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ADEQUACY OF POST CAESAREAN SECTION PAIN MANAGEMENT AT THE TIME OF DISCHARGE AT AN ACADEMIC HOSPITAL

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A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree

Of

Master of Medicine in the branch of Anaesthesiology

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DECLARATION

I, Makhosazana Dlamini, declare that this research report is my own work. It is being submitted for the degree of Master of Medicine in the branch of Anaesthesiology at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

Signature

Signed at: University of the Witwatersrand, Johannesburg

On this date:

DEDICATION

In memory of my father

Sibongile George Dlamini

1947 - 2011

ABSTRACT

Introduction

Adequate analgesia post caesarean section accelerates ambulation, improves patient outcome, reduces maternal morbidity, and facilitates early infant care. Clinical practice guidelines for post caesarean section pain management, if successfully implemented and adhered to, should improve quality of care and patient pain outcome. Current trends are moving towards earlier discharge of patients post caesarean section. The aim of this study was to determine whether guidelines used for post caesarean section pain management adequately controlled their pain at the time of discharge which was approximately 48 hours postoperatively at Chris Hani Baragwanath Academic Hospital (CHBAH).

Method

This was a prospective, contextual, descriptive study. Convenience sampling was used and 91 patients were enrolled after informed consent was obtained. At discharge patients pain was measured using a Visual Analogue Scale score and the patients' pain management was documented.

Results

The majority of patients, 41 (45.05%), were primiparous, 57 (62.64%) patients had no previous caesarean section and 87 (95.60%) had received spinal anaesthesia. The mean length of stay post caesarean section was 43.48 (SD 7.52) hours, with a minimum of 29 and a maximum of 66 hours. Of the 91 patients, 54 (59.34%) patients had a score <40 mm which was adequate pain control and 37 (40.66%) patients had a score ≥40 mm, which was inadequate pain control. The departmental clinical practice guidelines for post caesarean section pain management were correctly prescribed for all patients; however none of the patients received pain management as recommended by the guidelines. One (1.10%) patient received only 1 dose of omnopon, 23 (25.27%) patients received 2 doses, 65 (71.43%) received 3 doses and 2 (2.20%) received 4 doses. Seven (7.69%) patients received no indomethacin and 13 (14.29%) received no paracetamol. The secondary objective comparing adequacy of pain control with parity was not statistical significant (p=0.8321).

Conclusion

Pain medication was not given according to the pain management guidelines, even though it was prescribed correctly. At the time of discharge however, more than half of patients had adequate pain control despite receiving less pain medication than recommended by the guidelines. Education regarding pain management could result in patients receiving better pain management.

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CHAPTER 1

Overview of study

1.1 Introduction

In this chapter an overview of the study is given. This includes the background, problem statement, aims and objectives, research assumptions, demarcation of study field, ethical considerations, research methodology, significance of study, validity and reliability and a study outline.

1.2 Background

Pain is a complex, multidimensional symptom resulting from a combination of tissue damage and nociception, previous pain experience, personal beliefs, culture and mood. This explains why patients who undergo the same type of surgery can differ widely in the report of their pain experience. Because there is no objective measure of pain, it is believed that patients' report of pain reflects their personal pain experience. The Visual Analogue Scale (VAS) is commonly used in research for assessing the level of pain, and is validated for this purpose. Although the use of pain scales is necessary for documentation purposes, the clinical assessment of pain should always include asking patients to describe their pain and their pain experience. (1)

No “gold standard” has been established for post caesarean section pain management. There are plenty of options and the preferred method is determined to some extent by availability of drugs, resource limitations, regional and individual choices, and financial considerations. “An ideal post caesarean analgesic regimen would be one that is cost-effective, simple to implement and with minimal impact on staff workload. It would provide consistent and high quality pain relief, while catering for wide inter-patient variability but have a low incidence of side-effects and complications. It would not interfere with the maternal care of the newborn or with the establishment of breastfeeding and there would be minimal drug transfer into breast milk and no adverse effects on the newborn. In this regard, a multimodal approach

based on opioids is commonly recommended." (2) The consensus is that a multimodal regimen for management of post caesarean section pain is the method of choice. Studies conducted in this field focused on the multimodal treatment regimens (1, 3, 4), and did not evaluate the effectiveness of these regimens. No studies evaluating the treatment regimen or the effectiveness conducted in South Africa could be identified.

Due to the absence of conclusive data on the length of postoperative stay, the American Academy of Paediatrics and the American College of Obstetricians and Gynaecologists have issued standards for discharge. "These professional groups stated that 'when no complications are present, the postpartum hospital stay ranges from 48 hours for vaginal delivery to 96 hours for caesarean birth, excluding the day of delivery'." (5, 6) This is in contrast to the practice of routinely discharging post caesarean section patients at 48 hours at Chris Hani Baragwanath Academic Hospital (CHBAH). There are studies that have reviewed the safety of early postpartum discharge (7, 8), which mainly focused on maternal and neonatal outcomes. Studies that measure the level of pain at the time of discharge post caesarean section have not been identified.

1.3 Problem statement

Adequate analgesia post caesarean section accelerates ambulation, improves patient outcome, reduces maternal morbidity, and facilitates early infant care (9). Regardless of developments in postoperative pain management, adequate pain relief and satisfaction are still insufficient for some post caesarean section patients. This is due to limitations from adverse effects of analgesic medication or methods, as well as individual differences (4). Clinical practice guidelines for post caesarean section pain management, if successfully implemented and adhered to, should improve quality of care and patient pain outcome.

At CHBAH the guideline for managing post caesarean section pain is multimodal, using opioids, non-steroidal anti-inflammatory agents as well as paracetamol for the first 24 hours. The patients are discharged routinely around 48 hours

postoperatively. It is not known whether the current practice provides adequate pain management for caesarean section patients at the time of discharge.

1.4 Aim

The aim of the study was to determine whether the guidelines used for post operative pain management in caesarean section patients were adhered to and if pain was adequately controlled at the time of discharge at CHBAH.

1.5 Objectives

The following objectives were used in this study.

The primary objectives of this study were to:

- document adherence to the pain management guidelines
- determine if patients' pain relief at discharge was adequate using a VAS score
- describe the pain management received by the patients

The secondary objectives were to compare level of pain at discharge with parity.

1.6 Research assumptions

The following definitions were used in this research.

Adult patient: a patient 18 years or older.

Caesarean section: a surgical incision into the uterus to extract a foetus and in this study this may be done under a general anaesthetic or spinal anaesthetic. No caesarean section was done under combined spinal-epidural.

Routine discharge post caesarean section: at CHBAH this is at approximately 48 hours after the caesarean section.

University of the Witwatersrand (Wits), Department of Obstetrics and Gynaecology Guidelines: guidelines used at CHBAH for management of post operative pain in caesarean section patients. The guidelines stipulate the following prescription for the first 24 hours.

- Omnopon 20 mg intramuscularly 4-6 hourly
- indomethacin suppository 100 mg 12 hourly
- paracetamol 1g orally 6 hourly
- ibuprofen 400 mg orally 8 hourly may be used instead of indomethacin (9, 10).

Omnopon: It is a trade name for a combination drug contained in a 20 mg ampoule, Morphine HCl 13.44mg/ml, Codeine HCl 1.04 mg/ml, Papaverine HCl 1.20 mg/ml and Ethyl alcohol 6.44 %v/v

Indocid: Another name used for Indomethacin suppository

Visual Analogue Scale: VAS is a validated pain measurement scale. The scale is presented as a 100 mm line, anchored at either end by verbal descriptors, “no pain” and “worst imaginable pain”. The patient is asked to make a vertical mark on the 100 mm line to indicate their pain intensity. The score is measured from the zero anchor to the patient’s mark. When the patient’s score is measured using a millimetre scale, it will provide 101 levels of pain intensity (11).

Pain at discharge: is the patients’ level of pain at time of discharge as marked by the patient on a VAS. In this study adequate pain management is a score of less than 40 mm and inadequate pain management is equal to or greater than 40 mm (12).

1.7 Demarcation of study field

The study was done in the postoperative obstetric ward at CHBAH. CHBAH is a central hospital, occupying approximately 173 acres (0.70 km2), with 2888 beds and about 6 760 staff members. In the obstetrics unit, 500 to 600 deliveries are done per week and about 35% of these are caesarean sections. It is a teaching hospital

affiliated to the University of the Witwatersrand Medical School, Faculty of Health Sciences, located in Soweto, South Africa. (13)

1.8 Ethical considerations

Permission to conduct the study was obtained from the relevant authorities.

Patients that met the inclusion criteria were identified and invited to take part in the study. No identifying data was collected from patients.

The study was conducted in adherence to the principles of the Declaration of Helsinki (14) and the South African Good Clinical Practice Guideline (15)

1.9 Research methodology

1.9.1 Research design

A prospective, contextual, descriptive research design was used.

1.9.2 Study population

The study population was postoperative adult caesarean section patients and their' files.

1.9.3 Study sample

The sample size was calculated in consultation with the biostatistician. Convenience sampling was used in this study. Inclusion and exclusion criteria for the study were defined.

1.9.4 Data collection

The researcher went to the relevant postoperative ward on a daily basis after the doctors' ward round, to identify the patients for discharge on that day and suitable patients were invited to participate in the study.

The VAS was explained to patients prior to them marking the 100 mm line indicating their present level of pain. The researcher then collected other relevant information from the patient files.

1.9.5 Data analysis

Descriptive and inferential statistics were used to analyse the data

1.10 Significance of the study

A distinctive problem specific to caesarean section in comparison to other major laparotomies is the eagerness, but also the necessity for a hastened and safe interaction between patients and their infants soon after delivery. Postoperative pain is a major impediment to achieving this objective. Although it is acknowledged that postsurgical pain treatment relies on the subjective nature of the patient's pain perception, post caesarean pain has some predictable characteristics. (16) However, several reports continue to emphasize that the quality of acute or postoperative pain relief is relatively poor, and that a large proportion of patients experience moderate to severe pain after surgery (17, 18).

It was not known whether caesarean section patients' level of pain is adequately controlled at the time of discharge at CHBAH. The results from this study have given insight into the pain management of post caesarean patients and steps can be taken to ensure more effective pain management.

1.11 Validity and reliability

Measures were taken to ensure the validity and reliability of this study.

1.12 Study outline

The following chapters are presented in the study.

Chapter 1	Overview of study.
Chapter 2	Literature review.
Chapter 3	Methodology.
Chapter 4	Results and discussion.
Chapter 5	Summary, limitations, recommendations and conclusion.

1.13 Summary

In this chapter an overview of the study was given. In the following chapter the literature review is presented.

CHAPTER 2

Literature review

In this chapter a review of the literature is presented and includes pain definitions, physiology of pain, assessment of pain, pain control post caesarean section and patient satisfaction.

2.1 Pain definitions

“Pain is defined by the International Association for the Study of Pain (IASP) as an unpleasant sensory and emotional experience, associated with actual or potential tissue damage or described in terms of such damage” (9). It is classified according to a few variables, including its duration (acute, chronic), its physiologic mechanisms (physiologic, nociceptive, neuropathic), and its clinical context (postoperative, neuropathic, malignancy related) (19).

Acute pain is a result of damaging tissue injury, generally lasts for a brief period, and is associated with temporal decrements in intensity (19). “Acute pain include somatic, visceral, and referred. Somatic pain is superficial, coming from the skin or subcutaneous tissues. Visceral pain originates in the internal organs and linings of the body cavities. Referred pain is felt in an area distant from the site of the stimulus, it occurs because the area of referred pain is supplied by the same spinal segment as the site of stimulus” (20).

Chronic pain may be defined as pain persisting for 3 to 6 months or exceeding the expected duration of healing (19).

Physiologic pain is defined as a non-injurious discomfort that is rapidly perceived. It is caused by a brief exposure to a noxious stimulus such as touching a hot object (19).

“Nociceptive pain is defined as a noxious perception resulting from cellular damage following surgical, traumatic, or disease related injuries”. It is also known as

inflammatory pain because superficial inflammation and inflammatory mediators play significant roles in its commencement and progression. The enormity of tissue injury and release of inflammatory mediators is generally proportional to its severity (19).

“Neuropathic pain is defined by the International Association for the Study of Pain as pain initiated or caused by a pathologic lesion or dysfunction in peripheral nerves and central nervous system” (19).

Understanding the pain pathways and neurochemicals involved in acute pain processing is important for optimisation of acute or chronic pain management.

Pre-emptive analgesia is treatment or an analgesic regimen initiated before the onset of a noxious stimuli (e.g. surgery), in order to reduce the sensitisation of the peripheral and central pain pathways caused by transmission of pain signals evoked by tissue damage. It has the potential to be superior in effectiveness compared to a similar analgesic treatment initiated after surgery. (21, 22)

Caesarean section pain is a form of acute nociceptive pain and can be adequately managed using multimodal analgesic approach.

2.2 Physiology of pain

In order to understand the importance of pain we must understand the physiology of pain.

2.2.1 Pain pathways

A brief discussion of physiology of pain, pathways, mediation and modulation of pain, as well as the perception of pain follows. Pain is transmitted along three neuron pathways that transfer noxious stimuli from the periphery to the cerebral cortex, (23) as illustrated in Figure 2.1. “Primary afferent neurons (first order) are located in the dorsal root ganglia, which lie in the vertebral foramina at each spinal cord level. Each neuron has a single axon that bifurcates, sending one end to the peripheral tissues it innervates and the other into the dorsal horn of the spinal cord. In the dorsal horn,

the first order neuron synapses with a second order neuron whose axons cross the midline and ascend in the contralateral spinothalamic tract to reach the thalamus. Second order neurons synapse in thalamic nuclei with third-order neurons, which in turn send projections through the internal capsule and corona radiata to the post central gyrus of the cerebral cortex." (24). This is illustrated in Figure 2.2.

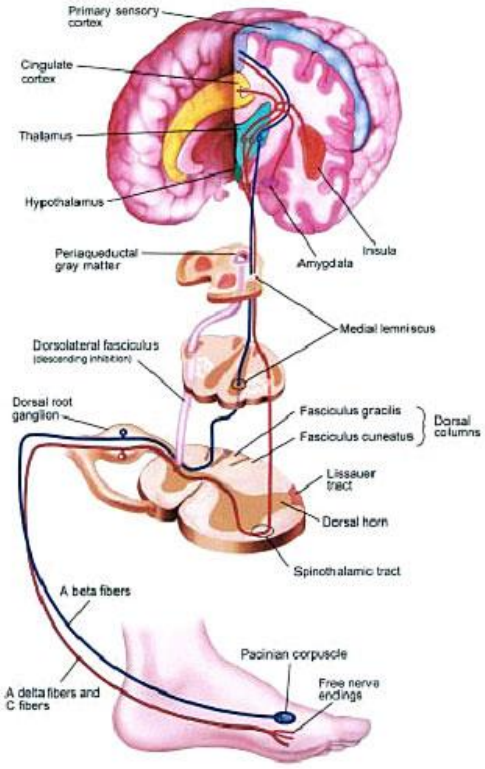

Figure 2.1 Physiological pathways of pain (25)

Nociceptors are mostly a bundle of nerve fibres (nerve endings) that run to various organs and tissues of the body and sense heat and chemical tissue injury." There are three different types. Polymodal mechanoheat nociceptors are the most prevalent and respond to excessive pressure. Mechanonociceptors respond to pinch and pinprick. Silent nociceptors respond only in the presence of inflammation. These can further be classified according to their anatomical location, namely, cutaneous, deep somatic, and visceral nociceptors."(24)

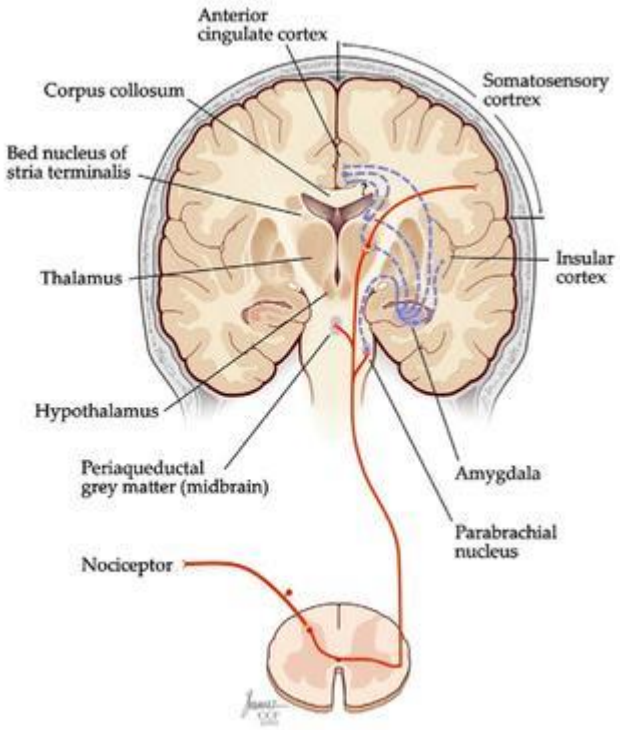

Figure 2.2 Basic pathway of nociception to pain matrix (26)

There are two main categories of nociceptors, namely, Aδ fibres (10 to 20%), which are thinly myelinated and conduct mechanothermal stimuli, and C fibres (80 to 90%), and these are unmyelinated and are polymodal. The Aδ and C fibres are high threshold fibres. First order neurons interact considerably with other afferent neurons together with second order neurons (interneurons) and descending fibre endings. Second order neurons are divided into “wide dynamic range” neurons and high threshold neurons (nociceptive specific). The wide dynamic range neurons, when stimulated, discharge in response to tactual non noxious stimuli. (27)

2.2.2 Mediation of pain

Several neuropeptides and excitatory amino acids function as neurotransmitters for afferent neurons conducting pain. Many neurons, if not most, have more than one neurotransmitter, which are co-released simultaneously. Substance P and calcitonin gene-related peptide (CGRP) are the most important of these peptides, and glutamate is the most important excitatory amino acid. (24)

2.2.3 Modulation of pain

Modulation of pain occurs peripherally at the nociceptor, in the spinal cord, or in supraspinal structures. It can either aggravate or impede pain (24). Peripheral sensitisation is simply the process through which transmission of a painful signal reaches the spinal cord out of proportion to or in the absence of a noxious stimulus (28). In central sensitisation there is an imbalance toward excitation at the dorsal horn of the spinal cord between excitatory and inhibitory ascending and descending pathways. Central sensitisation causes a secondary hyperalgesia. (28) The clinical term hyperalgesia and the process of neural sensitisation describe an aggravation of acute nociceptive pain and unpleasantness in response to sensations that normally would not be perceived as painful (19).

“Hyperalgesia defines a state of increased pain sensitivity and enhanced perception following acute injury that may persist chronically. The hyperalgesic region may extend to dermatomes above and below the area of injury and is associated with ipsilateral (and occasionally contralateral) muscular spasm or immobility. Hyperalgesia may be observed following incision, crush, amputation and blunt trauma.” (19)

Primary hyperalgesia is increased pain sensitivity at the traumatised site related to superficial release of intracellular or humoral noxious mediators. Secondary hyperalgesia is exacerbated pain sensitivity at adjacent, uninjured sites related to changes in excitability of spinal and supraspinal neurons. (19)

Unusual sensations associated with hyperalgesia are:

- “Hyperpathia (increased or exaggerated pain intensity with minor stimulation)
- Allodynia (non-noxious sensory stimulation is perceived as painful)
- Dysesthesia (unpleasant sensation at rest or movement)
- Paresthesia [unpleasant often shock-like or electrical sensation precipitated by touch or pressure.” (19)

To deal with pain, the body also has built-in chemical mechanism. “The fibres in the dorsal horn, brain stem, and peripheral tissues release neuromodulators, known as

endogenous opioids (endorphins and dynorphins), that inhibit the action of neurons that transmit pain impulses (29) and are responsible for pain relief." There is individual variability when it comes to endorphin levels; therefore different people experience different intensity of pain.

2.2.4 Perception of pain

There is an inter-individual difference in how patients respond to acute pain, including postoperative pain. Acknowledgement of the qualitative factors of the pain grievances from the patients can help direct the health care worker in distinguishing between pain levels and therefore treat each type of pain accordingly. (19) Although the pain experience is intricate and impacted by a number of variables, pain perception and behaviour associated with pain are influenced by the sociocultural background of the individuals experiencing the pain (30).

2.3 Assessment of pain

Clinicians often underestimate pain, although recommendations and pain assessment guidelines are in place. Pain rating scales can be utilised to ascertain the severity of pain experienced by the patient. (31) These scales have an important place in clinical practice. The major influence to successful pain management is dependent upon patients' ability to use the tools at their disposal, and the diligent interpretation of the scores by the health care personnel (11). There are four commonly used scales namely: VAS, Numerical Rating Scale (NRS), Verbal Rating Scale and Wong-Baker FACES Rating Scale (FACES).

2.3.1 Visual Analogue Scale

The VAS will be briefly discussed as it will be used in this study. VAS, a form of cross-modality matching (CMM) in which the length of the line is the response continuum, and is reportedly a valid and reliable measure for the intensity of pain (32-38). The VAS was validated in 1983 by Price et.al, (39) who demonstrated that the VAS could be used as a valid and reliable measure for both the intensity and the unpleasantness of human pain. "The scale is displayed as a 100 mm line, secured by verbal specifications, usually 'no pain' at 0 mm and 'worst imaginable pain' at 100

mm. “The patient is asked to mark a 100 mm line to indicate pain intensity. The score is measured from the zero anchor to the patient’s mark. Using a millimetre scale to measure the patient’s score will provide 101 levels of pain intensity.” The VAS is commonly considered as a valid and reliable instrument for chronic pain measurement, as evidenced by a number of studies (Downie et al. 1978; Scott and Huskisson 1979; and McCormack, Horne and Sheather, 1988) (40-42) and it seems unvaryingly valid in acute pain measurement (43-46).

The findings from a study by Bijur et al. (47) in 2001 indicate that the VAS is a extremely reliable tool for measurement of acute pain. These findings’ clinical significance is that if a VAS were used to measure individual patients’ change in pain, change of 10 mm or more would be likely to indicate a true change in the pain experience for most patients. (47) One of the restrictions of the VAS is that it must be administered electronically or on paper.(11)

In this study, 40 mm was used as a cut off point for adequate pain management at discharge. This was based on the study by Jensen, Chen and Brugger (12), who recommended that the cut off points for pain be: no pain (0-4 mm), mild pain (5-44 mm), moderate pain (45-74 mm) and severe pain (75-100 mm). These were based on a distribution of pain VAS scores reported by postsurgical patients (knee replacement, hysterectomy, or laparoscopic myomectomy).

For completeness, the NRS, VRS and FACES are briefly mentioned.
The Numerical Rating Scale is an 11, 21 or 101 point scale where the end points are the extremes of no pain or worst pain. The NRS can be verbally or graphically delivered. (11)

The VRS consists of a list of objectives used to indicate increasing pain intensities. The most regular descriptions used are:” no pain, mild pain, moderate pain, and severe or intense pain." (11)

The FACES scale may be more convenient and helpful in critical care and paediatric patients. “This scale includes six faces with indications of increasing pain intensity. A patient points to the appropriate face to indicate their level of pain.” (31)

“The sensitivity of pain rating scales is the ability of the scale to detect change. The more levels a tool has, the more sensitive it will be. A small change in pain is noticeable in the VAS however the small number of categories in the VRS demands that a larger change in pain is required before the change shows up on the scale. The lack of sensitivity of the VRS can lead to over or under-estimation of pain changes. (48) The VAS and NRS are superior in this respect because they have greater sensitivity to change.”

2.4 Pain control post caesarean section

Postoperative caesarean section pain is regarded as a form of acute pain because of the surgical damage to tissues, with an inflammatory reaction and induction of an afferent neuronal discharge. It comprises several undesirable sensory and mental experiences triggered by the surgical trauma and associated with autonomic, endocrine-metabolic, physiological and behavioural responses (8).

Previously, the obstetricians used to prescribe postoperative analgesia for post caesarean section patients. However, the recognition of the role of the anaesthesiologist as a significant component of the peripartum care team had increased in the last decade, and has transferred additional responsibility to the anaesthesiologist, including provision of postoperative analgesia. A number of factors contribute to the escalating participation of the anaesthesiologist in acute postoperative pain management. “These include knowledge of the physiological changes in pregnancy, knowledge of neuroanatomy, understanding of pain pathways, physiology and the mechanism of pain, knowledge of pharmacology, pharmacokinetics and pharmacodynamics of analgesic drugs, and skills in regional anaesthesia.” (9) Although the dispensation of opioids still remains the mainstay of treating post caesarean section pain, a more balanced multimodal approach to postoperative analgesia is now used due to enhanced understanding of pain pathophysiology.

Patients are at increased risk for thromboembolic events post caesarean section due to the physiological changes. In the postoperative period, this risk may be higher due to poor ambulation from inadequate pain management, obesity or excessive

sedation from opioids. The patients are expected to mobilise quickly so they can breastfeed and care for their newborns within a few hours following the operation. They do not want to feel sedated or drowsy or limited by equipment (e.g. a drip) that does not allow them free access to care for their babies. (49) These are compelling reasons to achieve postoperative pain relief. Despite advances in postoperative pain management, individual differences and restrictions from adverse effects of analgesic medication or methods still render postoperative pain relief for caesarean section in some patients inadequate. (4) Postoperative outcomes and patient satisfaction can be improved by adequately relieving pain post operatively.

2.4.1 Available analgesic options

Effective postoperative analgesia is cardinal because while also caring for her new born baby, the patient has to recuperate from major abdominal surgery. A variety of factors can influence the preference for a pain management method, namely patient choices and expectations, anticipated obstacles and length of the surgery, and the anaesthesiologists experience and preference (2). Most regimens incorporate opioids, with anti inflammatory drugs as a supplement, peripheral nerve blocks or other methods used as adjuncts. Some techniques (e.g. spinal and epidural) are contraindicated in some obstetric scenarios, these being local infection, pre-eclampsia, bleeding disorders and patient refusal. The number of post caesarean section pain management options is continually increasing whilst existing regimes are advanced. (2) The following analgesic options will be discussed: neuraxial techniques, intravenous and oral techniques, wound infiltration and nerve blocks, as well as the multimodal approach to postoperative analgesia.

2.4.2 Neuraxial techniques

Regional anaesthesia has extensively documented advantages when compared to general anaesthesia, especially with regards to patient safety, and affords a convenient and effective route of administering opioids for the anaesthetist (50, 51). Spinal anaesthesia, epidural anaesthesia or combined spinal and epidural anaesthesia are the commonly used neuraxial techniques. “Opioids, especially morphine, are central to many intrathecal-based analgesic regimens.”(2) Administration of subarachnoid or epidural opioids provides a number of advantages

to post caesarean section patients. These include outstanding postoperative pain relief with a low level of sedation, decrease in total dose of opioid required, very little build up of the medicine in breast milk, early return of bowel function as well as facilitation of early ambulation. (52, 53)

Both fentanyl and sufentanyl are extensively used for their intraoperative analgesic effect, but they have a too short duration of action for their effects to be of benefit postoperatively, unless used in high doses. They were not found to alter 24 hour opioid consumption (2). Morphine, on the other hand has a long duration of action, due to its low lipid solubility, which means it takes a long time to cross the lipid bilayer and penetrate neural tissues. This accounts for the delay in its onset of action as well as its long-lasting length of action (51). Only one bolus dose of morphine is usually adequate for the initial 24 hours in epidural opioid delivery, for the same reasons as those stated above.

A variety of non-opioid analgesic drugs have been combined with intrathecal and epidural opioids to optimise pain management postoperatively. The most widely studied out of all these agents is Clonidine, an α_2 adrenergic receptor agonist. Its mechanism of action is enhanced by pregnancy (54) and it seems to be efficient, particularly for visceral pain (55). Intrathecal use of clonidine reduced the waning of the sensory block post spinal anaesthesia in post caesarean section patients, therefore the onset of postoperative pain is delayed. This was shown in a study in 1991 by Bonnet 1991 (56).

2.4.3 Intravenous and oral analgesics

A considerable proportion of patients require supplemental oral or parenteral analgesics during the first 24 hours after surgery and subsequent days until discharge, as demonstrated in studies by Abouleish 1988 and Sun 1992 (57, 58). Morphine is commonly used as a mainstay of treatment, and as a standard against which other analgesic regimens are evaluated. It is often used for intravenous patient controlled analgesia in obstetric patients. Oral opioids have been used historically as “step down” analgesics secondary to neuraxial or intravenous opioids. Potentially fewer adverse effects compared with the neuraxial or intravenous routes of

administration, as well as convenience for both the patients and health care workers are some of the benefits for using the oral route (16, 59). “Non-steroidal anti inflammatory analgesics (NSAIDs), are particularly effective against the visceral pain that arises from the uterine incision and uterine involution following caesarean section delivery. They have a well-documented opioid sparing effect, with a consequent reduction in opioid related side effects.” (60). Indomethacin is the NSAID used in this study, and has been accepted for use in nursing mothers because of the low levels found in breast milk. (61) In a study by Eeg-Olofssen, Malmros, Elwin and Steen (62) no adverse effects were noted in babies breastfed by mothers using Indomethacin. Chronic use of NSAIDs can lead to gastritis and platelet dysfunction; however this is not relevant in this study as they are used for a short period only. Paracetamol is a useful alternative with a low incidence of side effects and with mostly similar or slightly reduced efficacy compared to NSAIDs. It is also used for early postoperative analgesia. (27)

2.4.4 Wound infiltration and nerve blocks

A surgical incision through the abdominal wall accounts for a significant amount of pain post caesarean section delivery. “This can be blocked with a number of local anaesthetic techniques, including ilioinguinal and iliohypogastric nerve blocks, wound infiltration and the transverse abdominis plane block.” (2) The potential benefits of these methods are that they are less invasive than neuraxial blocks, are appropriate for patients undergoing general anaesthesia and that they can be repeated postoperatively if necessary. (2)

2.4.5 Multimodal approach

The establishment of a multimodal approach to postoperative pain management provides effective postoperative analgesia (9). The aim is to gain synergistic or additive analgesia with minimal adverse effects by combining lesser doses of each drug with different mechanism of action (4). Pain assessment throughout the first 24 hours post caesarean section indicates superior pain relief when using a multimodal regimen, and it is therefore this regimen is recommended for prevention and relief of pain postoperatively (63). In keeping with international standards, at CHBAH the

guidelines for managing post caesarean section pain are multimodal, using opioids, non-steroidal anti-inflammatory agents as well as paracetamol for the first 24 hours.

2.5 Current practice

The acute pain service is a modern innovation established to improve pain management in postoperative patients. Services in Seattle (64) and in Kriel (65) were amongst the earliest developed. A publication of a joint report by the Royal Colleges of Surgeons and Anaesthetists and a publication in the United States of America of a protocol for the Investment in Health Gain expanded the concept in the early 1990's in the United Kingdom. By 1994, in the United States of America, 73% of hospitals had an established pain service, whilst 88% of hospitals in the United Kingdom had a pain service by 1999 (18)

Practice guidelines for acute pain management have been developed internationally in different institutions in order to promote the safety and efficacy of acute pain management in the perioperative context. These guidelines are consistently developed recommendations that assist the health care worker as well as the patient in decision making about health care. They may be approved, diversified, or excluded according to clinical needs and constraints. (66)

"The American Pain Society's Quality of Care Committee published a set of guidelines recommending quality improvement programs for acute pain". These include five key elements:

- assuring that a report of unrelieved pain raises a "red flag" that attracts clinicians' attention
- making information about analgesics convenient where orders are written
- promising patients responsive analgesic care and urging patients to communicate pain
- implementing policies and safeguards for the use of modern analgesic technologies and
- coordinating and assessing implementation of these measures." (67)

The National Health and Medical Research Council of Australia published evidence-based guidelines on management of all forms of pain in 1999. (17) Recommendations of this nature have the possibility to enhance patient satisfaction with health care and eradicate some of the barriers so as to manage pain optimally.

Among the various forms of acute pain, postoperative pain management has been a concern for a long time as evidenced in a 2000 study by McKintosh & Bowles. (68) To help ensure consistency of quality of care experienced by women post caesarean section, The National Collaborating Centre for Women's and Children's Health in conjunction with The Royal College of Obstetricians and Gynaecologist published clinical guidelines for management of acute pain in caesarean section patients in 2004 (69).

The South African consensus group that was tasked with making recommendations for the management of acute pain is in agreement with every other international body that acute pain management is still insufficient. In 2009, The South African Society of Anaesthesiologists (SASA) developed the acute pain guidelines that reflects the current emphasis on delivering care that is patient centred, cost-effective, and fair (27). The guidelines re-emphasise that a multimodal analgesia approach is the most effective way of relieving post caesarean section pain.

Use of practice guidelines cannot guarantee any specific outcome and are therefore not regarded as essential. They are therefore subject to change from time to time, as justified by the improvement of technology, medical knowledge, and practice. (66)

2.6 Adherence to practice guidelines

Clinical practice guidelines are defined by the Institute of Medicine as " systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific circumstances" (70). Advantages of practice guidelines are to improve health care outcomes, advance consistency of care, influence public policy, enhance efficiency in health care systems and potentially reduce morbidity and mortality in certain conditions (71).

Despite the availability of clinical practice guidelines, a disjunction often exists between actual clinical care and that recommended in the guidelines (72). Organisational factors were one of the factors found to play a role in influencing adherence to protocol in a study by Ebben et al. (72) Of note in this study was that governmental institutions seemed to have more negative attitude towards adhering to international guidelines. Lyndon et al. (73) reviewed guideline adherence for management of non-specific acute lower back pain among three primary contact professions. They demonstrated that none of the professions were consistent in adhering to guidelines, and this study's results seemed to be in agreement with findings of other studies of a similar nature. Mc Evoy et al. (74) however illustrated in their study that there was an increase in adherence to different and improved guidelines.

A study by Cabana et al. (75) found a variety of barriers that can be responsible for inhibiting or restricting practitioners from adhering to clinical practice guidelines. These barriers included lack of familiarity, lack of agreement, lack of self-efficiency, lack of outcome expectancy and external barriers. They further concluded that all the barriers must be evaluated together rather than individually in order for interventions to be successful. Lack of self expectancy was a variable as it spoke to the attitudes of practitioners. It is an expectation that when practitioners use a guideline to treat a patient, a specific result should be anticipated. This informs the thinking that practitioners are less likely to implement a guideline if they don't agree with it or believe that it cannot work.

2.7 Parity and pain

It is a general thought among experts that parity has an influence on pain perception of the patient. Primiparous patients seem to report higher pain scores as compared to multiparous patients. Only a few studies were identified and conflicting evidence noted. A study by Solehati and Rustina (76) found an association between parity and intensity of pain post caesarean section. They found that the mean pain intensity was 5.16 in primiparous women and 4.37 in multiparous women. The reason for this significant difference might be related to the notion that primiparous women have no experience of labour and coping with it compared to multiparous women. Sousa et

al.(77) however found that there was no significant statistical association in parity to pain scores at rest, when walking, sitting and standing between primiparous and multiparous women post caesarean section.

2.8 Patient satisfaction

Effective and adequate pain management has grown to be a standard for the proficiency of health care. The patients' perception of the adequacy of pain management has steadily been accepted as a determinant of patient satisfaction with health care (78). Pain has acquired such significance that it is now labelled as the ''fifth vital sign'' (79). A 1996 study by (80) differentiated between pain management, which is curative alleviation of clinical pain, and patient satisfaction, which is a personal assessment of health care resources and personnel. Stated another way, the components of satisfaction are complicated and not only related to a clinical pain management programme (78).

Some of the commonly reported reasons accounting for dissatisfaction with pain management include; inadequate assessment, individual variability in the experience and exhibition of pain, misconceptions about pain, negative attitudes toward the use of opioids and poor communication among members of the health care team and their patients (81). A reported high level of satisfaction despite a relatively high incidence of moderate to severe postoperative pain in studies (82-84) was a common finding which merits research. In a study by Joanne, Chung, Joseph and Lui (85), however, the incidence of satisfaction was lower.

Satisfaction with pain management is difficult to comprehend because patients may experience similar pain ranking but express a different level of pain intensity, thus it is necessary to empower patients by teaching them about the significance of reporting the presence of pain to health care providers (85).

2.9 Summary

In this chapter the literature review was presented. In the following chapter the research methodology is discussed.

CHAPTER 3

Methodology

3.1 Introduction

In this chapter the problem statement, aim, objectives, ethical considerations, research methodology and the validity and reliability are presented.

3.2 Problem statement

Adequate analgesia post caesarean section accelerates ambulation, improves patient outcome, reduces maternal morbidity, and facilitates early infant care (9). Regardless of developments in postoperative pain management, adequate pain relief and satisfaction are still insufficient for some post caesarean section patients because of limitations from adverse effects of analgesic medication or methods of administration, as well as individual differences among patients (4). Clinical practice guidelines for post caesarean section pain management, if successfully implemented and adhered to, should improve quality of care and patient pain outcome.

At CHBAH the guidelines for managing post caesarean section pain is multimodal, using opioids, non-steroidal anti-inflammatory agents as well as paracetamol for the first 24 hours. The patients are discharged routinely around 48 hours postoperatively. It is not known whether the current practice provides adequate pain management for caesarean section patients at the time of discharge.

3.3 Aim

The aim of the study was to determine whether the guidelines used for post operative pain management in caesarean section patients adequately controlled their pain at the time of discharge at CHBAH.

3.4 Objectives

The primary objectives of this study were to:

- document adherence to the departmental pain management guidelines
- determine if patients' pain management at discharge was adequate using a VAS score
- describe the pain management received by the patients

The secondary objective was to compare level of pain at discharge with parity.

3.5 Ethical considerations

Permission to conduct the study was obtained from the Human Research Ethics Committee (Medical) (Appendix A) and the Postgraduate Committee (Appendix B) of the University of Witwatersrand. Written permission to conduct the study was obtained from the Medical Advisory Committee of CHBAH (Appendix C). The nursing manager in charge of the postoperative ward at CHBAH was informed of the study.

Patients that met the inclusion criteria were identified and invited to take part in the study. An information letter (Appendix D) was given to patients and those willing to participate were asked to sign informed consent (Appendix E). No file numbers or patients' names were used to ensure confidentiality of patient information.

If at the time of discharge the patients' pain did not appear to be adequately controlled, the ward sister in charge and treating doctor were notified.

Data will be stored securely for a period of six months following completion of the study.

The study was conducted in adherence to the principles of the Declaration of Helsinki (14) and the South African Good Clinical Practice Guideline (15).

3.6 Research methodology

3.6.1 Research design

A prospective, contextual, descriptive research design was used.

A research design determines the methods by which the researcher obtains subjects, collects data, analyses data and interprets results, as stated by Brink (86). Burns and Groove (87) further describe a research design as the blueprint of the study.

In prospective studies, data about a presumed cause are first collected before the effect or outcome is measured. The variables being measured will be occurring during the study (86), as in this study.

A contextual study is conducted within a specific location where a problem is identified (86). This study was done at CHBAH.

Brink (86) defines a descriptive design as one in which phenomena are described or the relationship between variables is examined and no attempt is made to determine cause-and-effect relationships. This study describes the pain level of post caesarean section patients at time of discharge from hospital.

3.7 Study population

The study population was postoperative adult caesarean section patients and their files.

3.8 Study sample

3.8.1 Sample size

In consultation with a biostatistician it was calculated that if the proportion of caesarean section patients was 35% of all deliveries, then the sample size should be equal to 87 patients, at a precision of 0.1.

3.8.2 Sampling method

A convenience sampling method was used in this study. In convenience sampling, subjects are included in the study merely because they happened to be in “the right place at the right time”. It provides little opportunity to control biases. Available subjects are simply entered into the study until the desired sample size is reached (88). This method of sampling is accepted in descriptive research design (23) such as this study.

3.8.3 Inclusion and exclusion criteria

The following inclusion and exclusion criteria were used in the study.

Inclusion criteria

- ASA I and ASA II patients post caesarean section
- patients who received spinal, epidural and general anaesthesia
- patients who consented to participate in the study

Exclusion criteria

- patients not discharged at approximately 48 hours
- patients with intraoperative complications
- patients with still born babies
- intensive care unit admissions or high care admissions (mother or baby)
- patients with missing files or inadequate documentation

3.9 Data collection

Potential patients were identified from the postoperative caesarean section ward on the day of discharge. The patients were approached and invited to participate in the study. An information letter (Appendix D) was given to each patient and the researcher explained the purpose of the study and what it entailed in the patients’ home language, as the researcher speaks seven official languages. No patient requested an explanation in a language that the researcher did not speak. The patients were given an opportunity to ask the researcher any questions about the study. Written informed consent (Appendix E) was obtained from the patients who agreed to participate in the study.

The researcher went to the appropriate ward on a daily bases after the doctors' ward round, to identify the patients for discharge on that day. The following information was collected from the patients' files and from questioning the patients.

- age
- parity
- previous caesarean section
- indication for previous caesarean section
- indication for current caesarean section
- time from operation to discharge
- type of anaesthesia administered
- name and dose of drug given

The VAS was presented to the patient as a 100 mm line, anchored at either end by verbal specifications "no pain" and "worst possible pain". The patient was asked to mark a vertical line on the scale to indicate their pain level at discharge. The score was measured from the zero anchor to the patient's mark using a ruler with millimetre markings to measure the patient's score. The VAS provided 101 levels of the intensity of pain on the 100 mm line.

If at the time of discharge the patients' pain did not appear to be adequately controlled, the ward sister and treating doctor were notified.

3.10 Data analysis

Data was analysed using descriptive and inferential statistics.

Data was analysed in consultation with a biostatistician and Microsoft Excel® spreadsheet and Statistica Version 12.5 was used.

Means and standard deviations were used to describe normally distributed data and medians and ranges were used if the data were not normally distributed. Categorical variables were described using numbers and percentages. Minimum and maximum values were used where relevant.

A Chi^2 test was used to test the association between pain control and parity. A p- value of < 0.05 was considered statistically significant.

3.11 Validity and reliability

Botma et al.(89) refers to validity as “the degree to which a measurement represents a true value” and reliability as the “consistency of the measurement achieved.”

The validity and reliability of this study was ensured by:

- the researcher being the only data collector
- using an appropriate study design
- using the VAS which is a validated pain measuring instrument
- the researcher being able to speak seven official languages, none of the sampled patients spoke a language the researcher did not understand therefore no translator was needed.
- calculating the sample size with the assistance of a biostatistician
- checking all the data entry points on the spread sheet for accuracy
- analysing the data with the assistance of the biostatistician

3.12 Summary

In this chapter the research methodology has been presented. The following chapter contains the results and discussion.

CHAPTER 4

Results and discussion

4.1 Introduction

This chapter contains the results and discussion. Results are presented as per the research objectives.

The primary objectives of this study were to:

- document adherence to the departmental pain management guidelines
- determine if patients' pain relief at discharge was adequate using a VAS score
- describe the pain management received by the patients

The secondary objective was to compare level of pain at discharge with parity.

4.2 Sample realisation

During the eight month data collection period (Oct 2013 to May 2014), 96 patients were recruited for this study, however only 91 patients were included as the files of five patients contained incomplete information.

4.3 Results

A VAS score of less than 40 mm indicated adequate pain control and a score of 40 mm or greater indicated inadequate pain control. All percentages were rounded off to two decimal places.

4.3.1 Demographic characteristics

The majority of patients, 41 (45.05%), were primiparous and 57 (62.64%) patients had not had a previous caesarean section. Most patients, 87 (95.60%) had received spinal anaesthesia. The breakdown of this demographic data is shown in Table 4.1.

The mean length of stay post caesarean section was 43.48 (SD 7.52) hours, with minimum of 29 hours and maximum of 66 hours.

Table 4.1 Demographic data

Parity	Number	Percentage
1	41	45.05
2	22	24.18
3	13	14.29
4	13	14.29
5	1	1.10
6	1	1.10
Previous caesarean sections		
0	57	62.64
1	18	19.78
2	11	12.09
3	5	5.49
Type of anaesthesia		
Spinal	87	95.60
General	4	4.40

4.3.2 Primary objective: to document adherence to the departmental pain management guidelines

The departmental pain management guidelines were correctly prescribed for all the patients. None of the 91 patients received pain management as stipulated by the departmental guidelines that recommend that in the first 24 hours postoperatively patients should receive:

- Omnopon 20 mg intramuscularly 4 to 6 hourly
- Indomethacin suppository 100 mg 12 hourly
- Paracetamol 1g orally 6 hourly
- Ibuprofen 400 mg orally 8 hourly may be used instead of indomethacin (10).

4.3.3 Primary objective: to determine if patients' pain management at discharge was adequate using a VAS score

Pain scores of these patients were collected on a VAS ranging from 0 to100 mm. Of the 91 patients, 54 (59.34%) patients had a score <40 mm which was adequate pain control and 37 (40.66%) patients had a score ≥40 mm, which was inadequate pain control. The scores that the patients received are shown in Table 4.2.

Table 4.2 Pain score of patients

Pain score (mm)	Number of patients	Percentage
0-9	18	19.78
10-19	15	16.48
20-29	10	10.99
30-39	11	12.09
40-49	15	16.48
50-59	10	10.99
60-69	6	6.59
70-79	4	4.39
80-89	1	1.10
90-99	0	0
100	1	1.10

4.3.4 Primary objective: to describe the pain management received by the patients

The patients received the following pain management postoperatively but not necessarily during the first 24 hours (Table 4.3).

Table 4.3 Pain management received by patients

Number of Omnopon doses	Number of patients (%)
1	1 (1.10)
2	23 (25.27)
3	65 (71.43)
4	2 (2.20)
Number of indomethacin doses	
0	7 (7.69)
1	26 (28.57)
2	48 (52.75)
3	10 (10.99)
Number of paracetamol doses	
0	13 (14.29)
1	22 (24.18)
2	19 (20.88)
3	23 (25.27)
4	9 (9.89)
5	3 (3.30)
6	1 (1.10)
7	1 (1.10)

Omnopon is the mainstay of pain management for post caesarean section pain in this study and pain management is described according to the dose received. One person received only one dose of Omnopon, no indomethacin and four doses of paracetamol.

The dosages of indomethacin and paracetamol received by patients who received two doses of Omnopon are shown in Figure 4.1. The dosages of indomethacin and paracetamol received by patients who received three doses of Omnopon is shown in Figure 4.2

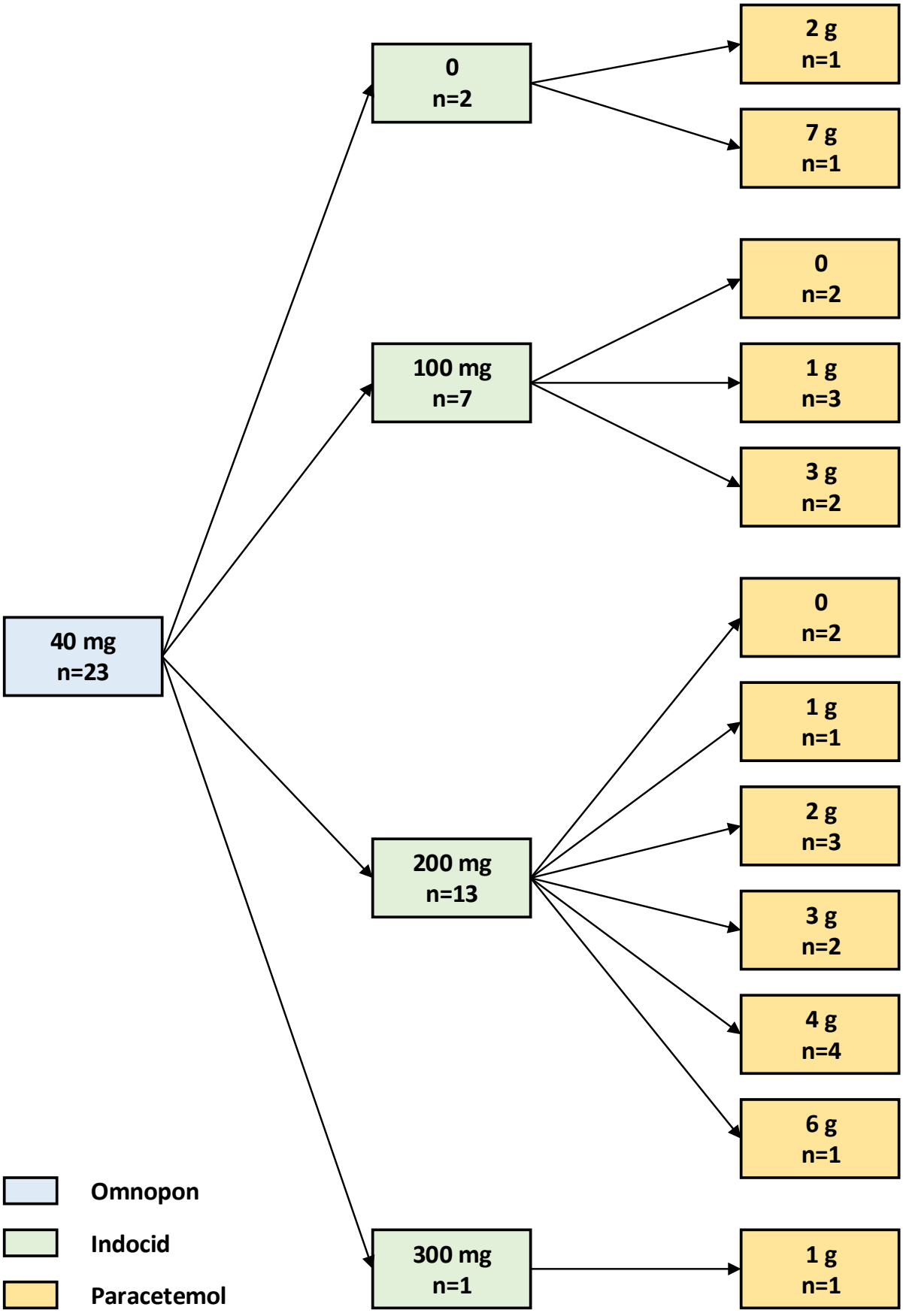

Figure 4.1 Patients who received two doses of Omnopon

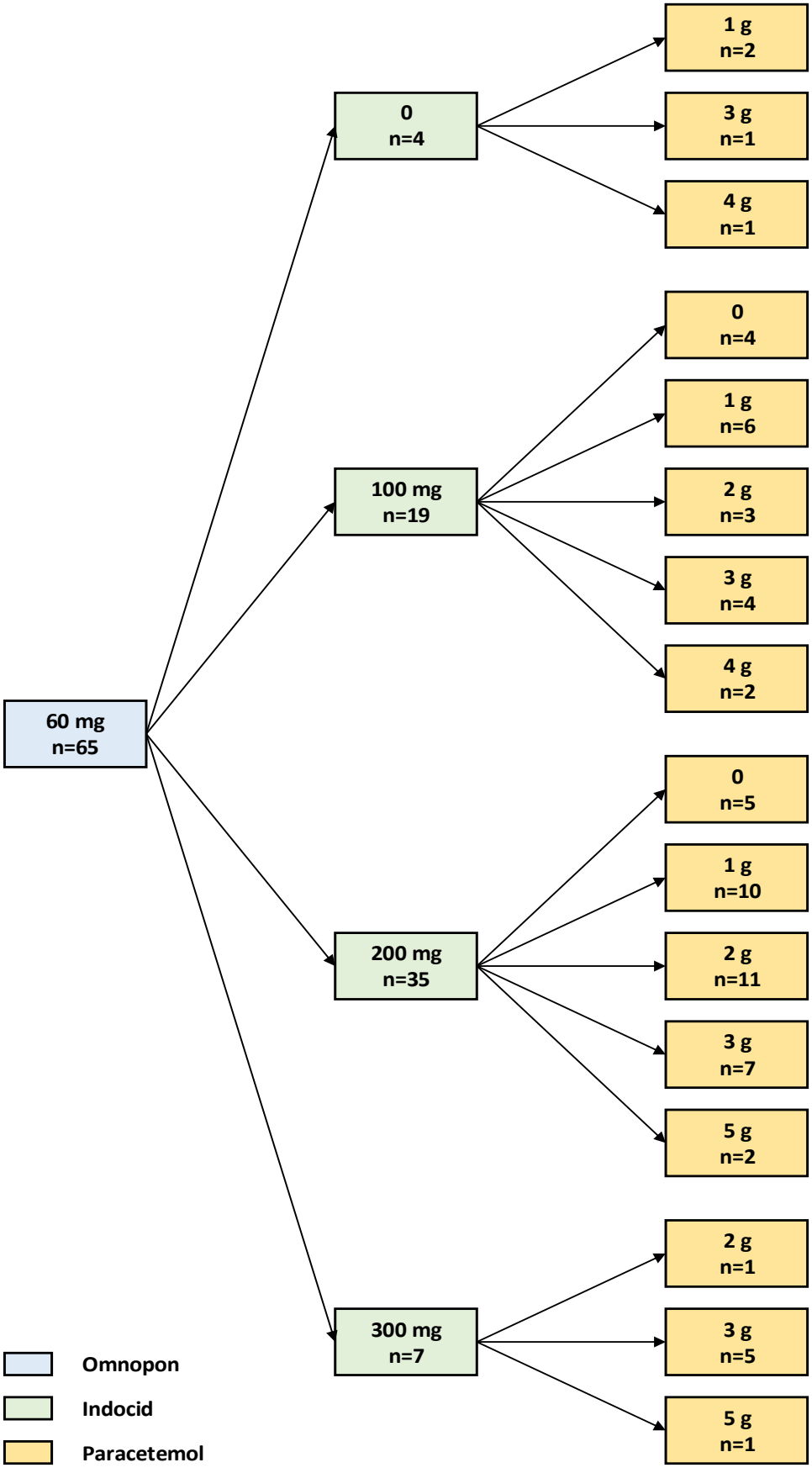

Figure 4.2 Patients who received three doses of Omnopon

Two people received four doses of Omnopon, they both received three doses of idomethacin and of the two, one received three doses of paracetamol and one received four doses of paracetamol.

4.3.5 Secondary objective: compare level of pain at discharge with parity

The comparison between adequate (<40) and inadequate (≥40) pain control and parity is shown in Table 4.4

Table 4.4 Comparison between pain levels at discharge with parity

Parity	Pain score < 40 mm	Pain score ≥ 40 mm
Primiparous	25	16
Multiparous	29	21

*P = 0.8321

No association between parity and adequate or inadequate pain control was found (P-value = 0.8321)

4.4 Discussion

Adequate pain management post caesarean section is central to patients' quick ambulation to allow patients to take care of their babies as soon as possible (2). Current trends are moving towards earlier discharge of patients post caesarean section. There were no studies identified that assessed the adequacy of pain management at the time of discharge prior to 72 to 96 hours. The aim of this study was to determine whether guidelines used for post caesarean section pain management adequately controlled their pain at the time of discharge which was approximately 48 hours post operatively at CHBAH.

There were studies that have reviewed the safety of early postpartum discharge. Pillay and Buchmann (90) found that it was safe to discharge patients on the second day post caesarean section. Strong et al. (91) showed that out of 80% of patients that were discharged, no difference in outcomes was found as there were no hospital readmissions in those patients. Brooten et al. (92) results compared with the previous two studies and concluded that there was no significant difference observed

in maternal rehospitalisation and emergency admissions following early discharge. None of these studies reviewed the level of pain at the time of discharge.

In order to ensure that adequate pain management is achieved post caesarean section, a number of guidelines have been published by different organisations (17, 18, 63-65). A balanced multimodal approach to postoperative analgesia is the preferred mode of analgesia internationally to manage post caesarean section pain. This approach evolved due to a better understanding of the physiology of pain (4, 9). Opioids are still regarded internationally as the mainstay of treatment in the initial 24 hours post caesarean section. In this study, a multimodal approach to treat post caesarean section pain was in place. CHBAH Department of Obstetrics and Gynaecology, had guidelines that were prescribed to adequately manage postoperative pain (10). Omnopon, an opioid, was prescribed as central to the multimodal treatment post operatively, but was not given according to prescription.

In this study it was found that none of the patients received pain management as stipulated by the departmental guidelines, although the pain management was correctly prescribed. A number of reasons might have contributed to this. One reason was that nurses may have been uninformed of current pain management principles and the concept of pre-emptive analgesia. This lack of understanding was confirmed as it is anecdotally known that patients were asked whether they were in pain before medication was administered by some nurses at post caesarean section wards. A further reason is that medication was given at a certain time everyday so patients did not necessarily receive medication at the required time according to their individual postoperative needs. Medication being out of stock was a significant limitation, and played a major role in inadequate pain management. Paracetamol in particular, was out of stock at different times during the study period of data collection. Staff shortages might have been another reason for non-adherence to clinical guidelines as patient to staff ratio were often in disequilibrium.

Adherence to protocol is cardinal in making sure that adequate pain management is achieved, and ensures that the same level of care is received regardless of where patients are treated or by whom. Cabana et al. (75) analysed a few studies, and stipulated that variable barriers can be responsible for inhibiting practitioners from adhering to clinical practice guidelines. Other studies showed that there is generally

apathy towards adhering to guidelines by practitioners, citing various reasons for this. (72-74) In this study, adherence to the departmental guidelines was not achieved. It was however found that the majority of the patients' pain was controlled even though they didn't receive their pain treatment according to the prescribed guidelines. Fifty four (59.35%) of the patients' pain was adequately controlled, and 37 (40.65%) were inadequately controlled. Part of the reason for these findings might be cultural differences in the perception of pain; the population of patients at CHBAH that is predominantly black might not want to complain about pain. Another reason might be that patients were eager to go home and nurse their infants, or because of social circumstances. Patients may have felt that if they said they were pain-free they may be able go home earlier.

A study by Solehati (76) reported that primiparous patients were found to report more pain postoperatively than multiparous women. A study by Sousa et al. (77) however found no difference between the pain experienced by primiparous and multiparous women. In this study no association between parity and adequate or inadequate pain control was found (P-value = 0.8321). However this was a secondary objective and may not have been adequately powered to find a difference if a difference existed.

4.5 Summary

In this chapter the results and discussions were presented. In the following chapter the summary, limitations, recommendations and conclusion are found.

CHAPTER 5

Summary, limitations, recommendations and conclusions

5.1 Introduction

In this chapter a summary of the study will be presented. The limitations of the study will be addressed, recommendations for clinical practice and further research made, and a conclusion presented.

5.2 Summary of the study

5.2.1 The aim of the study

The aim of the study was to determine whether the guidelines used for post operative pain management in caesarean section patients were adhered to and if pain was adequately controlled at the time of discharge at CHBAH.

5.2.2 The objectives of the study

The following objectives were used in this study.

The primary objectives of this study were to:

- document adherence to the pain management guidelines
- determine if patients' pain management at discharge was adequate using a VAS score
- describe the pain management received by the patients

The secondary objectives were to compare level of pain at discharge with parity.

5.2.3 Summary of methodology used in study

This study was a prospective contextual, descriptive study of patients that were post caesarean section delivery at CHBAH.
In consultation with a biostatistician, a sample of 87 patients was estimated.

A convenience sampling method was used in this study. Patients in the post caesarean section ward were asked to participate in the study after being discharged at approximately 48 hours postoperatively by the obstetrician in charge.

An information letter explaining the purpose of the study was given to the patients that agreed to participate, and the study, together with the VAS score sheet was further explained to the patients in a language of their choice. The patients were afforded an opportunity to ask questions. Then the patients were given a VAS sheet to mark their level of pain at that time.
Data was analysed using descriptive and inferential statistics.

5.2.4 Summary of results

The majority of patients, 41 (45.05%), were primiparous and 57 (62.64%) patients had not had a previous caesarean section. Most patients, 87 (95.60%) had received spinal anaesthesia. The mean length of stay post caesarean section was 43.48 (SD 7.52) hours, with minimum of 29 hours and maximum of 66 hours.

Of the 91 patients, 54 (59.34%) patients had a score <40 mm which was adequate pain control and 37 (40.66%) patients had a score ≥40 mm, which was inadequate pain control.

The departmental pain management guidelines were correctly prescribed for all the patients, however none of the 91 patients received pain management as stipulated by guidelines.

Omnopon is the mainstay of pain management for post caesarean section pain, and in this study is described according to dose received.

No association between parity and adequate or inadequate pain control was found (P-value = 0.8321).

5.3 Limitations

The following limitations were found.

- This was a contextual study being done in the context of patients presenting for caesarean section at CHBAH, therefore generalisation to other populations may be limited.
- Patients discharged before or after 48 hours postoperatively.
- Drug shortages, especially paracetamol.

5.4 Recommendations from the study

5.4.1 Recommendations for clinical practice

There is a growing trend towards discharging patients earlier than 72 to 96 hours postoperatively. At CHBAH patients are discharged approximately 48 hours postoperatively, but it was not known whether their pain is adequately controlled at the time of discharge. The results above have led to the following recommendations.

- Possible development of pain teams
- Training programmes and refresher courses in pain management for all involved personnel.
- Education on the importance of clinical practice guidelines, current practice and adherence for all personnel involved, especially the nursing staff.

5.4.2 Recommendations for further research

- Following education on adherence to the clinical guidelines and importance of pain management, the study can be repeated.
- Patient satisfaction with their pain management can be a focus for future research.

5.5 Conclusion

Pain medication was not given according to the pain management guidelines in the post caesarean section ward at CHBAH, even though it was prescribed. At the time of discharge, however 54 (59.34%) of patients had adequate pain control despite receiving less pain medication than recommended by the guidelines. Education regarding pain management could result in patients reporting better pain control at the time of discharge.

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APPENDIX A



UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Dr Makhosanzana Dlamini

CLEARANCE CERTIFICATE	**M120747**
PROJECT	Adequacy of Post Caesareab Section Pain Management at the time of Discharge at an Academic Hospital
INVESTIGATORS	Dr Makhosanzana Dlamini.
DEPARTMENT	Department of Anaesthesiology
DATE CONSIDERED	27/07/2012
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 27/07/2012 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Ms Juan Scribante

DECLARATION OF INVESTIGATOR(S)
To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...

APPENDIX B

Faculty of Health Sciences
Private Bag 3 Wits, 2050
Fax: 027117172119
Tel: 02711 7172040

Reference: Ms Thokozile Nhlapo
E-mail: thokozile.nhlapo@wits.ac.za

07 January 2014
Person No: 675604
PAG

Dr M Dlamini
1799 Sigcawu Street
Wattville
Benoni
1501
South Africa

Dear Dr Dlamini

Master of Medicine: Approval of Title

We have pleasure in advising that your proposal entitled *Adequacy of post caesarean section pain management at the time of discharge at an academic hospital* has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

APPENDIX C

GAUTENG PROVINCE
REPUBLIC OF SOUTH AFRICA

MEDICAL ADVISORY COMMITTEE
CHRIS HANI BARAGWANATH ACADEMIC HOSPITAL

PERMISSION TO CONDUCT RESEARCH

Date: 11 February 2014

TITLE OF PROJECT: Adequacy of post caesarian section pain management at time of discharge at an academic hospital

UNIVERSITY: Witwatersrand

Principal Investigator: M Dlamini

Department: Anaesthesiology

Supervisor (If relevant): J Scribante/S Chetty

Permission Head Department (where research conducted): Yes

Date of start of proposed study: February 2014
Date of completion of data collection: December 2014

The Medical Advisory Committee recommends that the said research be conducted at Chris Hani Baragwanath Hospital. The CEO /management of Chris Hani Baragwanath Hospital is accordingly informed and the study is subject to:-

- Permission having been granted by the Committee for Research on Human Subjects of the University of the Witwatersrand.
- the Hospital will not incur extra costs as a result of the research being conducted on its patients within the hospital
- the MAC will be informed of any serious adverse events as soon as they occur
- permission is granted for the duration of the Ethics Committee approval.

.....
Recommended
(On behalf of the MAC)
Date: 11 February 2014

.....
Approved/Not Approved
Hospital Management
Date: 12/02/14.

APPENDIX D

Patient information letter

Adequacy of post caesarean section pain management at time of discharge at an academic hospital

Good morning, my name is Dr Makhosazana Dlamini. I am a doctor in the Department of Anaesthesia at CHBAH. I am conducting a study and would like to invite you to participate in it.

The aim of the study is to determine whether the guidelines used for post operative pain management in caesarean section patients adequately controls their pain at the time of discharge at CHBAH.

I would like you to mark on the line between 0 and 10 where you feel your pain is at this moment. 0 means no pain and 10 means the worst possible pain you can imagine.

If you agree to participate, I will collect some information from you file and ask you a few questions. This will not take more than 10 minutes.

Your name and hospital number will not be part of the information collected. There will be no way for anyone not involved in the study to know that you have participated or what information I have collected. Keeping your information confidential is of utmost importance to me, and only my supervisors and I will have access to your information. To ensure anonymity, a study number will be assigned to you.

Participating in this study is entirely voluntary. If you decide to participate in the study, but change your mind at a later stage, we will remove all your information from the study.

Before you decide whether you will participate or not, do you have any questions?

Thank you.

APPENDIX E

Informed consent form

I, _____ (name), agree to participate in the study that Dr M. Dlamini has explained to me.

I understand that some information will be collected from my file and will be kept confidential.

I understand that my name and hospital number will not be part of the information collected for the study, and therefore no information used will be traced back to me.

I understand that my participation is entirely voluntary and that I can withdraw from the study at any time.

_____

Participants' signature

_____

Date

APPENDIX F

VAS Sheet

What is your level of pain now?

