

**PARENTS' ATTITUDES TOWARD PAIN MEDICATION,  
PARENTS' PERCEPTION OF CHILDREN'S PAIN AND  
PARENTS' MANAGEMENT OF CHILDREN'S PAIN AT  
HOME FOLLOWING DAY SURGERY OR  
SHORT-STAY SURGERY**

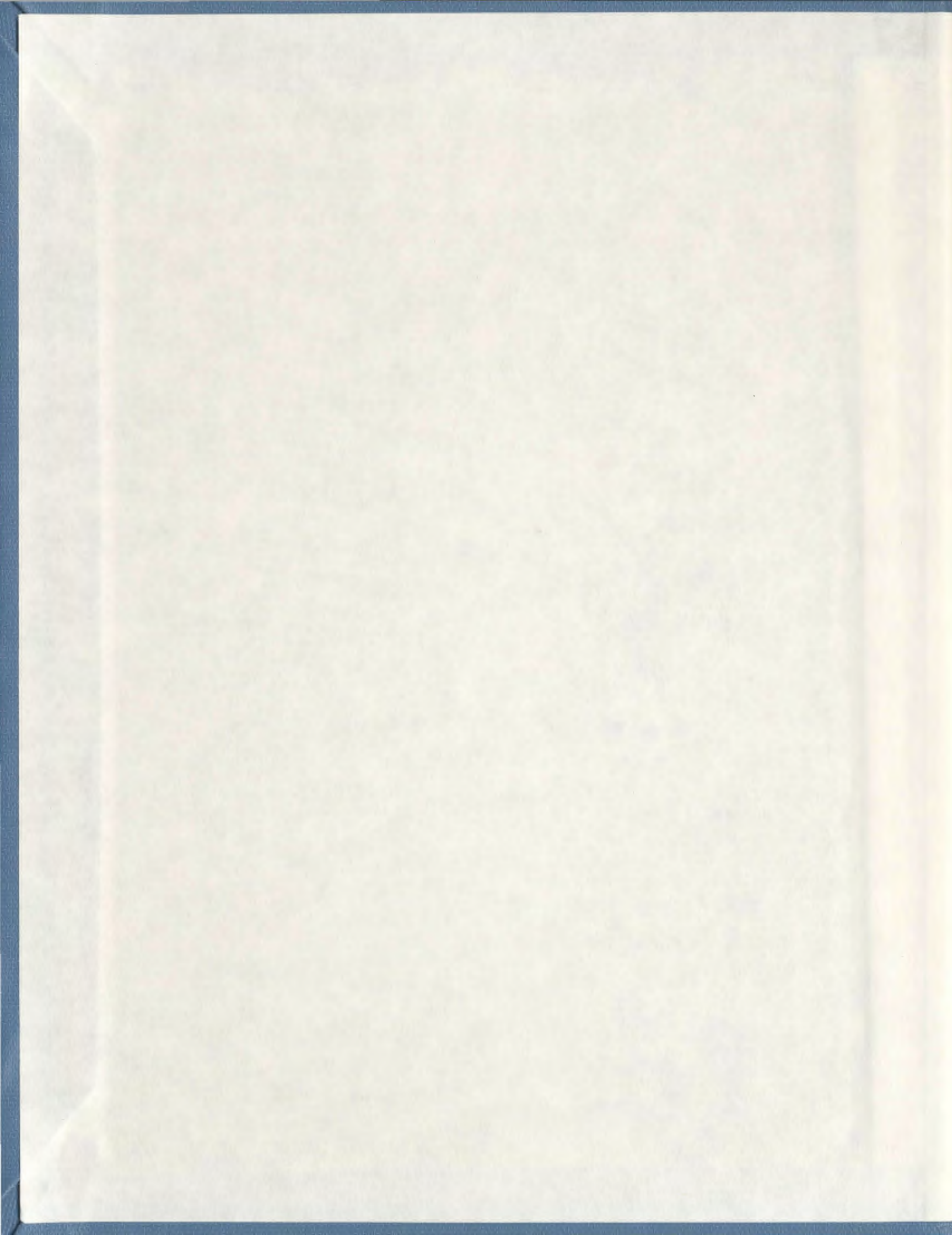
**CENTRE FOR NEWFOUNDLAND STUDIES**

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**COLLEEN (McDAVID) ANDERSON**









**Parents' Attitudes Toward Pain Medication,  
Parents' Perception of Children's Pain and  
Parents' Management of Children's Pain at  
Home Following Day Surgery or Short-Stay Surgery**

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## **Abstract**

A descriptive correlational study was designed to investigate parents' attitudes toward medication, parents' perceptions of children's pain and parents' management of children's pain at home following day or short-stay surgery in a convenience sample of fifty-six parents and children 2 to 12 years (Mean age 5.98 years, 58.9% males). This study was a replication and extension of a study by Finley, McGrath, Forward, McNeill, and Fitzgerald (1996). Data were collected over a 5 month period using a demographic data form, Parents' Attitudes Toward Medication tool, and a postoperative diary containing a Numerical Rating Scale (NRS), Parents' Postoperative Pain Measure (PPPM), analgesic record and Parents' Comforting Activities Checklist (PCAC).

Study findings focussed on what parents did at home on the day of surgery and on the two days following surgery to manage their children's pain. Most parents provided acetaminophen or acetaminophen with codeine but the number of doses and amount of medication given often were not adequate to manage their children's pain. The highest mean pain intensity ratings were reported by parents with children who had a tonsillectomy and adenoidectomy (T & A) or circumcision. More children were identified with clinically significant pain on the Day of Surgery with the PPPM than with the NRS. Most parents gave their children between 0 and 3 doses of medication over the three days of the study even when they perceived their children to have clinically significant pain. Parents' attitudes toward medication were neutral to slightly positive with both

positive and negative responses to statements on addiction and drug abuse. In approximately six years since the study by Finley et al. (1996) was published, little appears to have changed in the pharmacological management of children's pain at home following day surgery or short-stay surgery.

The unique part of this study included the development and use of the PCAC to document parents' nonpharmacological management and evaluation of the effectiveness of these comforting activities. Parents provided a large number ( $M = 20$ ,  $SD 7.78$ ) of comforting activities to manage their children's postoperative pain. Parents' intuitively selected comforting activities that were appropriate for their children's age and cognitive level of development. Presence of parents was most frequently reported activity and also rated as the most effective. Parents' mean ratings of the effectiveness of comforting activities were higher than their mean ratings of the effectiveness of medication provided to manage their children's pain. This tool is an important contribution to understanding parent's care of their children at home following surgery.

The major implication resulting from this study is the need for nursing to recognize the responsibility placed on parents to manage their children's pain and make needed resources available to them.

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## Table of Contents

Abstract .....	ii
Acknowledgements .....	iv
List of Tables .....	viii
List of Figures .....	ix
List of Appendices .....	x
Chapter 1 Introduction .....	1
Background and Rationale .....	2
Problem Statement and Study Purpose .....	4
Research Questions .....	6
Chapter 2 Literature Review .....	7
Attitudes about Pain Management .....	8
Attitudes of Health Professionals .....	8
Attitudes of Parents .....	11
Summary .....	14
Parents' Perceptions of Children's Pain .....	15
Parents' Perceptions of Children's Pain Intensity .....	15
Summary .....	20
Parents' Perceptions of Children's Behavioral Cues .....	20
Summary .....	23
Postoperative Pain Management .....	23
Parents' Pharmacological Management .....	24
Summary .....	32
Nonpharmacological Management .....	32
Summary .....	35
Conceptual Framework .....	36
Chapter 3 Methodology .....	40
Setting .....	40
Population and Sample .....	42
Procedure .....	43
Instruments .....	45
Demographic Data Form .....	45
The Postoperative Diary .....	46
Numerical Rating Scale .....	47
Parents' Postoperative Pain Measure .....	47
Analgesic Record .....	49
Parents' Comforting Activities Checklist .....	49
Parents' Attitudes Toward Medication .....	51
Data Analysis .....	52
Ethical Considerations .....	53
Summary .....	54

Chapter 4 Results .....	56
Descriptive Profile .....	56
Personal Characteristics of the Sample .....	57
Present Surgical Procedure and Previous Hospitalizations of Children .....	57
Parents' Perception of Children's Pain .....	59
Numerical Rating Scale .....	62
Parents' Postoperative Pain Measure .....	65
Parents' Management of Children's Pain at Home .....	69
Pharmacological Management of Children's Pain .....	69
Types of pain medication .....	69
Number of doses of pain medication given .....	70
Dosages of medication given .....	73
Effectiveness of pain medication .....	74
Parents' Attitudes Toward Medication .....	74
Parents' Nonpharmacological Management of Children's Pain ..	75
Parent Comforting Activities Checklist .....	75
Top rated parent comforting activities .....	75
Other activities .....	76
Age-related parent comforting activities .....	77
Relationships Among Variables .....	78
Parents' Attitudes Toward Medication and Management of Their Children's Pain at Home .....	79
Parents' Perception of their Children's Pain and Management of Pain at Home .....	80
Summary of Findings .....	82
Chapter 5 Discussion .....	85
Sample .....	85
Parents' Management of Children's Pain .....	86
Parents' Pharmacological Management of Children's Pain ....	86
Parents' Nonpharmacological Management of Children's Pain ..	89
Factors that May Influence Parents' Management of Children's Pain ..	92
Parents' Attitudes Toward Medication .....	92
Parents' Attitudes toward Medication and Management of Children's Pain .....	93
Parents' Perception of Children's Pain .....	94
Parents' Perception of Children's Pain and Management of Children's Pain .....	97
Strengths and Limitations .....	98
Summary .....	101
Chapter 6 Implications of the Study .....	102
Nursing Practice .....	102

Nursing Education .....	105
Nursing Research .....	106
Conclusion .....	107
References .....	109
Appendices .....	117

### **List of Tables**

Table 1	Personal Characteristics of the Sample
Table 2	Present Surgical Procedure and Previous Hospitalizations of Children
Table 3	Highest Mean Pain Rating Noted by Parents Using the NRS
Table 4	Mean NRS Scores for Highest Pain Reported Each Day According to Type of Surgery
Table 5	Numbers and Percent of Children with Clinically Significant Pain According to Type of Surgery
Table 6	Mean Number of Changes in Behavior Noted by Parents Using the PPPM
Table 7	Numbers and Percent of Children with Clinically Significant Pain Using PPPM According to Type of Surgery
Table 8	Types of Pain Medication, Numbers and Percentages of Children Receiving and Not Receiving Pain Medication at Home
Table 9	Number of Doses of Pain Medication Given to Children at Home on Day of Surgery, Day 1, and Day 2
Table 10	Numbers and Percentages of Doses Administered to Children With and Without Clinically Significant Pain
Table 11	Top Rated Parent Comforting Activities and Their Perceived Effectiveness
Table 12	Five Top Rated Parent Comforting Activities and Their Perceived Effectiveness for the 2 to 6 age group
Table 13	Five Top Rated Parent Comforting Activities and Their Perceived Effectiveness for the 7 to 12 age group
Table 14	Correlations Between Parents' Perception of Their Children's Pain and Parents' Management of their Children's Pain

## List of Figures

Figure 1 Conceptual Framework .....	37
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## **List of Appendices**

Appendix A	Letter to Surgeons .....	117
Appendix B	Letter of Introduction to Study .....	118
Appendix C	Consent to Participate in Health Research .....	119
Appendix D	Demographic Data form .....	121
Appendix E	Numerical Rating Scale .....	122
Appendix F	Parents' Postoperative Pain Measure .....	123
Appendix G	Parents' Comforting Activities Checklist .....	124
Appendix H	Parents' Attitudes Toward Medication tool .....	125
Appendix I	Human Investigation Committee Approval .....	127
Appendix J	Western Memorial Regional Hospital Ethics Committee Approval .....	128
Appendix K	Letter Requesting Permission from Hospital Administration to Complete Research .....	129
Appendix L	Test of Difference for Group Completing and Group not Completing Diary .....	130
Appendix M	Examples of How Appropriate Dosages were Determined ....	131
Appendix N	Mean and Standard Deviation for Individual Items for Parents' Attitudes Toward Medication Tool .....	132



## CHAPTER 1

It is recognized that children's pain has been undertreated. More than thirty years ago, Swafford and Allen (1968) erroneously concluded that children did not require analgesic medication following surgery because children did not experience pain. Since that time much work has been done dispelling the myth that children do not experience pain. It is now known that even premature and newborn infants are capable of experiencing painful stimuli since the physiological mechanisms of nociception are well developed by the third trimester of pregnancy (Anand & Hickey, 1987; Anand, Grunau, & Oberlander, 1997).

In the mid 1970's and 1980's, undermedication in hospitalized children was identified in a number of research studies. Insufficient administration of analgesic medication was recognized as a particular problem in managing children's postoperative pain. When children were compared to adults with similar types of surgery, it was found that children received far fewer doses of analgesic medication than adults (Beyer, DeGood, Ashley, & Russell, 1983; Eland, 1985; Eland & Anderson, 1977; Schechter, 1989; Schechter, Allen, & Hanson, 1986). As well, in more recent literature it was identified that health professionals have difficulty in assessing hospitalized children's pain and that attitudes of health professionals toward analgesics could be, in part, the reason children's pain was and continues to be under managed in hospital (Beyers &

Byers, 1985; Broome, Richtsmeier, Maikler, & Alexander, 1996; Collier & Pattison, 1997; Hamers, Abu-Saad, Halfens, & Schumacher, 1994; Kart et al., 1996; Mather & Mackie, 1983; McGrath, 1987; Schechter & Allen, 1986; Stevens, 1999). Although research is beginning to examine health professionals pain management practice and factors influencing practice in hospital, very little is known about the group of children who undergo day surgery procedures and how their pain is managed at home.

The expansion in utilization of outpatient services has resulted in greater numbers of children being treated in day surgery or short-stay surgery (Canadian Institute of Child Health, 2000). Consequently postoperative pain is now being managed by parents at home. Not surprisingly, recent research in the area of day surgery or short-stay surgery suggests that children may be undermedicated by parents in the home (Finley, McGrath, Forward, McNeill, & Fitzgerald, 1996; Nikanne, Kokki, Tuovinen, 1999; Warnock & Lander, 1998). As little is known about how parents perceive and manage their child's pain at home after day surgery or short-stay surgery, much more research is needed in this area.

### ***Background and Rationale***

The concept of pediatric day surgery was initially proposed at the beginning of the 20<sup>th</sup> century (Nicoll, 1909). In Canada, day surgery has increased with the downsizing of the health care system (Statistics Canada, 1999). Day surgery is seen as a safe and economic way of providing the same

service as inpatient surgery. At the same time, day surgery lessens the child's emotional trauma of separation from parents (Letts, Davidson, Splinter, & Conway, 2001; Macarthur, Macarthur, & Bevan, 1995) but increases the responsibility of parents to manage their children's postoperative pain in the home after day surgery.

From 1986/87 to 1993/1994, outpatient day surgery in Canada increased 37% for all ages (Statistics Canada, 1997). In Canada (excluding Quebec and rural Manitoba) for a four-year period (1996/20), the average number of day surgery procedures has decreased slightly for children from one month to 16 years of age, to an average of 141,258 children per year (Canadian Institute for Health Information, 2001). In Newfoundland from 1996 to 2000, for the same age group, the number of children having day surgery has been stable with an average of 4,470 children per year (Newfoundland and Labrador Center for Health Information, 2001). These numbers do not include the children who undergo a procedure with the day surgery services who are kept over night and discharged home the next day.

Management of children's pain after surgery has implications for the child's recovery from surgery and future response to pain (Taddio, Goldbach, Moshe, Stevens, & Koren, 1995; Weisman & Schechter, 1991). Further, there is no clear relationship between the extent of tissue damage and the intensity of pain experienced by the person (Cousins, 1994). Therefore, even minor surgery may result in intense pain or other unwanted effects.

Poor pain management can result in both short and long term consequences. Poor pain management places children at an increased risk of morbidity and mortality, and delays mobilization (Eland, 1990; Lewis, Whipple, Michael, & Quebbeman, 1994; Porter, Gruneau, & Anand, 1999; Riley, 1996; Yaster, Sola, Pegoli, & Paidas, 1994). A number of physiologic changes associated with pain such as cardiovascular changes (increased heart rate, increased blood pressure) and endocrine changes (increased blood glucose but not insulin levels) have been noted during and following surgical procedures (Anand & Aynsley-Green, 1985; Anand & Hickey, 1987). Painful stimuli cause many changes in children's behavior such as straightening and pulling of limbs toward the body along with grimacing and crying, and changes in sleep-wake cycles (Fitzgerald & Anand, 1993). Behavioral changes (e.g., sleep problems, crying, attention seeking) lasting 2 to 4 weeks longer than the pain itself have been seen in children following surgery (Kotiniemi, Ryhänen, & Moilanen, 1997).

Evidence exists to suggest that children who received inadequate analgesia during a first procedure may have an inadequate response to an analgesic in subsequent procedures even when appropriate analgesia is given (Weisman, Bernstein, & Schechter, 1998; Zeltzer, Bush, Chen, & Rival, 1997).

### ***Problem Statement and Study Purpose***

The management of children's postoperative pain continues to be a problem. There is evidence to suggest that inadequate pain management can

lead to short-term and long-term sequella. Many children are now having day surgery which results in parents' managing children's pain in the home. Few studies have examined parents' management of children's postoperative pain at home following day or short-stay surgery. Therefore we have little information about whether children are receiving appropriate pain management at home.

An additional problem is that no replication studies have been conducted in the area of parents' pain management of children's pain at home following day or short-stay surgery. It is important to acknowledge that replication studies are needed for the development of a scientific knowledge base and for use of research findings in clinical practice (Burns & Grove, 2001). Part of this research study is a systematic extension of the work initiated by Finley et al. (1996) which examined parents' attitudes toward pain medication, parents' perception of children's pain, and parents' pharmacological management of children's pain. This study will also examine parents' perception of children's pain using behavioral cues and will extend to parents' nonpharmacological management of children's pain.

The primary purpose of this study is to describe what parents do at home to manage their children's pain after day surgery or short-stay surgery. A secondary purpose is to examine the relationships among (a) parents' attitudes toward analgesic medication, (b) parents' perception of children's pain (both pain severity and behavioural cues) and (c) parents' management of their children's pain at home after day surgery including both pharmacological and

nonpharmacological management.

### ***Research Questions***

This study will focus on the following five research questions:

1. What do parents do at home to manage their children's postoperative pain after day surgery or short-stay surgery?
2. What are parents' attitudes toward medication for their children's pain after day surgery or short-stay surgery?
3. What are parents' perceptions of children's pain at home after day surgery or short-stay surgery?
4. Is there a relationship between parents' attitudes toward medication and parents' management of their child's pain at home after day surgery or short-stay surgery?
5. Is there a relationship between parents' perception of their child's pain and parents' management of their child's pain at home after day surgery or short-stay surgery?



## ***Attitudes about Pain Management***

### ***Attitudes of Health Professionals***

Studies have continued to indicate that attitudes of health professionals may influence children's pain management. An early study by Schechter and Allen (1986) examined physicians' attitudes toward pain in children. Fifty-six pediatricians, 42 surgeons, and 14 family practitioners responded (57% response rate) to a questionnaire mailed to all physicians in a small American city. Findings from this study indicated that surgeons were significantly different and more conservative than their pediatrician and family practitioner counterparts. For example, fewer surgeons felt that children experienced adult-like pain by age 2 and would use narcotics by the time children were 2 years old. Although there were no significant differences between specialities, 69% of surgeons, 70% of family practitioners, and 80% of pediatricians felt that a child should be at least 2 years old before receiving routine analgesic administration for post-surgical pain. Thirty-nine percent of the total group of physicians were concerned with the risk of addiction when using narcotics. A limitation of this study is that no information was given on the reliability and validity of the questionnaire. Although this is an older study results continue to be relevant but may no longer be representative of present physicians because of the recent expansion of knowledge in the area of children's pain.

A more recent study by Collier and Pattison (1997) studied the prevalence of belief in 12 pain myths in a group of doctors and nurses working in paediatric

care in a large multicultural British city. The final sample consisted of 47 doctors and 36 nurses, a 70% response rate of those targeted. Four of the 12 myths were identified as true by a significant portion of the doctors and nurses. Sixty-nine percent of the doctors and 61% of the nurses expressed agreement with the myth concerning *restraint during procedures being more distressing than any pain the child might have*. Three other myths were reported as true by approximately 28% of the respondents:

- *children not being able to accurately tell where it hurts*
- *children forgetting pain quicker than adults*
- *there being a usual amount of pain associated with a given procedure*

Although there continue to be some misconceptions, the authors suggest there appears to be an improvement in informed awareness regarding children's pain and that unconditional belief in myths about pain are not widespread among health professionals. There were no statistically significant differences between doctors' and nurses' responses. There were two identified limitations of this study. The researchers did not address reliability or validity of the tool, and there may also have been some inconsistency in the responses as no guidelines were given on the age of the children the respondents were to consider when answering the questionnaire.

Manworren (2000) surveyed a convenience sample of 274 nurses at a large paediatric medical center in the southwest United States using a 42-item *Paediatric Nurses' Knowledge and Attitudes Survey*. This instrument measures

general pain management, including the use of analgesics and nonpharmacological strategies. This tool is a modification of the Nurses' Knowledge and Attitudes Survey developed by McCaffery and Ferrell (1997) which has established reliability and validity reported in another article (Manworren, 2001). The intent of the tool is to be able to quickly assess knowledge and attitudes to identify areas of pain management requiring improvement (Manworren, 2000). No cut-off score was given to indicate when nurses knowledge and attitudes were sufficient. In this study, nurses' mean score was 28 and ranged from 13 to 34 out of a possible 42 correct responses. Higher scores indicated higher levels of knowledge and more positive attitudes. No significant correlations were found between scores on the tool and demographic variables such as age, etc. However, nurses' educational level and clinical area of practice made a difference; nurses with a master's degree scored statistically significantly higher than all other levels of nursing education and nurses in clinical areas such as hematology/oncology, Intensive Care Unit, and emergency room/transport scored higher than nurses in other areas. The authors concluded that while there were knowledge deficiencies, paediatric nurses were aware that their patients experienced pain.

In a qualitative study ( $n = 10$ ) and its replication ( $n = 10$ ), Hamers, et al. (1994) reported on factors influencing paediatric nurses' pain assessment and their decision to provide pharmacological (non-narcotic analgesic) or nonpharmacological interventions to children in institutions. The first study found

a variety of factors that influenced nurses' attitudes toward pain management: medical diagnosis, characteristics of the child such as age and vocal and verbal expressions of pain, and the child's parents. The majority of nurses felt that children experienced less pain than adults in the same situation. Parents were an obvious source for information about the child's pain because they knew their child well, but parents were not always considered reliable. The characteristics of the nurse which influenced assessment and implementation of pain interventions included professional knowledge about pain management, past experiences and nurses' attitudes. The authors particularly note that nurses' attitudes were *striking* and that nurses' attitudes toward analgesics caused them to postpone administering analgesics for as long as possible. The second study confirmed the initial findings and are similar to results from previous studies.

### ***Attitudes of Parents***

Health professionals' attitudes may influence parents' attitudes which in turn, may influence parents' management of children's postoperative pain at home following day surgery or short-stay surgery. A descriptive survey by Finley et al. (1996) examined parents' management of children's pain at home following short-stay or day surgery at a paediatric hospital in Halifax, Canada. The mean age of children in the study was 5.9 years with a range from 2 to 12 years. Using a diary, parents ( $N = 189$ ) assessed their children's worst pain using 100mm Visual Analogue Scale (VAS) at home during five time periods each day and recorded the medication used for three days. On the third postoperative day,

parents' attitudes toward medication use were measured; in a telephone interview parents used a 5-point Likert scale to state their agreement or disagreement with six statements about children's pain. Parents demonstrated strong positive attitudes to two statements

- *acetaminophen is a pain medicine that can be used without much worry*
- *generally it is safe to give children the amount of medicine that is recommended for their age*

However, as noted by the authors despite these positive attitudes, parents were hesitant to use pain medication. Approximately 50% of parents thought that children could become addicted to opioids used for pain management and 31% believed that children who have to take pain medicine regularly for pain might learn to use drugs to solve other problems. A limitation of this study was that no information was given on the development of the attitude statements. Finley and colleagues concluded that many parents have false beliefs about addiction and the proper use of analgesic medication.

Building on the previous study, Forward, Brown, and McGrath (1996) also used telephone interviews to gather data about mothers' ( $N = 298$ ) attitudes toward medication for children's pain after day surgery or short-stay surgery. The purpose of the study was to test a 20-item scale to measure parents' attitudes toward using pain medication for children and to assess intended medication behavior. Mothers of children between 5 and 12 years of age were asked to respond to the 20-item scale in relation to tonsillectomy pain in 5 to 12 year old

children in general rather than their own children. When the 20 items were factor analyzed, five subscales emerged with four items; the subscales were tolerance, side effects, stoicism, addiction, and drug abuse. The range of possible scores within each subscale was 4 to 28. Mean scores for the five subscales ranged from 16 to 22 ( $SD = 3.07$  to  $4.76$ ), indicating slightly positive to moderately positive attitudes toward pain medication. It was found that mothers with more positive attitudes toward nonnarcotic analgesics were more likely to medicate and give medication at lower levels of pain intensity compared to mothers with less positive attitudes. However, mothers were concerned about tolerance and side effects from acetaminophen. Limitations include selection of a sample from a middle class neighborhood and the context in which the mothers were asked to respond to the statement which was a theoretical situation and children in general rather than their own child.

In a randomized trial evaluating the effects of a parent education intervention to improve pain assessment and management, Chambers, Reid, McGrath, Finley, and Ellerton (1997) studied parents ( $N = 82$ ) of children between the ages of 2 and 12 years undergoing day surgery. Parents were randomly assigned to one of three groups prior to their child's surgery: the pain education group received information in the form of a booklet on pain assessment and pain management; the pain assessment control group received the same booklet but without the pain measurement section; and the no pain education control group received a booklet on general information about a



hospital visit which did not overlap in content with the other booklets. One week after surgery, parents were contacted by telephone to respond to the revised 13-item questionnaire on parents' attitudes toward medications for children's pain developed by Forward et al. (1996) as described in the previous study. Parents in the pain education group had significantly more positive attitudes than did parents in the other two groups. This study also found that higher scores on the attitude tool, indicating more positive attitudes, were correlated to higher numbers of doses of medication administered on each day.

### ***Summary***

This set of selected studies of attitudes of health professionals and attitudes of parents suggests that misperceptions and misbeliefs about pain in children and negative attitudes toward analgesic medication continue to be held by some health care providers and by parents as well. The limited number of studies on parents' attitudes toward pain medication suggests that parents with more positive attitudes are open to giving medication and understand the need for medication, but have concerns and mistaken beliefs about the consequences of giving even mild analgesics such as acetaminophen on a regular schedule for postoperative pain. It is also suggested that a relatively simple randomized trial education intervention may make a difference in the outcome of the management of children's pain.

### ***Parents' Perceptions of Children's Pain***

In addition to parents' attitudes toward pain medication, parents' perceptions of children's pain following day surgery may also influence parents' management of children's postoperative pain. This section includes two sets of studies. The first set examines parents' perceptions of children's pain intensity. The second set of studies examines parents' perceptions of children's behavioral cues which may indicate pain following surgery.

#### ***Parents' Perceptions of Children's Pain Intensity***

Studies that have examined parents' perceptions of children's pain intensity indicate that parents are able to recognize when their child is having pain but may have difficulty in estimating the pain intensity their child is experiencing. An American study by Nardone and Schuchard (1991) examined the degree of postoperative pain in children under nine years of age (Mean age: 4.2 years) as reported by parents ( $N=75$ ). The major types of surgeries children had were: tonsillectomy, adenoidectomy, myringotomy, tympanoplasty, or hernia repair. In a routine follow-up telephone call after the child's discharge from same day surgery, parents were asked to rate their child's pain using a word scale (none, mild, moderate, or severe). Results indicated that 31% of parents reported that their children had moderate to severe postoperative pain and one-third of parents reported no postoperative pain. The researchers noted that approximately 50% of the children were under the age of 3 which may have made the quantification of pain by parents more difficult.

The problem of postoperative pain was more pervasive in a survey by Bartley and Connew (1994) in New Zealand. These researchers studied the postoperative problems encountered by parents of children ( $N = 52$ ), between the ages of 2 and 10 years, following day surgery for tonsillectomy or tonsillectomy and adenoidectomy. Parents were contacted by telephone on the first postoperative day and again 10 to 14 days postoperatively. Forty-seven of the 52 parents (90%) identified postoperative pain as a problem in the first 24 hours. Twelve percent ( $n = 6$ ) of the children did not have pain relief with acetaminophen and 17% of children ( $n = 9$ ) had poor fluid intake the morning following surgery. When parents were contacted 10 to 14 days later, five parents (10%) reported continuing problems with pain management and one child was admitted for dehydration. With regards to the limitations of this study, no tool was used to measure pain intensity and no information was given regarding how often the parents were to administer the acetaminophen.

In a clinical audit conducted in a pediatric hospital in France, Grenier, Dubreuil, Siao, and Meymat (1998) evaluated the recovery and complications of children following day surgery. Children ( $N = 104$ ), between the ages of 8 months and 15 years (Mean age: 7 years) who had orthopedic, urology, plastic, general, endoscopy, or other surgeries were included in the study. A questionnaire, presented to parents at the time of discharge and returned by mail (return rate 95%), was used to evaluate parents' perceptions of their children's recovery following surgery. At home, 25% of the parents reported that their children had

pain. Pain was more frequent in children who had not received any opioid or regional anaesthesia while in hospital. No information was given on the development of the questionnaire or about how pain was measured.

In a prospective, randomized, double blind, placebo-controlled study, Nikanne et al. (1999) in Finland studied postoperative pain following an adenoidectomy, with pre-emptive medication given at the time of induction. Children, between the ages of 1 and 7 years (Mean age: 33 months), were randomly selected for either a pre-emptive dose of ketoprofen ( $n = 442$ ) or a placebo ( $n = 169$ ). The parents of the children completed a one week diary on pain intensity and duration at home following day surgery (response rate 91%). Pain intensity was measured using a four-point word descriptor scale from 1 (*no pain*), 2 (*mild pain*), 3 (*moderate pain*), to 4 (*severe pain*). Results indicated that the median worst pain intensity reported by parents was 3 (*moderate pain*). Eighty-seven percent of parents reported children had pain at home and 20% of parents identified their children as experiencing *severe pain* at home. Pain lasted a median of 2 days (range 0 to 5 days). There was no relationship between administration of pre-emptive ketoprofen and the intensity and duration of pain at home. These researchers concluded that parents should be encouraged to give analgesic medication on a regular schedule for at least 2 days postoperatively, even if the child does not seem to be in pain.

In a Canadian study that compared parents' and children's pain ratings, Bennett-Branson and Craig (1993) examined postoperative pain in 60 children (7

to 16 years; Mean age: 10.6 years) following minor surgery for tonsillectomy, adenoidectomy, appendectomy, hernia repair, circumcision, orchidopexy, and repair of labial adhesions. Most interviews occurred at home on the day following surgery with parents and children interviewed separately. Parents were asked to rate their child's present pain and worst pain since surgery using a 10-centimeter visual analogue scale with the anchors of *no hurt* and *hurt as bad as it can be*. Children were asked to rate their own present and worst pain using the same procedure. Findings indicated parents' mean estimate of children's present pain was 5.15 ( $SD = 2.72$ ). The researchers reported a moderate correlation  $r = 0.54$ ,  $p = 0.001$ ) between parent and children's ratings of *present* pain and no significant correlation between parents' and the child's *worst pain*. The authors concluded that parents were *accurate* judges of their children's present pain but not of worst pain.

A Scottish study by Knight (1994) explored the relationship between children's ( $N = 98$ ) ratings and parents ratings of children's postoperative pain, use of analgesia and any complications following day surgery at home using a questionnaire for 2 days postoperatively. The mean age of children in this study was 4.75 years (Range: 2 months to 12 years). Children three years and older were asked to point to a face, on a 7-point Faces pain scale (0 to 6 ), that showed how much pain they felt. Parents were asked to use a 7-point numerical rating scale (0 *no pain* to 6 *worst pain possible*) to assess their child's pain on the evening of surgery and once per day for the following 2 days. At home mean pain

intensity scores were between 1 and 2 on the evening of surgery, approximately a score of 1 at 24 hours postoperatively, and between 0 and 1 at 48 hours.

Although parents tended to underestimate their child's pain at home this did not reach statistical significance. Children who had undergone a circumcision tended to have higher mean pain scores at home but this was not statistically significant. The majority of participants were male (94 of 98) and 50% of the sample had a circumcision. A major limitation was that the procedure related to pain assessment by children and parents was not clearly explained.

Unlike the previous two studies, Chambers, Reid, Craig, McGrath, and Finley (1998) in a Canadian study, found poor correlations between child and parent reports of children's postoperative pain following minor surgery. Participants were parents and their 7-to-12- year-old children (Mean age: 9.4;  $n = 110$ ) who had a day surgery procedure. Procedures included eye muscle repair, circumcision, hernia repair, tonsillectomy and/or adenoidectomy, sinus surgery, dental surgery, frenectomy, and excision of skin lesion. A 7-point Faces Pain Scale (0 *no pain* to 6 *worst pain possible*) was used by parents and children to record pain intensity for the day of surgery and the 2 days following surgery. Parent mean pain intensity scores were 2.09, 1.19, and 0.72 on day 1, 2, and 3 respectively. Child pain intensity scores were 2.29, 1.41, and 0.82 on day 1, 2, and 3 respectively. Paired t-test results indicated that parents tended to underestimate their child's pain on the day of surgery ( $p < .10$ ) and day 1 ( $p < .05$ ) but not on day 2 of surgery. While Pearson's correlation and intraclass



correlation coefficients (ICC) were relatively high between parent and child reports for each of the 3 days, the kappa statistic indicated there was only poor to fair agreement beyond chance between child and parent pain ratings (range = 0.18 to 0.32). The kappa statistic was thought to be a more accurate assessment of agreement between parent and child reports. The authors concluded that parent reports should not be relied upon as the only source for ratings of children's pain.

### ***Summary***

This set of studies indicates that although parents were able to recognize their child was having pain, there was not always good agreement between the parents' and children's reports of pain intensity. One of the difficulties when comparing this set of studies is the variety of tools used to measure children's pain in any one study.

### ***Parents' Perceptions of Children's Behavioral Cues***

Parents' ability to identify various behaviors related to the postoperative pain experience may influence their management of children's pain. In a qualitative study, Gedaly-Duff and Ziebarth (1994) identified mothers' difficulties in assessing their child's pain. A purposive sample of 7 mothers with children, between the ages of 4 and 8 years, who had a tonsillectomy and adenoidectomy in day surgery was selected. Three interviews were conducted with the mother; one interview in the hospital and two at home following surgery. Four themes emerged from the data: mothers' descriptions of their children's overall pattern of

postoperative pain, mothers' assessment and evaluation of their children's pain and pain cues used, mothers' concern about addiction, and mothers' learning to manage their children's pain through *trial and error*. The major cue identified by mothers as indicative of pain was the child not drinking. Additional cues signifying pain behavior were facial grimace, crying and tiredness. In this study, some behavioral cues were interpreted as attention seeking and some mothers expressed concern about behavioral clues potentially signalling drug addiction.

Similar cues were identified in a study by Reid, Hebb, McGrath, Finley, and Forward (1995) who examined both verbal and nonverbal cues parents ( $N = 176$ ) use to assess postoperative pain in their children. Children ranged in age from 2 to 12 years old and had one of a variety of minor outpatient surgeries. In a pain diary completed at home, parents were asked to identify cues related to how their children were feeling. Parents reported a mean of 2.4 cues ( $SD = 1.55$ ) (range 0 to 7) on the day of surgery which remained approximately the same on day 1 but decreased significantly on day 2. These researchers found that verbal report and appetite were the most common cues used by parents to assess pain on all 3 days. The presence or absence of illness behavior cues (protective behavior, visible/audible discomfort) as well as disruptions to normal behavior pattern (sleep and level of activity) were related to pain intensity ratings. A limitation of this study was that parents were asked to report cues on how their children were feeling rather than cues related to how much pain their children were in.

Using a questionnaire, Knight (1994) explored the relationship between children's ( $N = 98$ ) and parents' ratings of postoperative pain following day surgery and analgesic use over a 48-hour period in Scotland. The majority of children (96%) had genitourinary surgery and were between the ages of two months to 12 years (Mean age: 4.75 years). Knight also found that 39% of the children ( $N = 98$ ) in her study had a disturbed first night's sleep after surgery as reported by parents but it was unclear if parents related this behavior to pain. The author concluded standardization of pain assessment by the use of a pain rating scale would be beneficial.

The findings of the three previous studies were supported by Sutters and Miaskowski (1997) who also studied parents' management of their children's pain postoperatively following ambulatory day surgery. Parents ( $N = 84$ ) and their children between the ages of 3 and 12 years (Mean age: 7 years), who had a tonsillectomy and/or adenoidectomy, and myringotomy were included in the study. Parents were contacted by phone about 24 hours following discharge from day surgery, and were asked a series of 15 questions about the child's pain experience and pain management. Findings indicated that children with higher pain intensity ratings, as reported by parents, drank less ( $p = 0.08$ ), had sleep disturbances ( $p = 0.004$ ), and had more behavioral changes ( $p = 0.001$ ) than children with lower pain intensity ratings. Over one-half of the children were reported by parents to be unusually quiet. Parents of those children who had moderate to severe pain also reported that their children were fussy, crying on

occasion while still attempting to participate in routine activities or play, or were extremely irritable or inconsolable and unable to engage in any form of distraction. It is unclear from this study if parents associated all these behaviors with pain. A strength of this study is that the questionnaire was developed from an extensive review of the literature and reviewed by a panel of paediatric pain management experts for content validity.

Many of the same cues were found in a study by Warnock and Lander (1998). These researchers studied pain progression, intensity and outcomes following tonsillectomy and/or adenoidectomy, and myringotomy. Participants were parents with children between the ages of 5 and 16 years. Parents ( $N = 130$ ) were interviewed via telephone, on the day of surgery and for the six subsequent days to report on changes in children's behavior. The most frequent behaviors noted were poor fluid intake, poor food intake and not sleeping through the night.

### ***Summary***

Most studies that have examined behavioral cues report appetite and drinking as cues recognized by parents indicating changes in behavior that may be pain related. One limitation of a number of these studies is that parents were not always clearly asked to report on changes in behavior related to pain.

### ***Postoperative Pain Management***

Parents' attitudes toward medication and parents' perceptions of children's

pain may influence the amount and number of times medication is administered by parents to manage children's pain after day surgery. Many of the same studies that studied parents' perceptions of children's pain also examined parents management of children's postoperative pain following day or short-stay surgery.

### ***Parents' Pharmacological Management***

In one of the first studies of parents' home management of pain, Nardone and Schuchard (1991) examined the degree of postoperative pain reported by parents and pain management given to children under nine years of age (Mean age: 4.2 years). Data were collected via telephone interview ( $N = 75$ ) following day surgery. The major types of surgeries children had were tonsillectomy, adenoidectomy, myringotomy, tympanoplasty, and hernia repair. Results of this study indicated that 31% of children experienced moderate to severe pain. Sixty-seven percent of the children received some form of pain medication postoperatively; 23% received acetaminophen with codeine and 44% received acetaminophen alone. Thirty-three percent of the children received no medication which was consistent with parent perception of no pain experienced by 29% of the children. Acetaminophen was perceived as slightly better in controlling pain compared to acetaminophen with codeine.

Using a questionnaire, Knight (1994) explored the relationship between children's ( $N = 98$ ) and parents' ratings of postoperative pain following day surgery and analgesic use over a 48-hour period in Scotland. Children were

between the ages of two months to 12 years (Mean age: 4.75 years) and the majority of children (96%) had genitourinary surgery. Findings indicated that at home over the 3 days following surgery, 84.4% of children ( $n = 77$ ) were given acetaminophen an average of 3 times. The author concluded that the increase in day surgery procedures meant that basic clinical research should be directed at improving analgesia at home.

Not all children with pain received adequate pain medication in a study by Finley et al. (1996) that examined parents' perception and management of children's postoperative pain ( $N = 189$ ; Mean age: 5.9 years, range 2 to 12 years) recorded in a 3 day diary at home following day surgery. The children in this study had one of a variety of surgical procedures including tonsillectomy, orchidopexy, circumcision, urethral repair, adenoidectomy, strabismus repair, sinus surgery, and revision of thumb all of whom had high mean pain scores; more than 25% of children having a tonsillectomy, dental extraction, or circumcision procedure still had clinically significant pain on day 3. These researchers found that of those children judged to be in significant pain, 47% of children were given 1 to 3 doses and 13% of children were given no medication on day 2. On day 3, 17% of children judged to have significant pain received no medication and 45% received 3 or fewer doses. Parents were asked about instructions given regarding pain medication; 68% recalled being told to use acetaminophen *if necessary*; only 18% of parents remembered being told to give pain medication on a regular basis. This study does not report on the actual

medications given to children. The authors concluded that most parents give inadequate doses of pain medication even when they recognize that their children are in pain.

Similar results were found by Kotiniemi, Ryhänen, Valanne et al. (1997) when examining postoperative symptoms in children ( $N = 551$ ) at home following day surgery in Finland. Children ranged in age from 4 months to 13.4 years with a mean of 3.8 years. The children in this study had ear, nose, throat, eye, genitourinary, or orthopedic surgery. Findings indicated that the type of surgery was the only significant factor determining the occurrence of pain at home with a tonsillectomy procedure having the highest incidence of reported severe pain. On the day of surgery, 56% of children had pain and 78% of these children were given pain medication. This number decreased to 60% of children in pain receiving medication the next day and 58% on the second day postoperatively. Only 3% of the children in pain were given more than 2 doses of medication per day. The authors concluded that treatment of pain at home and instructions for treatment of pain need to be improved.

Sutters and Miaskowski (1997) used a telephone interview 24 hours after discharge from same day surgery to study parents' ( $N = 84$ ) home management of their children's (Mean age: 7 years; range: 3 to 12 years) pain following a tonsillectomy. Findings indicated that while acetaminophen with codeine was the most frequently ordered analgesic, 93.7% of the doses ordered were below recommended levels, and all analgesics were ordered on an *as needed* basis

rather than on a routine schedule. Parents gave an average of 3 doses of analgesic to their child within the first 24 hours of surgery. Fifty-seven percent of the parents administered less than 50% of the maximum 24 hour dose that was ordered. These authors concluded that more parental instruction in home management of children's pain is needed to address the severity of pain associated with the surgical procedure.

Similarly Warnock and Lander (1998) examined the relationship between pain progression, pain intensity, and outcomes of paediatric day surgery for Canadian children between the ages of 5 and 16 years (Mean age: 7.3 years). They found that tonsillectomies caused considerable pain (*moderate to severe*) for three days with gradual decline over the next four days (*mild to moderate*). Consistent with other studies, the most commonly prescribed analgesics were acetaminophen (60%) and acetaminophen with codeine (26%). Fourteen percent of the children in the study were ordered codeine only for pain. There were no significant correlations between child-reported pain and the percentage of daily doses of medication given. Few children received the full daily dose of medication, even on the first postoperative day. One half of the children ( $n = 130$ ) received less than 50% of the analgesics ordered on the first day postoperatively. The authors concluded that post-tonsillectomy pain was poorly managed by health professionals and parents.

A Danish study by Rømsing, Hertel, Harder, and Rasmussen (1998) examined the difference between regular scheduled administration of



acetaminophen, based on weight appropriate dosing (study group), compared to *whenever necessary* administration of acetaminophen (control group) for postoperative tonsillectomy pain in children. Participants were parents ( $n = 40$ ) of children, between the ages of 5 and 15 years, at home for 3 days after day surgery for a tonsillectomy. Findings indicated that there were no significant differences on average pain scores for the 2 groups of children. Therefore, scheduled administration of acetaminophen was no more effective than as *needed* administration for post tonsillectomy pain. It is noteworthy that 18% of children in the *as needed* control group were not given acetaminophen by their parents even when they reported their pain was severe.

Nikanne et al. (1999) studied postoperative pain in Finnish children, between the ages of 1 and 7 years (Mean age: 33 months), following an adenoidectomy. The children were given either a pre-emptive dose of ketoprofen ( $n = 442$ ) or a placebo ( $n = 169$ ) in hospital. All children were prescribed ketoprofen 25 mg tablets and parents were instructed to give 2 to 3 tablets per day at home. A one week diary of pain intensity and duration and number of doses of ketoprofen given was completed by the parents of the children at home following surgery. Median worst pain intensity at home was moderate, however, 20% of children experienced severe pain at home. Ninety-six percent of the children were given ketoprofen and the median number of doses was 4 (range 1 to 10) during the first postoperative week. Older children ( $> 5$  years) received significantly more dosages of pain medication compared to younger children (2 to

4 years) in this study. The authors concluded that parents should be encouraged to give regular analgesic medication even if the child does not seem to be in pain.

In an audit of day surgery in a British hospital, Keeton (1999) examined the postoperative management of nausea, vomiting, and pain in hospital and at home for children ( $N = 188$ ) between the ages of four months and 16.5 years (Mean age: 5.5 years) following genitourinary surgery. A questionnaire completed by parents was used to note the time and type of medication given along with pain scores before and after medication for 5 days post surgery. On average over the 5 days, 45% of children recorded moderate pain and 27% had severe pain. Many children recording moderate to severe pain scores had long periods of 6 to 8 hours between administration of medication with the result that the half hour post-administration scores rarely returned to the desired pain free-level. No specific information was given on the type of medication given and the doses of medication administered by the parent.

Another study examined prescription patterns, pain relief, and parent management of pain in children ( $N = 460$ ) between the ages of 10 months and 18 years (Mean age: 5.4 years) following day surgery in a large tertiary care, university-based medical center (Munro, Malviya, Lauder, Voepel-Lewis, & Tait, 1999). Parents were called 24 hours after their child was discharged from day surgery. The children in this study had genitourinary, otorhinolaryngology, general/plastic, ophthalmology, orthopedic, or oral surgery. Ninety-five percent of

children were prescribed acetaminophen with or without codeine and 4% ( $n = 7$ ) did not receive a prescription. Approximately one-half of the prescribed dosages of acetaminophen were less than 10 mg/kg and the dosages of codeine were less than 1.0 mg/kg. Seventy-two percent of the parents gave the medication as prescribed, however, 23% gave less than, and 5% gave more than ordered but did not exceed the maximum recommended dosage. The authors concluded that despite variation in prescription patterns and compliance, 97% of children had acceptable pain control in the first 24 hours following surgery.

A Swiss study examined the factors associated with stress for parents whose children were undergoing day surgery (Tönz, Herzig, & Kaiser, 1999). Parents ( $N = 368$ ) of children between 3 months and 18.5 years (Mean age: 6.3 years) completed a survey questionnaire within the first postoperative week, following day surgery procedures (circumcision, metal removal, hernia repair and various others). Problems with postoperative pain at home was one of 6 identified stressors and was the most frequently reported concern of parents. This study found that only 45% of children received any postoperative pain medication at home and most of these children (75%) received medication only on the first postoperative day. Sixteen percent of the parents who perceived their children as having pain did not give pain medication and 20% of parents gave analgesics in a prophylactic manner. The authors concluded that parents of children who are undergoing surgery for the first time are particularly insecure in dealing with children's pain.

Education of staff and parents may increase the number of parents who administer medication and increase the number of doses of medication administered per day to children following day surgery. Chambers et al. (1997), in a randomized trial evaluating the effects of educating parents ( $N = 82$ ), reported parents administered analgesics with no greater potency than acetaminophen. The children (Mean age: 4.3 years; range: 2 to 12 years) in this study had otorhinolaryngology, genitourinary, ophthalmology, or oral surgery. Findings indicated that parents who were given education on the assessment and management of children's pain tended to give more medication but this was not significant until day 3 of the study.

A second intervention study by Sepponen, Kokki, and Ahonen (1999) examined parents' postoperative pain management at home. Participants were parents with children ( $N = 227$ ) between the ages of 7 months to 7 years 9 months (Mean age: 3 years 7 months) having otorhinolaryngology surgery. These researchers found that education of staff did increase parent usage of medication from 68% to 80%. The number of parents providing 3 doses of pain medication per day increased from 19% to 28% after the training program. There was a significant increase in the use of ibuprofen and a significant decrease in the use of acetaminophen. In addition, the use of medication in tablet form became significantly more common instead of rectal administration of medication. This study reports on the results of a questionnaire sent out to parents one week after their child's surgery so relies on parents' memory of

events.

### ***Summary***

Although direct comparisons are difficult because of the various surgeries, different health care environments, and various methods of pain measurement, most studies indicate that parents continued to under manage children's postoperative pain with the exception of two studies that found fairly good pain management practices by parents. Findings from this set of studies indicate the most common analgesic medication administered by parents is acetaminophen or acetaminophen with codeine. It is particularly troublesome that not all children with pain were given medication. Parents did not always administer the recommended doses and dosages of medication. Overall, few parents administered medication on a regular basis following day surgery.

### ***Nonpharmacological Management***

Parents' attitudes toward medication and parents' perception of children's pain may also influence parents' nonpharmacological management of children's pain. In an epidemiological study at a paediatric hospital in Canada, Cummings, Reid, Finley, McGrath, and Ritchie (1996) examined the prevalence of pain, analgesic prescription, and administration practices and their relationship to pain ratings. For children five years or older, both the child and parent were interviewed ( $n = 98$ ); if the child was less than five years old then the parent ( $n = 102$ ) was interviewed for their perceptions of pain intensity, pain source, and help received for pain while in hospital. All children who were inpatients, except

Neonatal ICU and psychiatry patients, were potential participants (Mean age: 6.3 years; 58% boys). Children who had pain were asked whether any help for the pain had been given and who had provided that help. Findings indicated that mothers and nurses were frequently reported sources of help for pain followed by a high number of *no-one helped them* responses. Fathers, friends, and child life specialists were all identified as infrequent sources of help for pain. Slightly less than one half of the children ( $n = 98$ ) reported nonpharmacological help such as talk, repositioning, touch, distraction, food/sleep, and healing as helpful. The authors concluded that children are often helped by nonpharmacological interventions but more education is needed for health professionals and parents to use these methods to help manage children's pain.

In a qualitative study, Woodgate and Kristjanson (1996) described how parents, mostly mothers, and nurses responded to children ( $N = 11$ ) following a variety of surgical operations. A theoretical purposive sampling technique was used to select participants on two surgical units of a university-affiliated paediatric hospital in central Canada. The primary method of data collection was by participant observation with periods of observation lasting 2 to 8 hours. Data were analysed using a constant comparative method. The major category that emerged describing how parents and nurses respond to and care for children in pain following surgery was *how parents and nurses take care*. This study found that parents in a hospital setting played a critical role in their child's care especially during times of severe pain. Besides providing their children's basic

care, two other principal categories of parent care were identified: monitoring and comforting. Monitoring included observing for signs of pain as well as making sure that some action was taken to relieve the pain. Parents provided comforting by helping children with their activities, holding or rubbing a body part, talking in a comforting or reassuring tone, and distracting by reading to the child. Just being with the child was perceived by both the parent and the child as the most important activity and most useful in relieving pain. The authors concluded that the communication between parents and nurses about pain assessment and management was limited.

In an American study, Gedaly-Duff and Ziebarth (1994) used a qualitative method to describe mothers' experiences in identifying and managing their children's acute pain. Mothers readily identified giving pain medication as treatment for pain but comfort measures were not named pain interventions but accompanied mothers' descriptions of their pain management. Some examples given were making a nest of a pillow and blanket on the couch, providing candy-flavored medication in liquid form, and treats such as popsicles and ice cream. Most mothers were unaware of their comforting and age-appropriate nonpharmacologic pain interventions. The authors concluded that mothers watched their children's behavior after surgery and took action to treat pain based on those observations.

In a Finnish study reporting on the postintervention phase of training health professionals on how to improve medication practices in both the hospital

and at home, Sepponen et al. (1999) studied the incidence of pain, different analgesics used, and problems related to administering medications at home following day surgery. Parents' with children ( $N = 227$ ), between the ages of 7 months to 7 years 9 months (Mean age: 3 years 7 months) were asked to respond to a questionnaire on postoperative pain management sent to them one week after their child was discharged from hospital. This study found that 66% of parents also reported using nonpharmacological interventions such as cool food or drink, nursing, and comforting to manage their child's pain at home. Thirteen percent of parents felt that their child did not need pain medication or any nonpharmacological management. The training intervention for health professionals did not influence parents' use of nonpharmacological interventions. The authors concluded that parents were willing to use both pharmacological and nonpharmacological methods to manage their children's pain postoperatively at home.

### ***Summary***

A limited number of studies were found that indicated parents' use of nonpharmacological interventions at home and in hospital. A variety of nonpharmacological strategies were identified as used by parents but there was no indication of how often parents used these strategies or how effective parents' nonpharmacological interventions were perceived to be in managing their children's pain at home following day surgery or short-stay surgery.



### **Conceptual Framework**

Based on this review of the literature, a conceptual framework was adopted for this study to explain the relationships among parents' attitudes toward medication, parents' perceptions of children's pain, and parents' management of children's postoperative pain using both pharmacological and nonpharmacological methods after day surgery (see Figure 1). The conceptual framework is based in part on the Theory of Reasoned Action (TRA) by Fishbein and Azjen (1980).

The fundamental goal of the Theory of Reasoned Action (Fishbein & Azjen 1980) is to understand, predict and influence a person's behavior. It is based on the premise that people are usually logical and are purposive in the use of the information available to them. A person's attitude toward the behavior will influence the person's judgment in favor of performing or not performing the behavior. Underlying attitudes are the person's beliefs that the behavior leads to certain outcomes and the person's evaluation of these outcomes.

In the conceptual framework for this study, parents' attitudes toward medication are hypothesized to influence parents' pharmacological management of children's postoperative pain. Parents' who have positive attitudes toward medication will have a tendency to medicate their children more frequently and those who have negative attitudes will have a tendency to give fewer doses of medication to their children.

It is also hypothesized that parents' attitudes to medication may influence

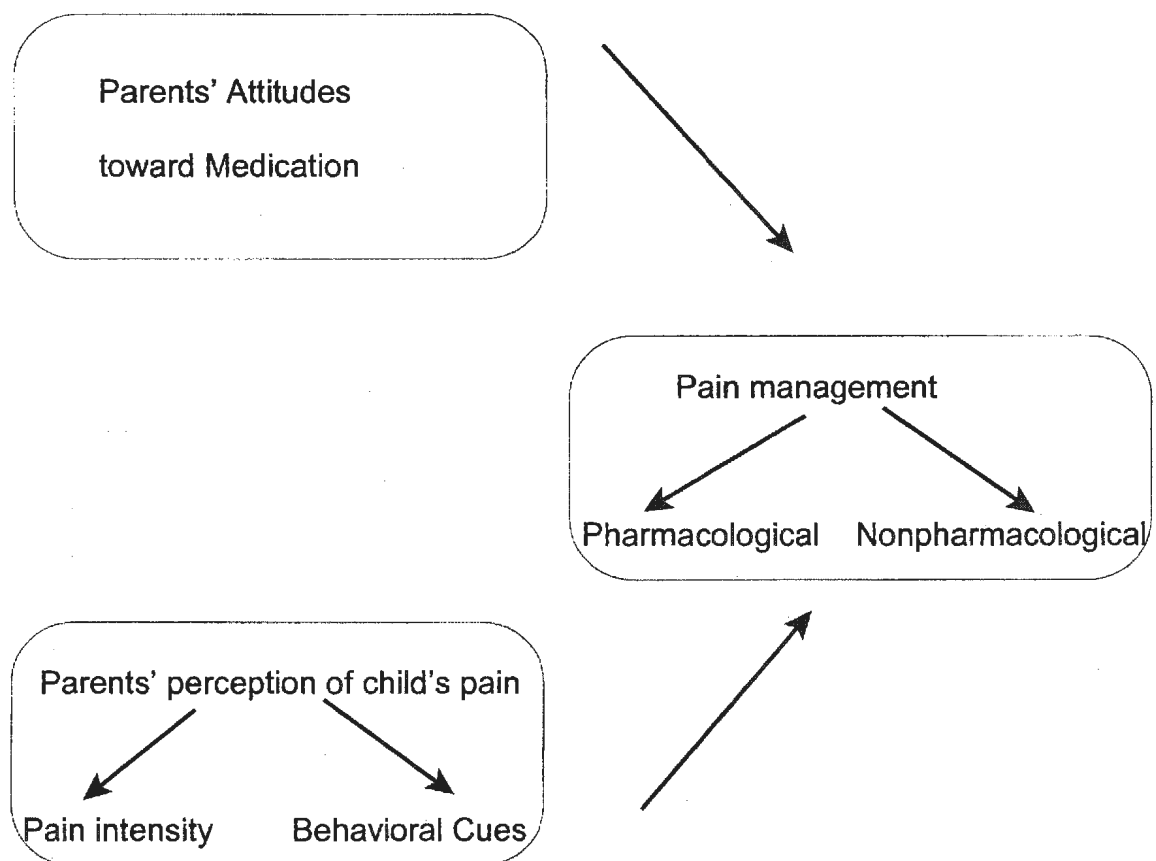


Figure 1 Conceptual Framework

parents' nonpharmacological management of their children's pain. Parents with positive attitudes may have a tendency to administer more medication and provide fewer nonpharmacological interventions. Parents with negative attitudes toward medication may have a tendency to use more nonpharmacological interventions to replace medication.

In addition to attitudes toward medication, parents' perceptions of children's pain will also influence their pharmacological and nonpharmacological management. Parents' perceptions of children's pain following day surgery and short-stay surgery are conceptualized in two parts: (1) parents' perceptions of children's pain intensity and (2) parents' perception of changes in behavior. Parents' perceptions of children's pain in these two areas contribute to parents' postoperative pain management. If the parent perceives that the child is in pain, then the parent will provide medication and nonpharmacological interventions to manage that pain. It is unknown whether perception of pain intensity or perception of behavioral changes will have the greater influence on parents' management of children's pain.

The Theory of Reasoned Action has been used extensively to understand health behaviors (Montaño, Kasprzyk, & Taplin, 1996). Only a few studies of paediatric pain management have been guided by a theoretical framework that seeks to explain the interaction of variables affecting children's pain management by either health professionals or parents' (Finley, et al, 1996; Sutters &

Miaskowski, 1997). A few adult studies have used the Theory of Reasoned Action and its associated Theory of Planned Behavior to explain attitudes toward medication, attitudes toward assessment and pain management by health professionals or adults themselves (Glynn & Ahern, 2000; Nash, Edwards, & Nebauer, 1993; Pederson, 1996; Pellino, 1997; Tricker, 2000).

## **CHAPTER 3**

### **Methodology**

A descriptive correlational design was used to investigate: parents' attitudes toward medication, parents' perception of their child's pain and parents' management of their child's pain at home after day surgery or short stay surgery. This chapter provides an overview of the setting, population and sample, procedure and instruments, data analysis, and ethical considerations of the study.

#### ***Setting***

The setting for this research study was the Day Surgery Unit at Western Memorial Regional Hospital (WMRH) in Corner Brook, Newfoundland. This 180-bed acute care regional hospital services the outpatient and inpatient needs of a population of 95,000. Pediatric day surgery is part of the general day surgery program at the hospital. From medical record information, an average of 35 to 40 pediatric procedures were performed through this day surgery unit per month at the time of data collection (M. Matthews, personal communication, April 17, 1998). The five most common procedures were tonsillectomy and adenoidectomy, external ear procedures, circumcision, skin procedures, and dental surgery. Children seen in this service ranged in age from 1 month to 16 years old.

During the data collection period of this study, children needing day surgery were seen in the surgeon's office at least once prior to the procedure. The surgery was booked by staff at WMRH and the office of the surgeon contacted the family to notify them of the day surgery date. The waiting period from the time at which the decision was made in the surgeon's office varied from one to two weeks or longer depending on the urgency of the procedure. Most children were discharged from the hospital within 5 hours. However, some children who underwent a tonsillectomy and adenoidectomy were kept overnight for observation and discharged from the hospital within 24 hours.

On the day of surgery, the parent and child were asked to come ninety-minutes ahead of the time the procedure was scheduled. The child was registered in the outpatient department and then went directly to the day surgery area. In the day surgery area, the parent and child were interviewed by a nurse to complete the day surgery preoperative record which included vital signs, health history, and a preliminary assessment of the child's general appearance to determine if he/she seemed healthy enough for day surgery. If any problems were identified, the anaesthetist was notified and visited the child if necessary. The interview assessment by the nurse usually took 15 minutes.

Postoperatively parents were given protocol sheets by the nurse in day surgery which originated from the particular surgeon who had done the surgery. These protocol sheets outlined information on pain medication, what to expect in the postoperative period, what would help in the child's recovery and what the

child should avoid, what to do if there was abnormal bleeding, and what to do if the child reacted to medication. After returning to the day surgery unit, children were usually discharged within 30 to 90 minutes (or longer depending on the type of surgery) to the care of their parents; the child had recovered from his/her procedure and the parents were comfortable taking them home. Some children who had undergone a tonsillectomy and adenoidectomy were kept overnight for observation and discharged from the hospital within 24 hours.

### ***Population and Sample***

The target population consisted of parents whose child had day surgery or short-stay surgery in the regional hospital. The parent who agreed to participate in the study also provided the majority of care for the child on the Day of Surgery and 2 subsequent days. Eligibility criteria for inclusion in the study sample were as follows:

1. The child was between the ages of 2 and 12 years.
2. The procedure for which the child was scheduled required an incision.
3. The child was hospitalized less than 24 hours.
4. The parent agreed to participate in this study.
5. The parent was able to read and understand English.
6. The parent had access to a telephone.

Parents/children who did not meet these criteria were excluded from this study.

It was anticipated that the correlation among study variables (attitudes

toward pain medication, pain intensity and behavioral cues, and number of doses of pain medication given) would be at least low to moderate. For a 2-tailed alpha set at 0.05 and beta at 0.20 to achieve 80% power and an expected correlation of  $r = .40$ , the estimated required sample size for this study was 47 participants (Hulley & Cummings, 1988). To account for a possible attrition rate of 20%, an additional 9 participants were recruited into the study for a total sample of 56 participants. This was considered a feasible sample size for this study.

### ***Procedure***

All surgeons in the Corner Brook area ( $n = 5$ ) who perform pediatric day surgery procedures were contacted by letter explaining the research study and requesting their cooperation as intermediaries for initial contact with participants (see Appendix A). The letter was followed up with a telephone call to the surgeons to answer any further questions.

The researcher met with the nursing unit supervisor in charge of the Day Surgery Program at WMRH to discuss the research study and to provide information on the study. Meetings were held with the nurses in the Day Surgery Unit and the Pediatric Unit to provide information on the study, the nurses' role as intermediaries for initial contact with participants, and to discuss any concerns.

Parents interested in participating in the study were identified in one of two ways. First, parents contacted the surgeon's office to express their interest in the study and gave permission for the researcher to contact the parent by telephone



to clarify the information given in the initial letter or to answer any questions the parent may have. Second, on the day of the scheduled day surgery, parents who had not specifically stated to date that they would or would not like to participate in the study were asked by the admission nurse on the day surgery unit or nurse on the pediatric unit whether they wanted to hear more about the study. If so, the researcher contacted and met with the parents. This latter approach for identifying participants was the most frequent method of recruitment into the study. Data collection began on March 27, 2000 and was completed on August 30, 2000.

On the day of surgery, the researcher met with parents who expressed interest in participating in the study. This occurred in the day surgery unit or in the pediatric unit at a convenient time arranged with the parent, after the parent and child had completed the admission procedures to the unit. At this time any questions the parent had about the research were answered. Participants were given an information package by the researcher. This information package included a one page description of the study (see Appendix B) and a copy of the consent form (see Appendix C) that they could take home with them and study further. If parents agreed to participate, the parent expected to provide most of the postoperative care at home was asked to sign the consent form. After consent had been obtained, the following protocol occurred:

1. A demographic data form was completed with the parent (see Appendix D).
2. The parent was given a Postoperative Diary and an explanation about

how to complete the tools within the diary. A stamped self-addressed envelope was provided for parents to return the diary to the researcher.

3. Arrangements were made with parents to be contacted by phone three days after the surgery to have them respond to some statements on attitudes toward medication.

4. On the third day following the child's surgery, the researcher contacted the parent as arranged. The parent was asked to respond to statements from Parents' Attitudes Toward Medication tool (Forward et al., 1996). At the conclusion of the telephone interview, questions asked by the parents were answered by the researcher. Parents were reminded to return the Postoperative Diary to the researcher in a self-addressed stamped envelope provided with the diary. Two reminder phone calls were made to the parent if the diary was not returned within seven working days after the telephone interview.

## ***Instruments***

### ***Demographic Data Form***

A form was developed by the researcher to gather demographic characteristics of the selected population (see Appendix D). The form included age of primary caregiver and child, type of surgical procedure performed, gender of the child, number of children in the family and family position of the child, and experience with past surgeries. The selection of variables was based on the review of the literature. This form was completed with the parent at the time of

surgery.

### ***The Postoperative Diary***

The postoperative diary given to parents was based on the Finley et al. (1996) study. Diaries are used to obtain information over a period of time that can be recorded shortly after the event thus improving accuracy of data collected (Burns & Grove, 2001). Parents were asked to use a structured diary to record their perceptions and management of their child's pain at home. Parents, whose children were discharged shortly after day surgery, completed the diary for three consecutive days [the evening of surgery (Day 0) and two days following the child's surgery (Day 1 and Day 2)]. Parents whose children were admitted for a short-stay admission overnight were to complete their diary for Day 1 and Day 2 only. The postoperative diary and instructions for its completion were given to the primary caregiver at the time of the interview in the day surgery area or pediatric unit. This diary included:

1. A series of Numerical Rating Scales (NRS) for parents to rate their child's pain intensity during specified periods of each day.
2. A Parents' Postoperative Pain Measure (PPPM) for parents to identify any changes in the child's behavior after the surgery (Chambers, Reid, McGrath, & Finley, 1996).
3. A page to record medication administered on each day.
4. A checklist of Parents' Comforting Activities that parents used with their child.

**Numerical Rating Scale (NRS).** Parents were asked to rate their child's *present pain* on a scale from 0 to 10 (see Appendix E). Word descriptors were included under 0 (*no pain*), under 4 to 6 (*moderate pain*), and under 10 (*worst possible pain*). Parents completed this tool at home on the evening of surgery and three times on the two days following surgery (breakfast, lunch, and supper). In the case of parents with a child admitted over night, these parents completed the NRS on Day 1 and Day 2.

The NRS was chosen because it is one of the most commonly used pain rating scales and is particularly useful when face-to-face contact between clients and health professionals is not possible. It is easy to administer, score, record and the validity of the NRS has been well established. It is used widely in clinical practice. The 0 to 10 scale is potentially more sensitive to changes in pain intensity than a 0 to 5 scale (McCaffery & Pasero, 1999). The NRS builds on the Visual Analogue Scale (VAS) which was used in similar studies of children's pain (Finley et al., 1996; Bennett-Branson & Craig, 1993; Gedaly-Duff & Ziebarth, 1994; Reid et al., 1995; Warnock & Lander, 1998).

**Parents' Postoperative Pain Measure (PPPM).** The Parents' Postoperative Pain Measure (see Appendix F) identifies cues in the child's behavior that may be related to pain (Chambers et al., 1996). Parents in the day surgery group completed this instrument on the evening of surgery at home and at a different time period (morning, afternoon, or evening) on each of the 2 days following surgery. Parents in the short-stay group completed the PPPM at home

on Day 1 and Day 2.

The time period for completion was allocated by the researcher and indicated in each parent's diary. The researcher indicated on the diary one of the three time periods when the PPPM was to be completed by the parent on Day 1 and then the next sequential time period was noted for the parent to complete on Day 2 in each of the diaries. For example, if the morning of Day 1 was the selected time period, then the afternoon of Day 2 was the next time period to be completed.

Because children's pain behaviors are known to vary over the course of a day (Gedaly-Duff, Ziebarth, 1994; Rømsing et al., 1998), it was thought important to have an equal distribution of PPPM scores across the 3 time periods for both days. To achieve this distribution, the investigator developed 60 diaries with 20 diaries assigned for each time period for Day 1 (i.e., 20 for morning, 20 for afternoon, and 20 for evening). As parents were enrolled in the study, diaries were allocated in sequence.

The development of the PPPM was based on children aged from 2 to 12 years and tested on 110 children between the ages of 7 and 12 years (Chambers et al., 1996; Reid et al., 1995). Initially, the instrument consisted of 29 items which were correlated with child-rated pain. Fifteen of the 29 original items with correlations of  $>0.30$  yielded good reliability ( $\alpha = 0.88$ ) and validity and higher levels of sensitivity and specificity. A cut off score of six positive responses out of 15 final items was selected as an indication of clinically significant pain. This

resulted in sensitivity of 88% on Day 1 and 80% on Day 2, and specificity of 80% on Day 1 and 84% on Day 2. Internal consistency reliability for both days was high (0.88 and 0.87). The PPPM showed concurrent validity with children's self-reports of pain. The PPPM has been used in subsequent studies (Finley, Chambers, McGrath, & Walsh, 1999a, 1999b; Khunsongkiet, Finley, Chambers, & McGrath, 1999; McGrath, Finley, Chambers, & Walsh, 1999). In this study, Cronbach alpha was 0.85 on Day of Surgery, 0.88 on Day 1, and 0.85 on Day 2 indicating good internal consistency.

***Analgesic Record.*** Parents were asked to record the name of any analgesic(s) administered to the child, time given, and dose of medication given at home. Effectiveness of medication on the evening of the surgery and for the two subsequent days was rated on a 0 to 10 scale with the word anchors *no effect* and *completely effective*. This measure was also used in the study by Finley et al. (1996).

***Parents' Comforting Activities Checklist (PCAC).*** In order to measure nonpharmacological management of children's pain, a new tool titled the Parents' Comforting Activities Checklist was used. Parents were asked to complete this tool on the evening of Day 1 of the study. This gave the parents approximately 24 hours to provide comforting activities prior to completing the tool. Parents were asked to indicate all activities listed which they used to comfort their child when the child was in pain. An item called *other* was used by parents to identify any additional comforting behaviors that they may have used. Parents were also

asked to list the five most effective comforting activities they used and to rate the effectiveness of these comforting activities on a scale of 0 to 10 with the anchors under 0 being *not effective* and under 10 *completely effective*.

The PCAC is a new checklist developed by the researcher to identify nonpharmacological activities used by parents to comfort their child following surgery. This tool was developed because no tool identifying what parents actually do to comfort their children was found in the reviewed pediatric pain literature. Based on a review of the pediatric pain literature, the researcher developed a preliminary list of potential nonpharmacologic strategies (Cummings et al., 1996; Denyes, Neuman, & Villarruel, 1991; Gedaly-Duff & Ziebarth, 1994; Woodgate & Kristjanson, 1996). Six pediatric nurses, five parents, and a pediatric pain expert, reviewed this list and suggested revisions which were incorporated into the checklist to provide face validity (Burns & Grove, 2001).

The final tool consisted of 39 items (see Appendix G). The tool has 6 conceptually different subscales. The six subscales were: *distraction* (10-items), *verbal comfort* (5-items), *physical comfort* (11-items), *presence of family member* (4-items), *nourishment* (4-items), and *environment* (5-items).

In this study the internal consistency for the entire tool was an alpha of .88. No items had high correlations ( $\geq 0.65$ ) which would indicate possible redundancy (Munro, 2001). Reliability analysis was completed on subscales that made theoretical sense. The *presence of family member* subscale had only 4 items of which *presence of grandparent* was dropped improving the alpha from

.25 to .40. The final reliability analysis of the subscales indicated that physical comfort ( $\alpha = .77$ ), nourishment ( $\alpha = .70$ ), verbal comfort ( $\alpha = .68$ ), distraction ( $\alpha = .64$ ), and environment ( $\alpha = .68$ ) had adequate internal consistency. The internal consistency for each subscale was close to or exceeded the recommended reliability of .70 for newly developed tools (Burns & Grove, 2001) with the exception of 'presence of family member' subscale.

### ***Parents' Attitudes Toward Medication***

Attitudes were measured during the telephone interview on the third day following surgery, the day after the Postoperative Diary was completed (see Appendix H). Using a 7-point Likert scale, the parent was asked to respond to each statement in relation to pain medication that the parent used after their child's day surgery or short-stay surgery. If the parent had not used any medication, then the parent was asked if they had ever used any pain medication for their child and the name of the previously used pain medication. This pain medication was then used in the statements on attitudes.

This instrument is in the early stages of development (Forward et al., 1996). Originally a 20-item scale on attitudes was developed based on the literature, reviewed by six pediatric pain researchers, and tested on parents ( $N = 298$ ). In this initial testing parents were asked to respond to a hypothetical tonsillectomy for 5 to 12-year-olds in general using a 7-point Likert scale. Negative items were reversed scored. This tool had five conceptually-based subscales measuring attitudes to addiction, side effects, tolerance, drug abuse,



and stoicism with coefficient alphas ranging from 0.35 to 0.75. When the entire stoicism subscale and three items from other subscales were dropped, the coefficient alphas of the remaining 13 items ranged from 0.63 to 0.75.

For the purposes of this study, 16 items were administered from the original scale tested by Forward et al. (1996); the original four items from the subscales measuring parents' attitudes toward addiction, tolerance, side effects and drug abuse were used. Internal consistency was conducted to evaluate the inter-item correlation with the total score.

In this study, reliability analysis of the initial 16 items revealed an alpha of 0.73. Three items were deleted which increased the internal consistency of the tool to 0.80. Therefore, as in the study by Forward et al. (1996) a 13 item version of the tool was used in statistical analysis.

Subscales for this tool are not reported in this study for two reasons. First, the study contained an insufficient number of participants to run a factor analysis on a tool with 13 items. Secondly, the primary developer of the tool indicated that a one factor solution of the tool might be appropriate because the items are all closely related (P. Forward, personal communication, April 02, 1999).

### ***Data Analysis***

Data were entered into the SPSS for Windows software program. Data were cleaned to detect missing data or outliers prior to running all analyses.

Background demographic and other characteristics of parents and children in the

study were described using appropriate descriptive statistics. Measures of central tendency, variability, skewness, etc. were conducted to test for the normal distribution of study variables. Each variable was examined for normal distribution; a box plot was constructed if the data were skewed to examine possible outliers prior to running all analyses (Munro, 2001). When data were normally distributed, Pearson's  $r$  was conducted to test for relationships between variables. Analysis of variance (ANOVA) was used to examine the differences among highest pain scores and the differences among changes in behavior over 3 days for the day surgery group. Paired t-tests were used to examine the differences between highest pain scores and between changes in behavior for Day 1 and Day 2 for the short-stay group. Independent t-tests were used to examine the differences between the day surgery group and the short-stay group. The chosen level of significance was 0.05 for all statistical tests.

### ***Ethical Considerations***

An application of approval for this study was made and received from the Human Investigation Committee at Memorial University of Newfoundland (see Appendix I) and the ethics committee at Western Memorial Regional Hospital (see Appendix J) prior to the implementation of the study. The vice president-operations of Western Memorial Regional Hospital was contacted and permission was sought and granted to proceed with this research at Western Memorial Regional Hospital (see Appendix K).

Strict measures were taken to protect participants' rights. Day surgery nurses, pediatric nurses or a delegate of the surgeon acted as intermediaries between parents and the researcher. Anonymity was maintained by using a numerical code on all questionnaires to protect the identity of participants. The list of participants' names and corresponding identifying codes were kept in a locked file cabinet in the researcher's office. The researcher had the only access to the data collected.

Participation in this study was voluntary. Parents were assured that all identifying information would be held in strict confidence. The purpose and procedure were fully explained and informed consent was obtained from the parents. There were no direct benefits to the parents or child by participating in the study; however, parents may have found participating in this study helpful in overseeing their child's recovery from surgery. No physical or emotional distress was voiced by the parents or child as a result of the study. Had any distress been expressed by a parent, the researcher would have asked the parent if they wanted a referral to their health care provider.

### **Summary**

The setting for this study was a regional hospital in a city in the province of Newfoundland. Nurses in the day surgery or pediatric unit were the primary intermediaries. The researcher spoke with parents who meet the inclusion criteria at a time arranged with the parent in the day surgery or pediatric unit. Once the

consent and demographic forms were completed, the parent providing most of the care was given a postoperative diary and an explanation of how to complete it. The postoperative diary consisted of the following four tools: a numerical rating scale, the Parents' Postoperative Pain Measure, an analgesic record, and a Parents' Comforting Activities Checklist. A follow-up phone call was done to collect data on parents attitudes to medications. All data was entered into SPSS and appropriate descriptive, correlational, and tests of differences were completed. Permission was obtained from two ethics committees and the vice-president of operations at Western Memorial Hospital before the study was implemented.

## **CHAPTER 4**

### **Results**

Study findings are presented in two sections. The first section presents a descriptive profile of the sample and key variables based on study findings. An overview of personal characteristics of children and their parents/caregivers as well as descriptive findings of parents' perception of children's pain, parents' pharmacological management of children's pain, parents' attitudes toward medication, and parents' nonpharmacological management of their children's pain after day or short-stay surgery are presented. The second section summarizes the relationships among key variables: parents' attitudes toward medication, parents' perception of children's pain, and parents' management of children's postoperative pain at home.

#### ***Descriptive Profile***

Fifty-six participants were recruited to the study. All of the participants were parents with one exception (a grandparent), so for purposes of this study, all primary caregivers will be referred to as parents. Seventy-five percent of parents ( $n = 42$ ) were recruited after their child was admitted to the day surgery unit and 25% of parents ( $n = 14$ ) were recruited when their child was admitted for a short-stay in hospital. For a short-stay, the child was required to stay over night and was discharged within 24 hours of admission. Four of the 56 parents did not

return the diary; one from the day surgery group and three from the short-stay group. Thirty-nine of 41 parents in the day surgery group completed the Numerical Rating Scale on Day of Surgery and 48 of 52 parents completed the Parent Comforting Activities Checklist on Day 1. Therefore, while demographic information from all 56 parents are reported, data from only 48 to 52 parents were included in the statistical analysis. No statistically significant differences were found between the group completing the diary and the group not completing the diary on the child variables of age, weight, gender, and type of surgery (see Appendix L).

### ***Personal Characteristics of the Sample***

Table 1 summarizes key personal characteristics of the sample ( $N = 56$ ). Children ranged in age between two and 12 years, mean age 5.98 years ( $SD = 2.85$ ) and weighed 11.8 to 67.7 kg with a mean of 25.7 kg ( $SD = 12.62$ ). There were slightly more males (58.9 %) compared to females (41.1 %). Forty-eight percent of the children were first or only children in their family. The most frequent family compositions were one (23.2 %) and two (57.1 %) child families. The caregivers of the children were primarily mothers (94.6 %) and the majority (69.7 %) ranged in age between 31 and 40 years with an overall mean of 33.5 years ( $SD = 5.35$ ).

### ***Present Surgical Procedure and Previous Hospitalizations of Children***

Tonsillectomy and adenoidectomy (T & A) and circumcision were the most frequent types of surgery for the children. These were followed by external ear

**Table 1*****Personal Characteristics of the Sample (N = 56)***

Variable	<i>n</i>	%
Age of child in years		
2 - 4	21	37.5
5 - 6	12	21.4
7 - 9	15	26.8
10 - 12	8	14.3
Weight of child in Kilograms		
< 15.00	8	14.3
15.00 - 19.99	13	23.2
20.00 - 24.99	12	21.4
25.00 - 29.99	11	19.6
30.00 - 34.99	2	3.6
> 35.00	10	17.9
Gender of child		
Male	33	58.9
Female	23	41.1
Caregiver		
Mother	53	94.6
Father	2	3.6
Grandparent	1	1.8
Age of caregiver		
< 25	4	7.1
26 - 30	8	14.3
31 - 35	24	42.9
36 - 40	15	26.8
41 - 45	5	9.0

surgery, eye surgery, hernia repair, dental surgery, and removal of hardware. Other types of surgery included removal of extra toe, frenectomy, release of bilateral trigger thumbs, and closed reduction of wrist. The short-stay group all had a T & A procedure.

Seventy-three percent of the children ( $n = 41$ ) had never been hospitalized overnight prior to this surgery. Of those children who were previously hospitalized ( $n = 15$ ), the most common reasons were for surgery and prematurity. All children who were premature also had surgery. Nine of the 41 children who had never been hospitalized had experienced day surgery prior to this surgery. In total, 19 children had a total of 29 surgeries prior to this study. External ear procedure, T & A, and hernia repair were the most common reasons for previous surgery. Table 2 summarizes types of present surgery and previous hospitalizations of the children.

### ***Parents' Perception of Children's Pain***

Parent's perception of children's pain was measured in two ways. The Numerical Rating Scale (NRS) and the Parents' Postoperative Pain Measure (PPPM) were used by parents in the day surgery group to assess their children's pain at home on the Day of Surgery, and for both the day surgery group and short-stay group for two days following surgery.



**Table 2**

***Present Surgical Procedure and Previous Hospitalizations of Children (N = 56)***

Variable	<i>n</i>	%
Present surgery		
T & A		
Short-stay admission	14	25.0
Day surgery	7	12.5
Circumcision	14	25.0
External ear surgery	6	10.7
Eye surgery	5	8.9
Hernia	2	3.6
Dental surgery	2	3.6
Removal of hardware	2	3.6
Other	4	7.1
Previous hospitalization of child		
None	41	73.2
One	10	17.8
Two - Five	5	9.0

Variable	<i>n</i>	%
Reason for previous hospitalization		
No previous hospitalization	41	73.2
Surgery (inpatient)	7	12.5
Prematurity (all had surgery)	3	5.4
Gastrointestinal problems	2	3.5
Other	3	5.4
Previous surgery (inpatient and day surgery)		
None	37	66.1
One	12	21.4
Two	5	8.9
Three	1	1.8
Four	1	1.8
Reason for previous surgery		
No previous surgery	37	66.1
External ear procedure	6	10.7
Tonsillectomy and adenoidectomy	3	5.4
Hernia repair	4	7.1
Eye surgery	2	3.5
Circumcision	1	1.8
Other	3	5.4

### **Numerical Rating Scale**

Parents were asked to indicate their children's pain on a numerical rating scale of 0 to 10 with the word anchors *no pain* = 0, *moderate pain* = 4 to 6, and *worst possible pain* = 10. Parents ( $n = 39$ ) whose children were discharged home after surgery completed the NRS during the evening of Day of Surgery. On Day 1 and Day 2, all parents ( $n = 52$ ) completed this tool a total of three times each day (morning, afternoon, evening).

For each child, the highest NRS score reported for each of the three days of the study was identified (see Table 3 for highest mean pain rating using the NRS). For the day surgery group, parents' highest mean pain rating for their children on the Day of Surgery ( $n = 39$ ) was 3.21. This score decreased to 2.71 and 1.78 on postoperative Day 1 and Day 2 respectively. Repeated measures ANOVA results found an overall significant difference over the three time periods,  $F(2, 37) = 7.98, p = .002$ . Within-subjects contrasts showed a statistically significant reduction in highest mean pain for Day 2 compared to Day of Surgery and Day 1,  $F(1, 38) = 16.71, p .000$ .

The highest mean pain rating reported by parents in the short-stay group was 4.81 and 4.64 on Day 1 and Day 2 respectively. There was no statistically significant difference between the scores for the two days using the paired t-test ( $t = .265, p = .796$ ).

Results from independent t-tests indicated the short-stay group had significantly higher mean pain scores compared to the day surgery group as a

**Table 3*****Highest Mean Pain Rating Noted by Parents Using the NRS***

Day	Highest Pain Rating			
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Range</i>
Day of Surgery				
Day surgery	39	3.21	2.78	0.00 -10.0
Day 1 ( <i>n</i> = 52)				
Day surgery	4111	2.71	2.80	0.00 - 8.00
Short-stay surgery		4.81	2.14	0.00 - 8.00
Day 2 ( <i>n</i> = 52)				
Day surgery	4111	1.78	2.40	0.00 - 9.00
Short-stay surgery		4.64	1.85	2.00 - 8.00

whole on Day 1 ( $t = -2.71, p = .013$ ) and Day 2 ( $t = -3.65, p = .000$ ). The surgeries resulting in high mean pain scores on all three days of surgery included circumcision, T & A, hernia repair, and eye surgery. The children having T & A's had the highest mean ratings by parents on both Day 1 and Day 2 following surgery (see Table 4 for mean NRS scores for highest pain reported each day according to type of surgery).

A score of 3 or greater on the 0 to 10 NRS scale was chosen as the indicator of clinically significant pain (Finley, McGrath, Forward, McNeill, & Fitzgerald, 1996; Munro, Malviya, Lauder, Voepel-Lewis, & Tait, 1999; Warnock & Lander, 1998). Forty-nine percent of parents in the day surgery group ( $n = 19$ ) rated their children's pain to be in the clinically significant range on Day of

**Table 4**

***Mean NRS Scores for Highest Pain Reported Each Day According to Type of Surgery***

Surgical procedure	Day of surgery			Day 1			Day 2		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Circumcision <sup>a</sup>	12	4.58	2.75	13	4.23	2.42	13	2.54	2.26
T & A									
Short-stay	-6	-4.5	-2.26	117	4.81	2.14	117	4.64	1.85
Day surgery <sup>b</sup>					3.43	3.46		3.00	3.91
Hernia repair	2	4	1.41	2	4	1.41	2	1.5	2.12
Eye surgery	5	3.2	4.09	5	2.6	2.79	5	1.4	2.19
Dental surgery	2	2	2.83	2	0	0	2	0	0
Removal of hardware	2	1	1.41	2	0	0	2	1	1.41
External ear procedure	6	0.33	0.82	6	1.17	2.86	6	0.5	1.22
Other	4	2.75	1.5	4	1	1.41	4	1	1.41
Total surgeries	39	3.21	2.78	52	3.15	2.8	52	2.38	2.57

<sup>a</sup>. 12 of 13 parents with children having a circumcision responded to the NRS on Day of Surgery

<sup>b</sup>. 6 of 7 parents with children having a T & A and discharged home on the same day responded to the NRS on Day of Surgery

Surgery. Overall, 58% of children on Day 1 were rated by parents ( $n = 30$ ) as having clinically significant pain. On Day 2, 44% of the children were rated by parents ( $n = 23$ ) as having clinically significant pain. The majority of children in the short-stay group ( $n = 11$ ) continued to have clinically significant pain postoperatively (91% on Day 1 and 81% on Day 2).

The numbers of children having clinically significant pain following a T & A, circumcision, eye surgery, and hernia were relatively high on all three days of the study (see Table 5 for numbers and percent of children with clinically significant pain using the NRS).

#### ***Parents' Postoperative Pain Measure (PPPM)***

Parents were asked to respond *yes* or *no* to a list of 15 statements concerning changes in their children's behavior which may indicate pain following surgery at home. Parents of children in the day surgery group completed this tool on all three days while the short-stay group completed the tool on Day 1 and Day 2 only.

Table 6 presents the mean number of changes in behavior each day noted by parents using the PPPM. Parents of children in the day surgery group ( $n = 41$ ) noted a mean of 6.78 changes in their children's behavior on the Day of Surgery. This decreased to 4.41 behavior changes on Day 1 and 3.05 changes on Day 2. Repeated measures ANOVA results found an overall significant difference over the 3 time periods, [ $F(2, 39) = 33.18, p = .000$ ]. Within subjects

Table 5

***Numbers and Percent of Children with Clinically Significant Pain Using NRS According to Type of Surgery***

Surgical Procedure	Day of Surgery ( <i>n</i> = 39)		Day 1 ( <i>n</i> = 52)		Day 2 ( <i>n</i> = 52)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
T & A						
Day surgery ( <i>n</i> = 7)	5	83.3 <sup>a</sup>	4	57.1	3	42.9
Short-stay surgery ( <i>n</i> = 11)	-	-		90.9		81.2
Circumcision ( <i>n</i> = 13)	8	66.7 <sup>b</sup>	10	76.9	7	53.8
Eye surgery ( <i>n</i> = 5)	2	40	2	40	1	20
Hernia repair ( <i>n</i> = 2)	2	100	2	100	1	50
External ear procedure ( <i>n</i> = 6)	0	0	1	16.7	1	16.7
Dental surgery ( <i>n</i> = 2)	1	50	0	0	0	0
Removal of hardware ( <i>n</i> = 2)	0	0	0	0	0	0
Other ( <i>n</i> = 4)	1	25	1	25	1	25
Total number and % of children with clinically significant pain	19	48.7	30	57.7	23	44.2

<sup>a</sup>. 6 of 7 parents with children having a T & A responded to the NRS on Day of Surgery

<sup>b</sup>. 12 of 13 parents with children having a circumcision responded to the NRS on Day of Surgery

**Table 6*****Mean Number of Changes in Behavior Noted by Parents Using the PPPM***

Day	Number of changes noted in behavior			
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Range</i>
Day of Surgery				
Day surgery	41	6.78	3.98	0.00 - 15.0
Day 1 ( <i>n</i> = 52)				
Day surgery	4111	4.41	3.85	0.00 - 12.0
Short-stay surgery		9.09	3.59	4.00 - 15.0
Day 2 ( <i>n</i> = 52)				
Day surgery	4111	3.05	3.32	0.00 - 12.0
Short-stay surgery		6.45	3.56	0.00 - 13.0

contrasts showed statistically significant reductions in the PPPM from Day of Surgery to Day 1 [ $F(1, 40) = 29.28, p = .000$ ] and from Day 1 to Day 2 [ $F(1, 40) = 36.31, p = .000$ ].

The mean changes in behavior reported by parents in the short-stay group was 9.09 and 6.45 on Day 1 and Day 2 respectively. There was a statistically significant difference between the scores for the 2 days using the paired t-test ( $t = 3.61, p = .005$ ). Results from independent t-tests indicated that the short-stay group had significantly higher mean behavior scores compared to the day surgery group as a whole on Day 1 ( $t = -3.78, p = .002$ ) and on Day 2 ( $t = -2.86, p = .012$ ).

The cut off score for clinically significant pain for the PPPM is 6 out of a



possible score of 15 (see Table 7 for numbers and percent of children with clinically significant pain using PPPM according to type of surgery). On the Day of Surgery, 63.4% of the 41 parents ( $n = 26$ ) noted changes in their children's behavior at a level that would indicate clinically significant pain. On Day 1, 42%

**Table 7**

**Numbers and Percent of Children with Clinically Significant Pain Using PPPM According to Type of Surgery**

Surgical procedure	Day of Surgery		Day 1		Day 2	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
T & A						
Day surgery ( $n = 7$ )	3	42.9	29	28.6	28	28.6
Short-stay surgery ( $n = 11$ )	-	-		81.8		72.7
Circumcision ( $n = 13$ )	12	92.3	6	46.2	3	23.1
Eye surgery ( $n = 5$ )	3	60	3	60	1	20
Hernia repair ( $n = 2$ )	2	100	1	50	1	50
Dental surgery ( $n = 2$ )	2	100	0	0	0	0
Removal of hardware ( $n = 2$ )	2	100	0	0	0	0
External ear procedure ( $n = 6$ )	0	0	0	0	0	0
Other ( $n = 4$ )	2	50	1	25	0	0
Total number and % of children with clinically significant pain <sup>a</sup>	26	63.4	22	42.3	15	28.8

<sup>a</sup>  $n = 41$  for Day of Surgery and  $n = 52$  for Day 1 and Day 2

of 52 parents ( $n = 22$ ) rated children's pain as clinically significant. The majority of these children had a T & A, circumcision or eye surgery. On Day 2 the percentage of children with clinically significant pain dropped to 28.8%. The majority of these children had a T & A.

### ***Parents' Management of Children's Pain at Home***

What parents did to manage their children's pain at home after day or short-stay surgery was examined in two ways. Pharmacological management of children's pain was recorded on all 3 days of the study by the parent providing most of the care during the evening of the Day of Surgery for the day surgery group and the two days following surgery for both the day surgery and the short-stay group. Nonpharmacological management was recorded by parents on the evening of Day 1 of the study for both groups.

### ***Pharmacological Management of Children's Pain***

Parents ( $n = 41$ ) in the day surgery group recorded the name, time given, amount, and effectiveness of pain medication given to their children at home on the evening of surgery and all parents ( $n = 52$ ) recorded this information on the two days following surgery (see Table 8 for types of pain medication given at home). Effectiveness of pain medication was determined by parents using a numerical rating scale from 0 to 10 with anchors 0 equal to *no relief* and 10 equal to *complete relief*.

***Types of pain medication.*** Of the 41 children in the day surgery group,

21 (51.2%), received acetaminophen, 4 (9.8%) received acetaminophen with codeine and 16 (39%) were not given any medication. On Day 1, pain medication was given to 24 children including 16 children who received acetaminophen and 8 who received acetaminophen with codeine. Fifty-four percent of children ( $n = 28$ ) were given no pain medication on Day 1. On Day 2, 11 children were given acetaminophen, 4 were given acetaminophen with codeine, and 2 children received ibuprofen for pain. Thirty-five (67.3%) of the children received no pain medication on Day 2 postoperatively.

**Table 8**

***Types of Pain Medication, Numbers and Percentages of Children Receiving and Not Receiving Pain Medication at Home***

Name of pain medication	Day of Surgery		Day 1		Day 2	
	$n = 41$		$n = 52$		$n = 52$	
	$n$	%	$n$	%	$n$	%
Acetaminophen	21	51.2	16	30.8	11	21.2
Acetaminophen with codeine	4	9.8	8	15.4	4	7.7
Ibuprofen	0	0	0	0	2	3.8
No medication given	16	39	28	53.8	35	67.3

***Number of doses of pain medication given.*** Children ( $n = 41$ ) in the day surgery group were given a mean of 1.17 ( $SD = 1.18$ ) doses of medication on the Day of Surgery by their parents at home. On Day 1, children ( $n = 52$ )

received an average of 2.21 doses ( $SD = 1.42$ ) and on Day 2, children ( $n = 52$ ) received an average of 0.79 ( $SD = 1.42$ ) doses of pain medication.

Table 9 presents the number and percentages of doses of pain medication given on Day of Surgery and the two days following surgery. As expected, the number of children receiving medication decreased over the 3 days. However, two children received 5 doses of pain medication on Day 1 or Day 2. One child received six doses of pain medication on Day 1 and Day 2. These 3 children receiving 5 to 6 doses of pain medication had all undergone a T & A procedure.

**Table 9**

***Number of Doses of Pain Medication Given to Children at Home on Day of Surgery, Day 1, and Day 2***

Number of doses	Day of Surgery $n = 41$		Day 1 $n = 52$		Day 2 $n = 52$	
	$n$	%	$n$	%	$n$	%
One dose	10	24.4	8	15.4	6	11.5
Two doses	8	19.5	8	15.4	4	7.7
Three doses	6	14.6	4	7.7	4	7.7
Four doses	1	2.4	2	3.8	1	1.9
Five doses	0	0	1	1.9	1	1.9
Six doses	0	0	1	1.9	1	1.9
No medication given	16	39	28	53.8	35	67.3

Table 10 presents the number of doses administered to children with and without clinically significant pain which is equal to or greater than 3 as measured by the NRS (Finley, McGrath, Forward, McNeill, & Fitzgerald, 1996). On the Day of Surgery, for those parents completing the NRS ( $n = 39$ ), two of these children had clinically significant pain and received no medication. On Day 1, nine children who did not receive pain medication had clinically significant pain. On Day 2, seven children who did not receive pain medication had clinically significant pain. There were also some children on each of the days of the study who received 4 or more doses of medication and still had clinically significant pain. There was also one child on Day 1 and one child on Day 2 who received 4

**Table 10**

***Number and Percentages of Doses Administered to Children with and without Clinically Significant Pain<sup>a</sup>***

Day	Pain Rating	Doses administered					
		0	%	372 58	%	≥4	%
Day 0 ( $n = 39$ )	<3	12	30.8	8	20.5	1	0.0
	≥3	2	5.1	16	41.0		2.6
Day 1 ( $n = 52$ )	<3	19	36.5	219	3.8	12	2.6
	≥3	9	17.3		36.5		3.8
Day 2 ( $n = 52$ )	<3	28	53.8	14	0.0	12	2.6
	≥3	7	13.5		26.9		3.8

<sup>a</sup> Clinically significant pain is a rating of ≥3

or more doses of medication and did not have clinically significant pain.

***Dosages of medication given.*** Dosages of medication were assessed by comparing recommended dosages for age and weight in the Compendium of Pharmaceuticals and Specialties [CPS] (2001) to the dosages given and noted by parents in the 3 day postoperative diary at home (see Appendix M for examples of how recommended dosages were determined). For the day surgery children ( $n = 25$ ) on the Day of Surgery who received pain medication, 56% of children ( $n = 14$ ) were given pain medication as recommended according to weight. Seven children received dosages that were below and 2 children received dosages that were above the recommended dosages for weight based on CPS recommendations. When the dosages were considered according to the child's age, 14 children (56%) received the recommended dosage of medication. Six children were given dosages that were less than recommended and 3 children were given more medication than recommended for age.

Some parents ( $n = 4$ ) varied the dosages of medication they gave to their child. On the Day of Surgery one parent gave less than the recommended dosage according to age and weight, then on Day 1 doubled the dosage which was greater than the recommended dosage for age and weight. Another parent gave more than the recommended dosage of medication on the Day of Surgery and then on Day 1 and Day 2 reduced the dosage to the approximate recommended dosage. On Day 2 in the short-stay group, one parent changed acetaminophen with codeine to  $\frac{1}{2}$  dosage of acetaminophen with codeine and a

full dosage of acetaminophen, and another parent decreased the pain medication for one dose then increased it back to the recommended dosage.

In summary, in total only 56% of the children appeared to receive the appropriate dosage as per CPS recommendation based on either age or weight. However, for the rest of the children there appears to be little consistency in the dosage of medication given to children by parents.

***Effectiveness of pain medication.*** For those children who received pain medication at home on the Day of Surgery, parents' ( $n = 25$ ) mean rating of the effectiveness of the pain medication (0 to 10 scale) on the Day of Surgery was 7.8 ( $SD = 1.84$ ). On Day 1, parents' mean rating of the effectiveness of pain medication decreased slightly for their children to 7.3 ( $SD = 2.18$ ,  $n = 24$ ) and increased slightly to 7.6 ( $SD = 2.25$ ,  $n = 17$ ) on Day 2.

#### ***Parents' Attitudes Toward Medication***

Parents were asked about their attitudes toward medication via a telephone call on the third day after surgery. The tool used has a midpoint score of 4 (range 1 to 7) indicating neither positive nor negative attitudes toward medication on any one item. In this sample of 52 parents, the mean item score and standard deviation was 4.14 ( $SD = 0.92$ ) indicating that parents had a neutral or slightly more positive than negative attitude toward pain medication for their children.

Three individual items had high means indicating positive attitudes toward medication: two items relating to addiction (item 8 and item 12) and a third item

concerning drug abuse (item 13). For example, parents agreed that *it was unlikely that children could become addicted to acetaminophen when used for pain, there was little risk of addiction when acetaminophen is given for pain, and they agreed that children would learn to use acetaminophen responsibly when it was given for pain*. At the same time, two additional items had low means indicating negative attitudes toward medication: the items related to concerns about addiction (item 6) and drug abuse (item 11). Parents also agreed with negative statements that *children could become addicted to pain medication if they take it for pain and using pain medication for children's pain leads to later drug abuse* (see Appendix N for mean and standard deviation for individual items).

### ***Parents' Nonpharmacological Management of Children's Pain***

***Parent Comforting Activities Checklist.*** Parents completed the Parent Comforting Activities Checklist (PCAC) on the evening of Day 1. Parents ( $n = 48$ ) reported using a mean of 20.06 ( $SD = 7.78$ ) behaviors to comfort their children postoperatively at home. The number of activities a parent used ranged from 5 to 34. In addition to the identified activities which were grouped under 6 subscales (distraction, presence of family member, environment, nourishment, verbal comfort and physical comfort), an item called *other* was included to draw out additional behaviors not included on the original list.

***Top rated parent comforting activities.*** Parents were asked to identify the activities they found most helpful and to rate the effectiveness of the activity



on a numerical rating scale ranging from 0 to 10 with the anchors *not effective* and *completely effective* (see Table 11 for top rated parent comforting activities and their perceived effectiveness). The most frequently selected comforting activity was presence of mother ( $n = 22$ ) which was followed by movies/TV ( $n = 20$ ). Presence of father ( $n = 14$ ), cuddling ( $n = 10$ ), holding or rocking ( $n = 10$ ) and favorite treat ( $n = 10$ ) were the other most frequently selected comforting activities. The most effective comforting activity selected was cuddling followed by the remainder of the top activities selected.

**Other activities.** As anticipated the section called *other* brought forward many additional comforting activities. The most frequent *other* activity noted by

**Table 11**

***Top Rated Parent Comforting Activities and Their Perceived Effectiveness  
( $n = 48$ )***

Comforting Activity	Parent Reporting		Effectiveness	
	<i>n</i>	%	<i>M</i>	<i>SD</i>
Presence of mother	22	45.8	9.25	0.19
Presence of father	14	29.2	9.21	1.31
Cuddling	10	20.8	9.5	0.71
Holding or rocking	10	20.8	9.1	1.2
Favorite treat	10	20.8	8.1	1.37
Other (movies/TV)	20	41.7	8.91	0.27

parents was movies/television ( $n = 15$ ). While movies/television was selected almost as frequently as presence of mother, it was perceived as the least effective comforting activity except for favorite treat. Pets, bath, and use of the phone to call friends or relatives ( $n = 3$  for each activity) were the next most frequent *other* activities noted by parents. Additional comforting activities included presence of relatives, stuffed animals, hot water bottle, modeling clay, and applying an antibiotic ointment to the affected area ( $n = 1$  for each activity).

***Age-related parent comforting activities.*** The top parent comforting activities were slightly different when the sample was grouped into two age groups (2 to 6 years and 7 to 12 years). For the age group of 2 to 6 years, presence of mother and holding or rocking were the most frequently selected activities. These were followed by presence of father, cuddling and warm blanket. Presence of father was rated as the most effective comforting activity followed by presence of mother (see Table 12 for five top rated Parent Comforting Activities for the 2 to 6 age group and their perceived effectiveness).

For the age group of 7 to 12 years, presence of mother and father were the top two most frequently selected and perceived as the most effective comforting activities. This was followed by drink and favorite treat from the nourishment subscale and reassuring tone from the verbal comfort subscale (see Table 13 for five top rated Parent Comforting Activities for the 7 to 12 age group and their perceived effectiveness).

Table 12

***Five Top Rated Parent Comforting Activities and Their Perceived Effectiveness for the 2 to 6 age group (n = 27)***

Comforting Activity	Parent Reporting		Effectiveness	
	<i>n</i>	%	<i>M</i>	<i>SD</i>
Presence of mother	9	33.3	9.56	1.52
Holding or rocking	8	29.6	9.37	1.52
Presence of father	7	25.9	9.71	0.76
Cuddling	7	25.9	9.29	0.76
Warm blanket	6	22.2	8.67	1.21

In summary, presence of parent (especially mother) was important for all age groups. While parents of children from the younger age group tended to use more physical comforting activities, parents of children from the older age group tended to use more nourishment and verbal comforting activities. Movies/TV was the most frequent *other* activity identified by parents.

### ***Relationships Among Variables***

This section examines correlations among the key variables in the study: parents' attitudes toward medication, parents' perception of their children's pain, and parents' management of their children's postoperative pain at home. Because all data from key variables were normally distributed, Pearson's *r*

Table 13

***Five Top Rated Parent Comforting Activities and Their Perceived Effectiveness for the 7 to 12 age group (n = 21)***

Comforting Activity	Parent Reporting		Effectiveness	
	<i>n</i>	%	<i>M</i>	<i>SD</i>
Presence of mother	11	52.4	9	1
Presence of father	7	33.3	8.71	1.6
Drink	5	23.8	8.2	2.05
Favorite treat	5	23.8	8	1.87
Reassuring tone	5	23.8	7.4	2.7

was used to identify significant correlations. Level of significance chosen was 0.05.

***Parents' Attitudes Toward Medication and Management of Their Children's Pain at Home***

One question posed in the study was: Is there a relationship between parents' attitudes toward medication and parents' management of their children's pain at home after day or short-stay surgery? No significant correlations ( $p \geq .05$ ) were found between parents' attitudes toward medication and parents' pharmacological management (number of doses of medication given) on all three days of the study ( $r = .27$ ,  $r = .19$ ,  $r = .13$  respectively for the 3 days). There was also no significant correlation found between parents' attitudes toward medication and parents' nonpharmacological management as measured by the

Parent Comforting Activities checklist ( $r = .04$ ).

***Parents' Perception of Their Children's Pain and Management of Pain at Home***

A second research question was: Is there a relationship between parents' perception of their children's pain and parents' management of their children's pain at home after day surgery or short stay-surgery? Table 14 presents the correlations among variables. Significant positive correlations were found between parents' rating of their children's highest pain (NRS) and parents' pharmacological management (number of doses of medication given) on Day of Surgery and on the 2 days following surgery ( $r = .45$ ,  $r = .42$ , and  $r = .46$  respectively). No significant correlations were found between parents' rating of their children's highest pain (NRS) and parents' nonpharmacological management (Parent Comforting Activities Checklist totals, PCAC) on the Day of Surgery and Day 1 when the PCAC was completed.

Significant positive correlations were found, between the Parents' Postoperative Pain Measure (PPPM) and parents' pharmacological management (number of doses of medication given), on Day of Surgery and on the subsequent 2 days ( $r = .45$ ,  $r = .57$ , and  $r = .59$  respectively for the 3 days).

A significant correlation was found between the PPPM and parents' nonpharmacological management (Parent Comforting Activities Checklist totals, PCAC) on Day of Surgery ( $r = .42$ ) but not on Day 1 following surgery when the PCAC was completed. As would be expected, the two pain measures (NRS and

Table 14

***Correlations Between Parents' Perception of Their Children's Pain and Parents' Management of Their Children's Pain***

Variables	Pearson's <i>r</i>	Significance (2-tailed)
NRS <sup>a</sup> and number of doses of medication given	Day 0 <sup>d</sup> .45	.004
	Day 1 .42	.002
	Day 2 .48	.000
NRS and PCAC <sup>b</sup>	Day 0 .10	.551
	Day 1 .02	.884
PPPM <sup>c</sup> and number of doses of medication given	Day 0 .45	.003
	Day 1 .57	.000
	Day 2 .59	.000
PPPM and PCAC	Day 0 .42	.013
	Day 1 .14	.357
NRS and PPPM	Day 0 .62	.000
	Day 1 .54	.000
	Day 2 .60	.000
Number of doses of medication given and PCAC	Day 0 .42	.012
	Day 1 -.10	.488

<sup>a</sup>. NRS - Numerical Rating Scale

<sup>b</sup>. PCAC - Parent Comforting Activities Checklist

<sup>c</sup>. PPPM - Parents' Postoperative Pain Measure

<sup>d</sup>. Correlations are based on 39 children discharged to home on Day 0 and the entire group of 52 on Days 1 and 2.

PPPM) were moderately correlated, on each of the three days ( $r = .62$ ,  $r = .54$  and  $r = .60$  respectively).

A significant correlation was also found between parents' pharmacological management (number of doses of medication) and parents' nonpharmacological management (PCAC totals) on Day of Surgery ( $r = .42$ ) but not on Day 1.

### ***Summary of Findings***

In summary, 52 of 56 parents completed and returned the three day postoperative diary. Participants were mostly mothers with children who had a T & A, circumcision, external ear surgery, or eye surgery. Most children having a T & A procedure were admitted for a short-stay overnight in hospital. Thirty-four percent of the children in this study had a previous surgery.

Parents in the day surgery group perceived their children to have moderate pain on the Day of Surgery which decreased to mild pain over the next 2 days. There was a significant decrease in pain over the 3 days of the study for the day surgery group. Parents in the short-stay group perceived their children to have moderate pain which was not significantly different from Day 1 to Day 2. Overall, the short-stay group had significantly higher mean pain scores than the day surgery group.

On the Day of Surgery children having a circumcision or T & A had the highest mean pain ratings. Children having a T & A in the short-stay group had

the highest mean pain rating on Day 1 and Day 2. Approximately one-half of the children on the Day of Surgery had clinically significant pain which increased slightly on Day 1 with the addition of the short-stay group and then decreased on Day 2. The majority of children who had a T & A procedure and circumcision were perceived by parents to have clinically significant pain during each of the 3 days of the study.

Overall, the mean number of changes in behavior (PPPM) noted by parents was 7, indicating that children in the day surgery group had clinically significant pain on the day of surgery. The mean number of behavior changes decreased on both of the 2 days following surgery to below the cut off score of 6 for clinically significant pain in the day surgery group. The mean number of changes in behavior for the short-stay group remained at or above 6 indicating clinically significant pain on Day 1 and Day 2 for this group. More children were identified as having clinically significant pain with the PPPM compared to the NRS on the Day of Surgery but the numbers of children with clinically significant pain were similar on the other two days with both of the tools.

At home, pharmacological management of children's pain was primarily with acetaminophen and a small number of children received acetaminophen with codeine. The number of children receiving medication gradually decreased and at the same time the number of children with clinically significant pain not receiving medication increased dramatically from Day 0 to Day 1. Most children with clinically significant pain who were given medication received one to three



doses of medication.

The majority of children were given recommended dosages of medication for age or weight. Some children were given inadequate dosages and a few were given more than the recommended dosage of analgesic medication. Four parents altered the dosage given in some way following surgery. Parents perceived the pain medication to be moderately to highly effective.

Parents' attitudes toward medication were neutral or slightly positive toward medication. However, parents had both positive and negative attitudes regarding addiction and drug abuse.

Parents nonpharmacological management of children's pain included a variety of activities used to comfort their children. The top rated comforting activities in order of perceived effectiveness were cuddle, presence of mother, presence of father, hold, movies/TV, and favorite treat. The five top rated parent comforting activities and perceived effectiveness were slightly different for two age groups ( $< 7$  years and  $\geq 7$  years).

Significant relationships were found among most variables as described in the conceptual framework except for parents' attitudes toward medication, and parents' perception of children's pain using the NRS and parents' nonpharmacological management of children's pain. No significant correlations were found between parents' attitudes toward medication and parents' pharmacological or nonpharmacological management of children's pain.

## **CHAPTER 5**

### **Discussion**

This study was a replication and systematic extension of the work initiated by Finley and colleagues (1996) therefore the findings for each of the five research questions will be discussed and compared first when possible to the study by Finley et al., and then compared to other similar research studies. The findings of the study will be discussed under the following four major sections: (a) characteristics of the sample; (b) parents' management of children's pain at home following day surgery or short-stay surgery; (c) factors that may influence parents management of children's pain, and (d) strengths and limitations of the current study.

### ***Sample***

Although a convenience sample, participants in this study were comparable to other samples in studies examining parents' postoperative pain at home following day or short-stay surgery. Sample characteristics such as caregiver, mean age of caregiver, children between the ages of 2 and 12 years with slightly more males, children experiencing a variety of day or short-stay surgical procedures were all similar to the Finley et al. (1996) study with the exception of the mean age of caregivers which was slightly lower at 32.6 years versus 33.5 years in this study. Other studies also had similar samples

(Chambers et al., 1997; Reid et al., 1995) with the exception of the mean age for children in the Chambers et al. study which was slightly lower at 4.3 years compared to 5.98 years in this study.

Approximately one third (34%) of children had a total of 29 day and inpatient surgeries prior to this surgery with external ear procedure, T & A and hernia repair being the most common reasons for previous surgery. At least two previous studies have indicated similar numbers of children having prior surgeries (Warnock & Lander, 1998) or lower numbers but only included children having day surgery (Chambers et al., 1997).

### ***Parents' Management of Children's Pain***

The major question asked in this study was: What do parents do at home to manage their children's postoperative pain after day surgery or short-stay surgery? Parents used medication and/or comforting activities at home to manage their children's pain.

### ***Parents' Pharmacological Management of Children's Pain***

In this study, as in previous studies, parents continued to undermedicate their children even when they recognized their children were in pain. The pain medication parents gave to their children was primarily acetaminophen or acetaminophen with codeine, and a very small number of children were given ibuprofen. Finley et al. (1996) did not report on the medication given but reported that the majority of parents recalled being told to use acetaminophen. A number

of other studies have also reported the frequent use of acetaminophen and/or acetaminophen with codeine to manage postoperative pain following day surgery (Chambers et al., 1997; Knight, 1994; Nardone & Schuchard, 1991; Sutters & Miaskowski, 1997; Warnock & Lander, 1998). The Finnish study by Sepponen et al. (1999) was the only study found that indicated an increase in the use of ibuprofen and decrease in the use of acetaminophen. This may indicate a change in clinical practice with ibuprofen being utilized more frequently as a medication to treat children's postoperative pain following day surgery.

Parents gave medication appropriate for mild to moderate pain (Agency for Health Care Policy and Research, 1992; CPS, 2001) but the number of doses and amount of medication administered was less than optimal. A number of previous studies have also found the number of doses and amount of medication given to children for postoperative pain following day surgery to be inadequate (Chambers et al., 1997; Finley et al., 1996; Gedaly-Duff & Ziebarth, 1994; Sutters & Miaskowski, 1997).

The numbers of children receiving even one dose of medication quickly decreased over the three days of the study. While the percentage of children receiving some form of pain medication in previous studies has varied, some studies have indicated that there was a sharp decrease in the number of children receiving pain medication over time similar to findings in this study (Kotiniemi et al., 1997; Tönz et al., 1999).

On all three days of the study, there were children with clinically significant

pain who did not receive any medication for that pain or received too few doses to adequately control postoperative pain. The majority of children with clinically significant pain received 3 or fewer doses of pain medication. Finley et al. (1996) also found that most children with clinically significant pain received between 0 and 3 doses of medication. Previous studies have reported that some parents who recognized that their children were in pain or whose children reported pain either administered a small number of doses of analgesics or none at all (Cummings et al., 1996; Kotiniemi et al., 1997; Sutters & Miaskowski, 1997; Tönz et al., 1999). Parents' administration of such a small number of doses of medication may be linked to their attitudes and knowledge of analgesics (Finley et al., 1996).

While the majority of children received dosages of pain medication that were age and weight appropriate, there were a significant number of children who received dosages that were inadequate for their age and weight and a small number of children who received too high a dosage of medication. Previous studies have also indicated that parents have varied the number of dosages and/or amount of medication given to children following day or short-stay surgery (Munro et al., 1999; Sutters & Miaskowski, 1997).

Although there were too small a number of children receiving optimal doses and dosages of medication to draw any conclusions, some of these children still had clinically significant pain which may indicate the need for more effective medication. Rømsing et al. (1998) found that even when acetaminophen was given

in weight appropriate doses on a regular basis, it did not significantly improve pain management indicating that the most commonly used analgesics may not be effective for all surgeries.

Few previous studies have asked parents to rate their perception of the effectiveness of the medication given to children for pain as was done in this study. Parents rated pain medication given as *moderately* to *highly* effective with few parents consistently rating pain medication as *completely* effective. Previous studies have found that for the most part parents feel that the medication given provides adequate pain relief. However two studies found that a small percentage of parents felt that the medication was inadequate to manage their children's pain (Nardone & Schuchard, 1991; Sutters & Miaskowski, 1997). Additionally, some parents may not have known what to do about pain relief as only a few requested something stronger to manage their children's pain.

### ***Parents' Nonpharmacological Management of Children's Pain***

Parents have other methods, in addition to medication, to comfort their children following surgery. Previous studies have indicated the use of nonpharmacological methods by parents to manage children's pain in hospital and at home (Cummings et al., 1996; Gedaly-Duff & Ziebarth, 1994; Sepponen et al., 1999; Woodgate & Kristjanson, 1996). However, this was the first quantitative study to the researcher's knowledge which measured the number and perceived effectiveness of comforting activities provided by parents at home following day or short-stay surgery. In general, many of the comforting activities selected have been

identified in previous studies, but some such as distraction were not identified as clearly as in this study (Cummings et al., 1996; Denyes et al., 1991; Gedaly-Duff & Ziebarth, 1994; Woodgate & Kristjanson, 1996).

At home, parents used an average of 20 comforting activities for their children which may not be surprising given the small amount of medication utilized for pain management. Presence of parent, especially mother, was the most frequently selected comforting activity, a finding which has been recognized in previous studies completed in health care facilities (Cummings et al., 1996; Denyes et al., 1991; Woodgate & Kristjanson, 1996). Cuddling and holding, and nourishment such as a favorite treat were the next most frequently selected comforting activities chosen by parents after presence of parent. Similar comforting activities were identified in previous studies done in hospital and at home (Cummings et al.; Denyes et al.; Sepponen et al., 1999).

Most parents intuitively provided comforting activities that were appropriate for the age and cognitive stage of development of their children according to Piaget's cognitive developmental theory (Gaffney, 1993). This theory consists of four main stages, two of which are relevant to the age groups in this study, the preoperational and concrete operations stages.

Children's thinking in Piaget's preoperational stage is less logical and more preoccupied with the surface of their bodies than the interior of the body (Gaffney, 1993). Most of the comforting activities provided by parents for the younger age group were directed at the surface of their children's bodies. For this age group,

presence of mother, holding or rocking, presence of father, cuddling and warm blanket were the most frequently selected comforting activities. Similar comforting activities were identified in previous studies of younger children in hospital (Denyes et al., 1991; Woodgate & Kristjanson, 1995) and at home (Gedaly-Duff & Ziebarth, 1994; Sepponen et al., 1999).

In Piaget's stage of concrete operations, children are capable of logical thinking and can conceptualize pain as happening inside the body (Gaffney, 1993). Parents with children in the older age group utilized comforting activities that took into consideration the children's ability to reason and understand the pain they were experiencing from surgery. For the older age group, presence of mother and father, drink, favorite treat, and reassuring tone were the most frequently selected and most effective comforting activities. Most research studies have focussed on nonpharmacological interventions for children 8 years and younger. Cummings and colleagues (1996) were the only researchers who examined children between the ages of 2 weeks to 21 years but did not report if the nonpharmacological methods were the same or dissimilar for different age groups. Children in the older age group may be a group that are unintentionally excluded by researchers when examining nonpharmacological management of children's pain.

In this study parents' ratings of the effectiveness of nonpharmacological management of children's pain were higher than their ratings for the effectiveness of pain medication administered to their children. A possible explanation of these results may be attributed to parents observing an immediate change in their



children's behavior when providing a comforting activity which would indicate to the parents that the comforting activity eased their children's pain. Medication takes between 15 and 30 minutes before any effect can be expected, so changes in children's behavior at this later time may not be credited to the medication given earlier by busy parents, especially if parents are not taught to evaluate the effectiveness of an intervention to manage children's pain.

### ***Factors that May Influence Parents' Management of Children's Pain***

#### ***Parents' Attitudes Toward Medication***

Parents had neutral to slightly positive attitudes toward pain medication used for their children following day surgery which is similar to findings by Forward et al. (1996). In particular, parents had positive attitudes toward two statements on addiction and one statement on drug abuse. Forward et al. (1996) also found positive attitudes in the subscales for addiction and drug abuse. Finley et al. (1996) found that parents have some positive attitudes regarding the use of medication but these positive attitudes were related to side effects and the safety of giving the recommended dosage of medication. In contrast to these findings, Chambers et al. (1997) found that a group of parents who had received an education intervention had significantly more positive attitudes than the other groups in the study. It would seem that education can make a difference in parents' attitudes toward medication.

Parents also had low scores indicating negative attitudes regarding two myths concerning pain medication, leading to addiction and drug abuse, even when

the medication was acetaminophen. Previous studies had similar findings regarding drug abuse (Finley et al., 1996) and addiction (Gedaly-Duff & Ziebarth, 1994) as a concern of parents when medicating their children following surgery. However, Forward et al. (1996) found the most negative attitudes were toward tolerance and side effects of pain medication.

However, parents' belief in the myth that children will become addicted to acetaminophen if taken for pain may be related to lack of knowledge regarding this medication. Acetaminophen is not a narcotic or controlled substance with addictive properties (CPS, 2001).

The other myth regarding using pain medication that could lead to later drug abuse is more complex to understand. One can only speculate why parents would believe this myth because parents were not asked to explain their reasons for the choices made. It is plausible that this negative attitude is the result of a lack of knowledge about what constitutes drug abuse or it may be the result of a pervasive societal belief about drugs reflected in the media.

Telephone survey was the method used to obtain information on parents' attitudes toward medication which may have had an impact on how parents chose their answers to these statements. The questions that were negatively phrased seem to cause some parents some concern. Another method such as a face-to-face interview may produce different results.

#### ***Parents' Attitudes toward Medication and Management of Children's Pain***

No relationship was found between parents' attitudes toward medication and

parents' pharmacological and nonpharmacological management of children's pain following day surgery or short-stay surgery. Higher scores on the medication attitude tool were not related to higher number of doses of medication administered on each day. In contrast to this study, Chambers et al. (1997), found low but significant correlations between attitudes and medication on two days of that study. Other studies have also indicated that parents' attitudes would influence parents' administration of medication (Finley et al., 1996; Gedaly-Duff & Ziebarth, 1994).

The findings of this study do not support the conceptual framework developed for this study which postulated that there would be a relationship to explain, in part, parents' management of children's pain following day or short-stay surgery. An explanation as to why no relationship was found between parents' attitudes and parents' management of children's pain may be difficult to find. One possible reason is the tool used to measure attitudes which is still relatively new and may require more testing. There may also have been other factors influencing pain management that were not considered in this study.

### ***Parents' Perception of Children's Pain***

Parents' perception of children's pain was obtained through the Numerical Rating Scale (NRS) and the Parents' Postoperative Pain Measure (PPPM). Differences were found between the group of children (day surgery group) discharged on the Day of Surgery and the group of children (short-stay group) kept overnight for observation and discharged from the hospital. There was a significant difference in pain intensity scores between the day surgery and short-

stay group. Children, following a tonsillectomy and adenoidectomy (T & A), in the short-stay group had moderate pain on the two days following surgery while the children in the day surgery group had their pain decrease from moderate to mild. The short-stay group had a significantly higher number of changes in behavior than the day surgery group on Day 1 and Day 2. The much higher mean number of changes in behavior in the short-stay group on Day 1 may be related to the type of surgery this group had which was a T & A procedure. Some studies have also found that a tonsillectomy procedure resulted in higher pain intensity scores (Kotiniemi et al., 1997; Warnock & Lander, 1998).

In this study, there was a significant decrease in pain intensity scores and behavioral scores over the three days of the study as seen in previous studies. Children having a T & A procedure and circumcision had the highest pain ratings and the highest number of changes in behavior. Parents were able to identify more children with clinically significant pain with the PPPM on the Day of Surgery than with the NRS but not on the two days following day surgery.

While it is difficult to compare findings from other studies because of the variety of different tools used by other researchers to measure pain intensity, similar findings can be elicited from the literature. Procedures such as a circumcision, T & A, hernia repair, and eye surgery resulted in children experiencing *mild* to *moderate* pain in this study and in the study by Finley and colleagues (1996). Other studies which included a variety of different types of day surgery procedures have indicated that children experience different levels

of pain from *no pain* to *mild* (Chambers et al., 1998; Knight, 1994; Sepponen et al., 1999) to *moderate pain* to *severe pain* (Bennett-Branson & Craig, 1993; Nardone & Schuchard, 1991; Nikanne et al., 1999) at home following day surgery and that pain scores decrease over time.

When using the PPPM to identify children with clinically significant pain, the majority of children (63.4%) in the day surgery group following a T & A, circumcision, eye surgery, hernia repair, dental surgery, and *other* were perceived as having clinically significant pain by their parents on the Day of Surgery. On the next two days of the study, the percentage of children having clinically significant pain decreased fairly quickly but the numbers of children having clinically significant pain following a T & A remained high. Some children following a circumcision, eye surgery, and hernia repair also continued to have clinically significant pain. Kotiniemi et al. (1997) also found that most changes in behavior occurred on the day of surgery which was significantly related to pain and these changes in behavior continued up to four weeks following surgery.

While the PPPM showed good reliability, this tool may not have included all behaviors that parents use to assess children's pain. Tesler, Holzemer, and Savedra (1998) found the most frequently observed pain behaviors of older children and adolescents were remaining calm, maintaining one position, flexing limbs, eyes shut, and knees drawn up. These behaviors are not measured in the PPPM.

### **Parents' Perception of Children's Pain and Management of Children's Pain**

A positive correlation was found between parents' perception of children's pain using the NRS and the PPPM and the number of doses of medication given to children by their parents on all three days of the study. Higher pain scores and a higher number of changes in children's behavior, as perceived by parents, resulted in more medication given by parents to children on all three days of the study. This correlation was found for both the NRS and PPPM method of pain measurement used by parents. Chambers and colleagues (1997) also found moderate correlations between parents' assessments and medication of their children's pain.

There was also a positive relationship found between parents' perception of children's pain and nonpharmacological management. Although higher pain intensity scores were not correlated to parents using more comforting activities, a greater number of changes in children's behavior on the Day of Surgery, was correlated to parents using more comforting activities for their children. This may be the result of parents being able to see changes in children's behavior on the day of surgery and relating them to pain from the surgery.

There was a positive relationship found between pharmacological and nonpharmacological management of children's pain on the Day of Surgery. Parents who gave higher doses of pain medication were more likely to provide a greater number of comforting activities for their children. It is unclear why parents would provide more comforting activities when giving more pain medication but

not when they perceived their child to be in pain using the pain scales.

Conceivably, parents may have chosen to enhance the effect of the medication by providing additional comforting activities that helped manage the pain.

Positive correlations were found between most variables in the conceptual framework developed to explain the relationships between parents' perception of children's pain, and parents' management of children's postoperative pain.

However, no correlation was found between parents' attitudes toward medication and parents' pharmacological management of children's pain.

### ***Strengths and Limitations***

One of the major strengths of this study is that it was a replication and systematic extension of another study (Finley et al., 1996). The results of this study could be compared to this previous study to examine any changes in the management of children's postoperative pain following day surgery or short-stay surgery. Other strengths of this study include: the use of two measures of pain (pain intensity and behavioral cues); use of tools found to be valid and reliable in previous studies; the use of a diary that tracked pain assessment and pain management over 3 days; and, the measurement of perceived effectiveness of pain medication. A unique strength of this study was the development of a new tool to examine parents' nonpharmacological approaches for the management of children's pain.

This study also had a number of limitations. The non-probability convenience sample limits the generalizability of study findings. The sample was

obtained from a homogenous population of one small regional hospital in one province of Canada. The sample consisted of approximately 1.25% of this population.

Parents were asked to complete a diary which is a recognized approach allowing for recording information shortly after the event and is used to collect data over time. This is a more accurate method of data collection than an interview that relies on memory to recall events. Diaries have some disadvantages such as altering the behavior under study, the participant becoming more sensitive to the problem resulting in over reporting, or becoming bored with the diary and becoming less thorough in recording resulting in under reporting of the problem (Burns & Grove, 2001). While it is not known if any of these problems occurred, the diaries were fairly well completed and some parents even wrote additional comments on it.

The Parent Comforting Activities Checklist (PCAC) is an example of a possible way of sensitizing or perhaps altering parents comforting behavior following day surgery or short-stay surgery. Parents upon reading through the list may have been stimulated to use some of the activities listed there that they might not normally use to comfort their children. In addition parents, mostly mothers, self-reported comforting activities which could result in the parent becoming more sensitive to the problem and perhaps over reporting the comforting activities they provided. The PCAC is a new tool that needs further development to become a valid and reliable tool.



Another limitation of this study, is the lack of child reported pain measures. The gold standard is to have the child rate their own pain (AHCPR, 1992). However, this study was about parents' perceptions of children's pain which was measured in two ways using a pain intensity scale and a behavioral tool. The NRS and PPPM showed moderate positive correlations, that is, parents' score on the NRS was related to the number of changes in behavior noted with the PPPM. Reflecting back to the conceptual framework, this framework predicted that parents' perception of children's pain would influence parents' pharmacological and nonpharmacological management of children's pain. There is a need to know about parents' attitudes toward pain medication for their children and how parents' perceive children's pain as this may influence parents' management of children's pain at home and the need to know what influence's parents' management of children's pain is important because parents control the administration of medication in the home.

The Parents' Attitudes toward Pain Medication was completed by 52 parents even though not 52 parents gave pain medication to their child in this study. The parents who did not give pain medication to their child were asked if they had given any pain medication to their child in the past and if so what had they gave. The name of this medication was used when the statements were read out to the parents. These parents may have additional biases that could have influenced their responses to these statements. Since this is a relatively new tool, which has not been tested frequently there may be some reliability

problems with some items in this tool as well.

A final limitation of this study is the shorter length of time on the first day of the study compared to the next two days. The Day of Surgery had a shorter time period compared to Day 1 and Day 2 so that the mean number of doses of medication given on Day of Surgery is based on a shorter period of time compared to the other two days of the study.

### **Summary**

In summary, the findings and the sample in this study are comparable to previous studies on parents' pharmacological management of children's postoperative pain at home following day or short-stay surgery. Parents continue to undermedicate their children even when they are aware their children are in pain. In this study, it is evident that parents are concerned about their children's pain management by the large number and variety of nonpharmacological interventions which they provided and rated more effective than the medication they administered. Parents had both positive and negative attitudes toward the medication but was not correlated to medication administered. This study has many strengths and builds on the work of previous studies. There are some identified limitations which could be addressed in future studies.

## **CHAPTER 6**

### **Implications of the Study**

The results of this study have implications for nursing practice, education, and research. Each of these components will be addressed separately in the discussion that follows.

#### ***Nursing Practice***

The accessible population at the time of the study was mostly mothers with children following a day surgery procedure, some of whom were kept over night for observation and discharged within 24 hours of admission to a day surgery unit. The major implication of this study is the need for nurses to recognize the responsibility that has been placed on parents, especially mothers, and to provide adequate resources to aid parents in managing children's pain at home following day or short-stay surgery. Information that is easily accessible is a major resource that parents require to provide pain management in the home. A multidisciplinary approach is recommended so information is available for parents from a number of sources in health care facilities and in the community.

In health care facilities, nurses need to make children's pain a priority and include parents in their children's pain management by teaching parents how to identify and alleviate their children's pain in hospital and at home (Brennan-Hunter, 2001). It is evident that prioritizing children's pain is needed if any

improvement in children's pain management is to occur.

One suggestion is to incorporate, in a preadmission education program, information on the positive effects that pain medication can have on children's recovery following day surgery or short stay-surgery. Encouraging parents to talk about their concerns regarding pain medication may address negative attitudes that may interfere with pain management. Information on the appropriate types of medication, dosage, and timing of administration of medication could be provided in both verbal and written forms to parents, who may not hear everything that is said because of the stress of having their children undergo day surgery.

While the prescription of medication was not addressed in this study, the physician's role is important, in that medication be prescribed on a regular basis, rather than on an *as needed* basis to manage children's postoperative pain.

Information regarding assessment of children's pain is essential. In this study higher pain intensity scores as perceived by parents were related to parents' administering more doses of pain medication for their children's pain and using more nonpharmacological strategies to manage children's pain. There are a number of valid and reliable pain tools available in the literature which could be discussed with parents and provided in written form to assist parents in measuring children's pain upon returning home. While the gold standard is to have the child assess the pain, parents are in control of any pain medication and may want to do their own assessment of their children's pain before giving any

pain medication. One such tool which allows parents to do their own assessment is the Parents' Postoperative Pain Measure (PPPM) which was used in this study and was found to be effective for parents to identify that their children were in pain especially on the day of surgery. It was easy to complete and no parents had difficulty in completing this tool in this study. Parents can be taught that the changes in their children's behavior are related to pain which may provide incentive to provide medication for their children to ease the pain.

Evaluation of the effectiveness of medication is an important aspect of pain management that is often forgotten. In this study parents evaluated the effectiveness of pain medication given to be moderately to strongly effective for the small amount of medication that was actually given. Parents could be encouraged to evaluate the effectiveness of medication given at home and be provided with information on what to do if the medication is not completely effective. This is especially important given the numbers of children having day procedures followed by limited contact with health care professionals.

More resources could be provided in the community to assist parents in managing children's postoperative pain. Some suggestions would be to direct parents to contact a community pharmacist for additional information regarding pain medication. A 24-hour hot-line might support parents' need for information following their children's day surgery. Telephone contact by day surgery staff the day following surgery to enquire about the children's situation, with attention given to pain management, may also assist parents' with the responsibility of

caring for their children at home. Many of these interventions need to be studied to determine their effectiveness.

In this study parents used a considerable number of nonpharmacological strategies to assist in the management of their children's pain following day or short-stay surgery. Many of these strategies were rated by parents as just as effective as pain medication in reducing children's pain. Nurses could encourage parents to use age appropriate comforting activities, in addition to medication, to manage children's pain at home. Comforting activities that parents may not have previously considered could be discussed with them by the nurses. Nurses could point out to parents that their presence is a very effective comforting activity.

### ***Nursing Education***

In order to assist parents in the management of children's postoperative pain at home following day surgery or short-stay surgery, it is recommended a comprehensive pain management program be included in curriculums in schools of nursing and continuing education programs. Nurses could be more informed about the various tools available to assess children's pain, how to incorporate these tools in the care they provide to children, and how to teach parents to use assessment tools. It is essential that nurses have a thorough understanding of the implications of untreated pain so that pain management is a priority. Nurses may need to be educated about medication required following surgery including types, route, timing, and appropriate dosages. In turn, nurses

need to know the importance of teaching parents about different types of medication to manage children's pain and the appropriate dosages and administration times. Finally, nurses who are aware that lack of knowledge and negative attitudes may have a detrimental impact on the assessment and management of pain may provide more education to parents. Nurses in day surgery units, in particular, need education on pain management in order to assess parents' knowledge and attitudes so that these areas can be addressed to improve children's pain management at home.

### ***Nursing Research***

More replication studies are recommended for the further development of a scientific knowledge base and to promote the use of research findings in clinical practice. This study was a systematic extension of the work initiated by Finley et al. (1996) which examined parents' attitudes toward pain medication, parents' perception of children's pain, and parents' pharmacological management of children's pain. Previous information was confirmed and new knowledge was gained from replicating this study.

A number of studies about parents' management of children's pain did not use a conceptual framework to explain the relationship between variables. A conceptual framework helps establish connections between constructs and place in some context the results of a study (Burns & Grove, 2001). More research is needed in the area of parents' attitudes toward medication to clarify these

findings or to identify additional influences on parents' management of children's postoperative pain following day surgery or short-stay surgery.

Parents' perception of children's pain was related to their pharmacological and nonpharmacological management of children's pain. These results are encouraging but additional research is required to see what is needed to improve parents' management of their children's pain to an optimal level where the child does not experience clinically significant pain following surgery. It is recommended that children's perceptions of their pain be included in further studies.

In this study, the Parent Comforting Activities Checklist (PCAC) was developed to examine parents' nonpharmacological management of children's pain. One item which was not included on the initial list, *movies/television*, emerged a number of times under *other* as a comforting activity used frequently by parents and it is recommended that *movies/television* be added to the checklist when used in the future. While this checklist shows potential in this study, it needs further development in future research studies correlating it to observational tools before it can be used as a clinical tool.

### **Conclusion**

In conclusion, it is evident from this study that parents have taken the responsibility for providing pain management to their children following day or short-stay surgery. Results from this study indicate that parents are attentive to



their children's pain given the number and variety of nonpharmacological interventions used by parents, in addition to some medication given to manage their children's pain following day surgery. Although six years has passed since Finley and colleagues (1996) published their study on which this current study is based, little appears to have changed in parents' pharmacological management of children's postoperative pain at home. While some of these results are encouraging more work is needed to examine the role of attitudes on parents' administration of medication and further research is needed on parents' perceptions of children's pain using tools that are effective for parents in measuring children's pain.

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## Appendix A

### *Letter to Surgeons*

Colleen Anderson  
Nursing Faculty  
Western Regional School of Nursing, P.O. Box 2005,  
Corner Brook, Nfld A2H 6J7  
709-637-5587  
November 29, 1999

Name  
Address  
Corner Brook, Nfld.,  
A2H 2N2

Dear (surgeons name)

This letter is a follow-up to our phone conversation in which we discussed a study I will be conducting and the possibility of informing parents about the study through your service. The title of my research is 'Parents' Attitudes, Perception of Pain, and Management of Pain after their Child's Day Surgery'. This study will examine the relationship between (a) parents' attitudes about medication and their management of their child's pain following day surgery, and (b) parents' perception of their child's pain and their management of their child's pain following day surgery.

This study will be the basis for my thesis in the Masters in Nursing program from Memorial University of Newfoundland. My thesis supervisor is Dr. Sandra LeFort. The proposal for the study has been approved by the Human Investigation Committees at Memorial University and Western Memorial Regional Hospital.

Your involvement in this study would be as the intermediary for the parents. This would involve 1) briefly telling the parents that the study is being done, 2) distributing an information package to the parent, and 3) asking the parent to call, prior to the intended surgery, your office or the researcher directly to answer any questions about the study if they are interested in participating.

Please let me know if you would be able to assist me in the role outlined? Please also feel free to contact me to answer any questions you may have. I await your response at your earliest convenience.

Sincerely,

Colleen Anderson, RN, BN  
Nursing Faculty  
Western Regional School of Nursing

**Appendix B**  
***Letter of Introduction to Study***

Dear Parent:

Your doctor has recommended that your child have an operation which would be done as day surgery at Western Memorial Regional Hospital. I am interested in learning about your experience.

I am a nurse who has a special interest in families who are caring for their child after day surgery at home. I am currently completing a Master's degree in Nursing from Memorial University of Newfoundland under the supervision of Dr. Sandra LeFort.

The research which I am doing is concerned with parents coping at home with any pain their child may have after day surgery. The overall aim of the study is to provide information which will help nurses and physicians better understand how pain is managed by families caring for a child at home after day surgery .

I am asking one parent of each child to be part of this study - the parent who will be providing most of the care after the child's operation and return home. If you decide that you would like to participate in this study, I would meet with you in the Day Surgery area, on the day of your child's surgery to give you the materials and instructions for the study, ask a few questions about your child and the type of procedure he/she will have, and answer any questions you may have about the study. The main part of the study is that you would be asked to answer a few questions asked in a diary about your child's recovery on the day of surgery and for two days after. At the end of that time, I would contact you by telephone to ask you some questions on your beliefs about using medications for children's pain and ask you to mail the diary to me.

I expect that it will take less than ten minutes to fill out the diary each day. The telephone call will be about 10 -15 minutes.

Being part of this study is totally voluntary. Neither you nor your child are under any obligation to participate in the study and your care at Western Memorial Regional Hospital will not be affected by your decision. In addition, you may withdraw at any time.

I have enclosed a copy of the consent form for you to look over as you decide whether or not you would like to be in this study. As stated in that form, any personal information which is obtained (for example, your name and phone number) will be held in confidence. Parents who participate will be sent a summary of the findings if they wish.

If you are interested in participating in this study, or just hearing more about it before you decide, please contact your surgeons' office or call me directly (work 637-5587 or home 634-6491) so that I can answer any questions you may have.

Thank you.

---

Colleen Anderson, RN, BN  
Corner Brook, Nfld.  
634-6491 (home) 637-5587 (work)

**Appendix C**  
**FACULTY OF MEDICINE - MEMORIAL UNIVERSITY OF NEWFOUNDLAND**  
**AND**  
**HEALTH CARE CORPORATION OF ST. JOHN'S**  
**Consent To Participate In Health Research**

**TITLE:** Parents' Attitudes, Perception of Pain, and Management of Pain after their Child's Day Surgery

**INVESTIGATOR(S):** Colleen Anderson, RN, BN

**THESIS SUPERVISOR:** Dr Sandra LeFort, PhD, RN

You have been asked to participate in a research study. Participation in this study is entirely voluntary. You may decide not to participate or may withdraw from the study at any time without affecting your normal treatment.

Information obtained from you or about you during this study, which could identify you, will be kept confidential by the investigator. The investigator will be available during the study at all times should you have any problems or questions about the study.

1. Purpose of study:  
Little is known about parents' attitudes to medication and parent's perception of their child's pain and how these attitudes affect the parent's management of their child's pain in the home after day surgery. The information collected will help nurses understand how pain is managed by parents caring for a child at home after day surgery.
2. Description of procedures and tests:  
The parent will be asked to complete a form in the Day Surgery unit and then keep a diary on the day of surgery and for 2 days after the surgery. Three days after the surgery, the parent will be contacted by telephone to answer some questions about their beliefs about medication and reminded to mail the diary in the stamped self-addressed envelope.
3. Duration of participant's involvement: Three days
4. Possible risks, discomforts, or inconveniences: Completing the diary for three days may be somewhat inconvenient. There are no known risks or discomforts related to participation in the study.
5. Benefits which the participant may receive:  
There are no benefits from participation in this study. These findings may help nurses understand how pain is managed by parents caring for a child at home after day surgery.
6. Liability statement.  
Your signature indicates your consent and that you have understood the information regarding the research study. In no way does this waive your legal rights nor release the investigators or involved agencies from their legal and professional responsibilities.  
Initials \_\_\_\_\_

## Signature Page

Title of Project: Parents' Attitudes, Perception of Pain, and Management of Pain after their Child's Day Surgery

Name of Principal Investigator: Colleen Anderson, RN, BN

## To be signed by participant

I, \_\_\_\_\_, the undersigned, agree to my participation or to the participation of \_\_\_\_\_ (my child, ward, relative) in the research study described above.

Any questions have been answered and I understand what is involved in the study. I realise that participation is voluntary and that there is no guarantee that I will benefit from my involvement.

I acknowledge that a copy of this form has been given to me.

(Signature of Participant)

(Date)

(Signature of Witness)

(Date)

## To be signed by investigator

To the best of my ability I have fully explained the nature of this research study. I have invited questions and provided answers. I believe that the participant fully understands the implications and voluntary nature of the study.

(Signature of Investigator)

(Date)

Phone Number

## Assent of minor participant (if appropriate)

(Signature of Minor Participant)

(Age \_\_\_\_)

Relationship to Participant Named Above

## Appendix D

**Demographic Data Form**

Code \_\_\_\_\_

1. Age of Child: \_\_\_\_\_

2. Weight of child: \_\_\_\_\_

3. Gender of child:

☐ Male☐ Female

4. Type of Surgery:

☐ Tonsil and Adenoidectomy☐ External ear procedure☐ Circumcision☐ Skin procedure (requires an incision)☐ Dental surgery☐ Other \_\_\_\_\_

5. Number of children in family: \_\_\_\_\_

6. Family position of child having surgery: \_\_\_\_\_

7. Past hospitalizations of child:

☐ None☐ Once☐ More than once, please list number of times \_\_\_\_\_

8. Reason for past hospitalization: \_\_\_\_\_

9. Previous Surgeries of child:

☐ None☐ Once☐ More than once, please list number of times \_\_\_\_\_

10. Type of previous surgery: \_\_\_\_\_

11. Relationship of participant to the child:

☐ Mother☐ Father☐ Grandparent☐ Other

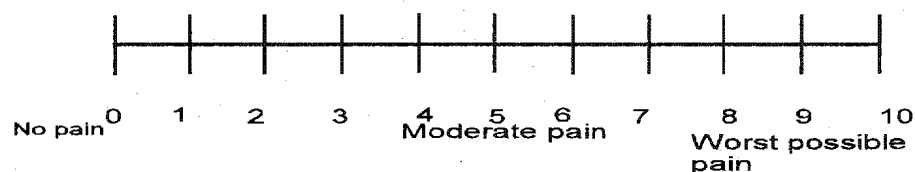
12. Age of participant: \_\_\_\_\_

### Appendix E Numerical Rating Scale

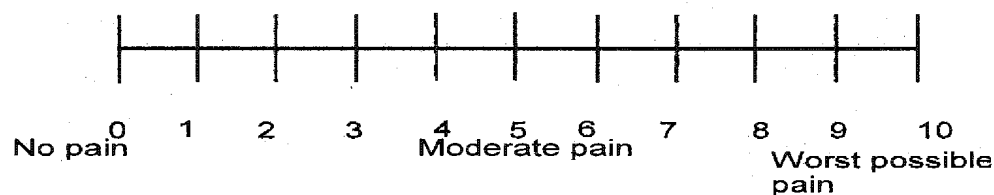
Code \_\_\_\_\_

The next three questions will ask you to rate your child's pain at particular times. Please circle a number on the scale to represent the intensity of the pain where 0 is no pain and 10 is the worst pain possible.

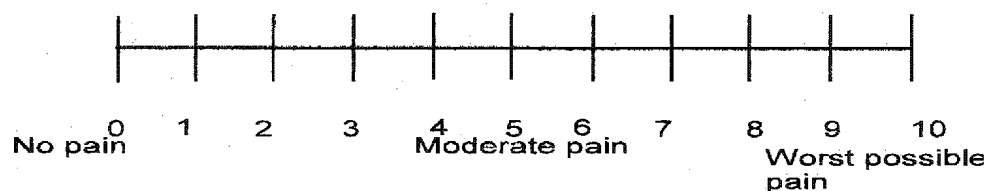
Example: How much pain does your child have at present?



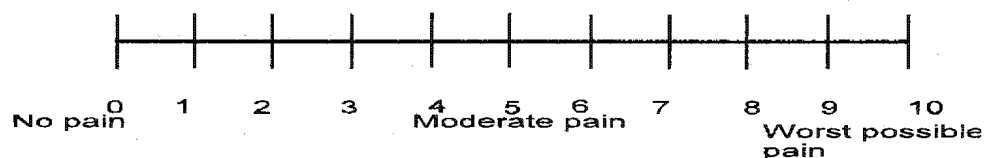
1. Between breakfast and lunch?



2. Between lunch and supper?



3. Between supper and bedtime?



## Appendix F

### ***Parents' Postoperative Pain Measure***

#### Behavioral Cues

Children sometimes have changes in behavior when recovering from surgery. The following is a list of behaviors that your child may or may not have exhibited while recovering from surgery between \_\_\_\_\_ and \_\_\_\_\_ today. For each of the behaviors below, circle the appropriate response, *yes* or *no*.

***When your child was recovering from surgery between \_\_\_\_\_ and \_\_\_\_\_ today, did s/he . . .***

- |     |  |     |    |
|-----|--|-----|----|
| 1.  | Whine or complain more than usual? . . . .     | Yes | No |
| 2.  | Cry more easily than usual? . . . . .          | Yes | No |
| 3.  | Play less than usual? . . . . .                | Yes | No |
| 4.  | Not do the things s/he normally does? . . .    | Yes | No |
| 5.  | Act more worried than usual? . . . . .         | Yes | No |
| 6.  | Act more quiet than usual? . . . . .           | Yes | No |
| 7.  | Have less energy than usual? . . . . .         | Yes | No |
| 8.  | Refuse to eat? . . . . .                       | Yes | No |
| 9.  | Eat less than usual? . . . . .                 | Yes | No |
| 10. | Hold the sore part of his/her body? . . . .    | Yes | No |
| 11. | Try not to bump the sore part of his/her body? | Yes | No |
| 12. | Groan or moan more than usual? . . . . .       | Yes | No |
| 13. | Look more flushed than usual? . . . . .        | Yes | No |
| 14. | Want to be close to you more than usual?       | Yes | No |
| 15. | Take medication when s/he normally refuses     | Yes | No |

**Note on Administration and Scoring:** Parents are asked to complete the measure between a specific time (i.e., between breakfast and lunch, between lunch and supper, or supper and bedtime). The number of items parents have circled "Yes" are summed for a total score out of

15. A score of at least 6 out of 15 signifies clinically significant pain.

Reference: Chambers, C. T., Reid, G. J., McGrath, P. J., & Finley, G. A. (1996). Development and preliminary validation of a postoperative pain measure for parents. *Pain*, 68, 307-313.



### Appendix G

#### Parents' Comforting Activities Checklist

##### Parents' Nonpharmacological Management of Child's Pain

Sometimes when children are in pain, parents may try many different ways of comforting their child. Please indicate with a check mark which of the following activities you used to comfort your child when the child was having pain. List five activities which you found most helpful and rate these activities on a scale of 0 (no help) to 10 (completely effective).

Parents Comforting Activities Checklist		
<b>Distraction:</b> 0 (no help) to 10 (completely effective)	<b>Physical comfort:</b> 0 (no help) to 10 (completely effective)	<b>Environment</b> 0 (no help) to 10 (completely effective)
1. reading	1. rubbing body part	1. keep noise down
2. puzzles	2. stroking	2. warm blanket
3. playing	3. positioning	3. call physician/mother/ friend for advice
4. music	4. holding child's hand	4. wrap in blanket on couch
5. singing songs	5. touch	
6. coloring	6. cuddling	<b>Nourish:</b>
7. telling story(s)	7. holding or rocking	1. drink
8. drawing	8. back rub	2. popsicle
9. video games	9. hugs	3. food
10. computer	10. handling gently	4. ice cream
	11. use cool cloth	5. favorite treat
<b>Verbal comfort:</b>		
1. humor	<b>Presence of parent:</b>	<b>Other activities:</b>
2. words of love	1. mother	
3. soothing voice	2. father	
4. ask where it hurts	3. grandparent	
5. reassuring tone	4. other	

## Appendix H

Code \_\_\_\_\_

**Parents' Attitudes Toward Medication Tool**

## Telephone Interview Format

Hello, may I speak with \_\_\_\_\_. This is Colleen Anderson calling, the nurse you spoke to in the hospital when (*child's name*) was having surgery. As I indicated at the time, I will ask you some questions on attitudes that you have toward medication for child's pain. It takes approximately five minutes to complete this part of the study. Is it a good time for us to talk? *If not, arrange a time that is convenient. If it is a good time, proceed. (If the parent has any questions, they will be acknowledged and a request will be made to answer these questions at the end of the call).*

## Proceed with Attitudes Tool

I am going to get you to respond to statements about using medicine to treat children's pain. What I would like you to do is to listen to the statement and tell me which one of the response choices best matches how you feel about the statement. There are no right or wrong answers. I am interested in knowing how you feel. First I would like you to find the response choices on a green sheet of paper. Are you ready? Okay, the response choices are Strongly agree, Agree, Slightly Agree, Uncertain, Slightly Disagree, Disagree, & Strongly Disagree. Now, before we begin, I need you to consider when thinking about how you feel about each statement is about the use of pain medicine for your child that has just had \_\_\_\_\_ surgery. Do you have any questions about that?

Which over-the-counter children's pain medicine was prescribed for your child. Okay so when I read you the statements, I will ask you about \_\_\_\_\_.

Do you have any questions before we begin? Okay, let's begin. I'll read the statement and you tell me which one of the seven response choices best suits how you feel about the statement.

Fill in the blank with the name of the medicine prescribed for the child of parent:

1. Children should be given \_\_\_\_\_ as little as possible because of side effects.
2. Children who take \_\_\_\_\_ for pain may learn to use drugs to solve other problems.
3. \_\_\_\_\_ works the same no matter how often it is used.
4. \_\_\_\_\_ works best when it is given as little as possible.
5. \_\_\_\_\_ has many side effects.
6. Children will become addicted to \_\_\_\_\_ if they take it for pain.
7. There is little need to worry about side effects from \_\_\_\_\_.
8. It is unlikely a child will become addicted to \_\_\_\_\_ if used for pain.
9. \_\_\_\_\_ is addictive.
10. \_\_\_\_\_ works best if saved for when the pain is quite bad.
11. Using \_\_\_\_\_ for children's pain leads to later drug abuse.
12. There is little risk of addiction when \_\_\_\_\_ is given for pain.
13. Children learn how to use \_\_\_\_\_ responsibly when it is given for pain.
14. Side effects are something to worry about when giving children \_\_\_\_\_.
15. The less often children take \_\_\_\_\_ for pain, the better the medicine will work.
16. Giving children \_\_\_\_\_ for pain teaches proper use of drugs.

Thank-you for your help in participating in this study. Please put the postoperative diary in the mail as soon as possible as I will use it to complete the study. Again thank-you so much for your help.

**Appendix I*****Human Investigation Committee Approval***



**Appendix J*****Western Memorial Regional Hospital Ethics Committee Approval***



May 9, 2002

Ms. Colleen Anderson  
c/o Western Regional School of Nursing  
Corner Brook, NF

Dear Ms. Anderson:

**Re: Research Proposal - Research into Parents' Attitudes, the Perception of Pain and Management of Pain after Child's Day Surgery**

First of all, I would like to apologize on behalf of the Regional Ethics Committee for the tardiness of our response to you. The above mentioned proposal was reviewed at a meeting of the Regional Ethics Committee on 13 March 2000 and full approval was given for this research project.

I trust this meets with your satisfaction. If you have any questions please feel free to contact me.

Sincerely,

REGIONAL ETHICS COMMITTEE

*J. Supple*  
for Fred Stacey (Rev.)  
Chairperson

FS/dst

● Regional Ethics Committee ● P.O. Box 2005 ● Corner Brook ● NF ● A2H 6J7 ●  
● Telephone: 1-877-938-4427 ● Facsimile: 709-637-5162 ●  
● Web Page: [www.healthwest.nf.ca](http://www.healthwest.nf.ca)

Operating the following sites:

◆ Bay St. George Long Term Care Centre ◆ Bonne Bay Health Centre ◆ Calder Health Centre ◆ Dr. Charles L. LeGrow Health Centre ◆ Inter-Faith Home For Senior Citizens ◆ J.I. O'Connell Centre ◆ Rufus Guinchard Health Centre ◆ Sir Thomas Roddick Hospital ◆ Western Memorial Regional Hospital ◆

**Appendix K**  
***Letter Requesting Permission from Hospital Administration to Complete Research***

September 3, 1999

Mrs. Bernice Blake-Dibbley,  
Vice President-Operations,  
Western Memorial Regional Hospital,  
Corner Brook, Nfld.  
A2H 6J7

Dear Mrs. Blake-Dibbley,

This letter is a request for permission to implement a research proposal on site at Western Memorial Regional Hospital which is a part of the requirements for the Master in Nursing program at Memorial University of Newfoundland in which I am enrolled. I will be implementing this proposal under the supervision of Dr. Sandra LeFort, a professor at Memorial University School of Nursing. This proposal has been submitted to the Human Investigation Committee, Faculty of Medicine, Memorial University of Newfoundland and approved prior to implementation.

The title of my research is 'Parents' Attitudes, Perception of Pain, and Management of Pain after their Child's Day Surgery'. This study will examine parents' attitudes to medication, parents' perception of their child's pain, and their management of their child's pain following day surgery.

I plan to meet with parents in the Day Surgery area while they are waiting for their child to go to surgery to explain this research.

Please feel free to contact me to answer any questions you may have. I await your response at your earliest convenience.

Sincerely,

Colleen Anderson, RN, BN  
Nursing Instructor, Master's Student



## Appendix L

***Test of Difference for Group Completing and Group Not Completing Diary***

Variable	Test	df	Significance
	Parametric T-Test		(2-tailed)
Age	t = -.013	54	0.99
Weight	t = -.504	3.101	0.648
	Nonparametric Chi-square		Asymp Significance (2-sided)
Surgery	$\chi^2 = 3.231$	7	0.863
Gender	$\chi^2 = 2.049$	1	0.152

## Appendix M

**Examples of How Appropriate Dosages Were Determined**

Acetaminophen with codeine Each 5 ml contains 160 mg acetaminophen and 8 mg of codeine Recommended dose of codeine for children is 0.5mg/Kg	
2-3 years	3.75 - 5 ml
4-5 years	5 - 6.25 ml
6-8 years	6.25 - 8.75 ml
9-10 years	8.75 - 10 ml
11-12 years	10 - 12.5 ml

For example:

Age of child: 3 years

Weight of child: 18.5 kg

Dosage given: 5 ml

Appropriate dose?

Yes/No

Acetaminophen 10 to 15 mg/Kg every 4 hours , as required, not to exceed 75 mg/kg/24 hours		
2-3 years	11 -15.9 Kg	160 mg
4-5 years	16 - 21.9 Kg	240 mg
6-8 years	22 - 26.9 Kg	320 mg
9-10 years	27 - 31.9 Kg	400 mg
11 years	32 - 43.9 Kg	480 mg
Adults and children over 12		650 mg to 1000 mg q4h prn

For example:

Age of child: 4 years

Weight of child: 19.5 Kg

Dosage given: 160 mg

Appropriate dose? Yes/No

From: Compendium of Pharmaceuticals and Specialties (2001).

## Appendix N

***Mean and Standard Deviation for Individual Items for Parents' Attitudes Toward Medication Tool***

Parents' Attitudes Toward Medication	M (SD)
1. Children should be given _____ as little as possible because of side effects.	4.56 (1.87)
2. Children who take _____ for pain may learn to use drugs to solve other problems.	3.38 (1.88)
3. _____ works the same no matter how often it is used.	3.31 (1.87)
4. _____ works best when it is given as little as possible.	4.02 (1.93)
5. _____ has many side effects.	3.33 (1.61)
6. Children will become addicted to _____ if they take it for pain.	2.84 (1.57)
7. There is little need to worry about side effects from _____	4.54 (1.70)
8. It is unlikely a child will become addicted to _____ if used for pain.	5.24 (1.59)
9. _____ is addictive.	3.84 (1.81)
10. _____ works best if saved for when the pain is quite bad.	4.47 (1.94)
11. Using _____ for children's pain leads to later drug abuse.	2.45 (1.33)
12. There is little risk of addiction when _____ is given for pain.	5.35 (1.48)
13. Children learn how to use _____ responsibly when it is given for pain.	5.35 (1.51)
14. Side effects are something to worry about when giving children _____.	4.67 (1.72)
15. The less often children take _____ for pain, the better the medicine will work.	4.60 (1.93)
16. Giving children _____ for pain teaches proper use of drugs.	4.75 (1.79)





