacists were core team members (and many more described close links with pharmacy) as were six physiotherapists. A small number of hospitals also identified surgeons, psychologists, senior nurses and audit assistants as part of the service.

Acute pain services in the sample did not necessarily operate in all surgical areas. Seven (28%) were not funded to care for patients who were undergoing surgery in areas such as cardiothoracics, day surgery, obstetrics or gynaecology, ENT, paediatrics, plastic surgery or neurosurgery. Reasons for this or alternative arrangements for patients in these areas were not explored by the PPMQ and many identified additional areas of responsibility. Table 6.2.7 highlights these areas showing that nearly half had input into the management of patients with chronic pain.

Table 6.2.7. Additional specialities covered by acute pain services

Specialty	n	%
Patients with chronic pain (e.g. outpatients, chronic pain service)	12	48.0
Accident and emergency	6	24.0
Patients with acute pain on medical wards	5	20.0
Patients with cancer pain or palliative care	4	16.0
Outpatients clinic	2	8.0
Intensive care unit	1	4.0

All services in the sample had some patient contact, usually those using PCA, epidural analgesia or referred to the team due to persistent unrelieved pain. In the hospital where

anaesthetists were part of the APS, a member of the team saw all patients preoperatively. Twenty-one (84%) hospitals conducted formal ward rounds visiting patients with PCAs or epidurals, usually on a daily basis either Monday to Friday or seven days a week. A small number (n=5) visited patients twice a day, often depending on the route of analgesia and patients. In two hospitals, patients with PCAs were visited once a day and those with epidurals three times a day.

The PPMQ asked respondents to identify the main aims of the service and through content analysis, 11 themes emerged from the data (presented in Table 6.2.8).

Table 6.2.8. Main objectives of acute pain services

Aim	n	%
Education of health care professionals	21	84.0
Participate in or conduct audits	14	56.0
Improve acute pain management or standards of care	10	40.0
Act as a resource/source of support for health care professionals	10	40.0
Introduce, provide or develop analgesic techniques (e.g. PCA, epidural, nitrous oxide and oxygen)	9	36.0
Maintain or improve the acute pain service provision	8	32.0
Develop standards, policies and/or guidelines	8	32.0
Educate patients and their families	6	24.0
Conduct or participate in research	4	16.0
Supervision or coordination of acute pain management	3	12.0
Management of resources for pain management	2	8.0

Staff education was the most frequently described objective followed by auditing practice and 40% of respondents identified the overall aim of improving pain management. In comparison, 19 themes emerged when asked to identify the major changes introduced since service inception. These themes (presented in Table 6.2.9) and the aims of the service do overlap but some new areas emerge.

Table 6.2.9. Major changes introduced by the acute pain services

Change introduced	n	%
Introduction and management of epidural/epidural PCA	15	60
Education of health care professionals	13	52
Introduction and management of PCA	10	40
Introduction of pain assessment charts and regular pain assessment	9	36
Developed of standards, policies, or guidelines	9	36
Established a link nurse system	5	20
Better relations and liaison with multidisciplinary team	4	16
Introduction of analgesic algorithm	4	16
Staff support and patient referral system	4	16

Commencing and managing epidural analgesia at ward level was the most frequently cited achievement with the introduction of assessment charts and developing guidelines perceived as further positive changes. Interestingly, 21 respondents (84%) identified education as an aim but only 13 (52%) felt that it had been a change successfully introduced. Only one respondent felt that audit of practice was a major change, yet it was the second most frequently cited aim of the service and 75% (n=24) of hospitals in the region actually audit pain management. Four respondents felt that conducting or participating in research was a key objective for the service but this element was not identified as a major change. Individual respondents also highlighted the discontinuation of intramuscular injections after surgery, merging acute and chronic pain services, and introduction of non-pharmacological methods of analgesia and patient information booklets. Some respondents focused on the affective changes they felt the service had achieved such as the "…positive change in staff attitudes to pain management" (respondent 4) or the fact that "nurses have become more assertive in advocating change in treatment of pain regimes that are not effective" (respondent 14).

A small number (n=5) described the introduction of a link nurse system; an informal network of nurses, usually one representative from each ward with an interest in pain, to

take information back to their area of practice. In a separate question, all respondents were asked to identify whether link nurses existed but hospitals without a service did not operate the system. Twenty-two hospitals with an APS supported link nurses to disseminate information and encourage changes in practice. One hospital described the system as an effective method of staff support as the pain service was based at another hospital.

A number of additional comments were made at the end of the PPMQ, predominantly from hospitals with an APS, describing areas currently under development such as new appointments, expansion of the service or merger with chronic pain services. A few comments gave a greater insight into the model of APS in operation. Respondents from three hospitals described a nurse-led service where anaesthetists had minimal input to patient care after commencing PCA or epidural analgesia. A comment from hospital twenty-five highlights this:

> The input of an anaesthetist is essential but their presence on the ward round isn't an effective use of resources. We have identified a named anaesthetist for each day who is on call for serious problems.

The same respondent also commented on the effectiveness of this model, suggesting that pain was not being well managed in all surgical patients:

> We have found that offering a PCA/epidural service, only offers support to patients with adequate analgesia.

The pain service in one hospital was led by registered nurses in recovery and a number of nurses contributed to ward rounds. Finally, four commented on arrangements "out of

hours" and the difficulties ward staff experienced contacting anaesthetists on call who also covered theatres, intensive care and maternity units.

The number of hospitals with acute pain services has increased since the Audit Commission (1997,1998b) research and a small number were in the process of forming a team at the time of administering the questionnaire. The structure of services varied in relation to the number of hospitals included, core team members and surgical areas covered. Nearly half had input into chronic pain services or other hospital areas despite a lack of funding for all surgical specialities in some cases. Patient contact was usually restricted to those with PCA and epidural modalities or recurrent unrelieved acute pain. The main objective of services was the education of health care professionals along with audit and improving standards of care. The introduction of ward-based epidural analgesia was seen as the greatest change introduced by respondents.

6.2.4 Summary of results from Postoperative Pain Management Questionnaire

The PPMQ was designed to explore organisational commitment to improving pain management in one NHS region. Only eight hospitals had implemented all of the recommendations from national reports but many had made significant changes compared to the Audit Commission work a few years earlier. Activities in most areas had increased. More hospitals had specific funding for pain management, a named clinician with overall responsibility, provided education for health care professionals, conducted audit and had an established pain service. Previous research had not explored the details of these activities and results here show wide variations in aspects such as the nature and frequency of staff education. In some hospitals, this occurred when clinicians felt education was necessary and other staff were running five sessions a week. Most hospitals (93.8%) had written protocols relating to pain management but less than a

third (28.1%) had set specific standards for care. Seventy-five per cent of hospitals were auditing pain management regularly but a range of topics were investigated and only 46.2% of this group audited patients' experiences in relation to pain scores or satisfaction with care.

The small number of hospitals (n=7) in the sample without formal pain services had shown some organisational commitment. Two had specific funding for pain management activities and five operated an informal network or multidisciplinary group with a similar professional background to formal pain services. A number of recommendations had been implemented by these hospitals.

Establishing an APS has been seen as an important step to improving pain management in UK hospitals. Seventy eight per cent (n=25) had an existing service or were in the process of building a team, a statistically significant increase since Audit Commission (1997) work. The PPMQ revealed variations in staffing, particularly in relation to acute pain nurses. Thirty-nine nurses across the region were employed for nearly half the WTE of APNs nationally and two services ran without nurse specialists. APSs in seven Trusts were not funded to operate in all surgical areas yet many had additional areas of responsibility such as chronic pain services. Objectives of pain services showed some similarities with the major changes outlined but the introduction of epidural analgesia to ward environments was the most frequently mentioned achievement.

Overall, the PPMQ highlighted some of the positive changes that have occurred in relation to the organisation commitment to improving pain management in one NHS region, although these changes were not uniform across hospitals. The ultimate aim of

these institutional changes is to influence the care at ward level and 120 patients in four hospitals were followed in the second stage of this research project.

Section 6.3 Management of postoperative pain in four English hospitals

This section describes the quantitative results from the non-participant observation of 120 patients on their first postoperative day, patient interviews and examination of nursing and anaesthetic records.

6.3.1 Organisational commitment of participating hospitals

Table 6.3.1 summarises information relating to the four hospitals and the organisational indicators from the PPMQ.

Table 6.3.1. Indicators of organisational commitment of the hospitals participating in the observational study

Indicator	Hospital			
	1	2	3	4
Acute pain service	✓	×	×	✓
Named clinician with overall responsibility	✓	✓	✓	✓
Statement in Trust quality strategy	✓	×[1]	×	✓
Funding source Trust (internal funding)	✓	✓	×	✓
Staff education	✓	✓	✓	✓
Regular audit	✓	✓	✓	✓
Standards Policies Guidelines	✓ × ✓	× ✓ ✓	× ✓ ✓	✓ × ✓
Documentation Pain assessment charts and care plans	✓	✓	✓	✓
Informal network/group for hospitals without APS	--	✓	✓	--

[1]Respondent reported currently writing pain management into the quality strategy

All four hospitals had a named clinician responsible for pain management, ran staff education sessions, audited practice and documented pain on assessment charts and nursing care plans (further details of the educational provision and areas audited in each hospital are supplied in Appendix 9). Hospital three did not have specific funding and

both organisations without a pain service did not have statements relating to pain in the Trust quality strategy or written standards for practitioners. These hospitals did have policies and guidelines for staff and had an informal network within the hospital of professionals with an interest in pain management.

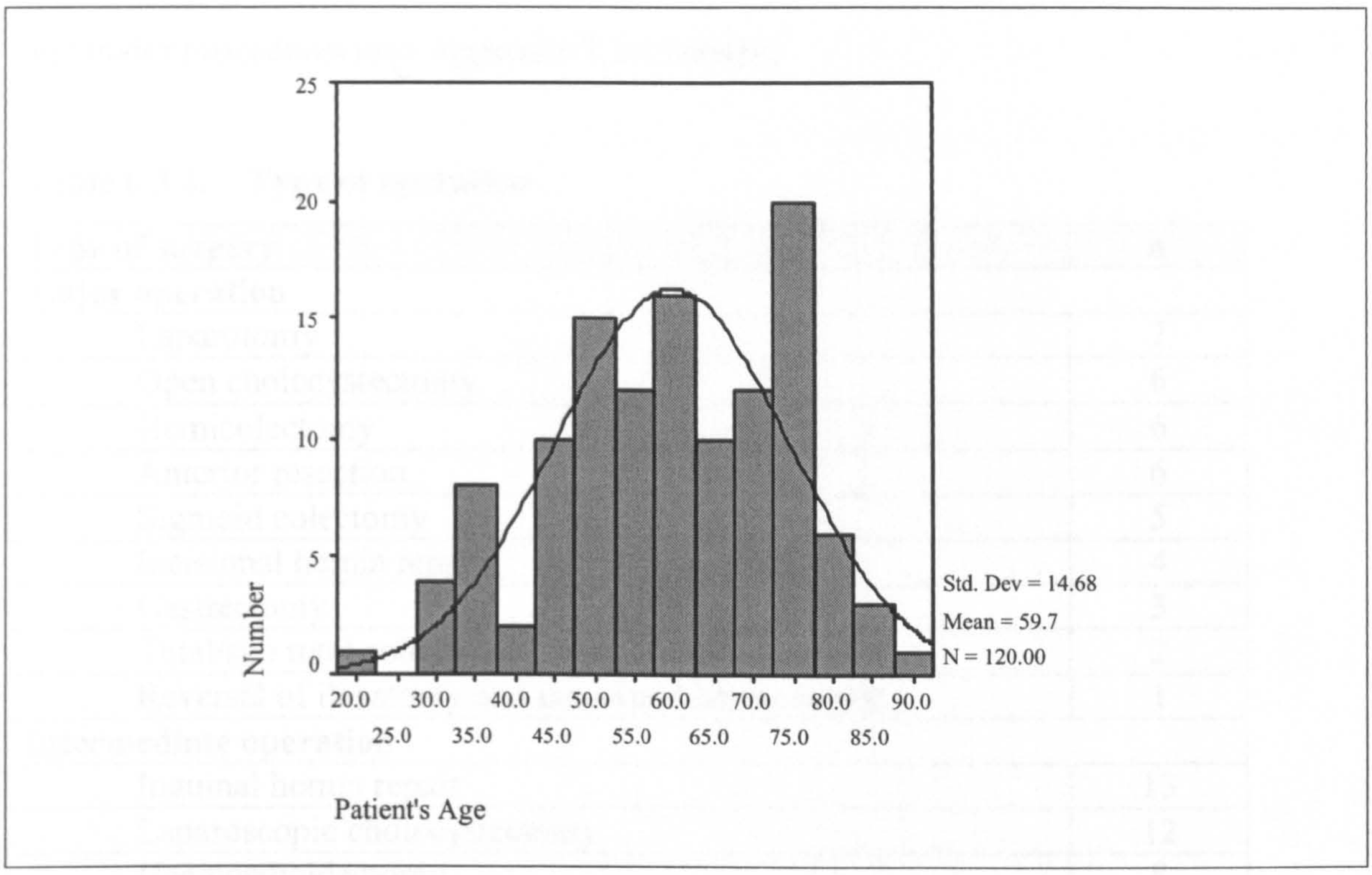
Evidence of organisational commitment occurred during the research period in some hospitals. Members of the APS in hospitals one and four visited thirteen patients using PCA or epidural analgesia to monitor their progress and an anaesthetist visited one patient in hospital two. Activity at ward level also showed commitment to improving pain management and patients from hospital two had each been given a leaflet called "Pain relief after surgery" explaining options for analgesia. In addition, the monthly agenda for ward meetings (posted in the treatment room) listed the pain audit results as a regular item for discussion. Each bedside locker in hospital three had a printed sticker that included a verbal rating scale for pain. These identified activities were noticeable to an observer and could have occurred in other hospitals but information may not have been publicly displayed.

6.3.2 Participant characteristics and the research period

6.3.2.1 Participant characteristics

In each of the four hospitals, 30 patients took part and Figure 6.3.1 illustrates the age of participants across the whole sample.

Figure 6.3.1. Age of patient participants



The mean age was 59.7years (SD 14.68) and range 69 years (19-88). Despite an older population and a large number of patients between 72.5-77.5 years, age was normally distributed (Z=0.99; p=0.27) and there was no difference in the age of participants between hospitals (F=0.92; df=3,119; p=0.43) or types of hospital, with or without an APS (t=0.46; df=118; p=0.65).

The patient sample comprised 62 (51.7%) men and 58 (48.3%) women with no difference in the proportion of male and female participants across hospitals (χ^2=0.67; df=3; p=0.88) or those with or without a service (χ^2=0.30; df=1; p=0.58). However, the men in the sample were significantly older (mean 62.8 years; SD 13.55) than female patients (mean 56.3 years; SD 15.22) (t=2.5; df=118; p=0.02).

All patients were admitted onto a general surgical ward for the range of procedures highlighted in Table 6.3.2. Participants were randomly selected from the theatre list but

stratified to ensure equal representation from the surgical groups of minor, intermediate and major procedures (see Appendix 2 for details).

Table 6.3.2. Type of operation

Type of surgery	n
Major operation	
Laparotomy	7
Open cholecystectomy	6
Hemicolectomy	6
Anterior resection	6
Sigmoid colectomy	5
Incisional hernia repair	4
Gastrectomy	3
Total/sub total colectomy	2
Reversal of ileostomy and incisional hernia repair	1
Intermediate operation	
Inguinal hernia repair	13
Laparoscopic cholecystectomy	12
Haemorrhoidectomy	8
Laparoscopic Nissen fundoplication	4
Mastectomy	2
Laparoscopic retroplexy	1
Minor operation	
Paraumbilical hernia repair	13
Femoral hernia repair	7
Thyroidectomy	7
Wide local excision of breast	5
Epigastric hernia repair	4
EUA and haemorrhoid banding/drainage of abscess	4
Total	**120**

There was no difference in the proportion of men and women in each surgical category (χ^2=0.47; df=2; p=0.79) but patients who received a major surgery were generally older (minor surgery, 57.1 years, SD 12.90; intermediate surgery 58.2 years, SD 15.03; major surgery 63.8 years, SD 15.47). However, these differences did not reach statistical significance (F=2.43; df 2,117; p=0.09). The demographic and inferential statistics illustrate the nature of the patient sample and similarities between participants in each hospital.

Nine patients refused to participate in the study and reasons were not requested but high levels of anxiety and an unknown outcome of surgery were the most frequent explanations given. Twenty-eight patients agreed to participate but had to withdraw due to unforeseen circumstances, illustrated in Table 6.3.3.

Table 6.3.3. Reasons for withdrawal from the study

Reason	Number according to hospital				Total
	1	2	3	4	
Operation cancelled	1	2	1	1	5
Moved to another ward	2	--	--	1	3
Discharged prior to observation period	5	1	3	3	12
Admitted to intensive care unit	1	2	4	--	7
Taken to theatre for emergency surgery	--	1	--	--	1
Total	**9**	**6**	**8**	**5**	**28**

One hundred and ninety registered nurses, student nurses and health care assistants took part in the study (see Table 5.4.1 for details) with three RNs refusing to participate in two hospitals. No explanations were sought or given and the observation periods did not coincide with their shifts. One RN initially refused because of concerns over patient involvement and requested further information before agreeing to participate.

6.3.2.2. Research period

The main data collection period occurred between April 2000 and July 2001 spending up 12 weeks in each hospital. Nurse-patient interactions and care given to one patient was observed for a maximum of a seven-hour period (07.30-14.30 or 14.30-21.30) followed by a patient interview and examination of nursing documentation and anaesthetic records. Seven hundred and seventy-eight hours of observation were completed and 22 patients discharged before the end of the observation period (five or six patients in each hospital). The minimum observation period for this group of patients was four hours.

Data collection occurred during 72 (60%) early shifts and 48 (40%) late shifts between Tuesday and Saturday of each week and Table 6.3.4 shows the observation period according to type of surgery. The shifts completed with patients who had received minor surgery could not be randomly selected because they were often discharged home before the late shift period.

Table 6.3.4. Observation periods according to type of surgery

Type of surgery	Observation period		Total
	Early 07.30-14.30	Late 14.30-21.30	
Minor	31	9	40
Intermediate	23	17	40
Major	18	22	40
Total	**72**	**48**	**120**

There was no difference in pattern of shifts completed in each hospital (χ^2=0.66; df=3; p=0.88) or hospitals with or without service (χ^2=0.32; df=1; p=0.71).

Summary

The patient participants underwent a range of minor, intermediate and major procedures on the general surgical wards. Their mean age was 59.7 years with approximately equal numbers of male and female participants. Male patients in the sample were older that their female counterparts, as were patients receiving major surgery. One hundred and ninety registered nurses, student nurses and health care assistants took part in the study from six different wards in the four hospitals.

The care received by one patient and nurse-patient interactions were observed for a maximum of seven hour period and more early (07.30-14.30) shifts were completed because of a propensity for patients receiving minor surgery to be discharged on the their first postoperative day. Patient characteristics (age and gender) and pattern of observation did not differ between the four hospitals included or two types of hospital

with APS or without. This suggests a representative sample and consistency in sampling between hospitals.

6.3.3 Experiences of pain

In the week prior to surgery, 18 (15.0%) patients had experienced pain; usually related to the reason for the surgery and only seven patients described a source of persistent pain for which they took regular analgesics. The nature and level of preoperative pain was not assessed in any detail.

All patients experienced pain following surgery and the 15 individual sites identified are shown in Table 6.3.5.

Table 6.3.5. Site of pain reported by patients

Site	n
Surgical site	
Abdomen	93
Perineum, anus, rectum	12
Throat/neck	7
Thorax/breast	6
Other sites	
Sore throat	15
Headache	7
"Wind" pain	5
Shoulder	4
Bladder/urethra	3
Lower back	2
Ear ache	1
Elbow joints	1
Heels	1
Hip joints	1
Knee joints	1
Total	**159**

Thirty-seven (30.8%) patients had two or more sites of pain, areas away from the surgical incision. This may have been due to chronic pain conditions or other factors

relating to the procedure e.g. referred pain, endo-tracheal tube during surgery, and position on operating table.

Patients rated their pain intensity using a visual analogue (VAS) and verbal rating scales (VRS). Instructions were given on the use of the instruments, repeated if individuals did not fully understand or the line of questioning abandoned if they were unable to use the scale. One patient could not use either tool, five patients could only use one tool, one was asleep and one patient refused to be interviewed due to exhaustion. Therefore, between 115-117 ratings were available for analysis depending on the assessment tool.

Patients gave four ratings using the VAS; acceptable pain level (a level at which they felt comfortable with, beyond which they would require pain relief), pain now at rest, pain now on movement (pain during coughing or touching the opposite side of the bed) and worst pain scores in the last 24 hours. The VRS was used to assess acceptable, pain now and worst pain scores. Twelve (10.2%) patients had difficulty conceptualising acceptable pain levels using one or both the assessment tools.

Mean pain intensity scores for the whole sample using the VAS are shown in Table 6.3.6.

Table 6.3.6. Mean pain scores using the visual analogue scale (VAS)

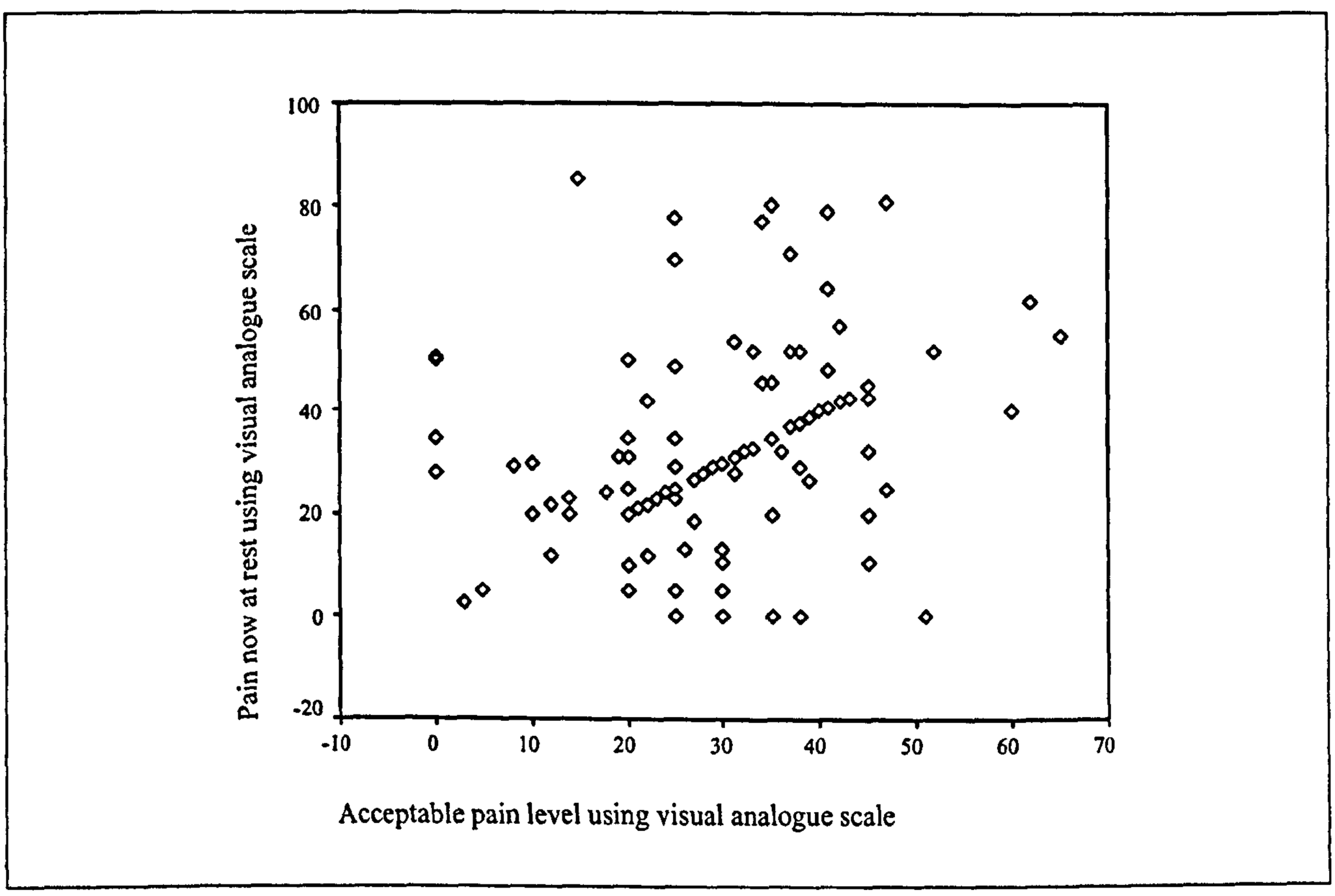
Rating	n	Mean mm	Standard deviation mm	Min-Max mm
Acceptable level of pain	106	29.6	13.13	0-65
Pain now at rest	115	34.2	19.31	0-85
Pain now on movement	114	43.3	19.87	5-97
Worst pain	116	57.0	24.99	5-100

The table demonstrates that patients experienced greater pain intensities than they felt were acceptable and differences between this rating and pain on movement (t= -6.368;

df=101; p <0.001) and worst pain in the last 24 hours (t= -10.677; df=103; p <0.001) were statistically significant. The difference between acceptable pain scores and pain now at rest was only 4.8mm and did not quite reach significance (p=0.059). In clinical terms, this is a very small difference and results may have been influenced by the assessment of acceptable pain scores postoperatively, when patients were currently experiencing pain. Therefore, the correlation between these pain ratings was explored.

Acceptable pain levels showed a low but positive correlation with pain now at rest (r=0.303; p=<0.001) and pain now on movement (r=0.25; p=<0.001). The relationship between acceptable pain and pain now at rest scores are illustrated in Figure 6.3.2.

Figure 6.3.2 Relationship between acceptable and pain now at rest scores



For some patients, their current pain *was* their acceptable pain level (despite a high intensity in a few cases) although the graph still demonstrates a wide dispersion of scores. Figure 6.3.2 also shows the low number of patients that felt that minimal or 'no pain' levels were acceptable.

At the time of the interview, 23.1% (n=24) participants were experiencing moderate to severe pain at rest with ratings above 50mm on the VAS. This figure rose to 38.3% (n=46) upon movement and 61.2% (n=71) had experienced this intensity in the last 24 hours. Comparison of pain ratings at rest and on movement revealed a significant difference between the scores (t=-9.17; df=112; p<0.001), highlighting the importance of assessing both these experiences in practice.

Male participants reported slightly higher acceptable pain intensity levels (mean 31.9mm; SD 12.32) compared with female patients (mean 27.3mm; SD 13.62) although this difference was not statistically significant (t=1.28; df=103 p=0.07). Pain at rest (t=0.25; df=114; p0.80), on movement (t=0.25; df=113; p=0.80) and worst pain scores (t=-0.16; df=114; p=0.87) were all similar between men and women.

Table 6.3.7 illustrates the mean pain ratings according to the type of surgery patients experienced.

Table 6.3.7. Mean pain scores using the VAS according to type of surgery

Rating	Type of surgery	n	Mean (SD) Mm	Min-max Mm	Statistics
Acceptable pain	Minor	38	27.9 (11.20)	0-51	F=0.49
	Intermediate	35	30.8 (13.72)	0-65	p=0.61
	Major	31	30.3 (14.76)	0-62	NS
Pain now at rest	Minor	40	29.3 (16.40)	0-77	F=2.52
	Intermediate	38	34.3 (16.97)	0-80	p=0.09
	Major	37	39.1 (23.30)	0-85	NS
Pain now on movement	Minor	39	38.1 (16.44)	11-80	F=3.29
	Intermediate	39	43.1 (18.63)	15-92	p=0.04
	Major	36	49.1 (19.92)	5-97	S
Worst pain	Minor	40	49.5 (22.18)	11-100	F=5.04
	Intermediate	39	55.4 (24.41)	20-100	p=0.008
	Major	37	66.8 (25.87)	5-100	S

Patients receiving intermediate or major surgery accepted slightly higher pain ratings (although this was not a statistical difference) and as expected, pain at rest, on

movement and worst pain scores were higher in these groups. Post-hoc tests confirmed that differences lay between minor and major surgical patients for pain on movement (Tukey HSD; p=0.03) and worst pain scores (Tukey HSD; p=0.006). In the 24-hours prior to interview, patients in all surgical groups had experienced nearly double their acceptable pain levels but the standard deviation of higher pain sores also show a greater dispersion of scores.

Table 6.3.8 compares VAS pain scores from patients from hospitals with and without an APS and suggests little difference between the types of organisation for this patient outcome. On average, patients were willing to accept 29mm on VAS and experienced 57mm worst pain scores but pain now at rest and on movement were slightly higher in hospitals with a pain service. However, this difference did not reach statistical significance.

Table 6.3.8. Pain scores using the VAS according to presence of a pain service

Rating	n	Pain service Mean score in mm	No pain service Mean score in mm	t	p
Acceptable pain	104	29.4	29.9	-0.21	0.84 NS
Pain now at rest	115	36.5	31.7	1.35	0.18 NS
Pain now on movement	114	46.0	40.6	1.45	0.15 NS
Worst pain	116	56.7	57.3	-0.14	0.88 NS

Previous research on the effectiveness of pain services has focused on patients undergoing major surgery and results from this study showed mixed results. Mean pain scores for current pain experiences demonstrate higher intensities in hospitals with pain services compared to those without; a statistical difference for pain on movement (mean 56.1mm Vs 42.7mm; U=106.0; p=0.048) but not pain at rest at p<0.05 (mean 45.5mm Vs 32.3mm; U=110.5; p=0.066). However, these results should be interpreted with

caution due to the low numbers in each group (n=19) and further work is needed to explore this in detail.

For all surgical patients, the lack of statistical difference in pain scores between hospitals with or without services can be explained by results from individual hospitals, displayed in Table 6.3.9.

Table 6.3.9. Pain scores using the VAS according to hospital

Rating	Hospital 1 mm	Hospital 2 mm	Hospital 3 mm	Hospital 4 mm
Acceptable pain	25.3	27.8	32.2	33.4
Pain now at rest	32.0	26.2	37.4	41.1
Pain now on movement	41.4	35.0	46.3	51.0
Worst pain	52.2	50.4	64.5	61.0
Overall mean	**37.7**	**34.8**	**45.1**	**46.3**

Overall, the lowest pain scores were achieved by a hospital without an APS (number two) and the highest scores in hospital with a service (number four). Patients in hospitals with higher pain scores appeared to have higher acceptable pain levels but this did not reach statistical significance ($F=2.28$; $df=3,103$; $p=0.084$) and worst pain scores showed a similar pattern ($F=2.22$; $df=3, 112$; $p=0.09$). However, pain on the first postoperative day at rest ($F=3.492$; $df=3, 112$; $p=0.018$) and on movement ($F=3.74$; $df=3, 112$; $p=0.013$) did illustrate a difference and post-hoc tests showed that this was between hospital two and four; the hospitals with the highest and lowest pain scores (pain at rest, Tukey HSD, $p=0.016$; pain on movement, Tukey, $p=0.01$).

The results from the verbal rating scale give a slightly different perspective on patients' experience of pain after surgery. Table 6.3.10 presents the results from acceptable, pain now and worst pain ratings.

Table 6.3.10. Pain scores using the verbal rating scale (VRS)

Rating	Acceptable pain level		Pain now		Worst pain	
	n	%	n	%	n	%
No pain at or on movement	5	4.9	5	4.4	2	1.7
No pain at rest, slight on movement	56	54.9	40	35.4	20	17.2
Slight pain at rest, moderate pain on movement	37	36.3	47	41.6	34	29.3
Moderate pain at rest, severe pain on movement	4	3.9	18	15.9	32	27.6
Severe pain at rest and on movement	--	--	3	2.7	28	24.1
Total[1]	**102**	**100**	**113**	**100**	**116**	**100**

[1]Percentages between 99.9-100.1 due to rounding up or down to one decimal point

Most patients (n=93; 91.1%) felt that "no" or "slight pain at rest" and "slight" or "moderate pain on movement" were acceptable on the first postoperative day and 60 patients (58.8%) experienced their accepted pain levels. For 18 patients (17.3%), their worst pain scores also matched their acceptable pain levels and only five (4.8%) had lower pain ratings.

Verbal rating scales are considered to be less sensitive than visual analogue scales in detecting differences or changes in pain intensity and this can be illustrated using acceptable and actual pain scores. As previously identified, the VRS showed 60 patients whose actual pain matched their acceptable pain levels. This figure is 29 patients using the VAS (± 5mm) perhaps reflecting the sensitivity and increased number of response options. However, within this sample, a relationship is evident between the assessment tools and Table 6.3.11 summarises mean VAS scores according to patient's verbal rating at rest and on movement.

Table 6.3.11 Relationship between VAS and VRS pain scores

Rating	Mean VAS score in mm according to adjective on VRS							
	No pain	Range	Slight pain	Range	Moderate pain	Range	Severe pain	Range
Pain at rest	18.9	0-43	36.6	20-52	58.6	33-80	81.6	70-85
Pain on movement	19.8	10-35	28.2	5-50	46.8	20-70	70.6	52-97
Overall	**19.4**	**0-43**	**32.4**	**5-52**	**52.9**	**20-80**	**75.9**	**52-97**

Patients generally perceived "no pain" as up to 20mm on the VAS and in one case 43mm. Other categories also showed a range of scores reflecting the different perceptions of pain. The two scales showed a strong correlation for acceptable pain (ρ= 0.67; p<0.001), pain now (ρ=0.79; p=<0.001) and worst pain scores (ρ=0.81; p<0.001).

Interestingly, the VAS equivalent of slight, moderate and severe pain is lower for pain on movement than pain at rest. Table 6.3.12 summarises the statistical results of these three categories illustrating a significant difference for each. The reason for these differences is unclear but may have been due to factors such as being more aware to changes in pain during movement or the nature of the VRS scale used (which incorporated measurements on rest and movement). This would need to further investigation to obtain a clear explanation of results.

Table 6.3.12. VAS scores in relation to the VRS at rest and on movement

Rating	VAS Mean mm (SD)	U	p
Slight pain			
Rest	36.6 (9.58)	488.0	<0.001 S
Movement	28.2 (11.83)		
Moderate pain			
Rest	58.6 (12.92)	201.5	0.002 S
Movement	46.8 (12.68)		
Severe			
Rest	81.6 (8.83)	7.50	0.035 S
Movement	68.4 (12.89)		

Summary

All patients experienced pain following surgery but 30.8% (n=37) identified additional sites unrelated to the surgical incision, highlighting the importance of assessing the location and cause of pain. Using the VAS, individuals experienced more pain at rest, on movement and worst pain over the previous 24 hours than they felt was acceptable. However, the difference between acceptable and pain at rest scores was not statistically or clinically significant but in fact showed a low positive and significant correlation.

This suggests some patients were using their current pain experiences to determine acceptable levels during interview.

Twenty-three per cent of participants experienced moderate to severe pain (>50mm on VAS) at rest, which rose to 38.3% on movement and 61.2% as worst pain scores. Acceptable pain scores did not differ between those receiving different types of surgery but pain on movement ($p=0.04$) and worst pain scores ($p=0.008$) were higher with intermediate and major surgical groups. Mean pain scores for hospitals with and without a pain service did not differ significantly but the most likely explanation for this result is the individual differences between hospitals. Hospital two, without an APS, achieved the lowest pain scores and a hospital with a service (number four) had the highest scores at rest, on movement and for worst pain experiences.

VAS and VRS pain scores showed a strong correlation between the scales for all of the different pain ratings. Interestingly, the mean VAS equivalent score at rest and on movement were statistically significant. The reasons for a lower VAS mean for slight, moderate and severe pain ratings requires further investigation to fully understand this phenomenon.

6.3.4 Prescribed and administered analgesics

Prescribed and administered analgesics were recorded from the preoperative period until midnight on the first postoperative day. This section summarises this information comparing activity in each hospital.

Ten patients received preoperative analgesics (eight from hospital two and two from hospital three) predominantly diclofenac 50-100mg and one patient was given

paracetamol. One hundred and eight anaesthetic records were available although the handwriting on one set of records was illegible and one patient did not have any documented analgesics. Most patients were given fentanyl or morphine during surgery and 21 received an additional opioid, compound analgesic preparation or non-opioid. Table 6.3.13 shows the mean analgesic doses and on average, patients were given 131μg of fentanyl (SD 75.79) and 11.3mg (SD 5.76) of morphine. Statistical results comparing amount given in each hospital suggest little difference between them but the standard deviations for fentanyl indicate a wide dispersion in the amount given perioperatively. Fentanyl and morphine administration did not differ according to gender ($t=-0.299$, $p=0.82$; $t=6.03$, $p=0.55$ respectively) or type of surgery ($F=2.237$, $df=2,79$, $p=0.11$; $F=1.282$, $df=2,59$, $p=0.29$ respectively). Major surgical patients received greater amounts of analgesics during theatre but epidurals were commenced during this time period for 13 patients, which may have contributed to a non-significant result for morphine and fentanyl administration.

Table 6.3.13. Analgesics administered in theatres and recovery according to hospital

Analgesic prescribed	THEATRES Mean dose in milligrams per hospital (SD)				RECOVERY Mean dose in milligrams per hospital (SD)				Statistics	
	1	2	3	4	1	2	3	4	F	p
Opioids										
Fentanyl (n=82)	0.12 (0.42)	0.14 (0.97)	0.12 (0.70)	0.13 (0.48)	--	150 (70.74)	--	--	3.87	0.76
Morphine (n=62)	12.5 (6.61)	10.2 (4.72)	8.8 (5.55)	12.3 (5.32)	12.2 (5.90)	6.9 (3.0)	10.4 (6.21)	8.4 (2.62)	1.46	0.23
Tramadol (n=1)	50[1]	--	--	--	--	--	--	--	--	--
Pethidine (n=1)	--	--	--	--	--	--	100[1]	--	--	--
Compounds and non-opioids									--	
Diclofenac (n=8)	93.8 (12.56)	91.7 (14.73)	--	--	--	100[1]	--	--		--
Ketorolac (n=7)	18.3 (4.11)	--	12.5 (5.0)	--	75[1]	--	--	--	--	--
Co-codamol (30/500 n=2)	--	--	--	--	--	--	60/1000[1]	60/1000[1]	--	--
Co-codamol 8/500 (n=2)	--	--	--	--	16/1000[1]	--	--	16/1000[1]	--	--

[1]One patient only

Thirty-four patients received analgesics in recovery with morphine being the most popular choice (n=25). Morphine equivalent doses were approximately 17.5mg (SD 10.60) for both hospitals without a pain service. Hospital one administered the lowest doses (13.5mg; SD 10.62) and hospital four the highest (19.5mg; SD 8.46). These differences between hospitals were not statistically significant (F=1.637; df = 3,101; p=0.19).

Differences in analgesic administration continued once patients returned to the ward and a patient with a high PCA use in hospital four may have contributed to the differences in morphine equivalent milligrams on the day of surgery. The mean for hospital one was 18.5mg (SD 14.64) and hospital four, 31.2mg (SD 16.91); a statistical difference confirmed by ANOVA and post hoc tests (F=2.93; df= 3; 102, p=0.03; Tukey HSD p=0.03). A summary of morphine equivalent doses (excluding epidural analgesia) throughout the research period is given in Table 6.3.14.

Table 6.3.14. Mean morphine equivalent milligrams received

Hospital	Time period			
	Theatres and recovery	Day of operation	Day 1	Total
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
1	13.5 (10.62)	18.5 (14.64)	10.1 (12.49)	28.9 (25.41)
2	17.5 (10.69)	21.5 (15.20)	7.9 (11.23)	30.2 (24.65)
3	17.6 (10.50)	24.9 (17.34)	14.2 (17.47)	38.2 (28.17)
4	19.5 (8.35)	31.2 (16.91)	16.9 (32.69)	48.3 (43.06)

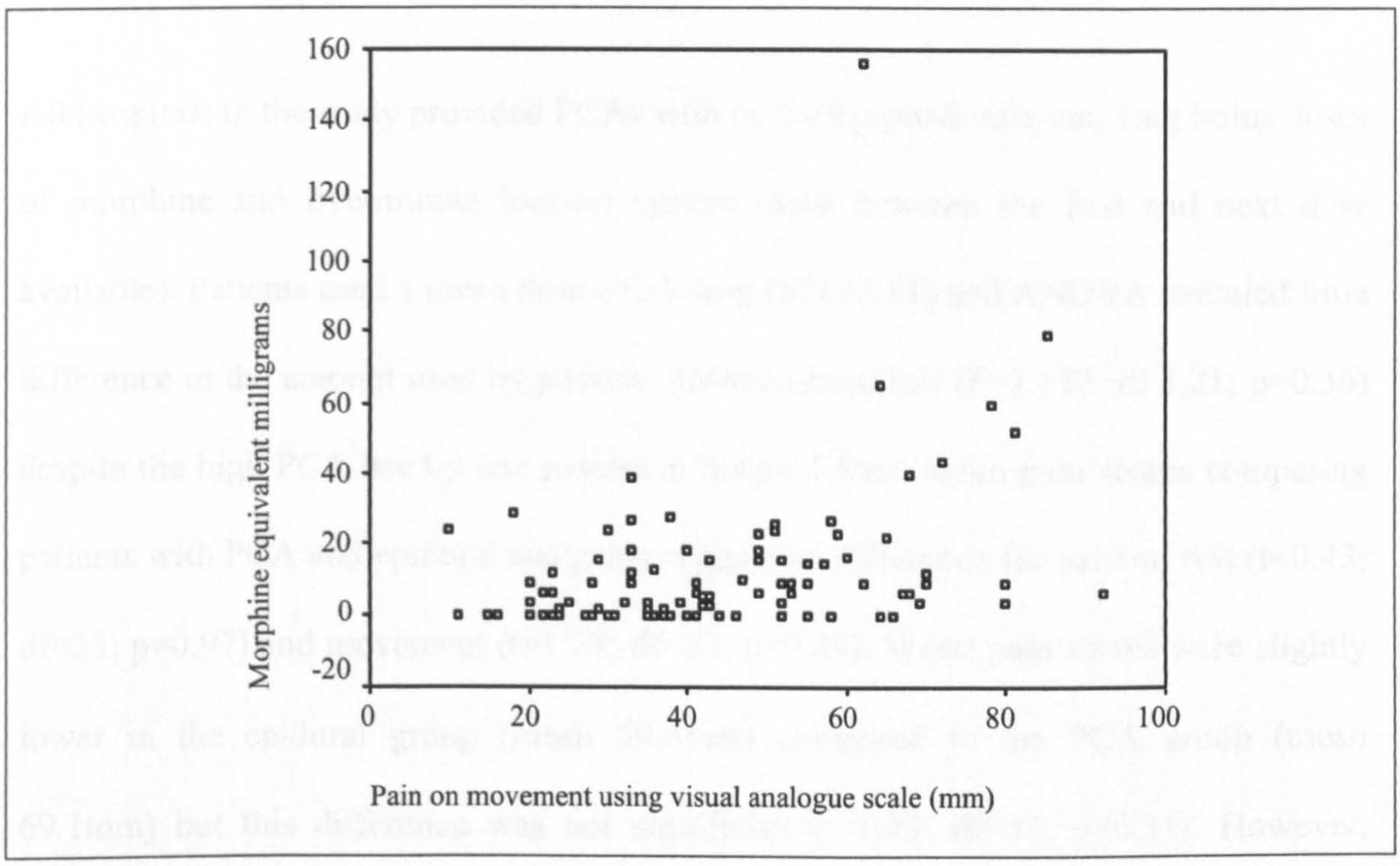
Morphine equivalent doses during theatre and recovery, day one after surgery and the total amount did not demonstrate a statistical difference between hospitals and Table 6.3.15 summarises the analysis of these results.

Table 6.3.15. Summary of ANOVA between subject results for morphine equivalent milligrams

Time period	Sum of squares	df	Mean square	F	p
Theatres and recovery	491.9	3	163.9	1.637	0.19 NS
Day of operation	2379.4	3	793.1	2.925	0.03 S
Day 1	1302.9	3	434.3	1.031	0.38 NS
Total to end of day 1	**6231.8**	**3**	**2077.3**	**2.094**	**0.10 NS**

For the whole sample, morphine equivalent doses showed a low but significant correlation with pain scores using the VAS at rest (ρ=0.404; $p<0.001$) and on movement (ρ=0.395; $p<0.001$) for day one. Both ratings showed a slight curvilinear relationship that is highlighted in Figure 6.3.3. The diagram also illustrates the number of patients receiving low doses of opioids even though some experienced high pain scores.

Figure 6.3.3 Relationship between VAS scores on movement and morphine equivalent milligrams



During the postoperative period, 119 patients had 282 prescriptions for analgesics (excluding low dose aspirin, PCA and epidural analgesia). A small number of prescriptions did not contain clear instructions or had details missing; five had not specified a dose, four did not describe the frequency or route of administration and the

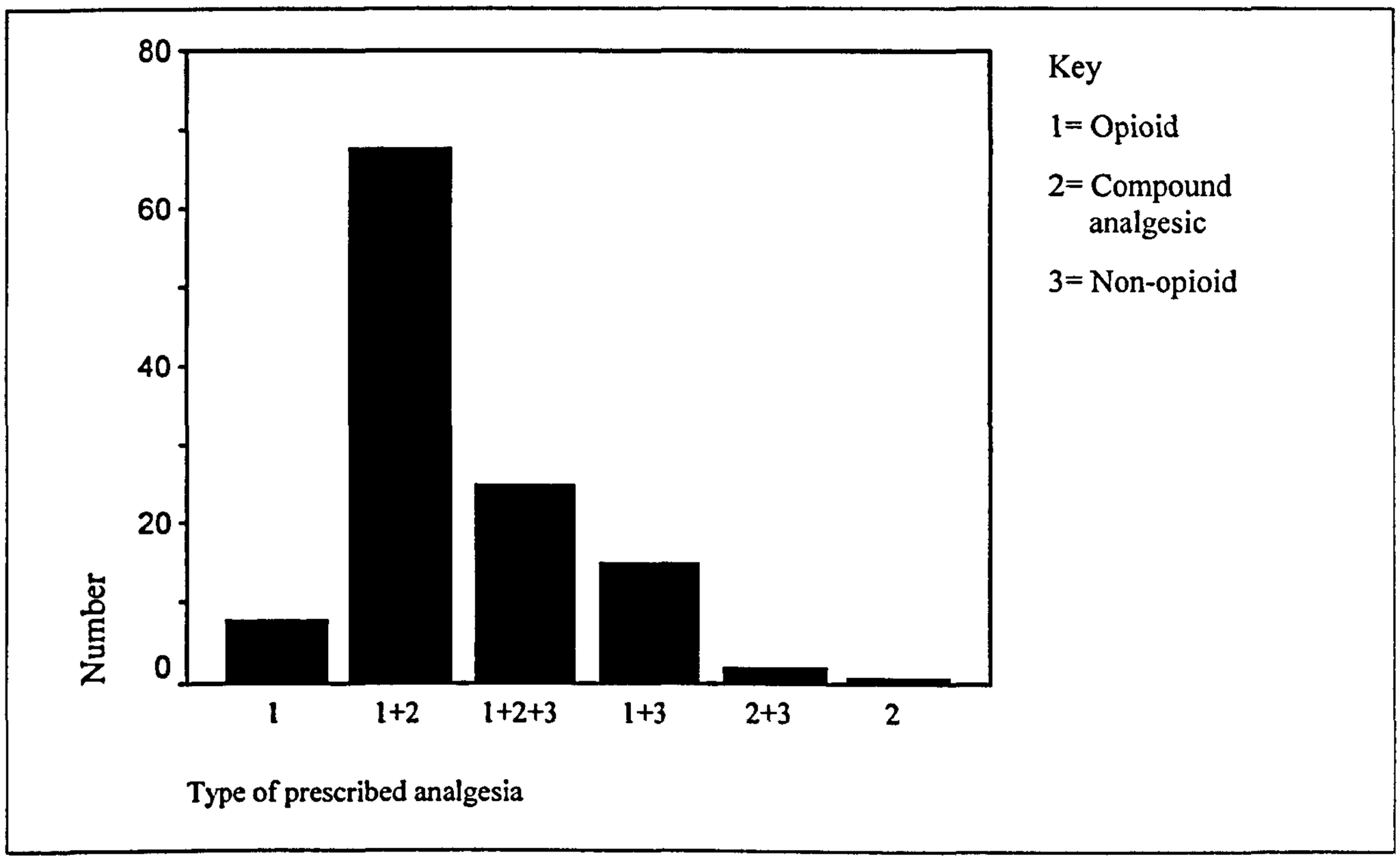
handwriting was illegible on one script. Nine prescriptions were above the recommended daily dose (based on British Medical Association and Royal Pharmaceutical Society of Great Britain, 2002).

There were 40 prescriptions for PCA (n=24) or epidural analgesia (n=16) for 37 patients. Three receiving major surgery were not prescribed these modalities and three patients did not receive adequate analgesia via an epidural and changed to PCA on the day of surgery. Diamorphine and fentanyl-based epidurals were used with different strengths of local anaesthetic (bupivicaine) and five patients (all in hospital one) had patient-controlled epidurals, which had a continuous infusion and allowed patients to administer a bolus dose. Comparisons between hospitals, amounts infused or pain scores were not explored because of the low numbers in the epidural group.

All hospitals in the study provided PCAs with no background infusion, 1mg bolus doses of morphine and five-minute lockout system (time between the first and next dose available). Patients used a mean dose of 53.4mg (SD 22.11) and ANOVA revealed little difference in the amount used by patients between hospitals ($F=1.152$; df 3,21; $p=0.36$) despite the high PCA use by one patient in hospital four. Mean pain scores comparing patients with PCA and epidural analgesia suggest no difference for pain on rest ($t=0.43$; $df=33$; $p=0.97$) and movement ($t=1.38$; $df=33$; $p=0.89$). Worst pain scores were slightly lower in the epidural group (mean 59.4mm) compared to the PCA group (mean 69.1mm) but this difference was not significant ($t=1.03$; $df=33$; $p=0.31$). However, these are tentative conclusions as numbers in each group may not be high enough to detect a statistical difference.

The remaining prescriptions were for opioids (n=94; 33.3%), compound analgesic preparations (n=96; 34.0%) and non-opioids (n=52, 18.4%). The majority of patients were prescribed two or more analgesics and Figure 6.3.4 illustrates that opioid and compound preparations were the most frequently prescribed combination.

Figure 6.3.4. Combination of prescribed analgesics



Only 13.8% (39) of prescriptions were ordered at pre-determined intervals providing "around the clock analgesia." Drugs were largely *pro re nata* (as required) and determined by the nurses caring for the patient but further guidance, such as "PRN four hourly," was given on 188 prescriptions. Oral and intramuscular analgesics were the most frequently prescribed routes (57.8% and 29.3% respectively) although a small number gave two or more possible routes to choose from (n=14; 5.8%). Ten prescriptions from hospital one allowed intravenous opioid administration on the ward.

Two hundred and eighty-two prescriptions led to 265 analgesic administrations between the time the patient returned from theatre to midnight on the first postoperative day. On the day of surgery, 23 opioids and 76 compound or non-opioid preparations were given

during a mean time period of nine hours and 24 minutes (SD two hours, 46 minutes). During the next 24 hours, a similar number of opioid administrations occurred (n=20) but compound/non-opioids almost doubled (n=147). Table 6.3.16 illustrates the number of analgesics given by ward staff according to type of medication in each individual hospital.

Table 6.3.16 Number of analgesic doses given in each hospital for both surgical days

Type of analgesic	Hospital				Total
	1	2	3	4	
Opioid	9	6	21	6	42
Compound preparation	26	27	47	42	142
Non-opioid	26	28	24	3	81
Total	**61**	**61**	**92**	**51**	**265**

Table 6.3.16 shows that hospital one and two administered a similar number of doses of each type of drug over the two days but the remaining hospitals show stark differences. Hospital three had the second highest pain scores yet gave the highest number of doses, nearly a third more than other hospitals, suggesting that there is not necessarily a direct relationship between types of analgesics and pain ratings. However, hospital four had the highest pain scores and the lowest number of administrations, particularly non-opioids. Only six opioid analgesics had been given but Table 6.3.14 had shown that this hospital had the highest morphine equivalent doses, a figure that may have arisen through the high consumption of morphine via PCA in hospital four. High PCA use by a small number of patients may have also contributed to the slight curvilinear correlation shown in Figure 6.3.3 and the relationship between analgesic consumption and pain ratings requires further investigation to arrive at clearer conclusions.

Table 6.3.17 further describes the relationship between prescribed and administered analgesics on day one for the whole sample.

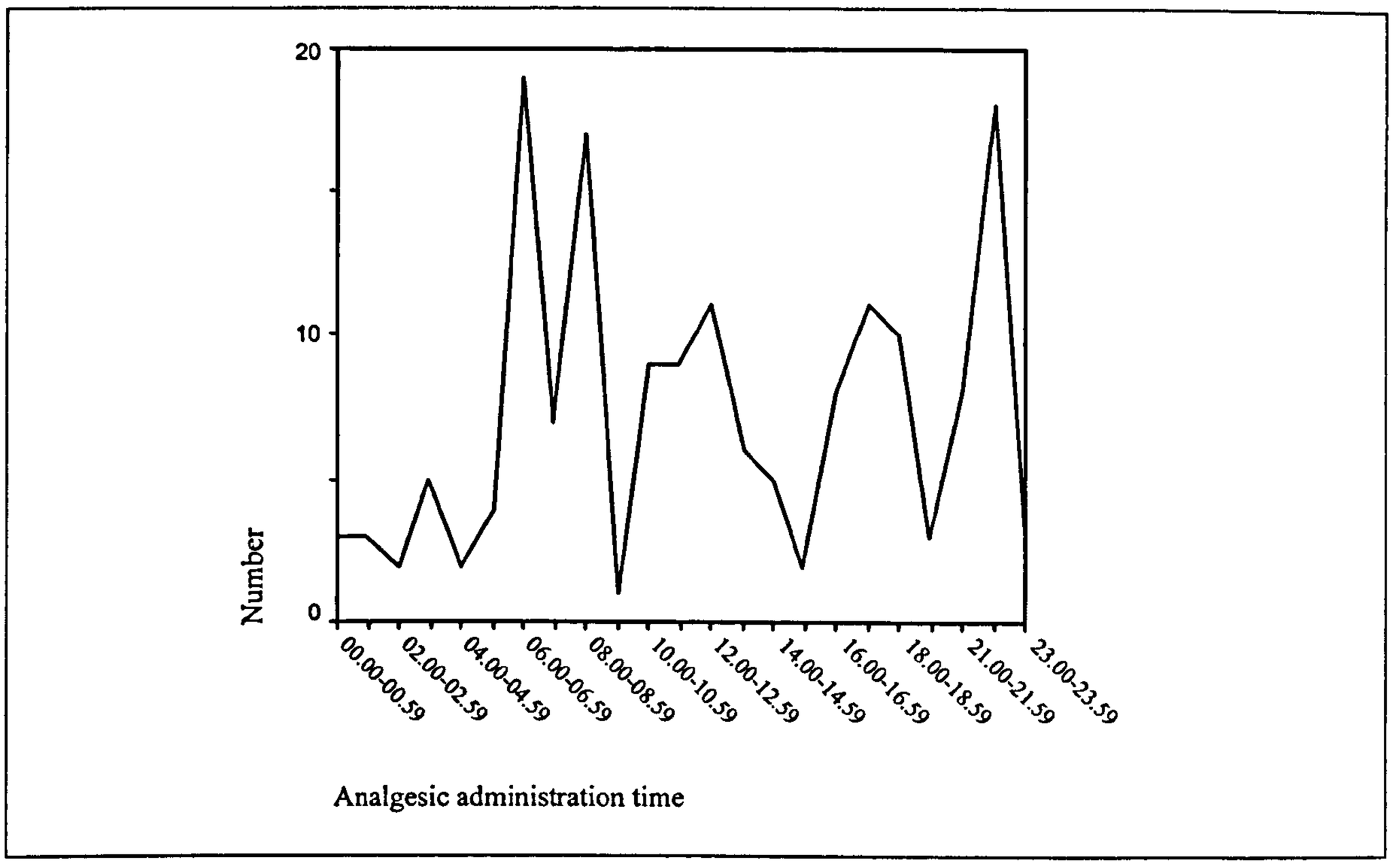
Table 6.3.17. Prescribed and administered analgesics on the first postoperative day (excluding PCA and epidural analgesia)

Analgesic prescribed	n.	Analgesic received n (%)	Mean daily dose in milligrams			Mean number of doses		
			Prescribed	Administered	% of prescription	Prescribed	Administered	% of prescription
Opioids								
Morphine	78	8 (10.3)	79.1	10.6	13.4	7.4	1.0	13.5
Tramadol	9	5 (55.5)	337.5	140.0	41.5	3.8	1.4	36.8
Pethidine	3	2 (66.7)	666.7	100.0	15.0	6.7	1.0	14.9
Codeine	2	0 (0)	75.0	0	0	2.5	0	0
Buprenorphine	1	0 (0)	0.6	0	0	3.0	0	0
Dihydrocodeine	1	0 (0)	180.0	0	0	3.0	0	0
Compounds and non-opioids								
Co-codamol 30/500	67	39 (58.2)	233.0/3924.2	60.8/2025.6	26.1	3.9	2.0	51.3
Paracetamol	24	9 (36.0)	3833.3	1777.8	46.4	3.8	1.8	47.4
Diclofenac	22	11 (50.0)	132.5	104.5	78.9	2.6	1.8	69.2
Co-codamol 8/500	21	4 (19.0)	65.5/4095.2	40.0/2500.0	61.1	4.1	2.5	61.0
Co-proxamol	5	5 (100)	425.0/2275.0	125.0/650.0	29.4	3.5	1.0	28.6
Co-drydramol	3	2 (66.7)	53.3/5333.3	20.0/2000.0	37.5	5.3	2.0	37.7
Ibuprofen	2	2 (100)	1000.0	800.0	80.0	2.5	2.0	80.0
Indomethacin	1	1 (100)	150.0	150.0	100.0	3.0	3.0	100.0
Meloxicam	1	1 (100)	7.5	7.5	100.0	1.0	1.0	100.0
Naproxen	2	0 (0)	256.0	0	0	2.0	0	0

The table generally illustrates the low numbers of patients receiving analgesics in comparison with the prescription although results vary according to the type of drug. Only 10.3% of patients received morphine yet 58.2% were given co-codamol 30/500. Considering the percentage of prescriptions administered, non-opioids have the highest administration rate but this accounts for a small number of patients; four of the five drugs were regular prescriptions for chronic pain conditions. The remaining non-opioid, diclofenac, did have the highest administration compared to prescribed daily doses. Interestingly, the two types of co-codamol preparations had different administration rates; tablets with lower concentrations of codeine were given more regularly. Overall, the mean doses were low compared to prescribed doses and highlight one off doses in many cases.

Analgesic administration was highest during traditional drug rounds suggesting that nurses were waiting to offer medications or patients were waiting to ask at these points. Figure 6.3.5 highlights three main peaks of activity; 06.00, 08.00 and 22.00 with additional peaks at 10.00, 12.00 and 17.00hrs.

Figure 6.3.5. Analgesic administration times on first day after surgery



Summary

Only ten patients (mainly in hospital two) were given pre-emptive analgesia administered preoperatively. Morphine and fentanyl were administered routinely throughout surgery and no difference was found between hospitals and the morphine equivalent milligrams given during theatres and recovery, day one after surgery or the total amount given. On the day of surgery a difference did emerge ($p=0.03$) between hospital one and four, where patients received the lowest and the highest doses respectively. VAS pain scores at rest and on movement showed a slight curvilinear relationship with morphine equivalent milligrams and a low but significant correlation.

Patients had a total of 282 prescriptions for analgesics and were usually written up for an opioid and compound analgesic combination. Only 13.8% of prescriptions were for "around the clock" analgesia despite pain being a predictable consequence of surgery. Nurses administered a similar number of opioids on the day of surgery as the first postoperative day. However, the former were given in a much shorter time period (mean

nine hours, 24 minutes) and the latter over 24 hours. Analgesics were predominantly administered during traditional drug rounds and overall a low amount of medication was given in relation to the prescription. Only 10.3% of patients prescribed morphine received it, 58.2% co-codamol 30/500 and 78.9% were given the diclofenac ordered. These figures strongly suggest that nurses are more likely to administer a non-opioid and compound preparation than an opioid analgesic.

6.3.5 Patient satisfaction and comments during patient interviews

6.3.5.1 Patient satisfaction

As part of the patient interview, participants were asked to rate their satisfaction with pain management since surgery on a Likert type scale (ranging from very dissatisfied to very satisfied). Two patients could not be interviewed and one interview was interrupted before the patient could answer the satisfaction question. Table 6.3.18 displays the ratings for the sample illustrating high levels of satisfaction; 98.3% (n=115) were satisfied or very satisfied with pain management and none of the patients felt very dissatisfied with their care.

Table 6.3.18. Patient satisfaction with pain management

Rating	n	%
Very satisfied	72	61.5
Satisfied	43	36.8
Don't know	--	--
Dissatisfied	2	1.7
Very dissatisfied	--	--
Total	**117**	**100.0**

Differences in patient satisfaction according to gender, type of surgery, hospital and presence of a service were explored and results presented in Table 6.3.19.

Table 6.3.19. Satisfaction with pain management according to various groups

Variable	Satisfaction rating			Analysis	
	Dissatisfied	Satisfied	Very satisfied	Statistic	p
Age (mean)	72.0yrs	55.8yrs	61.1yrs	F=2.579	0.08 NS
Gender					
Male	1	18	42	U=1450.5	0.097
Female	1	25	30		NS
Surgery					
Minor	--	13	26	χ^2=6.71	0.17
Intermediate	--	13	27		NS
Major	2	17	19		
Hospital					
1	1	6	22	χ^2=10.56	0.09
2	1	15	13		NS
3	--	13	16		
4	--	9	21		
Service					
Yes	1	15	43	U=1326.0	0.013
No	1	28	29		S

Men gave more "very satisfied" ratings but this difference between the two sexes was not significant (p=0.10) and similarly, the two "dissatisfied" patients received major surgery but the surgical groups did not show significant variations (p=0.17). Hospitals one and four cared for a greater number of patients who were very satisfied with their pain management but the results were not significant between the groups. However, when the results from hospitals with and without pain services are combined these data suggests that patients were more satisfied if they were cared for in a hospital with an APS.

The relationship between patient satisfaction and pain scores using the visual analogue scale was investigated using Spearman's rank correlation and Table 6.3.20 displays the results.

Table 6.3.20. Relationship between VAS pain scores and satisfaction with pain management

Pain rating Satisfaction score	**n**	**Mean VAS mm**	**Spearman's rho**	**p**
Acceptable pain level				
Dissatisfied	2	18.0	0.31	0.76
Satisfied	40	29.5		NS
Very satisfied	61	29.8		
Pain at rest				
Dissatisfied	2	53.0	-0.22	0.02
Satisfied	43	39.8		S
Very satisfied	69	30.4		
Pain on movement				
Dissatisfied	2	67.0	-0.24	0.01
Satisfied	43	48.9		S
Very satisfied	70	39.9		
Worst pain in last 24hrs				
Dissatisfied	2	92.5	-0.15	0.11
Satisfied	43	60.2		NS
Very satisfied	70	54.7		

Patient satisfaction was not related to acceptable or worst pain scores although pain now at rest and on movement appears to show a low, negative and significant correlation. Mean scores demonstrate that those who gave a "very satisfied" rating had slightly lower pain scores than those who were "satisfied" or "dissatisfied".

The relationship between morphine equivalent milligrams and patient satisfaction was explored and Table 6.3.21 summaries the mean doses according to satisfaction rating.

Table 6.3.21. Relationship between morphine equivalent doses and satisfaction with pain management

Time period	**Satisfaction rating**			**Statistics**	
	Dissatisfied mean (mg)	**Satisfied** mean (mg)	**Very satisfied** mean (mg)	**ρ**	**p**
Theatres and recovery	10.2	19.2	16.3	-0.09	0.37 NS
Day of operation	4.3	24.1	24.5	0.02	0.81 NS
Day one	18.6	16.9	9.9	-0.13	0.18 NS
Total since surgery	**22.7**	**41.0**	**34.6**	**-0.43**	**0.67 NS**

Table 6.3.21 shows that those patients who reported being "very satisfied" with their pain management had a lower mean morphine equivalent dose in theatres and recovery, day one after surgery and the overall amount (although satisfaction and doses did not statistically show a relationship). Table 6.3.20 has already shown that this group also had lower pain scores than the "satisfied" or "dissatisfied" groups suggesting a connection between these factors.

These results investigating patient satisfaction and its relationship with other factors should be interpreted with caution due to the low numbers of patients in some categories and all analgesic types administered were not included because of the lack of evidence for non-opioids and their analgesic equivalency.

6.3.5.2 Additional comments from patient interviews

At the end of the patient interview, participants were asked if they wanted to make any further comments in relation to their pain or pain management. The results offer a deeper insight into some of their experiences in hospital. Seventy-eight participants gave feedback and 22 were general comments about the high quality of care or how helpful nursing staff had been. A few patients had explained that they had not had much pain since surgery yet their current pain scores at rest were 53mm, 67mm, and 69mm respectively, highlighting the potential differences in pain perception.

Many patients (n=15) reported that their pain had been managed well and that nurses had offered painkillers regularly since they came back from theatre (n=6). Reluctance to seek pain relief was frequently expressed and avoiding medication the common explanation.

Patient 32

> My pain has not been as bad as I expected but you do have to expect a bit of pain. One of my friends who had the op last year had a really bad time. It's been a bit tender, well you saw me when I went to the loo earlier. I'm not one for taking tablets though, not if I can help it.

Another patient had a strong opinion on taking tablets and nursing activities.

Patient 20

> I've 'ad a bit of pain this morning and I know they gave me those painkillers but nurses deal out tablets too regularly. Luckily I have quite a high pain threshold cos I don't like 'aving to take tablets.

Stoic behaviour was quite common and patients reported not wanting to bother the nurses (n=17), waiting for them to next come round for the trolley (n=12) or waiting to be asked about pain relief (n=6).

Four patients had been particularly pleased with their PCA or epidural analgesia discussing how effective it had been in controlling their pain. Reluctance to use the PCA was sometimes reported for fear of "over doing it" and one individual was unsure how much relief he was supposed to be getting from the device.

Summary

Nearly all patients were "satisfied" or "very satisfied" with their pain management after surgery and ratings did not differ statistically according to age, gender, type of surgery or hospital. When the individual data from hospitals are combined, results suggest that patients were more highly satisfied in hospitals with acute pain services. Current pain experiences appear to show a low negative correlation with patient satisfaction but no

relationship with morphine equivalent doses although these areas require further investigation. Overall, patients made positive comments about their pain relief and experiences in hospital but there was also a general reluctance to report pain, request or take analgesics.

6.4 Chapter summary

Organisational commitment to improving pain management was explored using the Postoperative Pain Management Questionnaire to examine the implementation of major recommendations from national reports (RCS and CA, 1990; Audit Commission, 1997). The results showed that in one NHS region only eight hospitals had implemented all of the recommendations and there were wide variations in funding sources, staff education and audit practices. A key recommendation was the formation of an acute pain service and the number of teams had significantly increased since Audit Commission (1997,1998b) publications. Many hospitals without services had shown a degree of organisational commitment by forming an informal network of professionals and implementing much of the national guidance.

In the second phase of this research, four hospitals that had completed the PPMQ participated in an observational study following 30 patients on their first postoperative day. All patients had experienced some pain and for 23.2% this was moderate-severe at rest, 38.3% on movement and 61.2% during worst pain scores. Differences between hospitals did emerge in terms of pain scores (hospital two had the lowest, hospital four the highest), morphine equivalent doses (hospital one the lowest and hospital four the highest) and the number of analgesic doses (hospital four the lowest and hospital three the highest). Overall, results suggested that analgesics are predominantly administered

during traditional drug rounds and nurses were more likely to give a non-opioid or compound preparations than opioid analgesics.

Patients generally gave positive feedback about their care in hospital and the majority were "satisfied" or "very satisfied" with their pain management. Satisfaction was statistically unrelated to age, gender, type of surgery and individual hospitals but combined results implied that patients rated their satisfaction more highly if cared for in a hospital with a pain service. A significant element of this second research study was to examine this nursing care provided to patients in each of the hospitals.

CHAPTER 7

RESULTS

OBSERVED AND DOCUMENTED NURSING CARE

Section 7.1 Introduction

This chapter continues to address the aims of the study by presenting qualitative and quantitative results from the observational research. These two types of data are integrated to examine pain-related interactions, nursing records and congruence between observed and documented care. Data were gathered using the observation schedule and field notes and analysed using quantitative methods and content analysis (Appendix 8 contains a list of themes and categories that emerged from data analysis). Finally, the chapter provides a summary of the differences between hospitals participating in the research. Patient names were not recorded during data collection and those presented here are fictitious to protect the anonymity of participants.

Section 7.2 Pain-related interactions

Pain-related interactions were documented verbatim along with observations in field notes such as loudness, location of interaction, participants involved, behaviours, timing and sequence. On five occasions, one aspect of the conversation could not be recorded and one complete interaction relating to discharge was missed, both due to background noise. The remaining conversations are described here exploring the number and nature of interactions, responses to pain expression and patient discharge.

7.2.1 Number of interactions

During 778 hours of observation, 276 pain-related interactions occurred between patients and ward staff and Table 7.2.1 illustrates this information according to staff members and hospital.

Table 7.2.1. Number of pain-related interactions according to staff members

Staff	Hospital									
	1 (n=26)		2 (n=29)		3 (n=24)		4 (n=28)		Total (n=107)	
	No.	%	No.	%	No.	%	No.	%	No.	%
Registered nurses	52	80.0	74	70.5	41	87.2	39	66.1	196	73.7
Health care assistants	3	4.6	7	6.7	1	2.1	10	16.9	21	7.9
Student nurses	5	7.7	9	8.6	1	2.1	--		15	5.6
Other staff	5	7.7	15	14.3	4	8.5	10	16.9	34	12.8
Total[1]	**65**	**100**	**105**	**100**	**47**	**100**	**59**	**100**	**276**	**100**

[1]Percentages between 99.9-100.1 due to rounding up or down to one decimal point

On average, pain was discussed 2.4 (SD 1.70) times per patient in a maximum seven-hour period; most commonly one or two interactions occurred per shift (descriptive data showed multiple modes). Thirteen patients did not discuss their pain with ward staff during the observation shifts and six of these were from hospital three. Overall, the communication varied between organisations; hospital two had over 100 interactions, nearly double the number of other hospitals and with 47 interactions during 267.5 hours of observation, hospital three had the lowest number. Inferential statistics confirmed the statistical difference between the number of interactions in each hospital for all health care professionals ($H=15.557$; $df=3$; $p=0.001$) and nursing staff ($H=13.231$; $df=3$; $p=0.004$).

Most exchanges were with registered nurses although percentages varied slightly between hospitals. Health care assistants and student nurses had relatively few conversations about pain but those recorded are discussed in detail later. The "other staff" category included interactions with doctors on ward rounds (n=15), members of the acute pain service (n=13), physiotherapists (n=4), a social worker and a dietician. These professionals were aware of the research project and happy with the presence of an observer but their contributions are not reported, as consent was not requested. On the whole, patients generally gave similar responses to pain questions asked by different professionals but one patient changed his description of pain in a short period of time.

Field notes, patient 36

> After starting the shift this morning, I enquired how Mr. F was, "sore" he replied and I encouraged him to mention this to ward staff. At 07.45 a staff nurse asked if he had any pain and he said "no not really." When a doctor asked him at 08.12 he said, "no, none at all."

Whether the nature of this gentleman's pain had changed during this time or he was reluctant to express his discomfort to different members of staff is unclear.

The number of pain-related interactions also differed according to the severity of operation. Table 7.2.2 illustrates that professionals had a greater number of exchanges with patients who had received intermediate and major surgery (H=8.753; df=2; p=0.008), perhaps showing an awareness of potentially greater pain intensities. This difference was also evident for interactions with just nursing staff (H=6.930; df=2; p=0.031).

Table 7.2.2. Number of pain-related interactions according to type of surgery

Type of surgery	Hospital									
	1		2		3		4		Total	
	n	%	n	%	n	%	n	%	n	%
Minor (n=34)	14	21.5	28	26.7	17	36.2	11	18.6	72	26.1
Intermediate (n=38)	19	29.2	30	28.6	18	38.3	16	27.1	81	29.3
Major (n=35)	32	49.2	47	44.8	12	25.5	32	54.2	123	44.6
Total[1] (n=107)	**65**	**100**	**105**	**100**	**47**	**100**	**59**	**100**	**276**	**100**

[1]Percentages between 99.9-100.1 due to rounding up to one decimal point

In each hospital, interactions did not occur with one or two minor surgical patients. Five major surgical patients from hospital three did not have their pain discussed during the observation period and this was the only hospital to have a lower number of interactions in the major surgical group compared to other groups.

Interestingly, more pain-related exchanges occurred with male patients when all staff interactions were considered (U=1256.0; p=0.004) and conversations with nurses

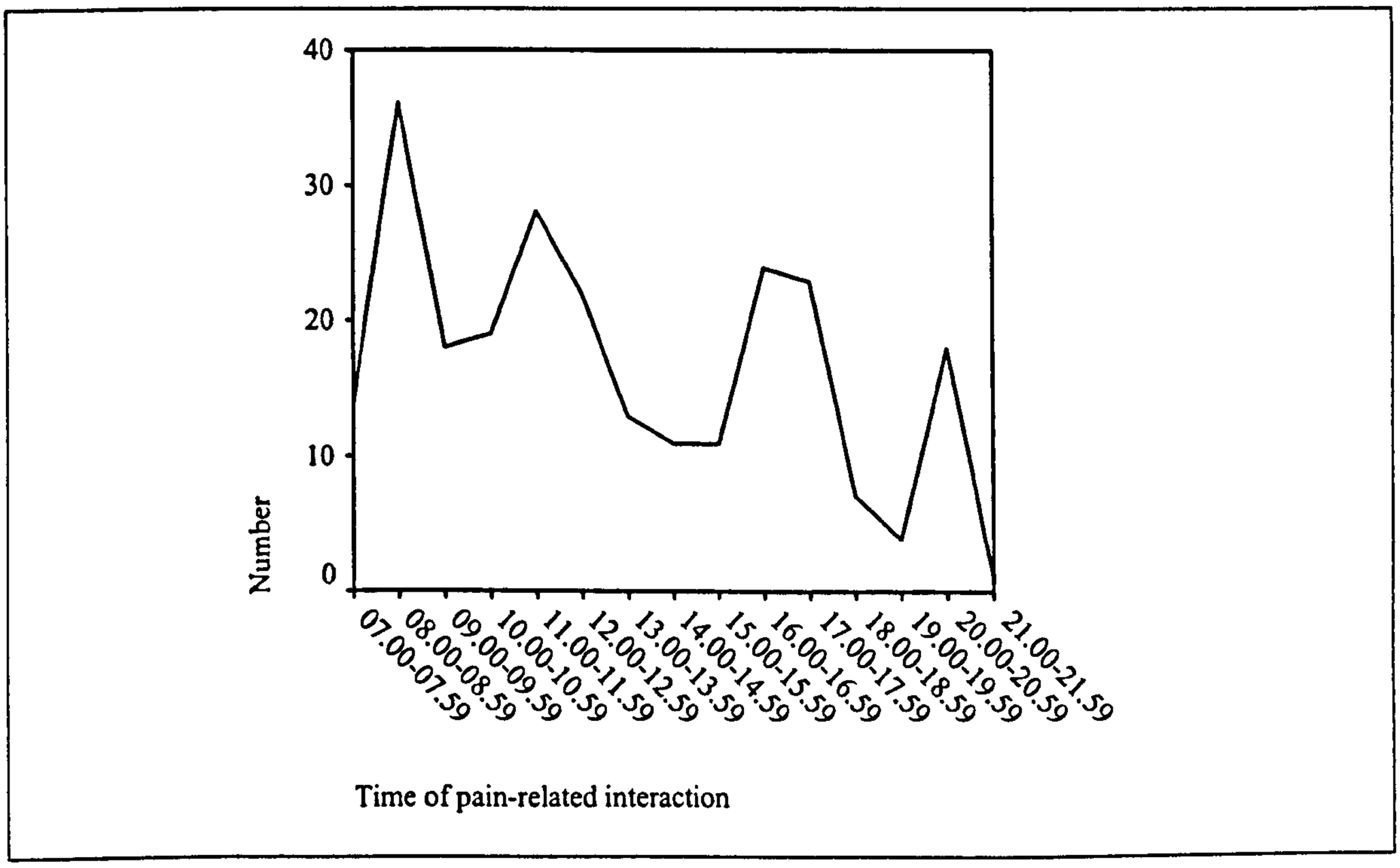
(U=1391.0; p=0.028). Patients aged 60-88 years (n=53) were involved in more interactions than 18-59 year olds (n=67; mean 2.7 Vs 2.0; U=1280.5; p=0.08) but this older age group contained a greater proportion of major surgical patients who generally had a higher number of interactions.

The nature of the 232 pain-related exchanges that occurred between nursing staff and patients is explored in the following sections.

7.2.2 Nature and timing of interactions

Interactions predominantly occurred on traditional drug rounds (n=137; 59.1%) and Figure 7.2.1 illustrates these peak times of 08.00, 11-12.00, 16-17.00 and 20.00 hours.

Figure 7.2.1. Timing of pain-related interactions with nursing staff



This graph shows a decrease in exchanges during the afternoon but this may be partly due to fewer late shifts undertaken. However, the mean number of interactions for the early shift was 3.0 (SD 1.63) and 2.2 (SD 1.32) between 14.30-21.30 hours, a small but statistically significant difference (U=909.5; p=0.014). This result may have arisen

because a greater number of drug rounds occurred in the morning (around 08.00 and 12-13.00 hours) compared to the afternoon and evening (16.00-18.00). The peak activity at 20.00 hours was largely associated with nurses completing care plans.

All the wards involved in the study undertook drug rounds to dispense medication at intervals throughout the day. Exchanges were usually completed whilst the patient was in bed or sat in a bedside chair. Nurses predominantly stood behind the drugs trolley, creating a physical barrier between them and the patient, which also meant that they stood some distance away. They then usually enquired about pain levels or the need for analgesics in a raised voice in order to be heard and patients equally had to respond in a tone louder than usual. For patients, this public description of a personal experience may have inhibited their expression. Also, patients were often asked to describe their pain soon after a neighbouring patient had responded to the same question, which also may have influenced expression. This illustrated by the following.

Patient 17

> *Patient in the next bed was asked if he was comfortable, he indicated that he wasn't experiencing pain before the nurse moved on with the drugs trolley.*
>
> Nurse: ...and what about you George? No pain?
>
> Patient: No...er...no thank you.

However, not all patients in the room were asked about their pain during a drug round and in one case (patient 88) the participant was the only one in the room who was not asked. It is unclear whether nurses were making judgements about who was most likely to be in pain, who looked like they were experiencing pain or whether they were not prompted to ask the patient if analgesics were not prescribed.

Other pain-related interactions occurred whilst providing patient care such as washing and dressing (n=30; 12.9%), after analgesic administration (n=6; 2.6%) or a patient had reported pain (n=5; 2.2%). Thirty-five (15.1%) appeared spontaneous and unconnected to previous activities or conversations and 19 (8.2%) took place while nurses were writing in care plans. Nurses used a number of initial questions to enquiry about patients' pain and these are outlined in Table 7.2.3.

Table 7.2.3. First pain-related question during interactions

Question	n
Have you got any pain?	42
Do you want any painkillers?	34
How is your pain?	15
Is it sore/painful? Does it hurt?	12
Have you had any painkillers? / Did your painkillers work?	9
How are we doing for pain?	7
Are you comfortable?	5
Have you got much pain?	5
Are you in pain?	4
Any pain at all?	4
Pain? / No pain?	4
You've hardly/haven't had any pain have you?	3
Are you happy with paracetamol or would you like an injection?	1
Have you got pain across your abdomen?	1
Pain control alright?	1
Not in pain then?	1
On a scale 0-3, how would you rate your pain?	1
What sort of pain is it?	1
What would you describe your pain as now?	1
Total	**151**

One hundred patients were asked 151 initial questions about their pain during the observation period and 15 were asked two or three questions at once, particular when nurses appeared anxious about verbal or behavioural expressions and symptoms. The table above shows that "Have you got any pain?" was the most common enquiry (27.8%). Although the word "any" was not emphasised, the question suggests that nurses were asking patients to report all severities of pain. Five asked whether patients had "much pain" but the meaning of term was not clarified during the conversation. One

nurse asked whether an individual's pain had "not been too excruciating?" The use of these latter phrases implies an acceptance that people will have a degree of pain after surgery. Also, using these terms instead of consistently measuring pain using an assessment scale, has potential for misunderstanding between nurse and patient and their individual perceptions of "much" or "excruciating pain."

Thirty-four (22.5%) opening questions focused on whether patients wanted analgesics rather than on whether they were experiencing pain. The small number of nurses that asked whether patients were feeling comfortable always quickly asked a second question about pain or the need for pain relief. Nine nurses asked patients leading questions such as "you haven't got any pain, no?" perhaps encouraging people to deny the existence of pain. Seven nurses strangely asked, "How are we doing for pain?" This is a phrase that is commonly used to see if a person has sufficient provision (e.g. food or drink) and four patients responded in this context by saying, "no thank you" as if more pain were being offered.

If the two most frequently asked questions are taken into consideration, some differences are illustrated between the hospitals, shown in Table 7.2.4.

Table 7.2.4. Opening questions according to hospital

Question	Hospital							
	1		2		3		4	
	n	%	n	%	n	%	n	%
Have you got any pain?	6	15.3	20	39.2	8	26.7	8	25.8
Do you want any painkillers?	9	23.1	8	15.7	6	20.0	11	35.5
Other question	24	61.5	23	45.1	16	53.3	12	38.7
Total	**39**	**100.0**	**51**	**100.0**	**30**	**100.0**	**31**	**100.0**

These two enquiries formed 38.5-61.3% of questions initially asked by nurses in these hospitals and the table shows that patients in hospital two were more frequently asked about pain generally, but they were also more likely to enquire about the presence of

pain rather than offer analgesics. Other results are mixed but hospitals one and four had a slightly higher number of interactions that simply offered analgesics to patients.

Only five patients reported pain to nurses without being prompted and on four occasions patients' behaviour clearly indicated that they were in pain, prompting staff to comment. Two nurses reacted anxiously, asking several questions in succession including offering analgesics.

Patient 12

Patient walking around the room.

Patient: Oh boy that hurts *(clutching site of surgical incision).*

Nurse: Where? Do you want any painkillers? Have you had some this morning? Let me have a look at it *(speaking quickly and anxious).*

Patient returns to her bed and staff nurse draws the curtain

Nurse: I think these bandages are on a bit tight. I've loosened them a bit. Have a rest and let me know if you need any painkillers.

Intensity of pain was very rarely measured using a formal assessment scale. On five occasions (2.2% of nurse interactions) patients were asked to describe pain using a 0-3, 0-10 or 1-10 scale and one verbal rating scale was used (mild, moderate or severe). In the absence of any scale, many patients used their own words to describe intensity including "a little," "some," "mild," "a bit," "quite a bit," "uncomfortable," "much" and "very." During one interaction further questioning included an assessment tool but nurses were largely using the adjectives used by the patient to inform decisions about analgesics. This demonstrates a lack of consistency in measuring postoperative pain and as previously highlighted, a potential for misinterpretation between two people and their respective definitions of "a bit" or "some" pain.

Pain was predominantly discussed whilst the patient was at rest and only six nurses made references to pain on movement. One asked an open question ("What about when you move?"), four asked patients whether it was only there when they moved and one finished a patient's sentence by saying "yes I know, it's only there when you move" (Patient 80). Eight patients did describe their pain when they moved, coughed or hiccupped without being prompted. The statistical difference between pain at rest and on movement ($t=-9.17$; $df=112$; $p<0.001$), outlined in Chapter 6 illustrates the importance of assessing pain on both these occasions but only 5.6% (n=14) of interactions related to pain on movement.

Some patients consistently used words other than pain to describe their experience such as "discomfort," "tenderness" or "soreness." These individuals often differentiated this feeling from their perception of pain. The following are examples of this:

Patient 5

Nurse: Have you got any pain?

Patient: Not pain as such. It's just discomfort really and pressure across here *(holding abdomen)*.

Field notes: Patient 53

Patient initially felt unable to use the VAS scale today because he thought a discomfort scale would be more appropriate. If such a scale existed he said he would have a very high rating but after explaining his reasoning further and without further prompting, he used the VAS and rated his experience at 23mm.

This patient's comment perhaps illustrates the need to explore the relationship between discomfort and pain and the point at which discomfort becomes pain. Section 6.3.3 (Table 6.3.11) has already shown that patients rated their experience on a VAS at rest between 0-43mm and on movement between 10-35mm, yet both these ratings were

described as "no pain" on a verbal rating scale. Perception of discomfort and pain at rest and on movement needs further investigation.

During discussions with patients, the location of pain was generally assumed to be the surgical incision. Nurses enquired where the pain was on four occasions but patients volunteered this information during 17 interactions. This is an important aspect of pain assessment illustrated by the results of the patient interview where participants identified 39 sites of pain unconnected to the surgical incision. Only 8.3% (n=21) of exchanges between nurses and patients mentioned the location of an individual's pain.

Three patients were asked to describe the quality or type of pain they felt but this was usually because they indicated that they were experiencing high levels of pain. The scenario below was also the only situation where the history of pain was briefly explored.

Patient 4. 20.45 hours

Nurse: What's the matter? Have you got pain?

Patient: Yes.

Nurse: Press your button. Have you been using your pain button?

Patient: Yes.

Nurse: Not for a while though *(looking at the PCA).* Is it a shooting pain?

Patient: No, it's gone off now.

Approximately 30 seconds later

Nurse: Is it back?

Patient: *Nods*

Nurse: Where is it? Is it a spasmy type of pain?

Patient: *Points to his abdomen.* Yes.

Nurse: Sounds like wind. Keep pressing your button when you need it. Did you have this pain this morning?

Patient: No.

Nurse: So this is new?

Patient: Yes.

Nurse: I think I'll let the night staff know and get the doctors to have a look at you. Don't be afraid to use the button to get some morphine, you can't overdose, it has a safety mechanism.

Independently eight patients volunteered information about quality of pain during their descriptions to nurses describing it as "sharp," "dull," "tight," "aching," or "pulling." A total of 11 interactions (4.4%) included a reference to the type of pain patient's were experiencing.

Around a third of the time (n=48, 31.8%) patients gave one-word or very limited responses to nurses' questions about pain such as "yes" (n=22), "no" (n=8), "none" (n=5) or "no, not really" (n=17). Most nurses followed this up with a further question, offered analgesics, gave advice about PCA use or repeated the patients response to check their understanding (e.g. "none?"). Two continued to question the patient with a pain scale, two simply documented the response and six took no action.

Patients often gave vague descriptions of their experience or were slightly hesitant when answering questions about pain, illustrated by the following example.

Patient 76

Nurse: Is it a bit sore?

Patient: No…well...no

Nurse: Ok then, are you feeling sick?

Patient: No, not at all.

The two questions provoked different responses and the patient may have been reluctant to describe his pain but he was very clear that he was not feeling nauseous. These subtle

differences were not picked up and similarly patient responses such as "not really" were rarely followed up by further questioning or use of a pain scale.

7.2.3 Responses to the verbal and behavioural expressions of pain

In response to patients' expression of pain, nursing staff administered analgesics, gave advice to the patient or provided a limited verbal response and no action was taken. Each of these areas is explored in detail.

Fifty analgesic administrations occurred during the observation period for 46 patients and Table 7.2.5 shows the type of pain relief witnessed according to hospital. Results in Chapter 6 illustrated that hospital three had a higher administration rate and this is reflected in the number observed.

Table 7.2.5. Interactions that led to analgesic administrations

Type of analgesic	**Hospital**				**Total**
	1	**2**	**3**	**4**	
Opioid	2	2	1	1	6
Compound preparation	5	3	16	9	33
Non-opioid	3	3	3	2	11
Total	**10**	**8**	**20**	**12**	**50**
Percentage of interactions that led to administration	**19.2**	**10.8**	**48.8**	**30.8**	**25.5**

Nearly a third (29.9%) of administrations for the first postoperative day occurred during the observation period and the proportion of interactions that led to patients receiving analgesics varied between hospitals. Hospital three had the lowest number of exchanges between patients and RNs yet nearly half resulted in patients receiving analgesics. Data in Table 7.2.4 suggested that nurses in this hospital offered an analgesic or asked about pain on a similar number of occasions. Hospital two had the highest number of interactions but the lowest administration rate at 10.8%. Table 7.2.4 showed that nurses

in this hospital enquired about pain more frequently than offering analgesics, perhaps explaining difference between the two hospitals.

Analgesics prescribed at regular intervals (n=8) were administered to patients without enquiring about their pain levels and similarly some offered painkillers (n=9) were given them without further question. Predominantly (n=20) patients reported pain after initial questioning and analgesics were dispensed without assessing intensity of pain further. Nurses appeared to be choosing analgesics based on the very limited verbal information given by the patient and perhaps using other cues such as behaviour. Only one registered nurse used an assessment scale during administration.

Patient 82

Nurse: How are you this morning?

Patient: Fine thank you, ready to go home.

Nurse: Have you got any pain this morning?

Patient: It's alright thank you.

Nurse: Even when you move?

Patient: Aye, it's not bad.

Nurse: Could you show me on this scale here. Is it mild, moderate, severe or very severe? *(pointing to bed side locker which had a VRS on the side)*

Patient: It's mild really.

Nurse: Even when you move about?

Patient: Yes, I think so.

Nurse: So, would you like some painkillers?

Patient: Ok then.

Nurse: *After looking in drug trolley.* I'll have to come back to you.

There were several unique issues relating to this interaction. The nurse walked away from the drug trolley to speak to the patient while he was stood up and assessed pain using a scale at rest and on movement. Despite a low level of pain reported by the

patient she continued and offered analgesics, which the patient accepted. However, even this nurse did not consistently assess pain in every patient; on that particular day, longer term patients who had been in hospital for one to two weeks appeared not have a pain assessment during the drug round.

On just three occasions nurses dispensing medications enquired about the effectiveness of previous doses before deciding on the analgesic to administer. Most patients left decisions in the hands of nursing staff but a small number (n=3) wanted to know which drugs they were allowed or suggested a particular medication. Only five patients were given a choice of drug or route of administration but often the patient did not make the final decision.

Patient 38

Nurse: Do you want any painkillers?

Patient: Yes please.

Nurse: Paracetamol? Would you like something stronger? Co-codamol?

Patient: Those ones I had this morning and last night were good.

Nurse: Co-codamol or you could have some voltarol.

Patient: Er…

Nurse: *Looking at the drug card*. We'll let you have some co-codamol.

Patient 72, *Drug round*

Nurse: Have you had any pain George?

Patient: Well, yes I'm pretty uncomfortable actually.

Nurse: Do you want anything for it?

Patient: Yes, can I have some paracetamol?

Nurse: *Looking at drug chart*. You're not written up for any. You can have co-drydramol or morphine.

Patient: Erm

Nurse: I don't want to give you morphine. Try co-drydramol, if it doesn't work I'll give you something else.

Patient nods

The timing of pain relief was important for a small number of patients and nurses but only four nurses suggested painkillers before patients moved out of bed or had a drain removed. In the late afternoon, five patients asked to "save their painkillers" until bedtime to help them sleep and several nurses gave this advice when patients were deciding whether they needed analgesics.

Patient 100

Nurse: How has it all been feeling *(pointing to her own abdomen)*?

Patient: Oh, a bit tender.

Nurse: Have you had any painkillers?

Patient: Yes at 12 o'clock.

Nurse: What I recommend is, have some at tea time and then that allows you to have some before bedtime.

Patient: Ok, I'll do that.

Patients were generally reluctant to take medications and this was evident from patient interviews and communicated to staff on occasions. The following excerpt illustrates this and one of three incidents where nurses strongly encouraged an individual to have pain relief despite their initial reluctance.

Patient 98, 07.40 hours

Nurse: ...and how are we doing for pain this morning?

Patient: It's uncomfortable.

Nurse: Comfortable or uncomfortable?

Patient: Uncomfortable.

Nurse: Oh, well how about having something for the pain?

Patient: No. I don't like taking tablets-even the ones I have to.

Nurse: *Looking at prescription chart*. No, you do take a lot don't you? Well if I give you some now, it will help you move about.

Patient: Rather not

Nurse: Yes, I know. In all seriousness, if you take them now, you can get up and we need to get you up and about this morning.

Conversation turns to the pre-medication the patient had been given the previous day and it's hallucinogenic side effects.

Nurse: These tablets have codeine and paracetamol in them.

Patient: Don't normally take them.

Nurse: You don't normally have an operation! Right I'll give you some and then we'll see how you go.

Patient: Ok then.

A delay between patient requests for analgesia and administration along with controlled drug policies are frequently mentioned barriers to adequate pain management (Slack and Faut-Callahan, 1991; Carr, 1997; McCaffery and Pasero, 1999). Five requests for pain relief were made by patients during drug rounds but no further attempts were made to ascertain the level of pain that these patients were experiencing or the type of analgesic they wished to take. These patients did not experience a delay although another individual waited an hour after a registered nurse administered an anti-emetic before she was given an oral analgesic. Only six administrations of opioids occurred during the observation periods and the two patients receiving intramuscular opioids experienced a 15-minute delay. Only six (12%) administrations of analgesics were evaluated between 30 minutes and five and half hours after the dose was given. Nurses usually asked if the painkillers had worked or "done the trick" but no formal pain assessment was completed.

A few patients (n=6) were proud that they had not needed analgesics since surgery and communicated this during interview (n=3) or to staff during enquiries about their pain (n=3). This achievement was praised on two occasions although one registered nurse clarified whether they had not needed it or had not been offered painkillers. This

perception of a well-behaved patient that does not require pain relief was verbalised by a student nurse who was talking about a patient:

Field notes: Patient 11

> A student nurse was discussing Mrs B's progress with me as if she wasn't near by. He commented on how well she looked and said loudly, *"(turning to the patient)*...and she has been really good,...haven't you? You haven't needed any painkillers since your operation." Mrs B responded positively agreeing with his statement.

For patients using PCA, after enquiring about pain, they were often asked if they had been using the handset (n=11) and encouragement given by staff to keep pressing the button if they experienced pain (n=22). On two occasions, nurses pressed the handset for patients and staff in one hospital became quickly aware of a relative who had been pressing the button for the patient. Nurses occasionally checked if patients understood the PCA and how it works, which revealed one patient who was confusing it with the nurse call system, one patient was pressing it three times for luck (boosting the number of attempts recorded on the infusion device) and one patient had been feeling bored and had repeatedly pressed the button to hear the device beep. Four patients were also encouraged to use the device before moving or getting out of bed and advised of the built in safety mechanism that meant that they could not overdose on morphine (n=5). However, some patients had received different advice about their PCA use from members of staff.

Field notes: Patient 108

> Mr.C. mentioned his pain when I first saw him and that he had received conflicting advice from nursing staff. This morning he was told that he had overused his PCA, that his respirations had been 10 breaths per minute overnight and not to use it so often. He was later advised by a pain team member to use it when he needs it. He chose to use it sparingly as the former advice had

frightened him and he was noticeably in pain for long periods of observation shift.

Sixteen patients were asked to describe their pain or reported it to staff, which prompted a limited verbal response and no further action. Figure 7.2.2 summarises these responses by nursing staff.

Figure 7.2.2 Verbal responses that did not lead to further questioning or administration of analgesics

- "Doctors will be round in a minute"
- "The dressings are on too tight, that's all"
- "OK then/right"
- "Yes it will be sore/its to be expected"
- "We'll have none of this talk about getting used to the pain"
- *After patient reported pain on movement/during coughing*
  "Well you need to cough/take deep breaths/move"

Some patients repeatedly reported pain but staff did not act upon their comments. The patient below had been admitted onto the ward previously, had received an open cholecystectomy but had not been given PCA or epidural analgesia.

Patient 61

17.08

HCA: Hello Margaret, how are you?

Patient: Hi, I'm fine; I have got a lot of pain though.

HCA: Have you?

Pause

Patient: How are you then?

HCA: I'm fine thank you, the weather is not very good today.

17.15

Nurse talks to patient whilst changing an intravenous infusion line (therefore not looking at her during the conversation)

Nurse: It's nice to see you Margaret. How you've been keeping?

Patient: Oh not so bad. I still have a lot of pain though.

Nurse: Have you really?

17.35

Nurse2: How are you feeling Margaret?

Patient: Ok thank you: It's very sore though.

Nurse2: Ok, then *(documents patient response on assessment chart).*

This patient expressed her pain to three different people in a short period of time but they did not enquire further or discuss pain relief with her. Several interactions occurred later during the observation period but the patient did not mention her pain again. This experience was evident in three other major surgical patients who, during interview, discussed not wanting to report pain to staff because they either could not help or would not listen. One verbalised his frustrations to staff when his epidural stopped working.

Patient 99

Nurse: How are you Mr. S.?

Patient Well it has been painful.

Nurse: It is less than 24 hours Mr S. and you have had a major operation, it is to be expected.

Patient: Yes you're right. It's no use complaining, no one listens.

These patients appeared to be experiencing learned helplessness; a theory based on animal and human experiments that suggests perceived lack of control may result in passivity and demoralisation (Peterson *et al.*, 1993). Peterson *et al.* (1993) described three elements that highlight a true case of learned helplessness; the relationship between a person's actions and the outcome are random (e.g. reports of pain may not result in analgesic administration), expectation that the outcome would not be consistent or positive (e.g. perception that staff are unable or unwilling to provide pain relief) and passive behaviour (e.g. not reporting pain to staff or asking for analgesics). The relationship between the learned helplessness theory and patients behaviour in the study

is inferred, patient interviews did not focus on this area and formal measurements were not taken. Therefore this phenomenon requires further investigation to explore these experiences with patients. Chapter 5 discussed the role of the observer and responses to these patient situations included encouragement to report pain or ask for analgesics and offering to act as an advocate and describe their experience to ward staff.

Pain-related interactions by health care assistants (n=21) and student nurses (n=15) were also analysed separately but the themes that emerged were similar to exchanges with registered nurses. For both groups there were initial questions relating to the presence of pain, one example of using a pain assessment tool, encouragement for patients to use their PCA and occasions where no action was taken after patients reported pain. HCAs did not discuss generally analgesia with patients but two student nurses felt confident enough to give advice about discharge or discuss previous pain relief given.

The role of the HCA and pain management appeared to differ between hospitals. In all cases, HCAs undertook nursing observations (blood pressure, temperature, pulse and respiration) on the first postoperative day but those in hospital two completed PCA observations and hospital four assessed patients with both PCA and epidural analgesia. The RNs only tested the level of the epidural block with ice in the latter hospital but this division of activities often led to a task-orientated approach. The following conversation illustrates a number of points; the patient had been repeatedly trying to communicate her pain to carers, the staff nurse was aware of her pain but not did act on it and the pain assessment had been completed by the HCA who also did not act on the results.

Patient 95

16.50 *Staff nurse completing a drugs round but had stopped to assess the level of epidural block with ice.*

Patient: I have got quite a bit of pain but I supposed you get used to it?

Nurse: It is probably wind pain. You can get it anywhere you know, wind pain.

Patient: Sorry?

Nurse: Pain inside, wind pain, some people get it in their shoulders. You'd be amazed at how painful wind pain can be

Few seconds later whilst standing in the middle of the room

Nurse: … and we'll have none of this talk about getting used to pain.

Patient smiled and laughed.

17.35 *Health care assistant completing nursing observations*

HCA: Do you have any pain?

Patient: Well, yes quite a bit.

HCA: Have been using your button?

Patient: Well, yes occasionally but I have not tried to….

HCA: Is it continuous?

Patient: Yes it is across my side

HCA: I'll put it down as a 2 then.

Patient: No it is an 8 out of 10 really

HCA: 2 is second from the highest, 3 is the highest.

Patient: Oh ok then.

HCA: Have a press of you button, there is a 5-minute lockout, so you can't overdose.

Patient: I didn't want to use it much.

HCA: You need to use it, that's what it is there for.

This patient had worked as registered nurse and this interaction is unique because without prompting, she rated her pain using a scale. Interpretation of the information given by patients and documented care is discussed in Section 7.5.

7.2.4 Patient discharge

Patients were often aware that pain might be a symptom that would prevent them from leaving hospital. Two patients refused analgesics during the morning but self-administered painkillers given on discharge after nurses had explained their medication

and left the room. This concern is reflected in a conversation that occurred during a drug round:

Patient 33

Nurse: You haven't got any pain?

Patient: *Quickly responding*. Nope I'm going home later.

Nurse: Oh that's good.

If patients felt that pain would delay their discharge from hospital, it may have influenced their decision to verbalise it to staff when questioned. Staff occasionally reinforced this and one patient was explicitly told that he could only go home if he did not have pain (patient 80). An unusual event provides insight into one nurse's attitude toward pain, analgesics and discharge.

Field notes: Patient 21

Mrs. A. was discharged early but she had experienced severe pain overnight. The staff nurse confided in me while Mrs. A. was in the toilet.

"She was given Kapake overnight and then had to have morphine. She later went out for a cigarette and felt dizzy, has slept for most of the morning. If she hadn't done that she could have gone home this morning."

It was unclear from the staff nurse's description which action she should have avoided; gone out for a cigarette; required morphine for pain or slept all morning because she had been awake all night. This lady was also a permanent night-shift worker.

Twenty-two participants, minor (n=13) and intermediate (n=9) surgical patients, were discharged before the end of the observation period allowing insight into the discharge process in relation to pain. Eleven patients were asked about the painkillers they usually take and currently have at home. Seven of these were told to simply take paracetamol if

they experienced pain at home and three were asked if they would like something stronger ordering from pharmacy. Some of these patients had experienced severe pain overnight and were given opioids during the previous 12 hours. Therefore the adequacy of this simple analgesic for this immediate postoperative period could be questioned.

General discharge advice relating to pain included information about maximum dose of drugs (n=6), not taking other preparations containing paracetamol (n=5), mobility, lifting and resuming driving (n=4), side effects (n=2) and contacting a general practitioner for further painkillers (n=2).

Section 7.3 Additional observations from the research

A number of additional themes emerged relating to the process of pain management in the participating hospitals. These included discussion during bedside handovers, discontinuing PCA or epidural analgesia, negative attitude of staff members, pain as a source of humour, non-pharmacological approaches and behaviour during public expressions of severe pain.

7.3.1 Bedside handover

Hospitals one, two and three usually conducted bedside handovers to late shift staff (began between 12.30 and 13.30 hours depending on shift pattern) and occasionally night staff personnel (21.00 hours onwards). This system gave the joining staff a chance to introduce themselves and patients often contributed to the information given about their recovery. Six discussions occurred about the patients' pain during handover and new staff either wrote it down (n=3) or patients were asked if they had received painkillers (n=2). One nurse appeared to change her attitude towards a patient's pain

when she was in this group situation. The two extracts below are from an interaction between nurse and patient and a conversation during a bedside handover.

Patient 06, 17.40 hours

Nurse sits down next to the patient with the nursing care plan in her hands

Nurse: How's your pain?

Patient: Well, I have this dull pain between my shoulder blades.

Nurse: That's wind.

Patient: Is it?

Nurse: Yes trust me it is. It is from the surgery and the gas they put inside so that they can see what they're doing. The pain afterwards often radiates up to your shoulders. I'll give you some tablets; if they don't work you are written up for something stronger.

Patient: I had some soluble ones last night.

Nurse: You have trouble taking tablets?

Patient: At the moment.

Nurse: Ok, I'll give you the soluble ones.

21.20 Bedside handover, *staff nurse is providing information about the patient*

Student: …and Mr. T has had referred pain in his shoulders this afternoon.

Nurse: Oh he has wind. Needs a good winding, that's all.

This nurse had initially taken the time to sit with the patient and explain the cause of his pain yet had quickly dismissed his experience or the student's comments in a group situation using a negative tone of voice.

7.3.2 Discontinuing PCA or epidural analgesia

Nine major surgical patients (from hospitals one and three) had their epidural or PCA removed before the start of the second postoperative day, even when it appeared to be effective. This process began on the first day after surgery when nurses were often observed turning down background infusion rates for epidurals when patients started

drinking fluids In one situation, the motivation appeared to be that the infusion device needed to be used by another patient.

Patient 22

Staff nurse completing the drugs round

Nurse: How are you feeling?

Patient: A bit rough, I've got a lot of pain.

Nurse: Have you been having a press of your button?

Patient: Yes I have.

Nurse: Good, cos we need to use it *(pointing at the PCA handset).* They'll be taking it down today, let you try something different. You're drinking now, so I'll give you some painkillers, some co-codamol. See how you go with those.

One patient had his PCA turned off overnight because his respiration rate had dropped to six breaths per minute but he was unaware of this, had continued to press his handset throughout the day and could not understand why he was experiencing pain. In hospital three, patients appeared to be nursed flat while the epidural was in place and they were not usually mobilised on the first postoperative day. Consequently, there appeared to be an incentive to remove the epidural so that patients could be move out of bed the following day. These patients would be on oral analgesics when they could potentially be experiencing the highest pain intensities.

The discontinuation of these modalities when patients were receiving adequate analgesia may occur for a variety of reasons and needs to be uncovered through further research. Contact with a patient on the first and second postoperative day resulted in the following documentation in the reflective diary.

Patient 19

The patient had been well this morning, keen to tell everyone that he hasn't got any pain and how wonderful his epidural is. Five months ago he had undergone a laparotomy and his pain wasn't managed adequately so he was relieved to hear that he was having an epidural PCA. At 10.10, one of the RNs turned the background infusion off because he wasn't in any pain, but why at this early stage when it is allowing him to be pain free?

Mr. S. (yesterday's patient) was walking about this evening; he no longer had his epidural. He asked for something to ease his trapped wind and he was given peppermint water but 20 minutes later he was back reporting excruciating pain. He was escorted back to his bed and given analgesics. Fifteen minutes later a message was given to a RN from a HCA saying that he was still in a lot of pain. The response from a senior member of staff was "Those bloody patients, give 'em a tablet and they think it should work instantly." No other action was taken.

7.3.3 Explicit negative attitudes, public expressions of severe pain, pain as a source of humour and non-pharmacological approaches

A small number of staff actively encouraged patients to take analgesics and prevent pain occurring but equally there were a small number who explicitly displayed negative attitudes in front of patients. In addition to the previous excerpt from field notes, the following example relates to a patient who had received major surgery and was using a PCA.

Patient 108

One HCA completing observations and another making the bed

HCA1: Have you got any pain darling?

HCA2: Any pain? Huh! If you haven't you shouldn't be here. I believe that you should have pain if you're in here.

HCA1: *Ignoring her colleague's comments.* Have you got some sunshine?

Patient: Yes.

Patient chart completed, no further questions.

When one patient in the room was experiencing severe pain and verbally expressing their suffering, the behaviour of other patients and visitors changed considerably. Patients interacted less with each other, lowered their voices to whisper and arriving visitors quickly learned to do the same. On the three occasions that this happened, nurses drew the curtains around the patient and people immediately expressed concern for the individual when the curtains were withdrawn and he or she appeared more settled. The reasons for these behaviours were unclear and could not be explored as the remaining patients were not participants and questions may have revealed the pain management focus of the study.

Pain was also a source of humour for some patients in the study who teased nurses by pretending that they had caused pain when they were changing a dressing or taking out drains. One patient was joking with staff about using the PCA handset as a musical instrument because of the noise it made and it could simultaneously keep him pain free.

Finally, 46.9% of respondents to the PPMQ reported the use of non-pharmacological approaches to pain management in their organisation and Appendix 9 illustrates that hospital two and four included this topic in staff education sessions. However, non-drug approaches were not observed during the second phase of the research, although techniques may have occurred outside these times and patients were not questioned on the techniques they employed independently.

Section 7.4 Documentation of pain management activities

In addition to reviewing drug charts and anaesthetic records, nursing documentation was examined at the end of each observation period for evidence of pain management activities. Entries onto pain assessment charts, care plans and critical pathways are explored in this section.

7.4.1 Pain assessment charts

The PPMQ revealed that the majority of hospitals in the region (n=26; 81.3%) documented pain on a specific assessment chart or on the nursing observation (TPR) chart. This second study illustrated that these charts were not consistently used across all groups of patients or hospitals. The nursing records of 59 patients (49.2%) contained a chart but just around half (n=29) were from hospital two where the assessment sheet was attached to the prescription chart for surgical patients. The two hospitals with acute pain services only used assessment charts with patients undergoing major surgery and using PCA or epidural analgesia. In these cases, physiological observations could be documented along with sedation, nausea and volumes of fluids infused. Hospital two also used an epidural analgesia chart for documenting these areas. A generic assessment chart was used in hospital three but on an irregular basis with major (n=5), intermediate (n=1) or minor surgical patients (n=2). Volumes infused via PCA or epidural analgesia were recorded on a fluid balance chart in hospital three.

Pain assessment charts had been developed for local use and Table 7.4.1 illustrates that verbal rating scales were recommended, which in most cases incorporated assessment of pain on movement. Three patients had assessment charts that had not been completed and 20 patients (all from hospital two) had preoperative pain assessments, which were not included in the analysis.

Table 7.4.1. Pain scales and corresponding entries onto assessment charts

Hospital	Assessment tool	Entries n	(%)
1	PCA and epidural chart only (n=10)		
	0=No pain on rest or on movement	104	(80.0)
	1=No pain on rest, mild on movement	16	(12.3)
	2=Mild on rest, moderate on movement	3	(2.3)
	3=Moderate on rest, severe on movement	3	(2.3)
2	Generic pain assessment and epidural chart (n=29)		
	0=No pain at rest or on movement	90	(43.3)
	1=No pain at rest, slight pain on movement	55	(26.4)
	2=Intermittent pain at rest, moderate on movement	38	(18.3)
	3=Continuous pain at rest, severe on movement	8	(3.8)
	Numerical, 0-10 scale	17	(8.2)
3	Generic pain assessment chart (n=9)		
	0=No pain	9	(20.9)
	1=Mild pain	18	(41.9)
	2=Moderate pain	6	(13.9)
	3=Severe pain	--	
	4=Very severe pain	--	
	Patient asleep/intensity not documented	10	(23.3)
4	PCA and epidural chart only (n=10)		
	0=No pain at rest or on movement	52	(41.9)
	1=No pain at rest, slight pain on movement	42	(33.8)
	2=Intermittent pain at rest or moderate on movement	19	(15.2)
	3=Continuous pain at rest or severe on movement	3	(2.3)
	Intensity not documented	9	(7.2)

A total of 505 records were made onto pain assessment charts following surgery and to the end of the day. The table above illustrates the entries made according to pain rating and "no pain" or "mild pain" was the most frequently documented scores in each hospital; comparatively few patients experienced moderate or severe pain according to nursing documentation. Table 7.4.2 further illustrates the differences between hospitals.

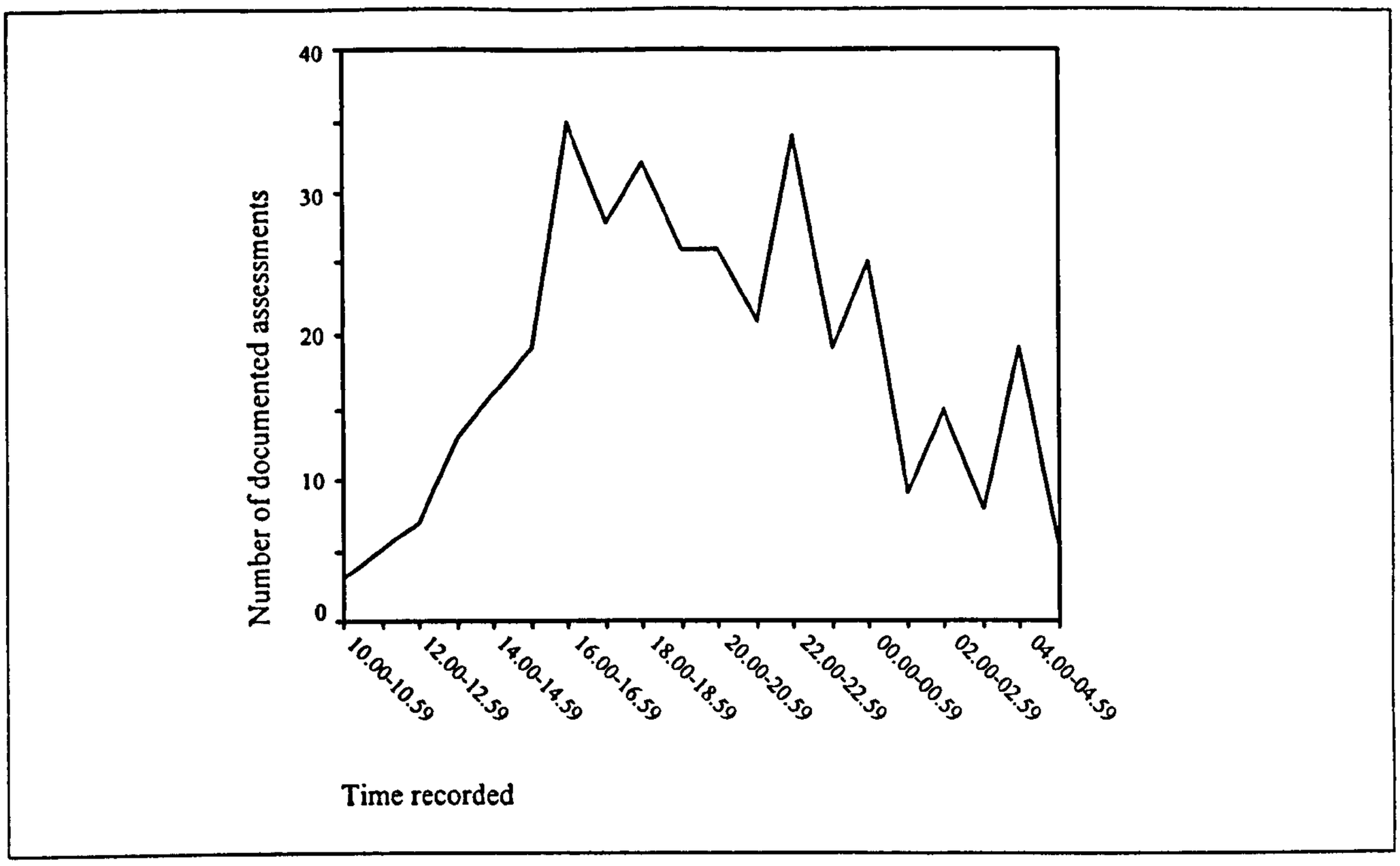
Table 7.4.2. Number of pain assessments documented according to hospital

Hospital	n	No. of entries	Mean	(SD)	Entries up to 06.00hrs day 1 No	(% of total)
1	10	130	13.0	(3.59)	103	(79.2)
2	29	208	8.0	(5.83)	157	(75.5)
3	9	43	4.8	(2.94)	37	(86.6)
4	10	124	12.4	(4.62)	105	(84.7)
Total	**59**	**505**	**8.7**	**(5.95)**	**402**	**(79.6)**

The initial results from Table 7.4.2 suggest that the two hospitals with a pain service (one and four) documented pain scores more frequently but these charts only relate to major surgical patients using PCA or epidural analgesia. Therefore, general nursing observations would be completed more frequently with these patients. If data from major patients with assessment charts are considered from hospital two (n=10) and hospital three (n=5) the mean number of scores documented rises to 14.5 (SD 2.46) for hospital two and decreases to 6.6 (SD 4.50) for hospital three. Statistical analysis confirmed a significant difference between the number of ratings documented for major surgical patients between hospitals ($F=5.14$; $df=3,31$; $p=0.005$). Post hoc tests illustrated that these differences lay between hospital three and all other hospitals (hospital one, Tukey HSD $p=0.01$; hospital two $p=0.003$, hospital four $p=0.03$).

Table 7.4.2 also indicates the timing of pain assessments following surgery with 79.6% of documentations occurring prior to 06.00 hours on the first day after surgery and a similar pattern in all hospitals. Figure 7.4.1 presents this information in more detail.

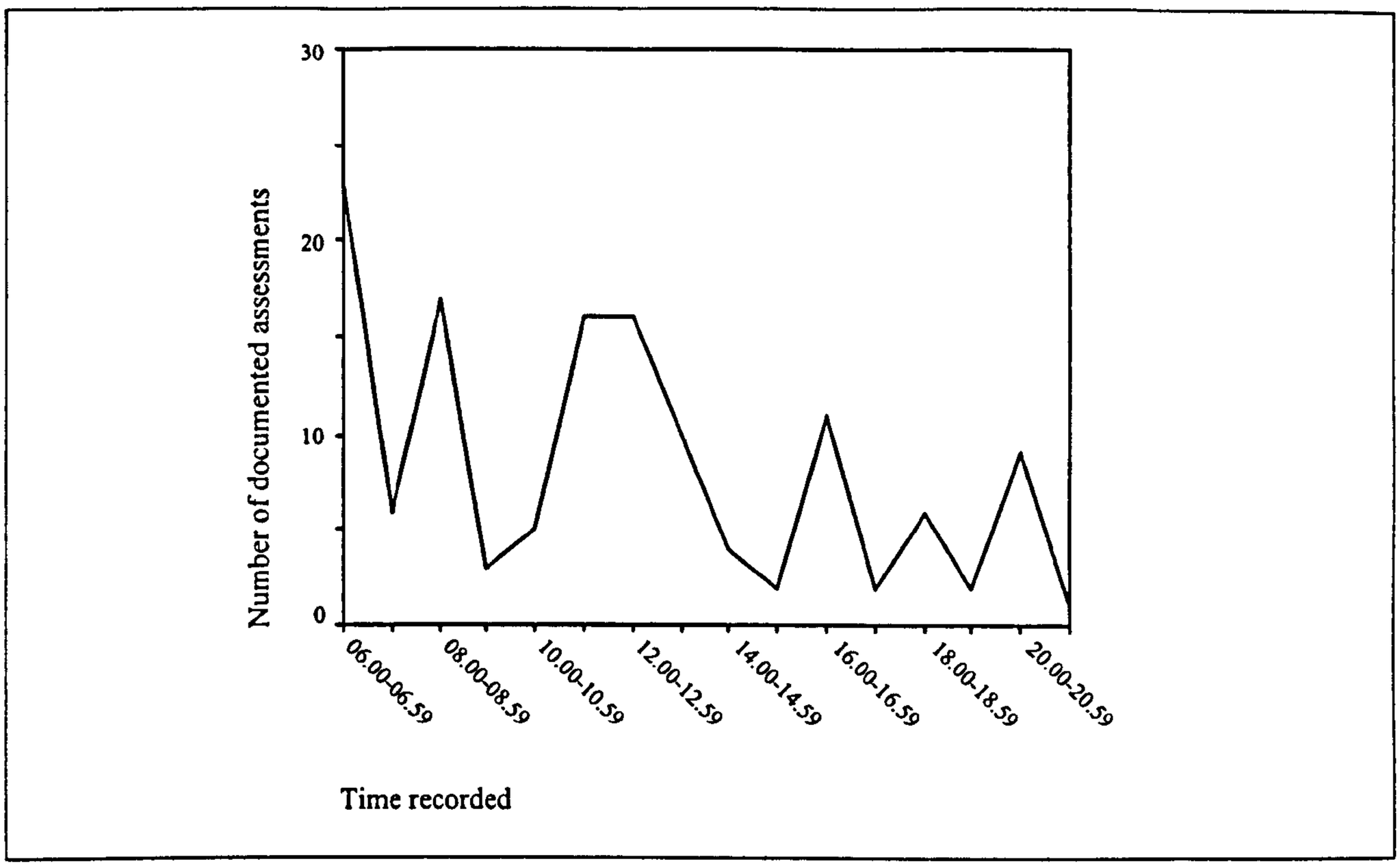
Figure 7.4.1. Documented pain assessments up to 05.59hrs on day one after surgery



The number of documented assessments remained high throughout the afternoon as patients returned from theatre and then peaks at 2-hourly intervals overnight. This may reflect the frequent nursing observations that occur after returning to the ward which gradually reduce if physiological parameters are satisfactory and stable.

The number of documented assessments after 06.00 hours on the patients first postoperative day dropped considerably but showed similar patterns of activity (see Figure 7.4.2).

Figure 7.4.2. Documented pain assessments after 06.00hrs on day one after surgery



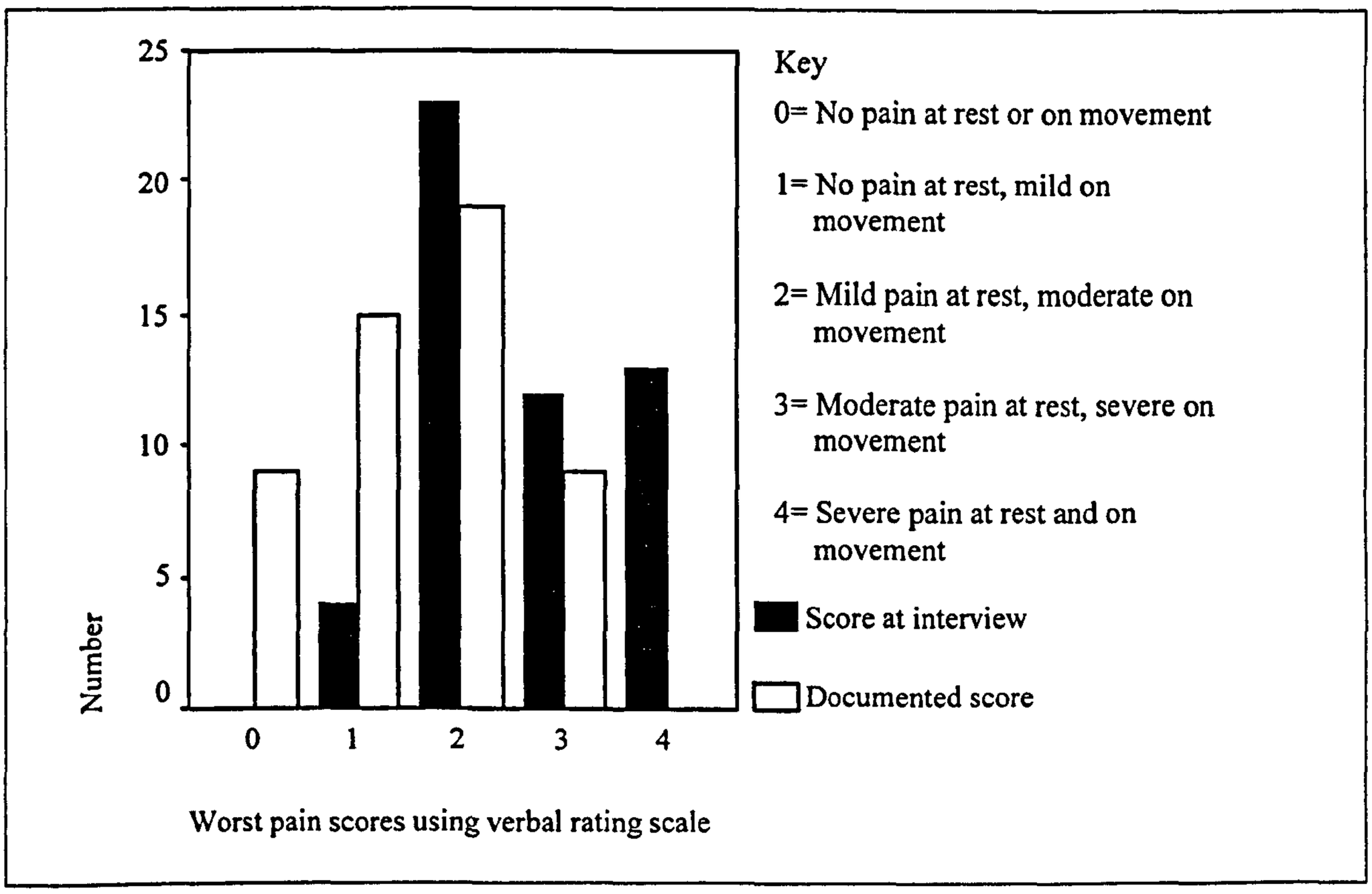
A higher number of assessments were recorded in the morning, initially by night staff at 06.00 hours and commonly at 08.00 hours and between 11.00-13.00 hours. Documented activities in the afternoon show peaks at 16.00, 18.00 and 20.00 hours. Twelve patients had no documented pain assessments on day one after surgery and 58 took place during the observation period. The relationship between actual nursing care and documented care is explored later in Section 7.5.

Information on assessment charts relating to patients' experience was limited to intensity of pain although this was omitted on 17 entries and the patient was recorded as "asleep" on 14 other occasions. Location or any other aspect of pain was not documented on any charts. On 20 occasions, nursing decisions were documented or addition information given (a total of 53 entries). These included the administration of specific analgesics (n=11), route of medication (n=8), comments relating to the effectiveness of PCA or encouragement given to use it (n=13) and if analgesics were not required (n=19). One described the patient discussing "discomfort" rather than pain

and one chart included comments from the pain team about discontinuing the PCA. However, 16 of the 20 patients with additional comments were from one hospital (number two).

Fifty-two patients with pain assessment charts had pain scores documented using a verbal rating scale similar to the scale used during the patient interview. This allowed some initial comparisons between documented and reported pain scores shown in Figure 7.4.3.

Figure 7.4.3. Comparison of documented and reported worst pain scores



The bar chart shows that the documented scores do not necessarily represent the patients' worst pain experiences. In some cases, a zero pain rating was the worst documented score yet no patient in the group chose this category to describe their pain. Documented scores were skewed towards the lower end of the scale and the reported scores towards the higher pain intensities. The final category (severe pain on rest and on

movement) was not part of the scale used by hospitals but 13 patients used this category to describe their pain during interview.

The results from Figure 7.4.3 do have to be interpreted with caution as they only include patients with a pain assessment chart, which were predominantly major surgical patients (n=35; 67.3%) and 55.8% (n=29) were from one hospital. There was a small difference relating to two assessment scales and the use of the word "slight" instead of "mild pain" or the use of the terms "intermittent" instead of "moderate pain" (see Table 6.3.16).

7.4.2 Pain management documented in nursing records

Hospitals involved in the study used a mixture of nursing documentation in addition to the pain assessment charts. Those with pain services had a pre-printed general postoperative care plan that included pain management and detailed care plans for patients using PCA or epidural analgesia. Hospital two used a combination of pre-written care plans and multidisciplinary integrated pathways. Finally, hospital three had a care plan system on computer and personalised a template according to the needs of the patient. Nursing documentation was examined using content analysis focusing on the key areas of assessment, goals identified, plan of care and documented evaluations.

Within nursing documentation, postoperative pain management was most commonly identified as the second or third nursing problem within care plans (n=52; 43.3%) or incorporated into a generic care plan (n=39; 32.5%). Table 7.4.3 illustrates the nursing problems identified in care plans.

Table 7.4.3. Pain-related problems in nursing care plans

Problem	n	Hospital/s
Pain due to surgery	29	1
Patient is in pain postoperatively or after a named procedure	24	3
(*Patient name*) has epidural/peripheral PCAS *in situ*	8	1
Gets pain due to (*space*). Site of pain (*space*). Nature of pain (*space*)	7	4
Pain due to (*space*)	5	2
(*Patient name*) has abdominal pain	2	1
Pain	1	2
No unique problem identified		
Generic care plan	22	4
Critical pathway	20	2
No care plan relating to pain	3	1,4
Total	**122[1]**	

[1]Some patients had more than one problem identified

All of the problems within care plans were pre-printed and provided space to personalise them with patient names, procedures or information about pain (although 18 were missing this information). The standardisation of documentation meant that a dominant approach to care planning occurred in each hospital which is illustrated by the final column in the table. Similarly, goals for nursing care were pre-written and these are shown in Table 7.4.4.

Table 7.4.4. Goals relating to pain management

Goal	n	Hospitals
Pain to be controlled or alleviated to an acceptable level to the patient	53	1,3
Keep pain to a minimum	10	2
Ensure adequate pain relief	7	1
Help be pain free/prevent or minimise pain/teach self-care if recurrent problem	7	4
To resolve the cause of the pain	2	1
No unique problem identified		
Generic care plan	22	4
Critical pathway	20	2
No care plan relating to pain	3	1,4
Total	**124[1]**	

[1]Some patients had more than one goal identified

The goal of nursing care in two hospitals (n=53) was to reduce pain to an acceptable intensity to the patient but no agreed level had been documented during the nursing

assessment. The importance of this was demonstrated through the pain scores reported during patient interviews (presented in Section 6.3.3). Mean acceptable pain scores were generally lower than scores at rest and on movement. One goal outlined in Table 7.4.4 gave three options; aiming to keep the patient pain free, minimise pain or teach self-care if pain was likely to be recurrent problem. In all cases, goals for pain management did not appear to be negotiated with patients in the sample and many (n=45; 37.5%) did not contain pain-related goals.

The plan of care section was often pre-written containing up to eight aspects of pain management and space to insert additional elements relevant to the patient. Table 7.4.5 illustrates the care planned for patients admitted to these hospitals.

Table 7.4.5. Plan of care relating to pain management

Plan of care	n
Give prescribed analgesia and monitor its effectiveness	77
Position the patient comfortably	58
Observe for signs of discomfort or pain	55
Encourage the patient to inform staff of pain/request analgesia	30
Document the severity, type or location of pain	23
Reassure the patient at all times to relieve anxiety	22
Ensure adequate pain relief	18
Preoperatively: explain postoperative pain control and allay any fears the patient may have	16
Give anti-emetic as prescribed	10
Provide alternative pain relief	10
Specific instructions on the frequency of PCA/epidural observations including insertion site and dressing	8
Use pain chart to monitor pain control if necessary	8
Assess pain control one hourly and record	6
No plan of care	4
Assist with changes in position and activities of daily living	2
Inform medical staff if unable to resolve pain	2
Use methods of distraction	1

The plan of care for patients varied between hospitals and within hospitals. For example, in hospital four most patients (n=23) had a generic care plan that contained one aim; to "observe for signs of pain and treat appropriately" yet seven other patients

had a comprehensive eight-point plan for pain management. In the whole sample, only three plans were individualised to the specific patient by adding their name or an additional aim.

The nursing documentation of 108 patients contained comments evaluating pain management up until day one after surgery. A total of 231 entries were made and Table7.4.6 summarises the number of entries according to hospital.

Table 7.4.6. Number of comments evaluating pain management according to hospital

Hospital	Day of surgery	Day one	Total
1	42	32	74
2	38	44	82
3	25	34	59
4	13	23	36
Total	**118**	**113**	**231**

Table 6.3.21 shows a similar number of entries for both days but apparent differences between hospitals. Hospital two has the highest number of documented evaluations and hospital four less than half this figure with 36 comments over two days. The documentation for 12 patients (all from hospital four) did not contain comments on pain management since surgery. In the whole sample, 32% (n=74) of entries had information missing; 43 had no time documented, 25 had recorded "nocté," "AM" or "PM" in place of a specific time and six contained no date.

Content analysis revealed a number of themes in this section on the care plans, shown in Table 7.4.7.

Table 7.4.7. Evaluation of postoperative pain management (n=108)

Comment	n
Pain score stated	33
No complaints of pain	31
Analgesia given with good effect	25
PCA/epidural effective or controlling pain	21
PCA in progress/*in situ*	14
Analgesia given	14
Analgesia given in theatre/recovery	13
Drug given stated	9
Frequency of observations stated	6
Height of epidural block stated	6
Hourly infusion rate of epidural stated	6
Oral analgesia given	6
Pain due to (*operation named*)	5
Complaining of pain	4
Location of pain	4
IM analgesia given	4
Problems with epidural described (e.g. filter disconnected, occlusion)	4
Minimal use of PCA	3
Use of PCA encouraged	3
Using large amounts via PCA	3
Pain affecting sleep	2
Pain control good/very good	2
PCA discontinued	1
Pain unbearable	1

Pain scores were the most frequently documented element in the evaluation section of care plans but this only occurred in one hospital (number two) for 21 patients. A very small number contained other elements of the assessment process such as location or the effect of pain.

The use of negative terms was evident throughout care plans in all hospitals and patients were frequently described as "complaining" or having "no complaints of pain." The term also implies a responsibility on the part of the patient to report pain to nursing staff and a lack of formal assessment by nurses. Thirteen entries included the word "appears" in relation to comfort, pain levels or the effectiveness of PCA; reinforcing the perceived role of the patient to show behavioural signs of pain rather than relying on verbal reports during an assessment. One patient was described as sleeping after returning from

theatre and therefore his epidural was effective. Most entries showed a lack of detail in pain assessment illustrated by the following examples

Patient 16

18.20 Pain ++ on moving, comfortable when still.

Patient 103

PM A bit sore. PCA *in situ*.

An entry for a patient offered analgesics by night staff gives a further example of the negative language associated with pain management in the documentation.

Patient 03

23.00 Patient in pain. Offered analgesia. Refused.

04.00 Patient not slept well, finally accepted analgesia.

The degree of pain relief following analgesia was also described in general terms such as "good," "...with good effect" or "mostly effective." Documentation illustrates that pain assessment or pain relief tools were not used to evaluate the effectiveness of analgesia.

Documentation across hospitals did show many similarities but patterns emerged in the phrases used by staff. One hospital frequently employed "comfortable upon warding" and another regularly documented the perioperative analgesics in care plans. Staff in hospitals two and four also recorded epidural infusion rates and height on the analgesic block in care plans. These consistencies in documentation may not be explained by the activities of one or two nurses as each care plan covered a time span of up to three shifts and the research took place over several weeks. The results suggest a pattern of language used by staff in hospitals.

Summary

Pain assessment charts were not consistently used across hospitals or surgical groups and only hospital two employed a chart with nearly every patient. Entries onto charts suggest that the majority of patients had "no pain" or "mild pain," skewed to the lower end of the scales employed and worst pain score reported during interview, skewed towards the higher ratings. This suggests that documented pain scores did not adequately represent patients' experiences. Focusing on major surgical patients, differences were shown between hospitals and the number of assessments documented. Hospital 2 had the highest number of entries and hospital three the lowest, both hospitals without a pain service. Seventy-nine per cent of documentations occurred before 06.00 hours on the first postoperative day and assessments on both days showed two hourly peaks.

Pain management activities were also documented in core care plans (on paper and using a computer system) and critical pathways. Therefore, there was often a standardised approach to care planning, which meant that common themes emerged from each hospital. The most frequent goal identified was for "pain to be alleviated or controlled to an acceptable level to the patient" but there was little evidence that this level had been negotiated or documented. On paper, the plan of care was most frequently to administer prescribed analgesics along with nursing the patient in a comfortable position and identifying signs of pain. Two hundred and thirty-one evaluation comments were documented to the end of the observation period and hospital two had the highest number of entries. This was also the only hospital to record pain scores in the evaluation section of nursing documentation. In all hospitals, patients' pain experiences or activities were often described in general or negative terms (e.g. "analgesia given with good effect" or "complains of pain").

Section 7.5 Comparison between observed and documented pain management activities

This section draws together the observation data and information from nursing records to evaluate the proportion of care documented by nurses. Pain-related conversations and activities are compared to assessment charts and patient care plans.

7.5.1 Pain assessment charts

One hundred and nine interactions were associated with the 59 patients (49.2%) that had pain assessment charts as part of their care plan. From this group, nine did not have any interactions or entries onto the chart during the observation period and a further 12 had discussed their pain with nurses but nothing was documented. The remaining patients (n=38) had 58 pain scores recorded but seven entries did not coincide with an exchange with the patient. In these cases, pain ratings had been documented as 0 (n=6) or 2 (n=1) without discussion. Therefore 51 interactions (46.8% of the 109 observed) could be compared to records on pain assessment charts.

Thirty-six entries (70.6%) were documented close to the time of discussion (± five minutes) but the remaining 29.4% were rounded up or down to the nearest hour. In one case, a health care assistant conducted pain assessments at 15.06 and 20.30 hours but documented times were 18.00 and 22.00 hours respectively. The reason for this could not be explored during the study.

As previously described, there were only five incidents where assessment scales were employed with patients. Four of these were documented, three matched the patient's numerical rating and one contained a lower rating than the patient expressed (patient 35, described a 3 out of 10 and documented score was 1-2). The reason for this is unclear but may be due to the 0-10 scale used verbally with the patient and the different rating

scale encouraged by documentation (0-3, see Table 7.4.1, hospital two). This interpretation by nursing staff from one scale to another was also seen in patient 85 (see Section 7.2.3 for conversation) where the patient offered a pain rating of 8 out of 10 and health care assistant then explained that three was the highest so it had to be written as a rating of two. This area requires further investigation.

Forty-seven entries onto assessment charts contained a pain rating but a formal scale had not been used during the interaction. This suggests that 92.2% of scores were interpretations by ward staff based on the general information patients gave about their pain. Table 7.5.1 summarises the patient responses and the range of scores documented by nurses.

Table 7.5.1. Patient responses and documented pain scores

Question	Response	Documented score	n
Have you got any pain?	No/ no, not really	0	11
	Yes	0	2
		0-1	1
		1	5
		2	2
		2-3	1
	Some	0	1
		1-2	1
	A little	0	1
		1-2	1
	Mild	1	1
	Feels so, so	1	1
	Just aching	1	1
	Only when I move	0	3
		0-1	1
		1	1
	Quite a bit	2	1
Do you want painkillers?	No	0	6
	Yes	1	1
		1-2	1
		2-3	1
Have you been using you pain button?	Sometimes	0	1
How are you feeling?	Oh, alright now	0	1

Most hospitals in the study were documenting pain scores on a 0-3 scale and Table 7.5.1 shows that after a simple positive response indicating the presence of pain, the full range of scores were recorded. Most commonly a score of one was documented (no pain at rest, slight/mild on movement for hospitals one, two and four). Declining the offer of painkillers was always interpreted as the patient not experiencing any pain (0 rating, n=6) and requesting pain relief resulted in scores of 1-3 (rating 3, moderate/ intermittent pain at rest, severe on movement for hospitals one, two and four). Two further questions did not directly ask about pain but on one occasion, a patient reporting that he sometimes used his PCA was interpreted as "no pain." The final question ("How are you feeling?") relates to the incident described in Section 5.6.2 where a student documented pain, nausea and sedation scores and a full set of physiological observations following this question. This observation was mentioned to her mentor who was requested to handle the situation diplomatically and the staff nurse later explained epidural management to the student at the bedside.

Examining nurse-patient interactions with documentation on pain assessment charts provides a useful insight into this area of practice but comparisons between hospitals could not be made because of the low number of dyads from some areas. Twenty-six interaction-documentation comparisons could be made from hospital two, 12 from hospital four, 11 from hospital one and only two from hospital three. These figures reflect both the proportion in interactions in each hospital (shown in Table 7.2.1) and documented pain assessments (shown in Table 7.4.2). In both these cases, hospital two had the highest number and hospital three the lowest. In all hospitals, documentation of pain management activities in care plans meant that further comparisons could be made between observed and documented care.

7.5.2 Nursing care plans

Table 7.4.6 illustrated that nursing staff, evaluating pain management activities, made 113 comments in patient care plans. Fifty-one (45.1%) records were made by nurses during the observation period and staff from previous shifts were responsible for the remaining entries. The two hospitals with a pain service had the lowest number of comments (hospital one, n=6; hospital four, n=11) and staff from both hospitals without a service made 17 documentations. Nursing interactions and care plans were analysed using content analysis to identify themes that highlighted the similarities and differences between the two.

Care plans were generally completed towards the end of a shift and were often written when nurses were stood next to the patient (n=18). This occasionally prompted staff to question the effectiveness of analgesics previously given or current pain experiences. Therefore, documentation often (n=10) reflected the last interaction rather than the pain experienced throughout the day.

Patient 48

16.20 Nurse completing routine observations

Nurse: Have you got any pain at the moment?

Patient: Yeah it's there in the background but it's only bad when I sit up really.

Nurse: Ok, keep having a press of your button.

20.10 Nurse writing in care plan.

Nurse: Are you comfortable at the minute? No pain?

Patient: No, I'm alright thank you.

Nurse: Let us know if you have won't you?

Patient: Ok then.

Care Plan

PM- PCA *in situ*. No pain, pain score 0.

However, when pain was expressed while nurses were writing care plans it was usually documented.

Patient 19

13.12 Patient asleep

Nurse: Are you alright? Do you have pain? So you feel sick?

Patient: Well, when I move.

Nurse: What the pain comes on?

Patient: Yes, I have been asleep.

Nurse: Would you like me to give you some paracetamol?

Patient: I'm not one for taking tablets.

Nurse: Well don't suffer, please don't be stoical.

Patient: Ok, I'll have some.

14.05 Nurse sat beside the patient taking out intravenous cannula.

Patient: I've still got a bit of pain.

Nurse: Have you had some painkillers this morning?

Patient: Yes I've just had some.

Nurse: Well, if they don't work, let me know and we can get you something stronger.

Patient: Ok.

Care Plan

14.30 Complaining of slight abdominal pain-oral analgesia given.

The intensity of pain was described in 12 care plans and in hospital two, pain scores were documented (n=7) but similar to the pain assessment charts, most were not based on the use of a formal scale presented to the patient. One record described "slight pain at rest, moderate on movement" (patient 47) which did not appear to reflect the conversation but part of one exchange was missed due to background noise. When patients suggested that they did not have pain they were described as "remaining pain free" (n=3) and other references to pain intensity included "slight pain," "some pain"

and "a bit sore." If individuals refused painkillers they were described as having "no complaints of pain" (n=5).

Three patients described a headache or sore throat, which was documented, and a further three care plans referred to the site of the incision as the location of pain. However, this was not discussed with patients as shown in the following excerpt:

Patient 84

07.55 Drug round

Nurse: Morning John, how ya doin' this morning?

Patient: I'm fine thank you, can I have some painkillers please?

Nurse: Ok *(after looking in the drug trolley)* Try your Kapake and see how you go.

Patient: And the little brown one?

Nurse: Yes

Patient: Ok then.

11.20

Nurse: Are you asthmatic?

Patient: Not much, I have some inhalers.

Nurse: I'm going to get the doctor to stop your little brown tablet, your anti-inflammatory. It can cause chest problems. We'll see how you go on your Kapake.

12.30 Drug round

Patient: Can I have some painkillers?

Nurse: You can.

Care Plan

12.00 Patient complained of discomfort around his wound site and regular oral analgesia has been given as per drug chart Kardex with good effect.

Many of the care plans (n=23) included practical aspects of pain management that had occurred during the day such as the analgesics given (n=10), modality, PCA or epidural (n=12) or that a patient had been seen by the pain team (n=1). Thirteen care plans made reference to the effectiveness of analgesic techniques but only two nurses had asked if pain relief had worked (patients 16 and 84). On other occasions analgesic methods were described as "effective," (n=1) "...given with effect" (n=1) or "appears to be controlling pain" (n=2) when no interaction had occurred. Similar terms were used when patients had identified that they were experiencing pain and reported the location or intensity was "mild," "some" or "a bit" (n=7). When one patient had rated their pain as five on a 0-10 scale an hour earlier, her PCA was still described as controlling her pain (patient 41).

Overall, a low number of care plans contained comments about the pain experiences of patients and information about activities that had occurred during the day information was often limited.

Summary

Less than half (46.8%) of pain-related interactions between patients and nurses led to ratings being documented on assessment charts. During 778 hours of observation, there was an extremely low use of formal assessment tools to assess pain (n=5) and on two occasions there appeared to be a difference between the scale used with the patient and documentation, which led staff to convert the patient rating into a documented score. Predominantly, staff were interpreting patients' general responses to documented pain ratings and the data showed a range of scores allocated to the same response by patients. A small number of scores were documented without asking the patient (n=7) or involved a question that was not directly related to pain intensity (n=2).

Fifty-one comments were written in nursing care plans during the observation period (although the number varied across hospitals). Documentations were usually made at the end of the shift and therefore reflected the last interaction, whether patients expressed pain or not. Overall, documentation contained few details about the patient's intensity, location or quality of pain. Two nurses asked patients whether the painkiller had worked but twelve care plans included comments about the effectiveness of pain relief. The cues that nurses were using to make these judgements are unclear.

Section 7.6 Summary of the differences between hospitals and wards

Appendix 9 highlights the similarities between participating organisations in the study in terms of hospital size, surgical specialities and ward details and Section 6.3.1 showed the organisational commitment to improving pain management as measured by the PPMQ. Here too, similarities were shown and some differences in terms of a statement in the Trust quality strategy, protocols for staff between hospitals with and without an APS and the lack of funding for one hospital. The two results chapters have shown significant differences at ward level between hospitals in relation to patient outcomes and nursing activity. This section summarises those differences and discusses the care provided within two hospitals (three and four), which involved observation on two wards.

7.6.1 Summary of the differences between the four participating hospitals

Both results chapters have highlighted various differences between hospitals in the study and Table 7.6.1 summaries the quantitative elements measured.

Table 7.6.1 Summary of the differences between hospitals

Parameter	Unit	Hospital			
		1	2	3	4
Pain scores					
Acceptable pain level	mm	25.3	27.8	32.2	33.4
Pain at rest	mm	32.0	26.2	37.4	41.1
Pain on movement	mm	41.4	35.0	46.3	51.0
Worst pain scores	mm	52.2	50.4	64.5	61.0
Morphine equivalent doses					
Day of operation	mg	18.5	21.5	24.9	31.2
Day 1 after surgery	mg	10.1	7.9	14.2	16.9
Total since surgery	mg	28.9	30.2	38.2	48.3
Total number of doses surgery	n	61	61	92	51
Pain-related interactions					
Registered nurses	n	52	74	41	39
All staff	n	65	105	47	59
Opening question					
Have you got any pain?	n	6	20	8	8
Do you want any painkillers?	n	9	8	6	11
Observed interactions led to analgesic administration	n	10	8	20	12
Mean assessment chart entries	n				
Major surgical patients		13.0	14.5	6.6	12.4
Evaluation comments in care plan	n	74	82	59	36

For each one of these parameters there are many intervening variables that may influence the ultimate result and these are multiplied when comparing a number of measured outcomes and between organisations. This means that a relationship between the measurements in Table 7.6.1 would be extremely difficult to explore but a number of interesting observations can still be made from this summary. Hospital two achieved the lowest pain scores but also had lowest administration rates for analgesics and the second lowest morphine equivalent doses; this suggests that pain ratings may not be clearly related to the amount of pain relief given. The ward did have the highest number of nurse-patient interactions (where nurses more frequently asked about pain experiences rather than offered painkillers) and the highest number of documentations

both on pain assessment charts and nursing care plans. Hospital four had some of the highest pain scores and the highest morphine equivalent doses but overall lowest number of analgesic doses given (a relationship discussed earlier which may be attributed to high PCA use). Finally hospital three had the second highest pain scores but the highest administration rate for analgesics. This hospital had the lowest number of interactions, entries onto pain assessment charts and evaluation comments within care plans.

Overall, the summary provides interesting results but it is difficult to draw firm conclusions between measurements and organisations, as there may be unknown factors, not assessed during the study that influenced the outcome of results.

7.6.2 Comparing wards in hospitals three and four

As outlined in Chapter 5, research in hospitals three and four had to include two wards for different reasons. Briefly exploring the sample characteristics and outcomes for individual wards, allows insight into how data from these wards contributed to the overall results for each hospital. Entries onto pain assessment charts were not compared between wards due to the low numbers from hospital three and one ward in hospital four did not admit major surgical patients or use assessment charts. Data from hospital three are presented in Table 7.6.2.

Table 7.6.2 Summary of differences between wards in hospital three

Parameter	Unit	Ward			
		3A	3B	Statistic	p
Patient age	Yrs	57.1	59.2	U=104.0	0.74 NS
Gender Male Female	n	 0 15	 15 0	--	--
Pain scores Acceptable pain level	mm	33.1	30.9	U=62.0	0.67 NS
Pain at rest	mm	38.2	36.5	U=84.0	0.56 NS
Pain on movement	mm	49.1	43.1	U=75.0	0.32 NS
Worst pain scores	mm	70.7	57.4	U=77.5	0.23 NS
Morphine equivalent doses Theatres and recovery	mg	18.5	16.8	U=81.5	0.88 NS
Day of operation	mg	27.8	22.0	U=72.0	0.55 NS
Day 1 after surgery	mg	18.5	10.2	U=60.5	0.15 NS
Total since surgery	mg	46.4	30.6	U=57.5	0.11 NS
Total number of doses since surgery	n	44	48	--	--
Pain-related interactions Registered nurses	n	18	23	--	--
All staff	n	21	25	--	--
Opening question Have you got any pain?	n	3	5	--	--
Do you want any painkillers?	n	3	3	--	--
Evaluation comments in care plan	n	12	7	--	--

Table 7.6.2 shows that there was no significant difference in the sample between wards in terms of age and gender and similarly, pain scores did not differ significantly between wards despite a much higher mean for worst pain ratings from ward A. The total amount of morphine equivalent doses was slightly higher on ward A but this was not statistically significant and overall the number of analgesic doses was similar. Interestingly, ward B had a lower number of documentations. The lack of statistical differences in each group suggests that it is reasonable to discuss conclusions about the hospital based on the amalgamation of data from these two wards. However, the low numbers in each ward (n=15) should be noted.

Table 7.6.3 presents the data from each ward in hospital four.

Table 7.6.3 Summary of differences between wards in hospital four

Parameter	Unit	Ward			
		4A	4B	Statistic	p
Patient age	Yrs	63.7	59.1	U=85.5	0.27 NS
Gender Male Female	n	6 9	8 7	χ^2=0.536	0.46 NS
Pain scores Acceptable pain level	mm	35.9	31.4	U=78.0	0.58 NS
Pain at rest	mm	51.0	31.8	U=43.5	0.01 S
Pain on movement	mm	56.9	45.1	U=68.0	0.07 NS
Worst pain scores	mm	66.2	55.9	U=79.5	0.17 NS
Morphine equivalent doses Theatres and recovery	mg	19.7	19.4	U=106.5	0.81 NS
Day of operation	mg	38.6	24.8	U=58.5	0.07 NS
Day 1 after surgery	mg	32.4	4.5	U=38.5	0.01 S
Total since surgery	mg	72.0	29.2	U=44.5	0.03 S
Total number of doses since surgery	n	20	31	--	--
Pain-related interactions Registered nurses	n	22	17	--	--
All staff	n	35	24	--	--
Opening question Have you got any pain?	n	5	3	--	--
Do you want any painkillers?	n	4	7	--	--
Evaluation comments in care plan	n	8	3	--	--

Once again, sample characteristics did not differ but pain scores and some morphine equivalent doses were statistically significant. The most likely explanation for this is the nature of patients on both wards; ward A only admitted major and intermediate surgical patients and ward B cared for those receiving intermediate and minor surgery. Therefore, pain scores and analgesic consumption can be an expected difference. Interestingly, pain on movements and worst pain scores did not differ between the two groups of patients. Ward B gave a greater number of analgesic doses possibly as many patients on ward A were using PCA and epidurals as the primary method of analgesia.

Data amalgamated from wards A and B from hospital four should be considered in light of the different nature of the patients they admitted.

Summary

This section summarised the quantitative differences between participating hospitals in terms of pain scores, analgesic doses, pain-related interactions and evaluation comments in nursing care plans. A number of interesting observations were made about the hospitals with the highest and lowest pain scores but it is difficult to link these differences to each other or organisational factors because of the number of intervening variables influencing individual outcome measures.

In hospitals three and four, two wards were included for different reasons in each hospital and the details of the units are presented in Appendix 9. Where statistical analyses were performed, wards in hospital three did not differ, so it may be reasonable to draw conclusions about practice in the hospital. The type of surgery patients received in hospital four differed between wards, therefore differences between pain scores and analgesic consumption were expected. Data should be interpreted in light of this difference between the two wards.

Section 7.7 Chapter summary

This chapter combined qualitative and quantitative data to present an account of observed and documented nursing care relating to pain management in four hospitals. Two hundred and seventy-six pain-related interactions took place during 778 hours of observation and most exchanges occurred with registered nurses on drug rounds. Intermediate and major surgical patients had more interactions with staff, as did male patients in the sample (although the reason for this latter finding is unclear). Other

interactions were either spontaneous or occurred whilst helping an individual to get washed and dressed. The first questions asked by nurses were predominantly "have you got any pain?" or "do you want any painkillers?" but the proportion of each question varied between hospitals. Staff from hospital two were more likely to ask a question about the existence of pain than simply offer analgesics. Patients gave very limited responses to nurses' enquiries or vague descriptions of pain but staff rarely asked for further information. A low number of interactions referred to the recommended areas of assessment such as intensity, location and quality of pain. Only five nurses used a pain scale during an interaction to formally assess the intensity of pain.

Responses to patients' expression of pain included the administration of analgesics, patient advice or a limited response was made and no action taken. Patients generally appeared reluctant to take medications and a very low number (n=5) specifically requested analgesics. Six participants were particularly proud of coping without pharmacological intervention and staff occasionally reinforced this view. Patients using PCA or epidural PCA were encouraged to use the device and their understanding was verified on occasions. For sixteen patients, their expressions of pain prompted a limited response and this occurred repeatedly for a small number of patients who expressed their frustration during the observation period or subsequent interview. These individuals may have been experiencing learned helplessness but the area requires further investigation.

The study also gave an insight into the discharge process in relation to pain management. Some patients behaved as if expressing pain would delay their discharge from hospital, refusing analgesics during the morning but taking discharge medication before they had left hospital. Patients also received a range of advice regarding

medication and their recovery although some were advised to simply take paracetamol even after receiving opioids overnight for severe pain.

The study illustrated the type of patients that had pain assessment charts as part of their nursing documentation and variations in the number of entries made between hospitals. Two-hourly peaks were shown in the timing of documentations but this may reflect the large number of major surgical patients and the nursing observations that may have occurred at the same time. Participating hospitals largely used pre-written or core care plans to document pain management and a range of problems, goals and interventions were mentioned. Most commonly, the stated aim in nursing documentation was "to relive pain to an acceptable level to the patient" but these levels were not negotiated.

The design of the study allowed the comparisons between observed and documented pain management. Seven entries were made onto assessment charts without discussion and the low number of pain scales used meant that on 92.2% of occasions, nurses were interpreting patients' responses and documenting scores they felt were appropriate. For example, a positive reply of "yes" resulted in 11 documentations of scores between 0-3 (the full range of the scale used in these hospitals). Documentations in care plans were usually made at the end of the shift and reflected the last interaction rather than the patient's pain experience throughout the day. In some cases, the interactions during the day did not appear congruent with documented care.

Finally, this chapter has highlighted the differences between hospitals according to the outcome measures used but a number of intervening variables affect each parameter and data from hospitals that involved two wards needs to be considered in light of these arrangements.

CHAPTER 8

DISCUSSION

Section 8.1 Introduction

This investigation addressed the following aims using a combination of qualitative and quantitative research methods:

- Examine the organisational commitment to improving pain management that may influence nursing care
- Explore patients' pain management experiences on the first postoperative day
- Examine nursing care provided in hospitals with and without a pain service.

Academic enquiry into practice was stimulated because of a lack of detail regarding the organisational changes that have occurred in hospitals, particularly those without acute pain services. In addition, there was a need to investigate the experiences of patients from all surgical groups and the process of pain management, including detection, assessment, analgesic administration and documentation across organisations. This chapter discusses the findings of the study and places them in the context of the literature, highlighting the similarities, differences and areas where the research contributes to new knowledge.

Section 8.2 Organisational commitment to improving postoperative pain management

Postoperative pain management has been the subject of several national reports in England and Wales (RCS and CA, 1990; Audit Commission, 1997; CSAG, 2000) that have each made recommendations to improve care at ward level through organisational changes. The Postoperative Pain Management Questionnaire was sent out three years after the Audit Commission research and subsequent 30-day review of anaesthesia and

pain services, which gave rise to objectives for individual hospitals (Balfe, 1999). The results from the survey provided a detailed picture of organisational changes in the Northern and Yorkshire NHS region since the Audit Commission work.

National surveys have shown that organisational activity has increased in relation to the number of hospitals with a pain service, a named practitioner with overall responsibility for pain management, clinical nurse specialist appointments, education for staff, regular audit, and written guidelines on pain management (illustrated in Table 4.2.1). Only eight (25%) responding to the PPMQ had implemented all of the recommendations from national reports but in comparison to regional data provided by the Audit Commission, there had been increases in every category in the short time between their research and the current survey.

Previous research (Harmer *et al.*, 1995; Windsor *et al.*, 1996; Audit Commission, 1997; CSAG, 2000) had established the percentage of hospitals in the UK providing staff education, conducting regular audits and the number of written guidelines in place but the PPMQ revealed the nature and frequency of these events in one NHS region. A multidisciplinary team delivered staff education in some organisations but 50% of APNs and 25% of anaesthetists were solely responsible for teaching pain management throughout their hospital. PCA, epidural, and general methods of analgesia were the most frequently delivered sessions but less than half explored the physiology (44%) or assessment of pain (48%) with staff. These two areas are fundamental to the management of pain and apply to all patients receiving surgery. However, if one staff member is delivering education for the whole hospital and new analgesic techniques are being introduced to ward areas, PCA and epidural analgesia may be the educational priorities. Staff education is seen as a major strategy to improve pain relief after surgery

in hospitals but the sample had shown variations in both the nature and frequency of education, which may influence care at ward level. Staff were given a free response question to outline the main content of teaching sessions rather than asked to identify specific learning objectives, which may have elicited greater detail regarding the sessions delivered.

Similar to previous research (Audit Commission, 1998b; CSAG, 2000; McDonnell, 2003b), the PPMQ illustrated that the majority of hospitals (93.8%) had written guidelines but the questionnaire also asked about policies and standards. The results highlighted the low number of hospitals (n=9) that had specific standards, especially relating to the assessment stage of pain management. Introducing written standards for care may act as a reference point for monitoring patient experiences through audit methods.

National data have indicated that 89.4% of hospitals (McDonnell *et al.*, 2003b) or 57.1% of those in the Northern and Yorkshire region (Audit Commission, 1998b) conducted regular audit of pain management activities. This had increased to 75% according to respondents to the PPMQ but topic areas varied considerably between hospitals. Only 46.2% of this group audited pain assessment, comfort levels or patient satisfaction. The remaining described PCA/epidural use, side effects, pain service activity, staff attitudes or knowledge. Audit areas appeared to focus on patients supervised by an APS, usually using advanced analgesic techniques such as PCA or epidural analgesia. Audit needs to assess the experiences of surgical patients admitted for a range of procedures and using a number of analgesic modalities. Shortly after the PPMQ had been distributed, the Royal College of Anaesthetists (2000) published a

compendium of audit recipes called *Raising the Standard*. Figure 8.2.1 highlights some of the relevant areas in the document.

Figure 8.2.1. Proposed standards or targets relating to pain management from RCA (2000) audit recipes

Patient information about anaesthesia
100% patients should receive the information about proposed method of pain relief
100% patients should received a leaflet preadmission which includes anaesthetic information

Acute pain services
Education and training of multidisciplinary team (nursing staff targets presented)
100% trained nurses on surgical ward received pain management training in last 5 years
66% of nurses on wards where epidurals are used should have attended epidural training in the last 2 years
100% of nurses had the opportunity to attend

Pain management in the recovery room
100% patients have a pain score <4 on VAS on first waking in recovery after surgery
100% patients have a pain score <4 on VAS within 30 minutes after waking

Patient monitoring on the postoperative ward
100% of units have a follow up service or register of patients receiving invasive methods of pain relief and system for reporting critical incidents arising out of acute pain management
Existence of hospital guidelines for the type and frequency of observations to be documented
% of patient in chosen group whom the documented observations adequately follow the guidelines (target depend on patient group chosen)

Efficacy and safety on the postoperative ward
There should be an APS in the hospital
<7% postoperative patients should experience failure of analgesia in the first 24 hours. In the absence of a nationally agreed pain scoring system, a score above 50% of the scale at two or more four hourly readings constitutes failure. Pain should be assessed at rest and on movement (either coughing or touching the opposite side of the bed)

Patient satisfaction
100% of patients should be satisfied about the information they received (including expectations of pain relief and proposed pain control methods), management of their pain and any side effects
0% of patients would opt for an alternative method of pain relief

Nurses knowledge of acute pain management
100% of trained surgical nurses should achieve a 100% pass rate on questions relating to the management of patients in pain.

These proposed standards could have wide-reaching implications at an organisational and ward level but the guidelines produced suggest that the recipes need to be modified to suit local need and ensure that they are realistic and achievable (RCA, 2000). Therefore hospitals could have a wide range of targets and further work is needed to investigate the uptake of these standards in practice.

The Audit Commission (1997) clearly stated that hospitals without a formal APS would need to make arrangements to ensure that their recommendations are implemented. Those responding to the PPMQ tended to be smaller and gave a variety of reasons for not having formal provision for pain management. Only one hospital had not followed any of the Audit Commission's recommendations. However, two had an identified source of funding and many had implemented up to five of the recommendations including education, written guidelines, audit and a named clinician with overall responsibility. Five out of the seven hospitals had an informal network of professionals with an interest in pain management. Previous research had focused on the activity of hospitals with services but the PPMQ has illustrated that some hospitals without formal teams have systems in place that aim to improve postoperative pain management.

Based on the Audit Commission data, the Northern and Yorkshire NHS region had the lowest number of hospitals with APSs (51%) compared to other regions in the country. However, this study illustrated that a further eight hospitals had established or were in the process of developing a pain service, a statistically significant increase ($p=0.02$). A range of practitioners contributed to services, which were led by consultant anaesthetists or acute pain nurses and all recovery staff in one hospital assisted the team. Ninety-two per cent of services employed a clinical nurse specialist, a higher proportion compared with services nationally (81%; CSAG, 2000). However, these nurses worked an average

of 33.1 (SD 8.71) hours per week or 0.87 whole time equivalents, compared with a national average of 38 hours per week (CSAG 2000) or 1.62 WTE (Audit Commission, 1997). Ten nurses (25.6%) worked on a part-time basis in hospitals in the region and five of these were the only APN contributing to the service. The Pain Society (2002) report highlighted that APNs clearly have a central role in pain services through clinical input, staff and patient education, audit and research. A few respondents in this study described their responsibility for the day-to-day management of the APS but it appears that some are employed for fewer hours than the national average.

Previous research has illustrated the presence of an APS in hospitals but the PPMQ revealed that seven teams (28%) were not funded to cover all surgical areas such as cardiothoracics, neurosurgery, gynaecology and paediatrics. These specialities would include major surgery but the alternative arrangements for patients in these areas were not explored by the questionnaire and require further investigation. Also many had additional responsibilities such as chronic pain outpatient clinics, accident and emergency or cancer pain management. The PPMQ has shown that the majority of hospitals (78.1%) had an APS but provision is variable in some organisations and two did not have an identified source of funding. Nine teams were operating across two or more hospitals and a few respondents commented on the differences in service provision for the other hospitals in the Trust.

All pain teams conducted ward rounds, focusing on individuals with PCA and epidural analgesia although contact varied from once to three times a day with these patients. Many described the difficulties ward staff experienced in contacting appropriate practitioners outside of normal working hours and recent guidelines emphasised the need to ensure back-up arrangements for acute pain management 24 hours a day, seven

days a week (PS and RCA, 2003). The main objectives of services included in the study reflected the original guidance provided in the RCS and CA (1990) report including improving pain management, provision of staff education, regular audit, introducing new analgesic modalities and acting as a resource or source of support for other health care professionals. These core responsibilities are also echoed in guidance from the Pain Society and Royal College of Anaesthetists (2003), which placed additional emphasis on providing "seamless liaison" between healthcare teams responsible for patients, patient education and assisting those experiencing acute pain who are taking analgesics for chronic or cancer pain.

The PPMQ generally showed an increase in organisational activity in the Northern and Yorkshire NHS region, aimed at improving pain management. Many of the questions were based on the Audit Commission research (1997; 1998b) but comparisons between this and subsequent publications (CSAG, 2000; McDonnell, 2003b) are complicated by a number of factors discussed in Chapter four. These include, possible differences in research instruments, sampling methods, professional backgrounds of the recipients and some surveys focus purely on hospitals with pain services. Also, McDonnell (2003a) highlighted that the nature of surgical and hospital provision has changed since some of the original surveys with an increase in day surgery and Trust mergers.

Section 8.3 Patients' experiences in hospital

In Chapter 2, Table 2.6.1 summarised previous research that found 74-90% of patients had experienced some pain after surgery and for 21-63% of patients in UK research, this had been moderate to severe pain (Seers, 1987; Balfour, 1989; Kuhn *et al.*, 1990; Closs *et al.*, 1993; Lloyd and McLaughlin, 1994; Oates *et al.*, 1994; Carr, 2000; CSAG 2000). These studies focused on patients receiving major surgery and largely assessed pain at

rest. All patients in this research project reported postoperative pain but similar to other UK studies, 23.1% had experienced moderate to severe pain at rest (i.e. greater than 50mm on a VAS). Those experiencing moderate to severe pain on movement increased to 38.3% on movement and 61.2% had felt this intensity in the past 24 hours. The statistical difference between patients' pain ratings illustrates that a range of pain measures are needed to gain an insight into patients' postoperative experiences for research and practice.

Similar to previous work (Ohnhaus and Adler 1975; Jensen *et al.*, 1986; Kunst *et al.*, 1996; Briggs and Closs, 1999; Jensen *et al.*, 2002) pain ratings on the VAS and VRS showed moderate to strong correlations between the scales. The mean for moderate pain was 49.8mm and severe pain, 71.1mm, in line with a review of analgesic trial data from 1080 patients (Collins *et al.*, 1997). The authors reported a mean for moderate pain of 49mm and 75mm for severe pain. The current study has shown that mean VAS equivalent of slight, moderate and severe pain was significantly different on rest and on movement. It is unclear if lower scores on movement were due to factors relating to the patient's pain or nature of the VRS scale used (which incorporated measurements on rest and movement). The findings require further investigation to be able to come to a firmer conclusion.

Literature surrounding pain management often advocates the negotiation of pain relief goals with patients (Scott, 1992; McCaffery and Pasero, 1999; Briggs, 2003) but previous research has rarely determined participants' acceptable pain levels. Using the measure does not necessarily mean that a pain-free state after surgery is unrealistic or unachievable but the rating takes into account the patient's own goals and used in practice, may promote communication between staff and patients. Results from this

study showed a significant difference between acceptable pain scores and pain on movement and worst pain scores. However, the mean difference between acceptable and pain at rest scores was only 4.8mm and in fact showed a low but positive correlation. Some patients were using their current pain experiences to determine their acceptable pain scores postoperatively, perhaps illustrating the importance of timing and the need to assess the rating preoperatively. A greater number of patients had difficulty conceptualising an acceptable pain score (11.8% using the VAS; 13.6% using the VRS) than pain now at rest (2.5% using VAS; 4.2% using VRS) or worst pain scores (1.7% for both scales). Whether this difference exists when acceptable pain scores are measured before surgery needs to be explored along with the negotiation of pain relief goals with patients and the relationship with pain expectations.

Age as a factor influencing pain intensity scores was not explored due to the number of intervening variables that may have affected results such as the size of the sample and variations in the type of surgery (major surgical patients were older than intermediate or minor surgical patients). As outlined in Chapter 2, a meta-analysis of experimental research had shown that men had higher pain thresholds and tolerance to experimental stimuli (Riley *et al.*, 1998) but clinical studies have shown no difference in pain intensity between male and female surgical patients (Taenzer *et al.*, 1986; Lynch *et al.*, 1997) or women had experienced higher pain scores (Puntillo and Weiss, 1994; Yates *et al.*, 1998). There was no significant difference between gender distribution and type of surgery or hospitals, therefore it was reasonable to explore gender and pain intensity. In this study, men had slightly higher acceptable pain scores (although not statistically significant) but the remaining ratings did not differ. However, these conclusions are tentative as results may have been influenced by unknown factors or numbers may not have been high enough to detect a statistically significant difference.

Pain scores were explored in individual hospitals and comparing those with and without pain services. Mean acceptable and worst pain scores were similar in both types of organisation but pain at rest and on movement were slightly higher in hospitals with pain services. However, there was no statistical difference between all pain ratings and mean differences could be explained by examining the individual results from hospitals. The lowest pain scores were achieved by a hospital without a pain service and the highest pain scores occurred in a hospital with a service. Very few studies have examined pain ratings across organisations and results available contradict those found here. Traverner (2003) conducted an audit involving 14 hospitals in the Northern and Yorkshire region and the author suggested that pain scores were higher in the two hospitals without an APS but no descriptive or inferential data were presented. Miaskowski *et al.* (1999) included 5837 patients from 23 hospitals in North America concluding that worst pain scores were significantly lower in hospitals with a pain service (who more frequently employed PCA and epidural analgesia) than hospitals without services. However, the authors questioned whether the small variations in scores were clinically significant and differences between UK and North American pharmacology and health care provision hinders the application of results here. The differences between organisations in this study are further explored in Section 8.8.

Similar to previous work (Donovan, 1983; Miaskowski *et al.*, 1994; Nay *et al.*, 1996; Jamison *et al.*, 1997; McNeill *et al.*, 1998; Thomas *et al.*, 1998; Calvin *et al.*, 1999; Sartain and Barry, 1999; Idvall, 2002; Stockwell *et al.*, 2002), this study has shown that patient satisfaction was skewed towards high levels of satisfaction despite high pain scores in some cases. Research has not previously found a link with age, gender, past surgery, pain scores, and perceived helpfulness of staff (Jamison *et al.*, 1997; Devine *et al.*, 1999; Carr, 2000) although Carr (2000) found a low, positive correlation with

effectiveness of analgesics ten days after surgery. In this study, satisfaction appeared to be unrelated to age, gender, type of surgery and individual hospitals but when data were combined, patients were more highly satisfied in hospitals with a pain service. Satisfaction also demonstrated a very low, significant correlation with pain at rest and pain on movement using the VAS but no relationship was found between ratings and morphine equivalent doses (although this measure does exclude non-opioid analgesics).

Patient satisfaction is a complex phenomenon that has been described as having two elements, a cognitive evaluation and emotional reaction that are closely linked to expectations of service care and delivery (Urden, 2002). Given this complexity, as a single measure patient satisfaction may not be a reliable indicator or useful construct in the assessment of patients' pain management experiences. However, it continues to be used to assess quality of care and the "gold standard" for measurement has reportedly not been developed (Carlson *et al.*, 2003). Further work is needed to establish the factors influencing satisfaction and develop assessment tools that adequately reflect the nature of the concept.

Section 8.4 Pain-related interactions

Previous work has examined pain assessment activity through interviews and questionnaires including nurses' knowledge and attitudes but these are poor predictors of behaviour (Ajzen, 1988) and results may not have reflected actual practice and its complexities. A small number of observational studies have investigated pain management activities but the research had a number of limitations; most were outside of the UK, restricted to one organisation and provided a 'snapshot' of care by following one registered nurse rather than exploring the care provided to one patient by a range of

professionals. The research also had a number of methodological issues that were highlighted in Chapter 3.

The current study is based on 778 hours of observation and provides insight into the number and nature of pain-related interactions on the patient's first postoperative day. As expected, registered nurses had the greatest number of exchanges with patients but differences were shown between hospitals (hospital two had nearly double the interactions of other hospitals), the type of surgery received (more exchanges occurred with major surgical patients) and gender (more interactions occurred with male patients). Interactions predominantly occurred on traditional drug rounds and there were a greater number of exchanges during the early shift period. The most likely explanation for this is the occurrence of two drug rounds during this period (around 08.00 and 12-13.00) and one drug round during the late shift period (17-18.00). The final peak period of activity at 20.00 hours was largely associated with nurses asking about pain whilst evaluating and documenting care.

Patients were predominantly asked whether they had any pain or simply offered analgesics and there was an extremely low use of formal pain assessment scales to assess intensity. Similarly, location, quality and the existence of pain on movement were rarely discussed and patients offered this information independently on more occasions than nurses requested it. Albrecht *et al.* (1992) described the phases of pain assessment and management; identifying appropriate cues; interpreting them accurately; considering all the available options, reflecting on reasons to do or not to do an activity and selecting an intervention, action or response. While this reflects the complexity of the decision-making process, pain assessment should not necessarily begin with identifying cues from patients. Regular verbal assessment using a scale to measure the

intensity of pain at rest and on movement, along with the location and quality of pain, should be the start of the pain management process.

The findings of the current study contradict nurses' descriptions of their own practice in previous research which suggested that the majority (75%) would regularly ask a direct question (Dalton, 1989), only assess pain verbally using a scale (Willson, 1992) or use a closed question (Schafheutle, 1999; although this last study included "ok/alright?" as a category). However, these studies did not address the frequency of pain assessment in practice and this research has revealed a very low incidence of formal assessment. Many studies have shown a positive attitude towards the use of assessment tools to accurately describe patients' pain (Fox, 1982; Nash *et al.*, 1993; Lloyd and McLaughlin, 1994; Hunt, 1995; de Rond *et al.*, 2001) but it is unclear why they were not being used in the current study. Waddie (1996) discussed language use and pain expression; drawing heavily on Wittgenstein (1967), the author proposed that patients were silenced if clinicians avoided the language of pain and practitioners are then free to deal with other demands placed on them by patients. The pain management focus of the research would have been revealed if the rationale for behaviours in the current study were explored, which in turn would have influenced future interactions with research participants. However, while motivations of nurse participants were unclear, the observations could be used as a basis to explore the decision-making process with staff in other surgical units.

Nurses asked for minimal information about patient's experience and patients often gave limited responses, were hesitant or gave vague descriptions of pain. This lack of communication and assessment of pain meant that on average only a quarter (25.5%) of interactions led to analgesic administrations but the proportion varied between 10.8-

48.8% in each hospital. Schafheutle (1999, 2001) surveyed 180 urology and vascular nurses about their pain management practices and reasons for not asking about pain during drug rounds. Three categories emerged, respondents did not ask about pain because of patient characteristics (they were asleep, could not communicate or were suspicious of analgesic misuse), perceptions of patients' pain status (judging non-verbal behaviour, postoperative status) and analgesic use (using PCA or epidural analgesia, recently had an analgesic). Schafheutle's results provide a useful insight into practice but further research is needed to ascertain why assessments scales were not being employed, the type of information nurses were using to assess pain and make analgesic decisions. Factors that promote the regular use of assessment tools to inform decision-making and encourage patient participation need to be identified.

Patients generally showed a reluctance to take medication, which was communicated to staff and mentioned during the patient interviews. Reasons behind these beliefs were not explored because of a need to keep the interview brief, due to the patient's stage of recovery. Francke and Theeuwen (1994) interviewed 26 Dutch women who had recently received breast surgery and returned home. They spoke of the inevitability of postoperative pain and a belief that analgesics were bad for their health or they feared addiction. In the current study, some patients were proud that they had not needed analgesics since surgery, staff occasionally reinforced this and one patient was praised for being "good" and not requiring pain relief. Byrne *et al.* (2001) reported similar descriptions by nurses when they were discussing the recovery of children after surgery. In another study, Salmon and Manyade (1996) requested 56 patients receiving minor surgery and 15 nurses to complete several VASs assessing pain intensity, pain-distress, pain coping and the need for analgesics. Nurses were also asked to describe patients as "popular," "dependent," or "demanding," categories formed after the authors' previous

work on nurses' descriptions of patients. Nurses underestimated pain coping ($p<0.001$) and the need for analgesics ($p<0.001$) and those who were in pain, felt distressed or unable to cope were evaluated as dependent. Popular patients were in less pain, were coping better and were less anxious. This work was undertaken with minor surgical patients and it would be useful to explore nurses' perception of patients with a range of surgical groups.

On sixteen occasions, staff took no action or gave a limited response to patients' verbal expression of pain. Four major surgical patients appeared to repeatedly comment about their pain, usually without specifically requesting analgesics but staff did not respond to these expressions. The patients appeared to be experiencing learned helplessness but further work is needed in this area to explore patients' experiences after surgery.

Bird and Wallis (2002) assessed nurses' management of patients with epidural analgesia using an observational tool to assess several areas including pain scores. The study gave an insight into the skills of Australian nurses but the situation involved actors and participants knew the researcher as a nurse consultant in pain management. The scenario may not represent the complexities of practice, which involves caring for several patients. The current study witnessed the care of 40 patients using PCA or epidural modalities across organisations. A standard prescription for PCA was used in all hospitals but epidural prescriptions differed. Patients in hospital one used a patient-controlled epidural and both diamorphine and fentanyl were the opioids of choice. The remaining hospitals used either fentanyl or diamorphine with various strengths of local anaesthetic. Only 13 patients in the study were given epidural analgesia, therefore comparisons between hospitals are not appropriate.

On the first postoperative day, patients were generally encouraged to use their PCA or epidural PCA to provide pain relief or nurses checked their understanding of the system. A small number received conflicting advice about their PCA use from different staff and chose to use it cautiously. In some cases, there also appeared to be an urgency to discontinue PCA or epidurals in the first two days after surgery, which seemed to related to the need for the infusion pump in one case and the mobilisation of patients in one hospital. Smith and Power (1998) described this period between parenteral or epidural opioids and oral medication as the "analgesic gap," an area that has not received enough research attention. The authors described their own practice; an oral regime of controlled-release morphine (based on the epidural or PCA dose used in the previous 24 hours) given on the fourth postoperative day after surgery when these modalities were discontinued. For patients in the current study, PCA or epidural analgesia appeared to be discontinued early and a structured regime, such as the one described by Smith and Power (1998), was not in place. The discontinuation of these analgesic modalities requires further exploration in UK hospitals by investigating policies and the rationale provided by ward staff for early withdrawal of these methods.

The current study also provides an insight into patient discharge in relation to pain management. Patients appeared to perceive pain as a symptom that would prevent them from leaving hospital, therefore refusing analgesics and possibly denying the existence of pain prior to discharge. This misconception may well influence patients' expression of pain following surgery and patients require reassurance that pain will not necessarily delay their discharge.

Half of the patients (n=11) discharged before the end of the observation period were given advice regarding pain management. This included enquires about analgesics

usually taken at home, maximum dose of drugs, preparations containing paracetamol, mobility, driving or side effects. Some patients experienced severe pain overnight and had been given opioids but were advised to simply take paracetamol after returning home, which raises questions about the adequacy of pain relief in this early postoperative period. A recent survey of 250 American patients who had received surgery in a hospital or day case unit, revealed that more patients reported pain after discharge (58% in hospital and 75% after discharge) although the number experiencing severe pain had reduced (Apfelbaum *et al.*, 2003). Patients' pain experiences and methods of analgesia following discharge in the UK warrant further investigation.

The role of health care assistants was also explored in participating hospitals illustrating similar pain-related interactions to registered nurses; encouraging patients to use their PCA, enquiring about the existence of pain and performing nursing observations on the first postoperative day. In some hospitals, care appeared fragmented and task-orientated in relation to pain assessment and reports of pain were not necessarily communicated to registered nurses. Consideration must be given to the role of the HCA in pain management and methods to improve the assessment, documentation and reporting pain experiences of patients. This area is examined further in the next chapter discussing the implications of results for practice.

Section 8.5 Analgesic administration after surgery

Chapter three highlighted the small number of British studies available that have reported prescribed and administered analgesics in the postoperative period. This study examined analgesic administration from the preoperative period to midnight on the first postoperative day, calculating morphine equivalent doses and examining individual drugs. Analgesics given in theatres and recovery did not differ between hospitals or

those receiving different types of surgery (although epidural analgesia was commenced with 13 patients during surgery which were not included in the final calculations). Similarly, on the day after surgery the total morphine equivalent dose was not statistically significant although hospitals did differ on the day of the operation. Post-hoc tests confirmed that this difference lay between the two hospitals that operated an APS who had the lowest (hospital one) and highest (hospital four) doses. However, high PCA use in hospital four may have contributed to this difference. Morphine equivalent doses also showed a low but significant correlation with pain scores at rest and on movement but this may have also been influenced by PCA use.

Previous research has shown that between 82.4-97.0% of patients had at least one prescription for analgesics, usually on a PRN basis (Closs, 1992a; MacLellan, 1997; Carr 2000). In the current study, one hundred and nineteen patients (99.2%) had prescriptions for 282 analgesics and opioid and compound analgesic preparations were the most frequently prescribed combination. Similar to previous work, 86.2% were written up on a PRN basis rather than designed to promote 'around-the-clock analgesia.'

This study has also shown that analgesics continue to be administered through traditional drug rounds although directly comparing peak periods during previous work (Closs, 1992b; Oates *et al.*, 1994; MacLellan, 1997) is difficult because of the different time periods used to present data. Using one-hour slots, this study identified many more peaks of activity than the two, four and eight hour units reported in other research but these were still essentially associated with drug round activity. Analysing the individual administration rates of drugs highlighted that nurses were more likely to give a non-opioid and compound preparations than opioid analgesics. Excluding prescriptions for regular analgesics, patients received between 0-61.3% of prescribed doses compared

with 4-41% provided during other studies (Closs, 1992b; Oates *et al.,* 1994; MacLellan, 1997). However, these studies included drugs that were not prescribed in this study (e.g. papaveretum), which may be due to regional variations or changes in prescription trends for pain management after surgery. These studies also examined practice in one hospital but this research has not uncovered any clear differences in prescriptions across organisations in the region.

Patterns of postoperative analgesic administration did vary considerably between hospitals. Hospital one and two showed a similar number of administrations for all types of analgesics. Hospital three administered a third more than other hospitals and hospital four demonstrated a high number of compound preparations, but low non-opioid use compared with other hospitals. There may have been a variety of reasons for these trends appearing but examining pain-related interactions, the study has shown the low number of patients involved in analgesic decision-making. Therefore, a difference in nurses' drug choice is the most likely explanation but the rationale behind decisions could not be elicited during the study.

Studies that have examined nurses' decision-making have largely used vignettes and one factor (such as age, patient behaviour) has differed between the two scenarios presented. Results have shown that nurses would give higher opioid doses to patients described as showing signs of pain (McCaffery and Ferrell, 1991, 1994, 1997a, 1997b), increased vital signs such as pulse and blood pressure (Chuk, 1999) and male patients (Cohen, 1980). As discussed in Chapter 3, much of this research presents descriptive data and statistical differences between groups were often not explored. Vignettes also restrict the information available to the participant and may not reflect the complex patient situations in practice. Interviews with nurses revealed other factors influencing

decisions including type of surgery, number of postoperative days, prescription and last medication (Cohen, 1980; Murray, 1992; Field, 1996b; Willson, 2000). Cioffi (2002), reviewing the judgements nurses make to inform decisions (e.g. whether a patient is in pain), highlighted previous experiences and knowing the patient were themes identified in all decision-making research. The author also described judgements that were based on certainty (e.g. blood pressure measurement) and less certainty (e.g. general malaise). No objective measure of pain exists and this subjectivity may introduce an element of uncertainty. The resolution to this is to consistently measure pain using an assessment scale to inform analgesic decision-making but nurses in the current study rarely used such a tool. Therefore, their clinical decisions were based on limited information requested, patient responses and other potential factors, including those that have been identified in previous research. The potential for error dramatically increases when nurses are making estimations about probability or inferences based on limited data (Cioffi, 2002). Future research needs to explore the process of decision-making in practice (rather than focus on hypothetical situations) as well as identifying methods of improving judgements made regarding pain management.

Very few previous studies reported the incidence of non-drug methods used at ward level although Carr (2000) had interviewed patients and identified coping methods such as distraction, having a positive attitude and using complementary therapies (acupuncture and arnica). Respondents to the PPMQ were asked to describe the range of analgesic techniques used in their hospital and rank them according to use. Non-pharmacological methods were identified by 46.9% of participants and most commonly ranked fifth. During the second phases of this research, there were no observed incidents of non-pharmacological methods encouraged by nurses or used by patients.

However, this was not an area included in the patient interview and individuals may have been independently using alternative strategies to aid pain management.

Section 8.6 Documentation of pain management activities

Record keeping is a fundamental part of the professional practice that should provide an accurate account of care planned and delivered, promoting high nursing standards and continuity of care (NMC, 2002c). Pain management documentation and the use of pain assessment charts have also been promoted through the national reports on pain after surgery (RCS and CA, 1990; Audit Commission, 1997; CSAG, 2000). Studies that have examined patient records retrospectively revealled that 47-79% of care plans contained evidence of pain management activities (Albrecht *et al.*, 1992; Clarke *et al.*, 1996; Ward and Gordon, 1996). In the current study, the nursing documentation of two patients did not contain any reference to pain management activity and a further nine (all from hospital four) contained a goal to "observe for signs of pain" but no further comments or actions.

Around 80% of nursing records in previous research did not contain pain assessment documentation (Clarke *et al.*, 1996; Malek and Olivieri, 1996) yet 81.3% of respondents from the PPMQ described such records existing in their organisation. The second phase of the research illustrated that half the patients in the study had (59; 49.2%) assessment charts but they were not consistently used across all groups of patients or hospitals. The hospitals with pain services employed specific charts only for patients using PCA or epidural analgesia and hospital three used charts inconsistently across groups of patients. In hospital two, the prescription charts had a pain assessment sheet attached for nearly all the patients involved in the study (n=29). For the whole sample, a high number of documentations on assessment charts occurred up until the end of the first

postoperative day but "no pain" and "mild pain" were the most frequently documented score. Comparisons between documented and reported scores illustrated that documented ratings were skewed towards the lower end of the pain scale and reported worst pain scores skewed towards the higher end of the scale. This suggests that records on pain assessment charts may not adequately represent the patient's pain experiences after surgery. The timing of documentations appeared to show two hourly peaks, perhaps coinciding with nursing observations and reflecting the high number of major surgical patients in this group using PCA of epidural analgesia (n=35).

Previous research has used documented pain assessments to make inferences about assessment activity in hospital. In a Swedish study, Idvall and Ehrenberg (2002) reported 93% (n=160) records containing one assessment but only 14% of patients had one assessment per shift. There are two major criticisms of this research; firstly the authors later described 102 records that included the use of an assessment scale, raising questions over the previously cited figure of 93% and their operational definition of pain assessment. Secondly, it is unclear how asking nurses "if the documentation concerning the patient's pain and treatment concurs with current regulations" influenced results. Nurses were not aware of the pain management focus in the current study in order to minimise the Hawthorne effect on behaviour and documented care.

This study showed a higher number of care plans identifying pain management as a problem (62.5% Vs 34%) than previous work by Briggs and Dean (1998) with 65 orthopaedic patients. However, care plans in this study were pre-printed generic care plans and those that did not identify pain management as a problem were hospitals in the process of introducing critical pathways. The remaining results showed similar themes to Briggs and Dean's work relating to goals for pain management and the plan

of care. One exception is the frequently mentioned target of "alleviating pain to an acceptable level to the patient." Despite this goal, none of the care plans had a documented agreed level. The study also illustrated the differences between the number of comments evaluating pain management in each hospital. Hospital two had the highest number of documentations up until the end of the first day after surgery (n=82) and hospital four the lowest (n=36). Content analysis revealed a number of themes including the documentation of pain scores in care plans (although this only occurred in hospital two) and negative use of language from all organisations. This was commonly expressed as "no complaints of pain" which has been commented on elsewhere (Briggs and Dean, 1998). There was also a frequent use of the term "appears" when describing comfort, pain levels or the effectiveness of analgesic methods, suggesting that nurses were not asking patients about pain or using behavioural cues to make judgements. One of the strengths of this work is the ability to compare observed and documented care.

Section 8.7 Observed and documented nursing care

Previous research had not adequately compared nursing care provided and subsequent documentation. Schafheutle (1999) observed drug rounds by nurses and gave one example of an observed interaction compared to documentation but there was little further discussion surrounding the topic. One of the major contributions of this study is the comparison between observed and documented pain management.

Fifty-eight interactions could be compared to documentations on pain assessment charts and the results highlighted the low incidence of pain assessment using a formal scale and two occasions where the scale used with the patient differed from the scale used to document pain. The lack of assessment illustrated that nurses in all hospitals were interpreting patient responses and documenting a score that they felt matched the

patients' description. Section 3.2.2.2 highlighted the number of studies comparing nurse-patient ratings of pain illustrating the significant differences between scores; a natural conclusion considering the personal nature of pain. In this current study, 92.2% of interactions that resulted in a documented pain score were not associated with using a formal assessment tool. This degree of interpretation may explain why intensity ratings did not necessarily reflect the patient's pain experience after surgery.

Comparisons could also be made between pain management activities during the observation period and nursing care plans, which were usually completed at the end of the shift. Analysis revealed that care plans often reflected the last interactions between nurses and patients rather than patients' experience throughout the day. On the whole care plans contained limited detail and some included pain intensity or location but this was not necessarily discussed during the day. Patients refusing analgesics were always described as having "no complaints of pain." Care plans often made reference to the effectiveness of analgesics but only two had discussed this with patients during the day.

The lack of detail and inaccuracy in documenting patients' pain experiences raises a number of issues. The NMC (2002c) suggested that from a legal standpoint, if care is not documented then it has not been carried out; on twelve occasions (11.1%), patients with assessment charts discussed pain with staff members but a score was not documented and 12 patients (10%) did not have comments relating to pain management in care plans. The current study also questioned the accuracy of most documented scores because of the inferences made by nurses and seven entries did not coincide with an interaction. Documentation needs to reflect the patient's experiences after surgery to demonstrate accountability in the four arenas outlined by Dimond (2002a), accountability to the patient, employer, profession and public (see Table 2.7.1 for more

details). While the NMC (2002b) acknowledged that nurses are personally responsible for their acts and omissions, pain management is a multidisciplinary effort. Strauss *et al.* (1974) suggested that improvements in pain management would not occur without full accountability throughout an organisation. There may even be a need to clarify and document roles in acute pain management in order to highlight responsibilities and develop lines of accountability for the failure of pain relief. However, accountability must occur at all levels of the organisation and issues relating to clinical governance are discussed further in Chapter 9.

Section 8.8 Organisational commitment and effectiveness at ward level

This study for the first time provides a comparison of care delivered at ward level across several different hospitals and variations were shown between organisations. The hospital with the lowest pain scores also had the highest number of pain-related interactions during the observation periods, documentations on both pain assessment sheets and care plans but the least number of analgesic doses administered. This hospital did not have an acute pain service but Section 6.3.1 highlighted a number of organisational factors in place to improve pain management (as measured by the PPMQ) and additional observations included the use of a patient information leaflet and pain assessment chart for every individual. Appendix 9 illustrates the pain management areas audited in each hospital and hospital two specifically examined pain scores, patient satisfaction and the use of assessment charts. The latter audit topic may have encouraged ward staff to enquire about and document pain regularly (although formal assessment tools were not used more frequently) and appeared to be an agenda item for ward meetings. These factors illustrated a number of activities that were occurring at ward level to improve pain management.

The two hospitals with the highest pain scores (three and four) also had a greater number of analgesic administrations or morphine equivalent doses. Findings by Aubrun *et al.* (2003) lend support to this observation as patients with higher pain scores in their study required more incremental doses of morphine to achieve acceptable pain levels (≤30mm on a VAS). However, as discussed earlier, the association between pain scores and morphine equivalent doses is not necessarily a positive, linear correlation and this study suggested a curvilinear relationship. This means that only patients with very high pain intensity levels were receiving the greater amounts of opioids but this result may have been influenced by PCA use rather than nurse-administered analgesics.

Despite the fact that the lowest pain scores were achieved by a hospital without a pain service and the highest score occurred in a hospital with an APS, it is difficult to draw conclusions regarding the two types of organisation. A number of factors affect each of the outcome measures used and hospitals were not an exact match for some organisational and local factors such as staffing levels, skill mix, surgical or anaesthetic technique, which may even vary on a day-to-day basis. Therefore it is inappropriate to draw conclusions about the effectiveness of acute pain services based on this data. McDonnell *et al.* (2003a) recently highlighted the lack of robust evidence available to assess the impact of pain services on surgical outcomes for adult patients suggesting a more pragmatic approach and examination of their impact retrospectively (although no details are given). Investigating the effectiveness of acute pain services is problematic because of the nature and number of changes that occur at many levels, the effect of more than one intervention is being measured and a vast range of intervening variables influence each outcome. Research is further complicated by the increasing number of hospitals establishing APSs, the different models of service employed and difficulties in

designing a quasi-experimental approach. However, research can still contribute to the evidence base in this area and further suggestions are discussed in Chapter 9.

Section 8.9 Summary

This study investigated the organisational improvements in pain management across one NHS region and subsequently followed the care of 120 patients on their first postoperative day. Regional Audit Commission (1997) data showed that acute hospitals in the Northern and Yorkshire region had the lowest number of organisational indicators in some cases (such as a formal APS) compared with other regions in the UK. Following the report and 30-day individual review of anaesthetic services, the PPMQ had illustrated an increase in activity in all these areas but for the first time has shown variations in the nature and frequency of staff education, audit, written guidelines, policies, standards and acute pain services. Arrangements in hospitals without services were also explored and many illustrated that recommendations of the national reports had been implemented.

The observational study conducted in four hospitals examined the care of major, intermediate and minor surgical patients highlighting their pain management experiences, pain-related interactions, prescriptions, analgesic administrations and documentation of nursing care. Differences were shown between hospitals in relation to these areas and pain scores were lower and nursing activity higher in a hospital without a pain service. However, conclusions cannot be drawn about the effectiveness of APSs because of the wide range of intervening variables and local factors were not an exact match between the wards or hospitals.

Some areas showed similarities with previous research (e.g. the number of patients experiencing moderate to severe pain, themes within patient documentation), differences with published data (e.g. number of patients with pain assessment charts) and areas where the work has contributed to new knowledge. The major unique contributions of this research include the detailed exploration of organisational factors, the care of all types of surgical patients from detection to documentation of pain, comparisons between observed and documented care and the inclusion of several hospitals. This was achieved through a mixture of qualitative and quantitative methods that addressed the methodological weaknesses of previous work in the area. The research occurred over ten years after the RCS and CA (1990) report which advocated changes at organisational and ward levels; therefore the study is a timely review of activities and changes in both these areas. The results have a number of implications for the nursing profession and organisation of postoperative pain management.

CHAPTER 9

IMPLICATIONS OF STUDY FINDINGS

Section 9.1 Introduction

This chapter explores the main issues arising from both phases of the study discussing the implications for nursing practice, education, management and research along with wider concerns for the organisational elements of pain management. These recommendations are based on data from several organisations but findings may not be reflective of practice in hospitals across the country and the limitations of the work are highlighted. Finally, conclusions are presented along with a summary of recommendations.

Section 9.2 Implications for nursing practice

The findings of the current study have a number of implications for practice in relation to pain assessment, analgesic administration and documentation of care.

Section 2.2 discussed the importance of using the patient's report of pain during assessment but Anand and Craig (1996) highlighted a weakness of using self-report, it depends on the context, reasons for eliciting pain and the individual's perceived consequence of expression. One of the possible solutions to this is sensitive communication within the nurse-patient relationship and the use of an assessment tool to consistently measure pain. Results from the observational study suggest that there were many incidents where nurses asked about pain but the process of communication could be improved. The majority of pain-related interactions occurred during drug rounds and a request to publicly describe pain may have influenced expression. Nurses need to be aware of both their verbal and non-verbal communication during pain-related interactions.

The limited amount of information about the patient's experience requested by nurses, provided by patients and other potential cues were used to make judgements and clinical decisions. Improvements need to be made in postoperative pain assessment and the process should involve the consistent use of a tool to measure pain and evaluate the effectiveness of analgesia. Pain is being promoted as the "fifth vital sign" to be assessed alongside physiological measurements of blood pressure, temperature, pulse and respiration (PS and RCA, 2003) but this positive campaign, aimed at raising the profile of pain assessments, also creates questions about the timing of events. In participating hospitals, registered nurses appeared to conduct observations when patients returned from theatre but by the first postoperative day health care assistants were predominantly assessing these areas. The study also illustrated the task-orientated approach taken in one hospital with HCAs performing nursing observations, pain assessments, epidural or PCA observations and RNs simply measuring the height of the epidural block. The communication between these two groups of staff was not always clear and patients may continue to feel frustrated if their expressions of pain are not acted upon. The problem of role ambiguity between registered nurses and health care assistants has been documented (Workman, 1996; Thornley, 2000) and tasks undertaken by HCAs depend on the wishes of the organisation and willingness of HCAs (Thornley, 2000). A number of steps are needed to ensure that pain assessment does not completely become the remit of HCAs and communication between staff is improved so that registered nurses are able to act on assessment results. HCAs need to be included in educational sessions delivered by organisations and NVQ training should contain elements of pain management highlighting the role of the HCA. At ward level, policies and guidelines should outline the frequency of pain assessment, include information about the role of various team members in pain management and measures for improving communication between staff. Registered nurses need to still assess pain at regular intervals.

Walker and Campbell (1989, p59) argued, "we must not pretend that the problems of pain are solved by its recognition." Adequate pain management includes effective decision-making regarding methods of analgesia. There was no detectable pattern in relation to how nurses interpreted the level of patients' pain and made subsequent analgesic decisions or choices to withhold medication. Pain is a predictable consequence of surgery and a system of regular or "around-the-clock analgesia" should be promoted.

Each ward also needs to consider the most appropriate method of dispensing medication as patients may wait until drug rounds to request pain relief and asking about pain at this point may not be conducive to an open response from individuals. This also relates to the principle of health care ethics, confidentiality and privacy discussed in Chapter 2; quiet discussions about pain should be made with the patient rather than asking about their experience on an open ward. Drug rounds have long been recognised as a nursing ritual that can hinder individualised care for patients (Walsh and Ford, 1989) but alternative systems exist. Self-medication of oral drugs has been successfully introduced into surgical areas (Jones, 1996) and may serve as a method of increasing the autonomy of patients.

Patients must also be encouraged to play a much more active role in pain management, understanding the benefits of adequate analgesia and taught how to use pain assessment scales used by the admitting ward. The research illustrated that a large proportion of the goals identified in nursing care plans aimed to "relieve pain to an acceptable level to the patient" but this was not specified. Pain relief goals should be negotiated preoperatively with patients and an acceptable pain level agreed to act as a reference point throughout their surgical care (although nurses need to be aware that some patients may have

difficulty with this measure). Also, the RCA (2000) standards and audit recipes (shown in Figure 8.2.1) proposed that all patients should receive an information leaflet prior to admission that contains anaesthetic information and methods of pain relief. These activities should begin as early as possible and pre-admission clinics for surgery may offer the perfect opportunity for this. Comments and behaviours from patients involved in the study suggest that they are reluctant to take analgesics and may feel that having pain will delay their discharge from hospital. Patients need to be aware that this is not necessarily the case and taking analgesics can help prevent pain occurring and aid recovery. Patients should also be encouraged to be involved in the decision-making process regarding methods of analgesia.

The use of pain assessment documentation has been a specific recommendation of the national reports (RCS and CA, 1990; Audit Commission, 1997) but the study highlighted inconsistencies across groups of patients and differences between hospitals. All patients should have a pain assessment chart so that their experience can be accurately recorded throughout their hospital stay. Two elements of practice in hospital two may have contributed to a greater number of interactions and documentation about pain. Nearly all patient records contained charts and staff documented pain scores preoperatively, in recovery and postoperatively on the ward using the came chart. This gives a clearer picture of the patient's pain experience throughout their hospital admission. Secondly, the use of pain charts by nurses was a specific area of practice audited and may have encouraged more exchanges with patients. However, pain assessment tools were not used more regularly in this hospital.

The majority of participating hospitals employed pre-written or core care plans which contained varying amounts of information regarding pain management. Hospital two

were in the process of introducing multidisciplinary integrated pathways (or critical pathways). They have been described as being an approach to managing and documenting care that lists patient problems, interventions and expected outcomes within a specific timeframe (Wilson, 1997). Gordon (1996) used pathways to introduce pain management into most hospital documentation, increasing its visibility and accountability in practice. The author was able to integrate hospital policies and procedures into the document to ensure that they were carried out. Integrated pathways reportedly have a number of benefits (e.g. reducing variation in practice, reducing hospital stay, eliminating duplications between disciplines and promoting evidence-based practice) and the approach is increasingly being used in health care settings (Currie and Harvey, 2000). Each ward needs to take local ownership of the documentation it employs but it must be used regularly to document pain scores and also allow space for the assessment, planning and evaluation of pain management activities.

Some of these recommendations for practice reflect fundamental guidance in nursing texts on pain (e.g. the regular use of pain assessment tools) but many of these elements appear to have not been implemented. Changing practice requires the continued support of nursing education, management and research.

Section 9.3 Implications for nursing education

Pain cannot be assessed accurately through objective methods and has therefore been described as one of the most significant cognitive tasks nurses face (Roberts *et al.*, 1995). Accurately assessing pain using a scale and making decisions regarding analgesic methods is a complex skill that requires a sound theoretical knowledge of pain physiology, assessment strategies, pharmacology, non-drug techniques and management

of specialised analgesic modalities. This knowledge has to be applied using skills of communication, patient education, negotiation, interpretation, decision-making and evaluation. The findings of the study clearly have implications for nurse education at both pre and post-registration levels.

Pre-registration programmes need to ensure that nurses have the knowledge and skills to provide pain management prior to qualifying. As part of university-based clinical skills education, pain assessment should be taught as one of the vital signs in line with current recommendations (Pain Society and Royal College of Anaesthetists, 2003) and part of drug administration. This study highlighted the lack of communication between nurses and patients; therefore teaching should include patient education regarding pain management and techniques for improving pain-related interactions. Educational methods need to prepare practitioners for the reality of practice and the complexity of decision-making required. This may not be achieved solely through traditional methods such as lectures, seminars and tutorials. Problem or enquiry-based learning (an educational strategy that poses a problem to students, using a situation as close as possible to real life, and a student-led approach to learning follows; Towards Unity for Health, 2003; Wilkie, 2000) may offer an opportunity to help student nurses develop the range of skills needed to provide adequate pain management.

When designing curricula, consideration should be given to publications from professional organisations; the IASP (1993) produced guidelines on curriculum content and learning outcomes for schools of nursing delivering basic pain management education. Also, nurse education is assessed by the Quality Assurance Agency for Higher Education (QAA, 2001) who published the *Subject Benchmark Statements for Healthcare Programmes: Nursing.* This document specifically identified pain

management as a core skill for award holders from all nursing branches and the statements will be used to assess the quality of nurse education in the next round of major reviews between 2003-2006 (QAA, 2001). Pain management needs to be a fundamental element of pre-registration curricula.

For qualified practitioners, education has been described as one of the main methods of improving practice in hospitals and a core recommendation of the national reports on pain (RCS and CA, 1990; Audit Commission, 1997; CSAG, 2000). However, the PPMQ illustrated the variation in the nature and frequency of sessions delivered across one NHS region and often individuals were solely responsible for teaching within their hospital. Education needs to be delivered regularly and include techniques of assessment, pharmacology and non-drug methods of promoting analgesia. Many hospitals focused their education on PCA and epidural analgesia and did not include sessions on pain management in the wider surgical population. The findings of the second phase of the project highlighted that pain management strategies need to be improved for all surgical patients and staff education should reflect this.

Creative ways of facilitating learning in all grades of ward nurses need to be considered as the time required for formal sessions may mean that individuals cannot be released from ward environments. Carr (2002) and staff on a surgical unit introduced a number changes that improved pain management including ward-based formal sessions focusing , on problem solving. The author also provided a "tip of the week" that summarised a research article on an A4 sheet and posted it on the drug trolley. Alternative methods of communicating information may assist changes at a local level.

Section 9.4 Implications for nursing management and organisational issues

The work undertaken in this thesis raises a number of issues for nursing management and organisational concerns that apply to the multidisciplinary team involved in improving pain relief after surgery.

The first study took place in a NHS region that had previously shown a low number of hospitals that had made institutional changes to improve pain management (Audit Commission, 1997, 1998b) but a few years later the PPMQ had illustrated increases in organisational activity relating to each of the key indicators including acute pain services. Small variations in activities can be expected as hospitals respond to local need, but the results demonstrated vast differences in aspects such as funding, education, audit and staffing levels of acute pain services. The level of funding was not obtained but two hospitals without a service had an identified source of support and two with an APS were operating without financial assistance. These situations may influence human and physical resources available (such as infusion pumps) to improve pain management. In the second phase of the study, hospital three was the only participating organisation that did not have a clear funding source and this may have influenced care in the ward environment where major surgical patients did not necessarily receive a PCA or epidural and there was no clear documentation for patients using these modalities. Hospital two had funding available and a number of organisational elements in place but there also appeared to be ward activities such as the use of patient information leaflets, assessment charts for all patients and pain management audit results were discussed at regular ward meetings. This hospital, without a pain service, had the lowest pain scores from the participating group. Organisational support needs to be in place to assist pain management and the formation of acute pain services is seen as the "gold standard" for managing pain after surgery

(Brodner *et al.*, 2000). However, local ownership of the changes may help to improve care at ward level.

Regular audit has been advocated by all of the national reports relating to pain management (RCS and CA, 1990; Audit Commission, 1997; CSAG, 2000) to monitor local targets. The PPMQ has shown the low number of hospitals with specific standards (n=9) and variation in audit areas; less than half included pain scores, comfort levels or patient satisfaction. There clearly needs to be an increase in the audit of patients' experiences after all types of surgery. Professional organisations (RCN Pain Forum, 2002) have recently been asked by the Department of Health to develop benchmarks or standards that can be audited to monitor the quality of care. Royal Marsden Pain Benchmark Group (2002) had specifically developed standards because pain was not included in the original set of benchmarks published by the government (Department of Health, 2001a) and the Trent Region Pain Network (2003) have also prepared a document for acute pain services. Benchmarks may help improve the quality of care surrounding pain management but some of the proposed standards focus on documentation as evidence of assessment. The findings of the second study suggested that nurses were not necessarily using pain assessment scales to document pain ratings and audit must also include other methods of establishing the nature of assessment such as observation or asking the patient.

Consideration should be given to developing clear lines of accountability throughout an organisation including the formal documentation of the pain management responsibilities of the multidisciplinary team on the ward. In line with Audit Commission (1997) recommendations, many hospitals had a named clinician with overall responsibility for pain management but it is unclear how this post relates to

accountability within an organisation. The report also outlined the role of members of the acute pain service, clinical directors and chief executives in the implementation of its recommendations, which included the introduction of specific standards about pain relief in contracts with main purchasing bodies. Clearly defining roles and responsibilities may help to develop lines of accountability throughout an organisation in a similar way that all staff are responsible for clinical governance.

Writing on the subject of clinical governance, the Department of Health (1998) suggested that the process could be used to identify weaknesses in postoperative care. Chapter 4 highlighted that the organisational reviews carried out by the Commission for Health Improvement did not always include pain management. However, a number of other developments are occurring at national level that may influence pain management in the future. The National NHS Patient Survey Programme was announced in a major government document on NHS reforms (Department of Health, 1997) and the first acute inpatient survey took place 2001-2002. The questionnaire included a small section on pain, enquiring about its existence and whether hospital staff did everything they could to control it; results were recently published (Department of Health, 2003). In light of the findings of this research project, which indicated high levels of patient satisfaction and positive comments about staff despite high pain scores in some cases, these questions may not reflect the adequacy of pain relief. However, pain management is a fundamental part of this major initiative aimed at improving the quality of NHS care.

The PPMQ highlighted the low number of hospitals in one NHS region with written standards for pain assessment and subsequent management. As highlighted in Chapter 3, pain assessment is part of a health and safety code in California and ratings should be 2 out of 10 or less on a 0-10 scale (Californian Board of Registered Nurses, 2000) but

firm guidance does not exist in the UK. Soon after the PPMQ, the RCA (2000) published their audit recipes suggesting that less that seven per cent of patients should experience failure of pain relief (a score above 50% of the scale at two or more four-hourly readings constitutes failure) but the authors recommended that targets should be set locally. Pain is highlighted in the *National Service Framework for Older People* (Department of Health, 2001c) and Diabetes (Department of Health, 2001b) but standards do not exist for these groups and pain itself is not a health priority in England. The Welsh Office NHS Directorate (1992) did publish standards for pain, proposing that the proportion of patients in severe postoperative pain should be less than 20% by 1997 and 5% by 2002, although it is unclear whether these targets were met. The University of Wales College of Medicine (2003) have highlighted that the *National Service Framework: Tackling Pain in Wales* is due to be published this year and a similar programme across the UK may help to attract funding for pain management and make it a national priority for the British population.

Section 9.5 Implications for nursing research

This study has provided insight into organisational commitment and pain management at ward level but it has also stimulated further questions and nursing research needs to continue into patients' experience after surgery, the assessment of pain in practice, decision-making, analgesic administration and organisation of pain management in hospitals.

Patients' experiences after surgery were only briefly explored because of the stage of their recovery but the research helped to identify areas that need further investigation. In particular, the relationship between discomfort and pain, reluctance to express pain and take analgesics, perceived role in pain management and the possibility of experiencing

learned helplessness. These areas could not be explored in depth using the research methods in the study.

The measurement of patient satisfaction in relation to pain management needs further development to identify factors affecting the outcome measure. It has been described an emerging science (Delbanco, 1996) and the "gold standard" remains undeveloped (Carlson *et al.*, 2003) but it will continue to be used an indicator of quality of care. As discussed earlier, pain management is now a key part of the NHS Patient Survey Programme for acute inpatients, used to provide a Trust, regional and national perspective regarding patient satisfaction. Research needs to aid the development of an appropriate tool to measure patient satisfaction with pain management.

Research methods included the use of visual analogue and verbal rating scales (the latter was similar to the scale used by participating hospitals), which suggested that the VAS equivalent of mild, moderate and severe pain were actually lower on movement than pain at rest. This could have occurred for a variety of reasons and may have implications for future pain research including analgesic trials. Research needs to uncover the reason for this and further explore patients' definitions of mild, moderate and severe pain.

Comparisons between observed and documented care illustrated the extremely low number of nurses using an assessment tool for pain and on the majority of occasions (92.2%), staff were interpreting patients' responses to general questions and documenting scores that they felt were appropriate. Research needs to explore the reason for this and identify factors that will promote the regular use of assessment scales with patients. On two occasions where a tool was used, the score reported by the

patient did not match the documented score possibly because a numerical rating was used (0-10) with the patient and assessment charts required the use of a verbal rating scale, whic included pain at rest and on movement. The reason why the tools on hospital documentation were not used also needs further investigation.

There is also a lack of insight into the judgements and decision-making by nurses regarding pain management and previous studies involving vignettes may not reflect the complexities or pressures associated with practice. An ethnographic approach, which includes non-participant observation and interviews with staff in a ward environment, may offer a more realistic insight into factors affecting decision-making in practice. This can help to identify areas where improvements need to be made and assist educators to build decision-making skills into the curricula (McCaughn, 2002).

The study gave rise to a number of interesting findings relating to the administration of analgesics on the first postoperative day. In participating hospitals, patients did not appear to have a structured regime for the discontinuation of PCA or epidural analgesia and these modalities were occasionally removed as soon as patients were able to tolerate fluid intake or in order to mobilise them the following day. Hospital policy in this area needs to be examined along with the reasons for early discontinuation of these methods by ward staff.

Morphine equivalency was originally published to guide clinicians when rotating opioids in patients experiencing cancer pain but the concept has recently received greater critical attention (MacRae and Sonne, 1998; Anderson *et al.*, 2001; Pereira *et al.*, 2001) and is increasingly being used in acute pain studies to compare groups of patients or newer drugs to morphine. The studies presented in Table 5.7.1 illustrate the

variations on published ratios on opioid equivalency in postoperative pain, therefore this area may benefit from further research, a full systematic review or meta-analysis. More robust evidence may help clinicians in practice when discontinuing PCA/epidural analgesia or changing an opioid because of intolerable side effects. This would also aid research studies when drawing conclusions between groups of patients.

Study findings also raised questions regarding the adequacy of analgesia following discharge. Some patients had been discharged without analgesics or were advised to take paracetamol when they had required opioids overnight. Postoperative pain is a significant predictor of pain one month after surgery and chronic pain development (Thomas *et al.*, 1998; Perkins and Kehlet, 2000), therefore management during this early postoperative period when minor and intermediate surgical patients are discharged is important. Adequate analgesia is required for short and long term clinical effectiveness. Patients' pain experiences and methods of analgesia employed following discharge need to be explored by further research.

The lack of difference between hospitals with and without an APS does not necessarily mean that pain services are ineffective methods of improving pain management. Quasi-experimental or randomised controlled trials of pain services are difficult to achieve and may be affected by intervening variables across organisations such as differences in surgical technique or analgesic modalities used. Through audit and research, APSs need to demonstrate their own clinical effectiveness at ward level for the whole of the inpatient population (rather than focusing on major surgical patients) and regularly measure patient outcomes such as acceptable, current and worst pain scores. Patient satisfaction should be included as an audit item but the limitations of the measure needs to be recognised along with the need for more research in this area. The RCA (2000)

standards and audit recipes offer guidance for organisations and research needs to establish the uptake of these in practice.

Section 9.6 Limitations of the study

This study has a number of strengths and has offered new insights into organisational commitment and pain management provision for a range of surgical patients in four hospitals. However, the boundaries of the research are highlighted in this section including an evaluation of the representativeness of study findings.

Postoperative Pain Management Questionnaire was sent to a relatively small sample in an NHS region where hospitals had the lowest number of organisational activities to improve pain management compared with other regions (Audit Commission, 1997, 1998b). Also, the accuracy of results relied on the information supplied by respondents, in particular, bed numbers and surgical specialities provided. The questionnaire provided some useful information regarding improvements since the Audit Commission (1997) and the variations across one region, but results may not be representative of other regions and therefore cannot be generalised. However, as well as providing insight into hospital activity, the data also provided some useful information for the basis for the second phase of the study.

Previous research has observed care provided by nurses but has given very little consideration to reducing the Hawthorne effect and data collection methods may have even exaggerated this (which included following registered nurses, wearing a white coat and using a head-mounted microphone to record field notes; Schafheutle, 1999; Manias *et al.*, 2002). This study was designed to minimise this effect by ensuring that participants were not aware of the specific topic under investigation, bearing in mind

appropriate forms of dress, position in the room, making notes away from participants and considering the role of the observer and impression management as described by Hammersley (1992). However, it is unlikely that the Hawthorne effect can be eliminated completely and there were a small number of occasions where there was a clear change in behaviour. This included situations where concerns about patients were raised (as discussed in Chapter 5) and a HCA who on the last day of the study had requested to know which was the participating patient. During the day she appeared to spend more time with this particular patient than those with a similar surgical history. On the whole, behaviours did not appear to change significantly and the number of comments regarding "fitting in," "forgetting that your there" and explicit negative attitudes towards pain in some cases, suggested that most staff were comfortable with my presence as an observer.

The cultural background of participants was not assessed as part of the study but there was a noticeable lack of individuals from ethnic minorities in sample. This may have been reflective of the local populations and the research did not aim to assess culture as a factor but its influence on pain expression has been highlighted earlier in Section 2.5.3. It is impossible to assess the representativeness of the sample compared to other regions in the country but it is a recognisable variable that may influence pain management in a ward setting.

The classification by Gould *et al.* (1992) was used to organise patients into minor, intermediate and major surgical procedures and results highlighted many differences between these groups in relation to pain scores and analgesic consumption. It may have been more appropriate to include patients undergoing exactly the same surgical procedures in each hospital but this would have lengthened the time to recruit sufficient

participants and increased the interval between observation periods. An intermittent presence on the ward may have influenced the relationship with staff participants.

For the second phase of this research, data were documented on the observation schedule and in the form of field notes, which gave rise to descriptive frequency data and categories and themes from content analysis. Some of the areas from these two approaches overlapped such as timing of interaction, which served to validate the categories chosen, and act as a checking mechanism for the frequency data. In some cases, the process of content analysis revealed further categories (e.g. interactions during other nursing activities such as washing and dressing) and areas that did not readily fit into the observation schedule such as patient discharge. Using both methods has highlighted areas for further development in the tool but also the benefits of using a mixed methodology to add to the data collected.

The results generated by the project are unique to participating organisations but factors in the hospitals with a pain service may have influenced results. One week before data collection commenced in hospital one, the acute pain nurse left her post and was not immediately replaced. However, anaesthetists from the service continued to visit patients who were using PCA or epidural analgesia. Hospital four had a unique model of acute pain service that employed an acute pain nurse on a part-time basis and recovery staff supported the work of the team by reviewing patients on the ward. Whether these factors influenced results obtained at ward level is unclear. In all cases, the participating hospitals were medium sized, district general hospitals and acute service provision may differ in the larger teaching hospitals. Also, the PPMQ revealed details of the organisational commitment of participating hospitals but these might have

changed between the time of the questionnaire and commencing the second phase of the research.

The research offered insight into pain management between the hours 07.30-21.30 but provides limited information about pain management at night. Also, the observation shifts were not evenly distributed between early and late shifts because of the propensity of minor surgical patients to be discharged on the first day after surgery. Although 47 (39.2%) late shifts were completed, it is unclear whether the higher number of early shifts influenced the results obtained.

The relationship between acceptable pain scores and the other pain ratings were explored in Chapter 6. This correlation suggests that acceptable pain scores should be determined preoperatively and patient expectation examined in more detail. Also, with hindsight, it is recognised that patient satisfaction required further exploration with participants. As outlined earlier, Urden (2002) suggested that the concept has cognitive and emotional elements and therefore a simple Likert scale may not be adequate to assess this construct. Carlson *et al.* (2003) adapted the American Pain Society's Satisfaction Survey, a tool that assesses pain scores (current and worst), pain relief, satisfaction with care provided by doctors, nurses, treatment changes and information provided. Patient satisfaction needs to be part of a more comprehensive assessment of the patient's pain experience.

The inferential analysis of some types of data has been the subject of academic debate and this is reflected in advice provided by textbooks, which can differ. One example of this is the one-way analysis of variance (ANOVA) and post-hoc scores used to determine where the difference lies between the groups. Burns and Grove (2001)

recommend reducing the alpha level in accordance to the number of groups included to further reduce the possibility of a Type I error (the mistaken rejection of the null hypothesis and accepting that the differences between groups are statistically significantly). Conversely, many other authors do not suggest this action when analysing data (Bryman and Cramer, 2001; Urdan, 2001; Fowler, 2002). The results of the post-hoc tests used in this study have been presented without reducing the $p<0.05$ acceptance level therefore must be interpreted in light of the possible increased risk of a Type I error.

Section 9.7 Conclusion

This investigation was stimulated by experiences in practice and a patient who had regular, documented pain assessments but was experiencing severe pain after surgery. Chapter 2 highlights pain management as a basic human right and its importance for ethical nursing practice, clinical effectiveness, accountability, legal issues and clinical governance. A review of the literature revealed a wealth of information available to inform practice, encourage organisational changes (as recommended by national reports) but there was little detail available regarding the nature of these activities or pain management at ward level. In light of the organisational changes, this study aimed to contribute to the research evidence and answer Bourbonnais's (1981) query; whether systematic assessment and management of the patient in pain was part of nursing practice?

The Postoperative Pain Management Questionnaire built on previous surveys and revealed the number of hospitals in one NHS region that had made organisational changes. The research highlighted details of these activities illustrating wide variations in funding available, the nature and frequency of staff education, audit of care and

standards, policies or written guidelines; factors that could influence pain management at ward level. Acute pain services are seen as vehicles for introducing and maintaining changes in practice but different staffing levels and models of service existed and acute pain nurses were employed for fewer hours than the national figure from previous research (Audit Commission, 1997; CSAG, 2000). Hospitals without services had implemented many of the recommendations of national reports.

Two hospitals with a pain service and two without participated in the second phase of the research following the care of 120 patients. The work has made a unique contribution by exploring care across organisations, comparing groups of surgical patients and providing evidence of observed and documented care. This study illustrated variations across organisations in most of the outcome measures. A fairly high number of pain-related interactions occurred between patients and nurses but the content of the exchange was limited and pain assessment tools were rarely used. As a result, documented pain scores were largely interpretations of the patient's response and nursing records did not necessarily reflect the patient's experience. Some of the fundamental recommendations in the nursing literature regarding pain management have not been translated into practice. A number of measures are needed to improve the communication process between nurses and patients and documentation in nursing records.

Previous work had rarely compared different types of organisation. In this study, the lowest pain scores occurred in a hospital without a pain service and a hospital with an APS had the highest pain ratings. However, conclusions cannot be made about the effectiveness of services because the number of variables influencing outcome measures and participating hospitals were not an exact match for some factors. It was evident that

hospital two, with the lowest pain scores, highest number of interactions and documentations, appeared to have organisational support and a number of local activities took place to improve pain management.

During the CSAG (2000) research, (the project took place in 1997), commissioners of health care described "limited added value" for funding pain management and central or local initiatives may take priority. At the time of completing this thesis, standards have been published by professional organisations (RCA, 2000; PS and RCA, 2003), benchmark statements are being developed (RCN Pain Forum, 2002; Royal Marsden Pain Benchmark Group, 2002; Trent Region Pain Network, 2003), pain is part of the national NHS Inpatient Survey Programme (Department of Health, 2003) and one country in the UK will be making pain management a national priority through a published national service framework (University of Wales College of Medicine, 2003). Activity to promote adequate pain management is beginning to happen at a national level.

The challenge for the future is two fold. Firstly, organisations need systems in place for the continued improvement of care that promotes pain as a quality of care indicator, encourages local ownership of developments and accountability at all levels of the organisation. Secondly, nursing practice, research, education and management need to work together to find creative ways of improving the experience of patients admitted for surgery.

Section 9.8 Summary of recommendations

9.8.1 Recommendations for nursing practice

- Patients should be provided with information about pain relief after surgery at the earliest opportunity and encouraged to take an active role in their pain assessment and management.
- Realistic pain relief goals should be negotiated with patients during pre-admission clinics or prior to surgery to ensure their own objectives are met postoperatively.
- Nursing policies should include a reference to the frequency and nature of pain assessment after surgery and document the roles of various team members. Guidelines also need to promote effective decision-making and around-the-clock analgesia.
- Nursing documentation needs to accurately reflect the patient's pain experience throughout their stay and contain areas for recording pain assessment, interventions provided and evaluation of care. The type of documentation will depend on the needs of the surgical unit.

9.8.2 Recommendations for nursing education

- Pre-registration curricula should include recommendations from professional organisations such as the IASP (1993), Quality Assurance Agency (2001) subject statements for nursing and any future benchmarks published for pain management.
- Educational methods should include a variety of techniques that prepare practitioners for the complexities of practice and the level of decision-making required.
- Pain management education within organisations should be delivered regularly and open to all health care staff. Programmes should aim to improve pain

management in all patients admitted for surgery and include creative ways of encouraging learning in the ward environment.

9.8.3 Recommendations for nursing management and organisational issues

- Consideration should be given to clearly defining and documenting the roles and responsibilities of staff throughout an organisation so that clear lines of accountability can be developed.
- Pain assessment and management should continue be a quality of care indicator and a key area of clinical governance. Published standards, audit recipes and benchmarks should be used to assess care delivery.
- Organisational commitment is needed and the recommendations of national reports fully implemented to support activities at a ward level and local ownership of the changes in surgical units.
- Through audit and research, acute pain services need to measure their own effectiveness for all types of patients admitted for surgery who use a variety of analgesic modalities.

9.8.4 Recommendations for nursing research

Future research should include:

- Exploration of patient experiences including the relationship of discomfort and other related concepts to pain, reluctance to express pain or take analgesics, perceived role in pain management and possible experiences of learned helplessness.
- Investigation into the adequate measurement of the construct, patient satisfaction with pain management.
- Further examination of the relationship between pain ratings on visual analogue and verbal rating scales at rest and on movement.

- Investigation into why pain assessment tools, particularly those outlined on nursing documentation, are not being used in practice. Factors that promote the use of tools and effective decision-making need to be identified.
- Examination of the policies and practices of discontinuing patient controlled or epidural analgesic modalities.
- Review the concept of morphine equivalency in acute pain management.
- Exploration of patients' pain experiences after discharge and analgesic methods used.
- Further develop methods of assessing the effectiveness of acute pain services for reducing pain in the general surgical population.

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APPENDIX 1

POSTOPERATIVE PAIN MANAGEMENT QUESTIONNAIRE, STANDARD INTRODUCTION AND COVERING LETTER

Postoperative Pain Management Questionnaire

Thank you for taking the time to complete this questionnaire that forms an important part of my research towards a Ph.D. As discussed, the questionnaire explores provision for postoperative pain management and will take approximately 20-25 minutes to complete. Confidentiality and anonymity are assured.

If you have any queries about the questionnaire or overall research project, please do not hesitate to contact me.

Many thanks again,

Emma Ironside

School of Nursing,
University of Hull,
Cottingham Road,
Hull,
HU6 7RX.

Tel: 01482-466523/465802
E-Mail: E.V.Ironside@nursing.hull.ac.uk

Please provide the following details:

Q1. The total number of in-patient beds in the hospital ☐☐☐☐☐☐

Q2. The number of surgical In-patient beds (excluding day case surgery). ☐☐☐☐

Q3. The surgical specialities within the hospital (please tick all which apply).

Cardiothoracic	☐	Vascular surgery	☐
Ear, nose & throat	☐	Urology	☐
Orthopaedics	☐	Gynaecology/ obstetrics	☐
Neurosurgery	☐	Paediatric surgery	☐
General surgery	☐	Day surgery	☐
Plastic surgery	☐	Other (please specify)	☐ _____

Q4. Approximately, how many surgical procedures take place in a year? ☐☐☐☐☐☐

Q5. Within this hospital, is there a named clinician with overall responsibility for acute pain management ? e.g. anaesthetist or clinical nurse specialist with a interest in the area or leading an acute pain service

Yes	☐ **Please identify the role of the clinician opposite**	Anaesthetist	☐
No	☐	Acute Pain Nurse	☐
Don't know	☐	Surgeon	☐
		Other Professional	☐

Q6. Does this hospital provide an acute pain service or team?

Yes ☐ **GO TO QUESTION 10.**

No ☐ **GO TO QUESTION 7.**

Currently forming a team/service ☐ **Please answer Question 10 onwards, as far as possible, in light of the future service.**

Q7. Is this hospital covered by an acute pain service based in a different hospital?

Yes ☐ **Please specify which hospital below**

_____

GO TO QUESTION 10

No ☐ **GO TO QUESTION 8.**

Q8. Does this hospital have an 'informal network' of professionals interested in pain management? e.g. A pain group or ward link nurses interested in pain.

Yes ☐ **Please describe in space provided below**

No ☐

Don't Know ☐

Q9. Is there a specific reason why the hospital does **not** have an acute pain service? (please tick) **Then go to Question 21.**

No reason ☐

No perceived demand ☐

Lack of funding ☐

Lack of appropriate health care professionals ☐

Other reason ☐ **(please specify)**

Q10. How long has the acute pain service been operating within **this** hospital? (please specify in years and months) ☐☐yrs☐☐mths

Q11. Does the service cover all areas of surgery identified in Question 4?

i.e. Cardiothoracic, ENT, Orthopaedics, Neurosurgery, General, Plastics, Vascular, Urology, Gynaecology/obstetrics, Paediatrics, Day surgery and other areas identified

Yes ☐

No ☐ **Please indicate below the surgical areas not covered**

Don't know ☐

Areas not covered:

Q12. Are there any additional areas of patient care (other than surgery) that the service covers?
e.g. A & E, chronic pain outpatients clinic?

Yes ☐ **Please indicate below the areas covered**

No ☐

Don't know ☐

Additional areas covered by team:

Q13. How many hospitals does this service cover? (please tick one)

- One-this hospital ☐
- Two ☐
- Three ☐
- More than 3 ☐

Q14. Which surgical patients are seen by a member of the acute pain service? (please tick all that apply).

- All patients admitted for surgery ☐
- Patients with a PCA/epidural as a primary method of pain relief ☐
- Patients whose pain control is difficult for ward staff ☐
- Patients are generally not seen by a team/service member, instead ward staff are advised on specific problems ☐ **GO TO QUESTION 16**
- Don't know ☐ **GO TO QUESTION 16**

Q15. Are patients seen on ward rounds carried out by members of the service?

- Yes ☐ **Please describe how often rounds are carried out in the space below.**
- No ☐
- Don't know ☐

Q16. Please indicate the number of health care professionals involved in the acute pain service.

- Acute pain nurse/s ☐☐
- Anaesthetist/s ☐☐
- Physiotherapist/s ☐☐
- Pharmacist/s ☐☐
- Other (Please specify) ☐ _____

Q17. If acute pain nurse/s form part of the team or service, how many hours a week do he/she/they work?

- Nurse 1 ☐☐ hours
- Nurse 2 ☐☐ hours
- Nurse 3 ☐☐ hours

Q18. Are there any ward nurses who act as pain 'link nurses' ?

- Yes ☐
- No ☐
- Don't know ☐

Q13. How many hospitals does this service cover? (please tick one)

- One-this hospital ☐
- Two ☐
- Three ☐
- More than 3 ☐

Q14. Which surgical patients are seen by a member of the acute pain service? (please tick all that apply).

- All patients admitted for surgery ☐
- Patients with a PCA/epidural as a primary method of pain relief ☐
- Patients whose pain control is difficult for ward staff ☐
- Patients are generally not seen by a team/service member, instead ward staff are advised on specific problems ☐ **GO TO QUESTION 16**
- Don't know ☐ **GO TO QUESTION 16**

Q15. Are patients seen on ward rounds carried out by members of the service?

- Yes ☐ **Please describe how often rounds are carried out in the space below.**
- No ☐
- Don't know ☐

Q16. Please indicate the number of health care professionals involved in the acute pain service.

- Acute pain nurse/s ☐☐
- Anaesthetist/s ☐☐
- Physiotherapist/s ☐☐
- Pharmacist/s ☐☐
- Other (Please specify) ☐ _____

Q17. If acute pain nurse/s form part of the team or service, how many hours a week do he/she/they work?

- Nurse 1 ☐☐ hours
- Nurse 2 ☐☐ hours
- Nurse 3 ☐☐ hours

Q18. Are there any ward nurses who act as pain 'link nurses' ?

- Yes ☐
- No ☐
- Don't know ☐

Q19. What are the main aims and objectives of the acute pain service in this hospital?

Q20. Since the development of an acute pain service, what major changes in relation to pain management have been introduced?

Q21. Is there funding specifically available for acute pain management? e.g. for resources such as PCA pumps, specialised staff, or pain service. If so, what is the source of funding? (please tick one)

No funding is available ☐

Main purchasing health authority ☐

Trust (internal funding) ☐

Anaesthetic / surgical directorate ☐

Other source of funding ☐

Q22. Please indicate below the main methods of postoperative pain control used in this hospital by ranking those used, according to frequency of use i.e. 1= most frequently used method, 6=the least used method.

Non-opioid or Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) ☐

Intramuscular/intravenous opioids PRN (as required) ☐

Patient-Controlled Analgesia (PCA) ☐

Epidural infusion/epidural PCA ☐

Non-pharmacological methods ☐

Other (please specify)_____ ☐

Q23. Within the surgical unit, are specific educational programmes or teaching sessions on acute pain management, available for ward based nurses? Yes ☐ No ☐ **GO TO QUESTION 27**

Q24. Who teaches these sessions?

Q25. Please briefly outline the nature and content of the teaching sessions? (please use additional space on the back of this questionnaire if required)

Q26. How often are these teaching sessions run?

Q27. Where do ward staff routinely document care relating to pain management for postoperative patients? (please tick one)

Pain assessment chart	☐
Pain is recorded on a nursing observation (TPR) chart using an assessment tool	☐
Pain is documented in nursing care plans	☐
Pain management is documented on pain assessment charts and nursing care plans	☐
Don't Know	☐

Q28. Within the trust's quality strategy, is there a reference to or specific aims relating to postoperative pain management?

Yes	☐
No	☐
Don't know	☐

Q29. Has this hospital or Trust developed standards, policies or guidelines relating to the following areas? (Please tick all that apply).

	Standards	**Policies**	**Guidelines**	**Don't Know**
Prescription of opioids for postoperative pain	☐	☐	☐	☐
Prescription of non-opioid or non-steroidal anti-inflammatory drugs (NSAIDs) for postoperative pain	☐	☐	☐	☐
The care of patients using patient controlled analgesia (PCA)	☐	☐	☐	☐
The care of patients using epidural/epidural PCAs	☐	☐	☐	☐
Pain assessment, levels of pain experienced by the patient and subsequent treatment	☐	☐	☐	☐
Other areas relating to pain management (please specify below)	☐	☐	☐	☐

_____

_____

Q30. Within this hospital, are there any areas of practice relating to acute pain audited regularly?

Yes ☐ **Please outline in the space provided below**

No ☐

Areas audited: _____

_____

_____

_____

Q31. Please feel free to provide any additional comments or information in relation to acute pain management in your hospital that you think will be useful.

Thank you for taking the time to complete this questionnaire.
Please return it using the stamped addressed envelope provided.

STANDARD TELEPHONE INTRODUCTION

Good morning / afternoon. My name is Emma Ironside and I am currently working within the School of Nursing University of Hull. I am registered for a PhD (Doctor in Philosophy) researching the organisation of pain management in hospitals in the North and Yorkshire region. I am ringing to see if you or a colleague with an interest in pain management would be willing to complete a questionnaire to describe the activity in your hospital

Allow for answer and respond accordingly

Do you have any questions about the questionnaire or wider project?

Allow for answer and respond accordingly

If identified as a hospital Trust with more than one eligible hospital:

Does surgery take place in any other hospital within ****** NHS Trust?

Positive response: Would it be possible to send a questionnaire to a member of staff in that hospital and if so, do you have contact details?

Thank you very much for your help and valuable time. A questionnaire will be placed in the post for you today. Please do not hesitate to contact me if you have any further queries.

COVERING LETTER

Direct Line: (01482) 466523/465802
Email: e.v.ironside@nursing.hull.ac.uk

ADDRESS
DATE

Dear NAME,

Following our phone call today, I would like to thank you for offering to complete the enclosed questionnaire that forms part of my research towards a PhD. The Postoperative Pain Management Questionnaire is being distributed to all hospitals in the Northern and Yorkshire region and while some of the questions focus on acute pain services the survey is aimed at hospitals with and without formal services.

It is estimated that the questionnaire will take 20-25 minutes to complete (it may not be necessary to answer all the questions) and complete confidentiality is assured. I hope that you can commit this time as soon as possible and return it by DATE using the stamped addressed envelope provided. In addition, please fill out the tear off slip below and indicate whether you would like to receive a summary of results when data analysis is complete.

Please do not hesitate to contact me if you have any queries about the questionnaire or overall research project. I am very grateful for your help and look forward to receiving the completed questionnaire.

Yours sincerely,

Emma Ironside

The Postoperative Pain Management Questionnaire was filled out by: (please indicate)

Director of Surgical Services/anaesthetics	____
An anaesthetist	____
Acute pain nurse specialist	____
Other	____

I/we **would/would not*** like a summary of results when data analysis is complete.
*Delete as appropriate

Please supply a name and address below of a nominated person to receive results, if requested.

APPENDIX 2

CLASSIFICATION OF SURGICAL PROCEDURES

Table A1. Classification of surgical procedures (Gould *et al*,. 1992)

Major operations	Intermediate operations	Minor operations
• Aortic aneurysm • Aortobifemoral graft • Amputation (lower limb • Appendectomy • Cholecystectomy • Gastrectomy • Incisional hernia • Laparotomy/bowel resection • Liver/pancreatic surgery • Splenectomy	• Femoral-popliteal bypass grafting • Haemorrhoidectomy • Inguinal hernia • Laproscopic cholecystectomy • Laproscopic diagnosis • Limb perfusion • Mastectomy • Reconstructive breast surgery • Skin grafts	• Breast lumpectomy • Carotid endarterectomy • Circumcision • Debridement of foot • Examination under general anaesthetic • Femoral hernia • Paraumbilical hernia • Superficial surgery • Testicular surgery • Thyroidectomy • Varicose veins

APPENDIX 3

OBSERVATIONAL STUDY: CONSENT FORMS AND COVERING LETTERS

PATIENT INFORMATION SHEET AND CONSENT FORM

An Observational Study of Nurse-Patient Interactions After Surgery

You are invited to contribute to a research study that focuses on the type of communication between nurses and patients in hospital. This research is part of a large project that I have been undertaking, working towards the qualification of a PhD (Doctor of Philosophy) from the School of Nursing, University of Hull. Please read the following information in order to understand why this research is being done and what it will involve. I appreciate you taking the time to consider participating.

The study does not require any special efforts from you but rather your permission for me as the researcher, to observe part of your day and the nursing care you receive after you have had surgery. There are no risks to you as a patient and the care you receive will not differ in any way. Both you and the nurses are ensured anonymity, as names are not recorded.

You have received an invitation simply because you are coming into hospital while the project is being undertaken and 120 patients will be similarly invited. Participants are also entitled to a summary of the results; please ask if you would like a copy after the project has finished. Taking part in the research doesn't benefit you directly but the results of the study may help contribute to nursing research and future patient care.

If you agree to take part in the study you are free to withdraw at any time without giving a reason. Similarly you may decline to participate in the study without suffering any repercussions or displeasure.

Summary and Frequently Asked Questions...

- **What will the researcher (Emma Ironside) do?**
  I will sit in the same room as you and the other patients, out of the way, on one morning or afternoon following your operation.

- **What do I need to do while the researcher is there?**
  Nothing. I'm observing what naturally happens in hospital. The care given to you by the nurses will NOT differ because I'm there. With your permission at the end of the day, it would be useful to look through the nursing notes (kept at the end of the bed) to see how much information the nurses have written down.

No personal information will be recorded from the notes. It would also be helpful if we could spend a few minutes discussing how you feel you day has been.

- **Who benefits from the results?**
  Depending on the results, future nurses may learn more about some aspects of communications with patients.

- **When the results are written up, will everyone know that I have taken part?**
  No. Your name and the names of the nurses are not written down on information relating to the study. It is completely anonymous.

- **Will the nurses have agreed to take part?**
  The nurses on the ward will have also received an invitation to participate. Permission will have also been sought from the consultant looking after you.

- **If I don't want to take part, what do I do?**
  No repercussions will occur as a result of you not wanting to take part. Simply sign the consent form indicating this. Similarly, you agree to take part and change your mind, you have the right to withdraw at any time without any repercussions, displeasure or effect on your nursing care.

- **What do I need to do now?**
  Once you have read this information leaflet (and re-read it if necessary) carefully consider whether you wish to take part. If you have any further questions, please do not hesitate to ask me. Following this, I would be grateful if you could complete the consent form attached indicating whether you wish to take part.

Thank you for your time and contribution.

Name of the researcher: **Emma Ironside**
Telephone: 01482 466523 / 465802
Date and time of the researcher attending:

An Observational Study of Nurse-Patient Interactions After Surgery

Consent Form

Please could you complete the following (circle your answer):

1) Have you read the information sheet? Yes\No

2) Have you had opportunity to ask questions and discuss the study? Yes\No

3) Have you received satisfactory answers to all your questions? Yes\No

4) Have you received enough information about the study? Yes\No

5) Do you understand that you are free to withdraw from the study:

- At any time
- Without having to give a reason for withdrawing
- Without affecting your future nursing or medical care Yes\No

6) Do you agree to participate in the study? Yes\No

Signed.....Date.....

Name in Block Letters.....

Signed (Researcher).....Date.....

STAFF INFORMATION SHEET AND CONSENT FORM

An Observational Study of Nurse-Patient Interactions After Surgery

You are invited to contribute to a research study that focuses on the communication between patients and nurses in hospital after surgery. This research is part of a large project that I have been undertaking, working towards the qualification of a PhD (Doctor of Philosophy) from the School of Nursing, University Of Hull. Please read the following information in order to understand why this research is being done and what it will involve. I appreciate you taking the time to consider participating.

The study does not require any special efforts from you but rather your permission for me as the researcher to observe part of your day caring for a specific number of patients after they have had surgery.

You have received an invitation because all nurses on this ward have been invited to contribute. Permission to conduct this study has been given by ***** Research Ethics Committee, your Director of Nursing, the ward consultants and ward manager. Over the study period, around 120 patients will be invited to participate (30 patients from each of the four hospitals involved, over a period of 8-12 months).

Taking part in the research doesn't benefit you directly but the results of the study will help contribute to nursing research and patient care. All participants, nurses and patients, are also entitled to a summary of the results and feedback when the project has finished. Please ask if you would like a copy. Both you and the patients are ensured anonymity, as names are not recorded.

If you agree to take part in the study you are free to withdraw at any time without giving a reason. Similarly you may decline to participate in the study without suffering any repercussions or displeasure.

Summary and Frequently Asked Questions...

- **What will the researcher (Emma Ironside) do?**
  I will sit in the room with the patients, out of the way, on one morning or afternoon on the first day following the patient's operation. With permission from yourself and the patient, it would be useful to look at the nursing care plans at the end of the day and discuss with the patient how their first day was. No personal information will be recorded from the notes.

- **What do I need to do while the researcher is there?**
  Nothing. I'm observing what naturally happens in hospital and how patients and nurses interact.

- **Who benefits from the results?**
  Depending on the results, future nurses may learn more about some aspects of communications with patients.

- **When the results are written up, will everyone know that I have taken part?**
  No. Your name and the names of the patients are not written down on information relating to the study. It is completely anonymous.

- **If I don't want to take part, what do I do?**
  No repercussions will occur as a result of you not wanting to take part, simply sign the consent form indicating this. The researcher will not be present on the ward during your shift. Similarly, you agree to take part and change your mind, you have the right to withdraw at any time without any repercussions or displeasure.

- **What do I need to do now?**
  Once you have read this information leaflet (and re-read it if necessary) carefully consider whether you wish to contribute to the study. If you have any further questions, please do not hesitate to ask me. I will be present on the ward at the times described in the attached letter or call me on the number below. To indicate your decision, I would be grateful if you could complete the consent form attached and return it in the reply box in a sealed envelope.

Thank you for your time and contribution.

Name: **Emma Ironside**
Telephone: 01482 466523 / 465802
Dates and times of Emma attending will be posted in a communal staff area

An Observational Study of Nurse-Patient Interactions After Surgery

Consent Form

Please could you complete the following (circle your answer):

1) Have you read the information sheet? Yes\No

2) If desired, have you had opportunity to ask questions and discuss the study? Yes\No

3) If yes, have you received satisfactory answers to all your questions? Yes\No

4) Have you received enough information about the study? Yes\No

5) Do you understand that you are free to withdraw from the study:

- At any time
- Without having to give a reason for withdrawing Yes\No

6) Do you agree to contribute to the study? Yes\No

Signed.....Date.....

Name in Block Letters.....Designation.....

Signed (Researcher).....Date.....

Please feel free to retain the information sheet. Return this consent form, sealing the envelope provided, to the reply box on the ward.

Thank you.

LETTER TO STAFF PARTICIPANTS

Tel: 01482-466524 / 465802

Email: E.V.Ironside@nursing.hull.ac.uk

NAME AND ADDRESS

DATE

Dear ******,

Re: Observational Study of Nurse-Patient Interactions After Surgery

I am a Registered Nurse studying for a PhD within the School of Nursing at the University of Hull. I am writing to invite you to contribute to a research study I am hoping to carry out, involving staff and patients from ***** ward. The study is taking place in 3 other hospitals, involving 120 patients and around 200 nurses. Please find enclosed an information sheet about the study. I would be grateful if you could spend a few minutes reading it to decide whether you wish to help with the research. I realise that there may be questions you wish to ask; therefore I shall around on the ward at the following times:

DATE 13.00-15.00
DATE 13.00-15.00

Alternatively, please do not hesitate to contact me on the numbers above, or leave a note for me on the ward.

I would be extremely grateful if you could complete the form attached to the information sheet (sealing the envelope that this letter was contained in) and place it in the reply box in the staff room by DATE. The study will be carried out mostly on day shifts and hopefully commencing DATE.

Thank you for your time and valuable contribution. I look forward to receiving your reply and meeting soon.

Yours sincerely,

Emma Ironside

LETTER TO SURGICAL CONSULTANTS

Direct Line: 01482-466524 / 465802
Email: E.V.Ironside@nursing.hull.ac.uk

NAME AND ADDRESS
DATE

Dear *****,

Re: Observational Study of Nurse-Patient Interactions After Surgery

I am a registered nurse currently studying for a PhD within the School of Nursing at the University of Hull. I am writing to request your permission to involve some of the patients under your care, in the study described above. The study focuses on aspects of communication between nurses and patients after surgery. Participants (both nurses and patients) are not required to make any special efforts, but rather their permission to observe part of their day. Patients will be those admitted for elective surgery, able to read, speak and understand English and give written consent. 30 patients in total will be recruited from ***** ward and they will be invited to participate the day before their surgery. I have enclosed a patient information sheet giving more details.

The study is taking place in 4 hospitals involving 120 patients and around 200 nurses. Permission to conduct the study in this hospital has been given by ***** Local Research Ethics Committee, the Director of Nursing and WARD MANAGER NAME. If you have any questions about the study, please do not hesitate to contact me on the numbers above, or leave a note for me on the ward.

To indicate your decision, I would be extremely grateful if you could complete the slip overleaf and place it in the reply box on ***** ward by DATE.

Thank you for your time and contribution. I look forward to receiving your reply and perhaps meeting in person soon.

Yours sincerely,

Emma Ironside
Lecturer

I give my permission for the study to include patients under my care ☐

I do not give my permission for the study to include patients under my care ☐

Signed.....Date.....

Name (block capitals).....

APPENDIX 4

OBSERVATION SCHEDULE AND OPERATIONAL DEFINITIONS OF CATEGORIES

Patient Code:.....Age:.....Sex:..... Type of Surgery.....Classification..... Date:..... Period of Observation: .....

	Assessment									Tools						Timing				Clinical Decision					
TIME	NO PAIN	OFFERED ANALG	INTENSITY	LOCATION I	LOCATION II	QUALITY	ONSET DURATION	Factors causing\ affecting pain	Effects of pain	NONE	VERBAL 0-10 0-5 ADJ	VAS	BODY CHART	OTHER	Rest (R) ___ Rest & move-ment (RM) ___ RM and coug-hing (RMC)	DRUG ROUND	PATIENT REPORT	AFTER ANALG	SPONTANEOUS	NONE	Oral ANALGESIA	IM/IV ANALGESIA	Non PHARMACOL.	Pt ADVICE	MDT MEMBER or APS
A																									
B																									
C																									
D																									
E																									
F																									
G																									
H																									
I																									
J																									

A

B

C

D

E

F

G

H

OBSERVATION SCHEDULE OPERATIONAL DEFINITIONS

General definitions and instructions

- The term nurse refers to any registered nurse, student/cadet nurse or health care assistant
- The term patient refers to the research participant who underwent surgery the previous day
- The term pain refers to "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of that damage" (IASP 1979 p 250). The terms discomfort, ache or comfort may also be related.
- The schedule should be used as a checklist and each category ticked

PAIN ASSESSMENT

No Pain

Definition	In response to question by a nurse, the patient indicates that they are not experiencing any pain
Example	Nurse: Have you got any pain? Patient: No, not really.
Additional notes	Refusing analgesics does not indicate that the patient is pain free.

Offered analg

Definition	The patient's pain is not assessed by the nurse but they are offered analgesics
Example	Nurse: Would you like some painkillers? Patient: No, thank you, I don't think so.
Additional notes	Alternative phrases: analgesics, tablets or injection for pain.

Location

Definition	The nurse requesting the patient to describe or point to the area on their body where they are experiencing pain or the patient indicating the area of pain. Location I-Refers to pain at the surgical site Location II-Refers to pain experienced other than the surgical site
Examples	Nurse: Where is your pain? Patient: Just where the bandage is. Patient: Nurse, I have this pain in my chest Nurse: What sort of pain is it? What does it feel like? Patient: A sharp stabbing pain that goes round to my back.

PAIN ASSESSMENT CONTINUED...

Intensity

Definition	The nurse asking the patient about the level of pain they are experiencing. May be as simple as "How bad is the pain?" or involve a numerical, adjectival rating or use of a visual analogue scale. Alternatively, the patient using his or her own words to describe the intensity of pain.
Examples	Nurse: Can you tell me how bad your pain is on a scale of 0-10? or Patient: I'm sorry, the pain is really severe.

Quality

Definition	The nurse asking the patient to describe the type of pain experienced or the patient using their own words to describe the type of pain.
Examples	Nurse: How would you describe your pain? Is it dull, sharp, throbbing etc? Patient: The pain is a really sharp pain across my stomach.

Onset/Duration

Definition	The nurse asking the patient to indicate the approximate time the pain began or the length of time he/she has been experiencing pain. Patient describing the time their pain started or how long they have been in pain
Examples	Nurse: When did the pain start? How long have you been in pain? Patient: I have been in pain for hours. It started about 10 o'clock.

Factors Causing\ Increasing Pain

Definition	The nurse asking the patient about any factors that have a positive or negative influence on the intensity of pain experienced or patient describing these factors.
Examples	Nurse: What increases your pain? What relieves your pain? Are you in pain when you move or get out of bed? Patient: It only hurts when I sit up or cough. It feels better when I lie on my left side.

The Effects of Pain

Definition	The nurse asking the patient to describe any repercussions of experiencing pain or the patient expressing these repercussions.
Examples	Nurse: Does the pain make you feel...nauseous/weak/tired/ lethargic/angry/depressed/anxious? Patient: The pain is making me feel really sick/tired etc.

TOOLS	
Verbal Tools	
Definition	The nurse asks the patient to rate the intensity of pain using a list of adjectives or numbers, given verbally or in written form.
Examples	Would you describe your pain as "none," "mild", "moderate", "severe" or "very severe?" "How would you rate your pain on a scale of 0-10?"
Visual Analogue Scale	
Definition	The nurse asking the patient to rate the intensity of pain by marking or indicating on a 10cm, vertical or horizontal line.
Body Chart	
Definition	The nurse asking the patient to mark, draw or point to the area of pain using an outline of a human body.
Rest, Movement and Coughing	
Definitions	**R** The nurse asks the patient to describe their pain only at rest **RM** The nurse asks the patient to describe their pain at rest and upon movement **RMC** The nurse asking the patient to describe their pain at rest, upon movement and coughing

TIMING	
During a Drug Round	
Definition	The nurse asks the patient about any aspect of their pain, while giving out prescribed medications from the drug trolley to a number of patients.
After the Patient Reports Pain	
Definition	The nurse asks the patient about any aspect of their pain after the patient has verbally expressed that he/she is experiencing pain.
After Analgesics	
Definition	The nurse asks the patient about the any aspect of their pain after a period of time has elapsed since the administration of analgesics (usually 30-60 mins).
Spontaneous	
Definition	The nurse asks the patient about any aspect of their pain during a period of nursing care other than those activities described above.

CLINICAL DECISION

None	
Definition	The nurse takes no action or intervention to promote analgesia.
Oral Analgesics	
Definition	The nurse administers analgesic tablets or an oral solution of to the patient.
Injection	
Definition	The nurse administers analgesics via intravenous or intramuscular injection
Non-Pharm.	
Definition	The nurse encourages patient to use non-pharmacological methods e.g. imagery, distraction, touch, massage, TENS etc.
Patient Advice	
Definition	The nurse encourages the patient to use PCA/epidural PCA or gives advice about pain management
MDT member or APS	
Definition	The nurse contacts another member of the multidisciplinary team or acute pain service for advice or to review the patient.

APPENDIX 5

DOCUMENTATION DATA COLLECTION TOOL

1. Assessment Charts

Observation period: E / L

Pain assessment chart ☐ TPR chart ☐ No pain documentation ☐ (if none, proceed to section 2)

		Assessment							Clinical Decision / Action						
	Time	NO PAIN OR ASLEEP	INTENSITY	RATING	LOCATION I	LOCATION II	QUALITY	ONSET/DURATION	NONE	Oral ANALGESIA	IM /IV ANALGESIA	NON PHARMACOL	Pt ADVICE	MDT CONTACTED	Other / Comments/
*															
*															
*															
*															
*															
A															
B															
C															
D															
E															

*Documentation prior to observation period Assessed Nausea Y/N Assessed Sedation Y/N

- Other factors documented (effects, factors affecting, additional tools used)

2. Drug Chart

Returned from theatre:_____

	Drug (Prescribed)	Amount (Prescribed)	Route	Freq.	Times administered				

Ward analgesics

1									
2									
3									
4									

PCA/EIA	Bolus:	Background:	Lockout:	Total since op: 24hrs:
MEU:		**MS oral**	MS Parenteral	NSAIDs

3. Care Plans

Core care plan (pre written)	
Handwritten care plan	
Critical pathway	

- Description of the problem.

3a.Assessment

- Identified as a problem? Y/N
- Problem No. _____

- Assessment tool to be used identified? Y/N
- Details_____
- Acceptable level of pain agreed? Y/N

Location: Care Plan / Chart

3b. Planning

- Goal described

- Plan of care

3c. Evaluation

Date Time Comments

APPENDIX 6

INTER-RATER AND INTRA-RATER RELIABILITY SCORES

Table A2. Inter-rater reliability: observation schedule and documentation data collection tool

	Observation schedule		Nursing documentation	
Case	Proportion of agreement %	Kappa coefficient K	Proportion of agreement %	Kappa coefficient K
1	95.8	0.91	97.5	0.93
2	95.8	0.89	98.5	0.93
3	95.8	0.91	93.6	0.84
4	95.8	0.90	99.0	0.95
5	89.3	0.80	98.0	0.93
6	95.8	0.90	98.5	0.94

Table A3. Intra-rater reliability: Observation Schedule

	Month													
	June 00		July 00		Aug 00		Sept 00		Oct 00		Nov 00		Dec 00	
Case	%	K	%	K	%	K	%	K	%	K	%	K	%	K
1	100	1.00					100	1.00						
2			95.8	0.90					100	1.00			100	1.00
3					100	1.00					100	1.00	95.8	0.92
4			100	1.00			100	1.00			91.7	0.82		
5	95.8	0.91												
6					100	1.00			100	1.00				

	Month													
	Jan 01		Feb 01		Mar 01		Apr 01		May 01		June 01		July 01	
Case	%	K	%	K	%	K	%	K	%	K	%	K	%	K
1	100	1.00							100	1.00			100	1.00
2					100	1.00			100	1.00				
3	95.8	.91					95.8	0.92						
4					95.8	0.91								
5			95.8	0.91							100	1.00	95.8	0.91
6			100	1.00			100	1.00			100	1.00		

% = Percentage agreement between pre study coding and monthly intervals
K= Kappa coefficient

Table A4. Intra-rater reliability: Documentation Data Collection Tool

	Month													
	June 00		July 00		Aug 00		Sept 00		Oct 00		Nov 00		Dec 00	
Case	%	K	%	K	%	K	%	K	%	K	%	K	%	K
1	98.0	0.95					98.5	0.96						
2			100	1.00					100	1.0			100	1.00
3					96.5	0.91					96.6	0.91	99.5	0.98
4			99.0	0.96			99.0	0.98			99.0	0.96		
5	98.5	0.95												
6					100	1.00			99.5	0.98				

	Month													
	Jan 01		Feb 01		Mar 01		Apr 01		May 01		June 01		July 01	
Case	%	K	%	K	%	K	%	K	%	K	%	K	%	K
1	99.0	0.97							98.5	0.96			99.0	0.97
2					100	1.00			100	1.00				
3	98.5	0.96					98.5	0.96						
4					99.0	0.96					99.0	0.96		
5			99.0	0.97							99.5	0.98	100	1.00
6			99.5	0.98			99.5	0.98						

% = Percentage agreement between pre study coding and monthly intervals

K= Kappa coefficient

APPENDIX 7

STRUCTURED PATIENT INTERVIEW

PATIENT INTERVIEW SCHEDULE

Thank you for letting me observe part of your day, it has been very useful to learn more about patients' experiences in hospital after they have had an operation. Is it possible to spend approximately ten minutes discussing certain aspects of your care such as the pain you have felt before and after surgery?

1. Did you have any pain prior to coming into hospital?
   Details:

2. Have you had any pain since the operation? YES / NO
   Location:

3. Could you rate the intensity of your pain using these scales?
   USE LAMINTED CARDS

VAS (mm)	**VRS:**
Acceptable:	Acceptable:
Now at rest:	Pain now:
Now on movement:	Worst pain:
Worst pain:	

4. How satisfied have you been with the pain relief you have received since your operation? Please choose from the list of words below:

Very dissatisfied	**Dissatisfied**	**Don't know**	**Satisfied**	**Very satisfied**

5. Do you have any other comments about your pain management in hospital?

Thank you very much for all your help today. With your permission, it would be useful to examine what information nurses have written down today (names or personal information are not recorded).

LAMINATED ASSESSMENT CARDS

Acceptable pain levels*= A pain level that you are most comfortable at, any more than this and you would like some pain relief.

1. Please drawing a cross on the line which illustrates the intensity of your pain:

No Pain

Worst Pain Imaginable

2. Please choose the words that best describe your pain:

No Pain

No pain at rest, slight pain on movement

Slight pain at rest, moderate pain on movement

Moderate pain at rest, severe pain on movement

Severe pain at rest and on movement

---

* Two further laminated cards contained the following headings

Card 2
Pain now at rest = pain intensity when you are in laid still in bed or sat out in the chair
Pain now on movement=pain intensity when you cough, move or touch the other side of the bed

Card 3
Worst pain= the worst pain intensity you have experienced in the last 24 hours

APPENDIX 8

CONTENT ANALYSIS OF FIELD NOTES AND PAIN-RELATED INTERACTIONS

Table A5 Themes and categories identified from pain-related interactions and field notes

Major theme	Themes	Categories Minor categories	
Non-verbal communication	**Behaviour during interaction**	**Drug round** Trolley as a barrier (98) Distance from patient (117) Public enquiry (67) Raised voices (57)	**Being with the patient** Sitting next to patient on bed or chair (8) Crouching below level of patient (2) Standing with patient (5) Unseen or behind drawn curtains (38)
	Patient expression of pain	**Detecting non-verbal expression** Nurses noticing non-verbal expressions (6) Patients showing non-verbal signs of pain (31)	**Reactions to public expressions of pain** Behaviour of other patients (3) Behaviour of visitors (2) Drawing the curtains (3)
Pain-related verbal interactions	**Pain assessment**	**Use of a scale** 0-3 (1) 0-10/1-10 (3) VRS (1) Patient using 0-10 scale unprompted (1)	**Nurses' requests for descriptions of pain** Intensity (5) Location (4) Quality (3) On movement (6)
	Nurses enquiring about the existence of pain	**Initial questions** Have you got any pain? (42) Do you want painkillers? (34) How is your pain? (15) Is it sore / painful? (12) Have you had any painkillers? (6) Leading questions (5) Other questions (37)	**Timing of interaction** Drug round (137) Spontaneous (35) Washing and dressing (30) Writing in care plan (19) After analgesic administration (6) Patient reported pain (5)
		Patient responses Limited responses (31) Hesitancy / not really (17) Patients' alternative words for pain (15) Descriptions of intensity (39) Patients described: Location (17) Quality (8) Pain on movement (8) Pleased not needed analgesics (6) Patient requests for analgesics on drug round (5)	

Table A5 *Continued…*

Major theme	Themes	Categories Minor categories	
Pain-related verbal interactions	**Responses to expression of pain**	**Analgesic decisions** Simply dispensed (37) Given choice of drug or route (5) Nurses making final decision (7)	**Further questioning** Use of a scale (1) Effectiveness of previous analgesia assessed (3) Used the PCA handset? (11)
		Patient advice Analgesics before moving / getting washed / drain removal (4) Persuaded to take analgesics (3) Saving analgesics until bedtime (5) Using PCA handset (22) Conflicting advice-PCA (2)	**Limited response or no action** To be expected (2) Ok / right (2) You will have to move / cough (3) Other responses (6) Repeatedly reporting pain / learned helplessness (3)
	HCA or student interactions	**HCA** Role in nursing observations (14) Enquiries about existence of pain (9) Using a scale (1) Encouragement to use PCA (4)	**Student** Enquiries about existence of pain (5) Using a scale (1) Encouragement to use PCA (2) Patient discharge advice (2) Effectiveness of previous analgesia (1)
	Patient discharge	**Prevention of discharge** Refusing analgesics until given discharge drugs (2) Discharge when pain free (1) Reported going home when nurses asked about pain (2) Staff attitudes (1)	**Patient advice** Painkillers usually taken at home (11) Take paracetamol at home (7) Orders from pharmacy (3) Maximum doses (6) Other preparations containing paracetamol (5) Mobility/lifting/driving (4) Side effects (2) Contacting GP (2)

Table A5 *Continued…*

Major theme	Themes	Categories Minor categories	
Pain-related verbal interactions	**Bedside handover**	**Pain discussed during handover** Patient described pain or effect of analgesics (3) Staff wrote on notes (3) Asked if given painkillers (2) Staff attitudes (1)	
	Negative attitudes	**Explicit verbal expressions** Pain expected in hospital (4) Taking analgesics (2)	
	Discontinuing PCA / epidural analgesia	**PCA** Encouraging patients to take oral analgesia (1) Device needed for others (1) Adverse effects (2)	**Epidural** Turning down background infusion (5) Encouraging patients to take oral analgesia (1) Nursing patients flat (3)
	Pain as a source of humour	**Patients and pain** Pain caused removal of dressings/drains (2) PCA handset use (1)	

Figures in brackets relate to the number of times category appeared in field notes and pain-related interactions

EXAMPLE OF CODING PROCESS

Table A6 Examples of how field notes and pain-related interactions contributed to themes and categories

Data extract	Categories	Theme/s
Patient 07 Nurse giving discharge advice sat with him on side of the bed Interaction Ns: Your body will tell you when you are ready to get back to doing things. Do you have any painkillers at home? Pt: Yes, I've got some Paracetamol, will that do? Ns: Yes, we usually say, take what you normally do at home.	**Being with the patient** Sitting next to patient on bed or chair **Patient advice** Painkillers usually taken at home (11) Take paracetamol at home (7)	Behaviour during interaction Patient discharge
Patient 82 Field notes 08.20 Drug round Open drugs trolley placed at the end of patient's bed. Nurse stood behind trolley looking at drug chart whilst asking patient about pain. Patient did not hear, she looked up and repeated her question in a louder voice. Pain-related interaction Ns: Have you got any pain today Theresa? Pt: Sorry dear? Ns: Pain? Have you got any pain? Pt: A bit, not much, mostly when I move. Ns: We'll give you some painkillers before you get up and dressed. Pt: Ok then.	**Drug round** Trolley as a barrier Distance from patient Public enquiry Raised voices **Initial questions** Have you got any pain? **Timing of interaction** Drug round **Patient advice** Analgesics before moving / getting washed	Behaviour during interaction Enquiries about the existence of pain Responses to expression of pain

APPENDIX 9

COMPARATIVE DETAILS OF SURGICAL UNITS

Table A7. Comparative details of surgical units

	Hospital 1 Ward 1	Hospital 2 Ward 2	Hospital 3 Ward 3A	Hospital 3 Ward 3B	Hospital 4 Ward 4A	Hospital 4 Ward 4B
No. of hospital beds	406	369	403		353	
Hospital surgical specialities	Breast Colorectal General Gynaecology Orthopaedics	Breast Colorectal General Gynaecology Orthopaedics	Breast Colorectal General Gynaecology Orthopaedics Urology		Breast Colorectal ENT General Gynaecology Orthopaedics	
Acute pain service	YES	NO	NO		YES	
Education available for staff	Physiology of pain Pharmacology PCA session Epidural session	Pain management study day Epidural session PCA session	PCA session Epidural session		PCA session Epidural session Non-pharmacological methods Spinal cord stimulation	
Audit areas	Pain scores Orthopaedic patients	Patient satisfaction Use of assessment charts Incidence of side effects	Pain scores Patient satisfaction		Respondent described auditing practice regularly but no specific areas identified	

Table A7 *Continued…*

	Hospital 1 Ward 1	Hospital 2 Ward 2	Hospital 3 Ward 3A	Hospital 3 Ward 3B	Hospital 4 Ward 4A	Hospital 4 Ward 4B
Observation weeks	10	10	11		12	
WARD DETAILS No. of beds	27	22	28	28	29	15
Accepts emergency admissions?	NO	YES	NO	YES	YES	NO
Shift patterns	Early:07.15-14.45 Late: 14.15-21.45 Night:21.30-07.30	Early: 07.30-17.00 AM: 07.30-13.30 Late: 12.15-21.45 PM: 15.45-21.45 Night:21.15-07.45	Early:07.15-15.00 Late: 13.15-20.45 Night:20.15-07.30		Early:07.00-15.00 Late: 13.40-21.40 Night:21.20-07.20	
Nursing pattern	Team nursing Two teams	Team nursing Two teams Patients also had primary and associate nurse	Team nursing Two teams	Team nursing Two teams	Team nursing Two teams	Team nursing Two teams
Nursing Documentation	• Care plans (pre-printed) • Epidural/PCA care plans and assessment chart	• Care plans (pre-printed) and critical pathways • Pain assessment charts for all patients, epidural assessment charts	• Care plans on an intranet • Pain assessment charts available		• Care plans • Epidural/PCA assessment charts	

APPENDIX 10

PERMISSION LETTERS

ELSEVIER
SCIENCE

Health Sciences

1-3 Baxter's Place
Leith Walk
Edinburgh
EH1 3AF

tel - 0131-524 1747
fax - 0131-524 1720

29 July, 2002

Ms. Emma Briggs
Dept of Nursing and Applied Health Studies
University of Hull
Cottingham Road
Hull

HU6 7RX

Dear Ms. Briggs,

SUBJECT: COPYRIGHT CLEARANCE FOR THESIS:

fig 5.1, ch 5, Textbook of Pain, Churchill Livingstone, 0443062528

Thank you for your letter requesting permission to use the above material.

We are happy to grant permission for this use of our material provided that:

1. complete credit is given to the source, including the Churchill Livingstone copyright notice

2. the material to be used has appeared in our publication without credit or acknowledgement to another source

3. if commercial publishing should arise, you must contact us again to clear copyright

We understand that microfilm publication of your thesis and abstract may be a requirement of your university under an agreement made with University Microfilms, Inc (UMI) and we agree to distribution of your thesis by UMI. We would point out, however, that no permission is granted for other sale of this material.

Yours sincerely,

Catherine Johnson
Permissions & Copyright Executive
Churchill Livingstone, Mosby, WB Saunders, Baillière Tindall

AUDIT
COMMISSION
Promoting the best use of public money

Emma Ironside
Graduate Teaching Assistant
The University of Hull
Faculty of Health
School of Nursing
Cottingham Road
Hull HU6 7RX

13 September 1999

REF: LMc\corres\sep99et_eironside

Dear Ms Ironside

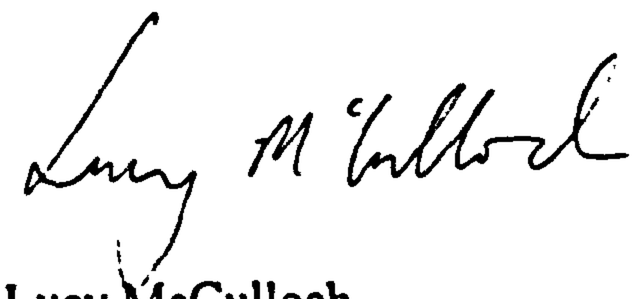
POSTOPERATIVE PAIN SERVICES DATA

Thank you for your letter of 6 September 1999 asking for my permission to publish the data I gave you last year.

You have our permission to publish the data we gave you, but we must insist that you don't publish the identity of the trusts or hospitals in the database. Please could you confirm in writing that the trusts' identities will not be published.

I look forward to hearing from you.

Yours sincerely



Lucy McCulloch
Research Associate
Direct line: 0171 396 1257
Email: lmcculloch@audit-commission.gov.uk