APPRECIATIVE INQUIRY: AN INTERACTIVE ORGANIZATIONAL INTERVENTION TO TRANSLATE ACUTE PAIN MANAGEMENT EVIDENCE INTO PEDIATRIC NURSING PRACTICE

by

Patricia Marie Kavanagh, RN, HonBSc, BScN

A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy

Graduate Department of Nursing Science
University of Toronto

©Copyright by Patricia Marie Kavanagh, 2010
Appreciative Inquiry: An Interactive Organizational Intervention to Translate Acute Pain Management Evidence into Pediatric Nursing Practice

Patricia Marie Kavanagh

Doctor of Philosophy

Graduate Department of Nursing Science

University of Toronto

2010

Abstract

Despite a substantial evidence-base for pediatric pain management, pain is not always well managed in clinical practice. Appreciative Inquiry (AI) is an innovative knowledge translation (KT) intervention that is compatible with the Promoting Action on Research in Health Services (PARiHS) framework. A prospective, repeated-measures, mixed-methods case study was conducted to (a) explore the implementation process of AI as a KT intervention in pain, (b) examine the beginning effects of AI on pain related outcomes, and (c) describe extraneous factors related to the PARiHS framework. Outcomes were measured at six and three weeks pre-intervention and three and six months post-intervention, ending with a semi-structured interview on the acceptability of the intervention. Data were analyzed using descriptive and inferential statistics, and quantitative and qualitative content analyses.

Twelve nurses (nine staff and three administrative/clinical leaders) from a surgical unit at a pediatric hospital participated in the study. They perceived their context to be relatively complex, with a culture focused on clinical competence, family-centered care, and teamwork, and a transformational leadership style. Overall, participants were satisfied with the intervention structure, which consisted of four three-hour, interactive sessions delivered
over two weeks to promote change based on positive examples of pain management on the unit, and suggested only minor refinements. The intervention was delivered with high fidelity and most participants (n = 11) attended all four sessions, where they developed an action plan to enhance evidence-based pain assessment documentation. There was a statistically significant improvement in participants’ pain knowledge and attitudes post-intervention. This outcome was significantly and positively correlated with participants’ attitudes towards research. Both of these factors had a significant relationship with participants’ effort to document pain assessments. Participants named AI a ‘refreshing approach to change’ because it was positive and democratic, with a focus on building on existing practices. They felt the process cultivated a positive reception to change, broadened their horizons around pain, and enhanced their team spirit. The facilitators were considered credible with effective communication skills. Given the promising results of this study, the refinement and evaluation of the AI intervention are warranted in other contexts and for other clinical practices.
Acknowledgements

This thesis was an Appreciative Inquiry and throughout this journey, I was acutely aware that I had much of which to be appreciative. Undoubtedly, I was blessed with help and support from the best of the best in all aspects of this project.

I am grateful to my supervisor, Dr. Bonnie Stevens, for taking a real chance and giving me the unique opportunity to enter the PhD program directly after completing my BScN. Thank you for your constant support, the unparalleled opportunities you presented to enrich my research training, and your kind understanding as my family grew alongside my thesis.

To my committee members, Drs. Kate Seers, Souraya Sidani, and Judy Watt-Watson, thank you for your unwavering confidence in me from start to finish and the vast knowledge and insight that you so generously gave to this project. I relied on each of you in different ways, but on all of you for your wisdom, support, and kindness.

I wish to acknowledge the Canadian Institutes of Health Research (CIHR Fellowship, PICH CIHR Strategic Training Grant Stipends, TROPIC CIHR Fellowship), University of Toronto, and Canadian Child Health Clinician Scientist Program (Rising Researcher Award) for personal support. Support for this study was also provided by Sigma Theta Tau International and the Registered Nurses’ Association of Ontario.

It was a privilege to work with the nurses who participated in this study; a truly exceptional group of clinicians. Thank you for embracing this novel intervention and for your unprecedented dedication and enthusiasm during the whole process.

Thank you to Lori Palozzi and Dr. Denise Harrison for agreeing to co-facilitate this intervention with me. Lori, you shared your time despite a schedule that would indicate
otherwise. Your warmth, passion, and intelligence made an impact on me when I first met you in the BScN program and were critical to making this project a success. Denise, your support gave me great relief during a challenging time and your enthusiasm and commitment made this project better.

To Manon Labrecque and Sheila Gandhi, thank you for your tireless and meticulous work in collecting data for this study. Dr. Charles Victor, thank you for sharing your time and statistical knowledge; you are a gifted teacher and your patience and support were a great comfort to me as I worked through the analysis.

Lastly, I extend my sincere gratitude to my family and friends. Argerie, you were part of this process from beginning to end; our daily chats kept me sane and your generosity as a friend and colleague were humbling. Michelle, thank you for the refreshing conversations, sticking with me through the busiest times, and being a constant friend. Dr. Jennifer Stinson, you were a mentor in the truest sense: a trusted advisor and endless source of help and support in every step that I took. To my family, I share this accomplishment with you. Thank you to my sister, Allison, for being a voice of reason and calm and sharing your time and energy with my children. Mom and Dad, you helped to give me the gift of this PhD through your selflessness; you were tireless in your prayers and support, with an unmatched generosity in caring for me and the boys. And lastly, to Jeff, my extraordinary husband and best friend; you are a dream come true and have sacrificed beyond words to make every desire of my heart a reality. Your love, enthusiasm, and commitment were unwavering and my stronghold in this and every journey. This accomplishment is yours as much as it is mine.
# Table of Contents

Chapter One: Introduction and Problem Statement ................................................................. 1
  Introduction ................................................................................................................................. 1
  Problem Statement and Study Purposes .................................................................................... 5

Chapter Two: Review of the Literature ...................................................................................... 6
  Factors Influencing Pediatric Nurses’ Acute Pain Practices ......................................................... 6
  Knowledge Translation and Evidence-based Practice ................................................................. 12
  Interventions to Improve Pain Practices in Nursing ................................................................. 16
  Appreciative Inquiry .................................................................................................................. 26

Chapter Three: Conceptual Framework ..................................................................................... 42
  The PARiHS Framework ............................................................................................................ 42
  Empirical Support for the PARiHS Framework ........................................................................ 47
  AI and the PARiHS Framework ............................................................................................... 49
  Evaluation Framework .............................................................................................................. 52
  Summary .................................................................................................................................. 55

Chapter Four: Methods ............................................................................................................. 57
  Research Objectives ................................................................................................................ 57
  Study Purposes and Research Questions ................................................................................ 57
  Research Design ...................................................................................................................... 59
  Setting .................................................................................................................................... 61
  Sample, Sampling Technique and Sample Size ......................................................................... 62
  Recruitment and Procedure ..................................................................................................... 64
  AI Intervention ......................................................................................................................... 65
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AI Intervention Manual</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>Instruments</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Sample Characteristics</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Implementation Process of the AI Intervention</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Outcomes of the AI Intervention</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Extraneous Factors of the AI Intervention</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>Procedures for Data Collection</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>Data Analysis</td>
<td>86</td>
</tr>
<tr>
<td></td>
<td>Triangulation</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Missing Data</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Ethical Considerations</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Chapter Five: Quantitative Results</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td>Derivation of the Sample</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td>Sample Characteristics</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>Implementation of the AI Intervention</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>Outcomes of the AI Intervention</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>Summary of Quantitative Results</td>
<td>126</td>
</tr>
<tr>
<td></td>
<td>Chapter Six: Qualitative Results</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td>Implementation Process of the AI Intervention</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>Extraneous Factors of the AI Intervention</td>
<td>156</td>
</tr>
<tr>
<td></td>
<td>Summary of Qualitative Results</td>
<td>161</td>
</tr>
<tr>
<td></td>
<td>Chapter Seven: Discussion</td>
<td>163</td>
</tr>
<tr>
<td></td>
<td>Implementation Process of the AI Intervention</td>
<td>163</td>
</tr>
</tbody>
</table>
Outcomes ........................................................................................................................... 176
Extraneous Factors of the AI Intervention................................................................. 186
Strengths ............................................................................................................................ 198
Limitations ......................................................................................................................... 200
Chapter Eight: Implications and Conclusions.......................................................... 207
Study Summary............................................................................................................... 207
Implications for Policy...................................................................................................... 210
Implications for Theory ................................................................................................. 210
Implications for Research ............................................................................................... 213
Implications for Practice ................................................................................................. 218
Conclusions....................................................................................................................... 222
References......................................................................................................................... 223
Appendices......................................................................................................................... 260
List of Tables

Table 1. Summary of the AI Intervention ................................................................. 68
Table 2. Study Instruments ...................................................................................... 71
Table 3. Practice Indicators .................................................................................... 97
Table 4. Nurse Characteristics ............................................................................... 107
Table 5. Types of Pharmacological Pain Management ........................................... 109
Table 6. Years of Nursing Experience for Participants and Non-Participants .......... 112
Table 7. Time Requirements for Each AI Phase ....................................................... 113
Table 8. Children’s Average Pain Intensity by Type of Pharmacological Pain Management 119
Table 9. NUCAT-3 Behaviors Important/Acceptable to Nurse Participants .......... 123
Table 10. NUCAT-3 Behaviors Unimportant/Unacceptable to Nurse Participants .... 124
Table 11. Staff Nurse Participants’ Ratings of the Administrative Nurse Leader on the MLQ 125
List of Figures

Figure 1. Recruitment, Outcomes Measurement, and the AI Intervention .......................... 85
Figure 2. Derivation of the Sample .......................................................................................... 105
Figure 3. Qualitative Research Themes and Sub-themes .......................................................... 128
List of Appendices

Appendix A. Summaries of Combined Individual and Organizational Level Studies in Pain Management................................................................. 261

Appendix B. 4D Cycle of AI ................................................................................................................................. 280

Appendix C. Summaries of AI Intervention Studies in Business............................................................. 281

Appendix D. Summaries of AI Clinical Practice Studies in Health Care .............................................. 284

Appendix E. Conceptual Framework ........................................................................................................... 287

Appendix F. Study Summary .......................................................................................................................... 288

Appendix G. Participant Interest Form ............................................................................................................ 289

Appendix H. Study Poster .............................................................................................................................. 290

Appendix I. Interview Guide .......................................................................................................................... 291

Appendix J. Action Plan .................................................................................................................................. 294

Appendix K. Research Consent Forms ....................................................................................................... 301

Appendix L. Conceptual Index ....................................................................................................................... 315

Appendix M. Questions Included in the PKNAS Pain Assessment Subscales ........................................... 320

Appendix N. Formula Derivation for the Practice Indicators ....................................................................... 321

Appendix O. Exploratory Analyses ............................................................................................................. 322

Appendix P. Process Facilitator Checklist: AI Process Components of the Intervention .... 325

Appendix Q. Content Facilitator Checklist: Pain Components of the AI Intervention .... 327
Chapter One: Introduction and Problem Statement

Introduction

Over the past two decades there has been substantial growth in the quality and quantity of pediatric acute pain research evidence. Ample research attests to the complex physiology of acute pain (which is yet to be fully understood, especially in the developing nervous system) and the adverse consequences of its under-management (e.g., Grunau & Tu, 2007; Melzack & Wall, 1965; 1973; 1982; Petersin-Felix & Curatolo, 2002; Woolf & Salter, 2000). Systematic reviews (e.g., Stinson, Yamada, Stevens, Dickson, & Lamba, 2008; Yamada, Stevens, Stinson, McGrath, Lamba, & Dickson, 2008) and quantitative studies (e.g., Sander Wint, Eshelman, Steele, & Guzzetta, 2002; Sparks, 2001; Usmani, Pal Singh, Quadir, & Chana, 2009) denote the clinical effectiveness of acute pain management interventions, while children’s perceptions of their pain have been explored through qualitative methodologies (e.g., Crandall, Miaskowski, Kools, & Savedra, 2002; Polkki, Pietila, & Vehvilainen-Julkunen, 2003; Woodgate & Kristjanson, 1996). Empirical evidence on pediatric acute pain assessment and management has been synthesized into clinical standards and guidelines by several accreditation (Canadian Pain Society [CPS], 2005; Joint Commission on Accreditation of Healthcare Organizations [JCAHO], 1999) and pediatric professional health care organizations (American Academy of Pediatrics [AAP], 2000; CPS/AAP, 2000). Moreover, international attention has been given to using this evidence in practice through a heightened focus on patient safety and accreditation standards (Canadian Council on Health Services Accreditation [CCHSA], Achieving Improved Measurement, 2003; JCAHO, 1999), as well as legislation geared at improving the quality of pain management (e.g., Conquering Pain Act of 2005; Global Year Against Pain in Childhood,

Despite a substantial evidence base and supportive political context, pain is not always well-assessed and managed in clinical practice (Taylor, Boyer, & Campbell, 2008; Twycross, 2007). The most recent Canadian descriptive study indicated that 58% of inpatients at a tertiary and quaternary pediatric hospital who were experiencing pain received analgesics in the preceding 24 hours, with only 25% receiving regular analgesia (Taylor et al.). Moreover, only 24% of children had a pain score documented in the preceding 24 hours. Consequent to a lack of evidence-based acute pain management practices, hospitalized children continue to experience unrelieved pain. The same pediatric hospital-wide survey indicated that 23% of children had moderate or severe pain at the time of interview and 64% had moderate or severe pain in the previous 24 hours (Taylor et al.).

Human and animal studies provide compelling evidence that unrelieved or excessive pain may result in significant and sustained neuronal changes in neonates (Grunau & Tu, 2007; Lidow, 2002). For example, an increased number of invasive procedures experienced by preterm infants in early life may result in diminished cortisol and behavioural responses to pain (Grunau & Tu; Lidow). In full-term infants, previous repeated painful or surgical procedures have resulted in heightened anticipation and manifestations of pain in later life (Grunau & Tu; Lidow). Unrelieved pain in infants may also have adverse physiological short-term effects. Anand and Hickey (1992) found that, relative to infants who received deep anesthesia, infants with lighter anesthesia during cardiac surgery exhibited heightened stress responses, metabolic alterations, increased incidence of postoperative complications (e.g., sepsis and disseminated intravascular coagulation), and even death.
A growing number of studies attest to the adverse psychological consequences of pain in infants and children. McCann, Water, Goumnerova, and Berde (2004) found that children with severe brachial plexus injuries who underwent surgery as infants demonstrated significantly more self-injurious behaviours than those children with minor injuries and no surgery. Unrelieved pain in infancy may contribute to diminished academic performance (Ludman, Sptiz, & Wade, 2001), while untreated acute pain in children may result in increased anxiety towards subsequent procedures and post-traumatic stress syndrome (Grunau, Whitfield, & Petrie, & Fryer, 1994; 1996). This anxiety may extend into adulthood, with high pain in childhood correlating with fear of medical procedures and avoidance of health care in young adults (Pate, Blount, Cohen, & Smith, 1996).

The consequences of unrelieved pain provide a persuasive argument for practicing evidence-based pain assessment and management. Within nursing, considerable attention has been given to individual nurse factors (e.g., knowledge, attitudes, and beliefs) as contributors to suboptimal pain assessment and management in hospitals (Broome, Richtsmeier, Maikler, & Alexander, 1996; Hamers, Abu-Saad, Halfens, & Schumacher, 1994; McCaffery & Ferrell, 1997). However, education interventions designed to increase nurses’ pain knowledge and challenge misconceptions have had variable success in improving outcomes and their effectiveness in sustaining evidence-based pain practices over time is unclear (e.g., Camp-Sorrell & O’Sullivan, 1991; Knoblauch & Wilson, 1999). Attributing the persistent and suboptimal state of nurses’ pain practices to individual factors alone appears to be an oversimplification of a larger and more complex issue; research indicates that adequate knowledge about pain does not guarantee its use in practice (Dihle, Bjolseth, & Helseth,
Rather than viewing the persistence of suboptimal pain management as a knowledge deficiency problem, the core issue can be conceptualized as a failure to use available evidence in practice (Scott-Findlay & Estabrooks, 2006a). The challenge therefore becomes one of knowledge translation (KT), not knowledge building alone (Kavanagh, Stevens, Seers, Sidani, & Watt-Watson, 2008; Scott-Findlay & Estabrooks). Innovative interventions are needed to translate pain management evidence into practice that reflect the complexity of the KT process. Grounding KT interventions in relevant theory is integral to the advancement of KT efforts in health care (Eccles, Grimshaw, Walker, Johnston, & Pitts, 2005; Estabrooks, Thompson, Lovely, & Hofmeyer, 2006). Theory can be defined as the existing body of knowledge that aids an understanding of the phenomenon and practice of KT (adapted from Sidani & Braden, 1998). Currently, there are no intervention studies to implement pain evidence in nursing practice that have been comprehensively grounded in KT theory. Evidence, context, and facilitation are identified as critical factors to effectively implementing evidence in practice in the Promoting Action on Research Implementation in Health Services (PARiHS) framework (Kitson, Harvey, & McCormack, 1998; Kitson et al., 2008; Rycroft-Malone, 2004). The organizational perspective of the PARiHS framework is congruent with the notion that the implementation of evidence in practice should be conceptualized as organizational change (Reay, Golden-Biddle, & Pablo, 2002).

Appreciative Inquiry (AI) is a method of organizational change that is consistent with the elements of the PARiHS framework (Kavanagh et al., 2008). AI is an effective organizational change intervention in the business literature (Bushe & Kassam, 2005) and is
emerging in health care research. It is interactive and context-specific, with a unique focus on the strengths, rather than the weaknesses, of an organization to improve practices (Cooperrider, Whitney, & Stavros, 2005; Mantel & Ludema, 2000). Given the likely variability in the quality of nurses’ pain practices, AI is a method that can be used to capitalize on nurses practicing evidence-based acute pain assessment and management in the clinical setting.

**Problem Statement and Study Purposes**

AI has yet to be examined as a KT intervention or directly applied to clinical issues, such as pain, in inpatient clinical settings. Due to the complexity of the concept and practice of KT, exploratory studies are recommended to select and refine potential KT interventions for use in the clinical setting (Eccles et al., 2005). Exploring AI as a KT intervention will provide evidence regarding the implementation process and beginning effects of a theory-based KT intervention. The purposes of this study are to (a) describe the process of implementing AI as an intervention to translate acute pain assessment/management evidence into pediatric nursing practice; (b) explore the beginning effects of the AI intervention on process, practice, and patient outcomes related to pain; and (c) describe extraneous factors related to the concepts of evidence, context, and facilitation in the PARiHS framework and explore their relationships with the outcomes of the AI intervention.
Chapter Two: Review of the Literature

This chapter begins with a review of factors considered influential to the frequently suboptimal assessment and management of acute pain by nurses. Explanations of the concepts of KT and evidence-based practice (EBP) follow, as well as a review of intervention studies conducted to improve the quality of nurses’ pain practices. Interventions targeting both adult care and pediatric nurses are reviewed, without limitation to the type of pain or patient population. Intervention studies are organized as those targeting individual factors only (i.e., nurses’ knowledge, attitudes, and beliefs) or a combination of individual and organizational factors (i.e., context of practice). Lastly, the theory and practice of AI are discussed, as well as its effectiveness and applicability as an intervention to implement acute pain assessment/management evidence in nursing.

Factors Influencing Pediatric Nurses’ Acute Pain Practices

Exploration of the use of research evidence in nursing has traditionally focused on individual determinants (Estabrooks, Scott-Findlay, & Winther, 2004); however, it was recently determined that nurses’ beliefs and attitudes towards research evidence were the only individual determinants significantly and positively correlated with the use of research in practice (Estabrooks, Floyd, Scott-Findlay, O’Leary, & Gushta, 2003). Numerous researchers have sought to determine the factors that contribute to the persistence of suboptimal acute pain assessment and management practices in nursing. Like the general EBP literature, there has been an overwhelming focus on individual characteristics. Suboptimal acute pain practices have been largely attributed to nurse knowledge deficiencies (Scott-Findlay & Estabrooks, 2006a), including those related to analgesics (Hamilton & Edgar, 1992; McCaffery & Ferrell, 1997; McGrath, 1995) and methods of pain assessment.
Erroneous beliefs and attitudes about acute pain and its assessment and management are considered a consequence of these knowledge deficits and identified as significant contributors to suboptimal practices. Examples reported for pediatric nurses include (a) infants and children are neurologically immature and experience no pain or pain of a lesser intensity than adults; (b) children have no memory of pain; (c) active or quiet children are not in pain; (d) children cannot verbalize their pain; (e) children become accustomed to pain; (f) opioids are more dangerous for children than adults, with children having a greater risk of addiction; and (g) unrelieved pain has no adverse consequences for children (Hamers et al.; McCready, MacDavitt, & O’Sullivan, 1991; Schmidt, Eland, & Weller, 1994). Nurses have also demonstrated a tendency to equate pain intensity with a child’s medical diagnosis, rather than with individual assessment (Atkinson, 1996; Hamers et al.) and to classify pain as a normal consequence of hospital admission (Hamers et al.).

However, empirical examination of the progression of nurses’ knowledge from 1988 to 1995 indicated that, despite the persistence of some deficits, nurses’ knowledge of pain assessment and management had improved (McCaffery & Ferrell, 1997). In the pediatric literature, Jacob and Puntillo (1999) sought to determine the persistence of historically reported fallacies surrounding pediatric pain. Pediatric nurses (n = 260) from eight acute care hospital units completed a pain survey that indicated improved knowledge and diminished presence of misconceptions regarding pediatric pain and its management. There was, however, discrepancy between nurses’ espoused beliefs regarding pain and its assessment and management and their actual pain practices; articulated knowledge regarding pain assessment and analgesic management did not appear to optimize the quality of actual
practices. For example, in spite of nurses’ demonstrated knowledge of analgesic use in children and documentation that patients were experiencing pain, 35-40% of medical records revealed that pain medications were not administered. More recently, Twycross (2007) compared pediatric nurses’ \( (n = 12) \) pain assessment and management knowledge to observational data on their post-operative pain practices and concluded that they did not appear to routinely use their theoretical knowledge in practice. Van Hulle Vincent and Denyes (2004) similarly found no significant relationship between pediatric nurses’ \( (n = 67) \) knowledge and attitudes regarding acute pain and their analgesic administration practices. These results are consistent with studies conducted with adult care nurses working in postoperative acute care settings (Dihle et al., 2006; Watt-Watson et al., 2001) and collectively imply that nurses may not necessarily use their pain assessment and management knowledge in practice and factors beyond those at the individual level may be influential in the process.

In a review of factors influencing nurses’ decision-making for the assessment and management of pediatric pain, Abu-Saad and Hamers (1997) advanced a theoretical argument for the influence of contextual factors, including colleagues, workload, and institutional pain management policies. Empirical evidence for the influence of hospital unit context and culture on nurses’ pain management practices is provided by a recent qualitative study examining health care professionals’ pediatric acute pain management decision-making (Scott-Findlay, Kavanagh, Profetto-McGrath, Stevens, & Estabrooks, 2004). A secondary analysis of qualitative data from 36 months of participant observation and interviews in two pediatric acute care settings revealed that the prevailing organizational/hospital unit culture influenced pediatric nurses’ pain management decision-making and practices more than
nurses’ personal attitudes/beliefs, evidence-based knowledge, clinical experience, or presence of professional practice guidelines (Scott-Findlay et al.). This finding is in accordance with the assertion that nurses rely on knowledge generated within their context of practice and on unit norms more than on research evidence to guide their daily practice (Estabrooks, 2003).

Ethnographic studies by Willson (2000) and Manias, Botti, and Bucknall (2002) support the influence of context and culture on nurses’ pain management practices. Willson observed and interviewed nine nurses involved in the care of a patient on one of three trauma/orthopedic wards to determine the factors that influenced their decision-making around the administration of analgesics. Shift-work, organization of patient care, time, customary analgesic practices, and interactions with the multidisciplinary team were identified as context/culture-related influencing factors. Manias and colleagues observed the pain assessment and management activities of 30 nurses and found contextual factors like interruptions in care related to other time-dependent tasks and competing demands presented by others (e.g., nurses, doctors, patients) adversely affected their practices (e.g., application of formal assessments, timely administration of analgesics).

Characteristics of the clinical phenomenon of pain may also be an important determinant of nurses’ use of pain assessment and management evidence in the clinical setting (Estabrooks, 1999a; 2009); that is, the complexity of the phenomenon of pain may contribute to suboptimal practices. Pain is defined as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (Merskey & Bogduk, 1994, p. 210). Pain is always subjective and, important to the appreciation of pediatric pain, the inability to communicate verbally does not negate the
possibility that an individual is experiencing pain and is in need of appropriate pain-relieving treatment (IASP, 2005). This broadly accepted understanding of pain is premised on the Gate Control Theory (Melzak & Wall, 1965), which succeeded the traditionally held specificity theory (von Frey, 1984). The specificity theory emerged as too simplistic in its proposition that the intensity of pain was proportional to the extent of tissue damage, implying a fixed, unidirectional transmission system from somatic pain receptors to a pain center in the brain (Melzack & Wall, 1982).

The complexity of pain perception resulting from the involvement of central mechanisms is outlined in the Gate Control Theory. This theory is premised on the proposition that the inter-neurons of the substantial gelantinosa act as a gate, modulating the input of large and small fibres to lamina V cells (Melzack & Wall 1965; 1973; 1982). Nociceptive impulses are transmitted to the thalamus and cerebral cortex when small fiber activity in the dorsal horn reaches a critical threshold. The degree to which the gate increases or decreases sensory transmission is determined by the relative activity in large-diameter (A-beta) and small-diameter (A-delta and C) fibers and by descending influences from the brain (Melzack & Wall 1965; 1973; 1982). Pain perception is a complex phenomenon in that it is influenced by and involves the interaction of physiological, psychological, behavioural, developmental, and situational factors.

More recent research attests to the plasticity of the nervous system, whereby neurons have the capacity to change their function, chemical profile, or structure in the presence of tissue injury or inflammation (Woolf & Salter, 2000). Neuronal changes may include peripheral and/or central sensitization. Peripheral sensitization occurs when damaging stimuli lead to a state of hyperexcitability in primary afferent nociceptors, where the response
threshold of intact nociceptors to nonnoxious environmental or weak stimuli is lowered (Dworkin et al., 2003; Petersen-Felix & Curatolo, 2002). Consequently, pain may result from stimuli that are normally innocuous (i.e., allodynia) or noxious stimuli may evoke greater and more prolonged pain (i.e., hyperalgesia) (Basbaum & Bushnell, 2002; Craig & Sorkin, 2001; Woolf & Salter). Central sensitization involves the progressively increased response to repeated noxious stimuli and the hyperexcitability of neurons in the dorsal horn (Dworkin et al.; Petersen-Felix & Curatolo). This hyperexcitability leads to biochemical changes in dorsal horn neurons, which are manifested by an increase in spontaneous activity, enlarged receptive fields, and a lowered threshold of neurons to peripheral stimulation (Craig & Sorkin). These sensitization phenomena typically reverse themselves subsequent to tissue healing and the subsidence of inflammation (Dworkin et al.). However, such neuronal changes are of critical clinical significance as they may increase the magnitude of perceived pain and contribute to the development of persistent pain syndromes in individuals (Petersen-Felix & Curatolo). Ultimately, the complexity of the clinical phenomenon of pain may impede the use of related research evidence in practice, as innovations that are perceived as difficult to understand may be adopted more slowly than those considered simpler (Rogers, 2003).

**Summary.** The persistent, frequently suboptimal state of nurses’ acute pain practices has been largely attributed to individual factors, such as knowledge deficits. However, recent research suggests that nurses’ knowledge regarding acute pain assessment and management has improved over time, but that such knowledge is not necessarily applied in practice (e.g., Twycross, 2007). This growing realization coupled with the likely influences of context and the clinical phenomenon of pain suggest that the proverbial focus on individual factors alone
is an oversimplification of a larger and more complex issue. Addressing the inadequate state of acute pain practices appears to require a focal shift from building knowledge to the process of translating evidence for use in the clinical setting.

**Knowledge Translation and Evidence-based Practice**

*Knowledge translation.* Knowledge translation is broadly defined as “a dynamic and iterative process that includes synthesis, dissemination, exchange, and ethically-sound application of knowledge to improve the health of Canadians, provide more effective health services and products, and strengthen the health care system” (Canadian Institutes of Health Research [CIHR], 2009, About Knowledge Translation section, para. 1). The intensity, complexity, and engagement of this process depend on factors related to the nature of the research, findings, and knowledge users (CIHR). Knowledge translation is distinct from the earlier and more traditional concept of knowledge transfer. Knowledge transfer refers to the unidirectional flow of knowledge from researchers to users (CIHR). Supplier push models (Davis et al., 2003; Dickinson, 2004) are examples of knowledge transfer, where knowledge is considered a product created by researchers and used by practitioners, with a linear and unidirectional sequence of research supply to use (Landry, Lamari, & Amara, 2003). Accordingly, knowledge transfer interventions have largely been limited to education and individual persuasion efforts (Davis et al.) and can often be characterized as passive dissemination. Passive dissemination neither involves personal contact with nor engages participants in the implementation process and includes traditional methods such as publications, guideline implementations, and didactic education (Bero et al., 1998). In general, interventions rooted in the knowledge transfer paradigm have met limited success in encouraging the use of evidence in practice (Bero et al.; CIHR). Researchers operating on the
concept of knowledge transfer have frequently attributed failed interventions to the distinct
and irreconcilable natures of research and practice communities (CIHR).

In contrast, KT is a dialogic and interactive process that joins individuals from
research and practice in the common goal of evidence application (CIHR, 2009). The concept
of KT is well articulated in interactive models of knowledge transfer, such as pragmatistic
models. Pragmatistic models of knowledge transfer explicitly embrace the term KT (rather
than knowledge transfer) and are premised on the necessity of cooperation between
researchers and clinicians to promote the use of evidence in practice (Dickinson, 2004). The
distinction made between KT and knowledge transfer is that, rather than appreciating
knowledge as a product, KT considers knowledge generation and use as processes.
Knowledge within KT is viewed as socially constructed through communicative processes of
learning that occur in contexts with established meaning systems, role structures, and values.
Knowledge translation is synonymous with social learning, requiring participation by those
affected by the new knowledge (Dickinson).

Knowledge translation interventions typically adopt a more comprehensive approach
to implementing evidence in practice compared to those premised on knowledge transfer
(Davis et al., 2003). For example, KT interventions are not limited to education because the
focus extends beyond building individual knowledge to improving health outcomes,
changing behaviour, and overcoming barriers to change. Knowledge translation interventions
are not limited to individual persuasion because, rather than being confined to learning
situations, KT is contextually relevant by being located in the clinical, social, organizational,
and policy contexts of practice. Lastly, the objectives of KT go beyond the identification of
best evidence to facilitating the use of that evidence in practice. This more holistic view of
KT relative to traditional methods of knowledge transfer may bolster the capacity of KT interventions to promote and sustain evidence use in practice (Davis et al.).

Historically, research utilization has been the focus in nursing literature (Estabrooks et al., 2004), with little consideration of the theory and practice of KT. Research utilization is a subset of EBP that specifically refers to the use of research to guide practice (Estabrooks, 1999a; 2009). An important contribution of the research utilization agenda to the advancement of KT science is a growing evidence-base on the sources of knowledge used by nurses in practice. Nurses appear to prefer interpersonal and interactive sources of knowledge (e.g., dialogue with colleagues) compared to traditional modes of dissemination (e.g., printed materials) (Estabrooks et al.), which implicitly supports the ineffectiveness of traditional knowledge transfer efforts to change practices in nursing and implicates KT as a viable alternative. Understanding KT as a social process suggests that passively handing research to clinicians is unlikely to promote its use in practice (Rycroft-Malone et al., 2002). Knowledge translation interventions based on social and relational capital in the context of practice are likely more fitting than traditional knowledge transfer strategies to promote the use of evidence in practice because they reflect the actual patterns of knowledge use by nurses (Estabrooks et al.).

Evidence-based practice. Evidence-based practice is a desired outcome of KT. This term is not universally applied in the nursing literature; other terms such as evidence-based nursing and research-based practice are also applied (Estabrooks et al., 2004). The term EBP has its roots in the evidence-based medicine movement, which originated from clinical epidemiologists at McMaster University (Evidence-based Medicine Working Group, 1992). The definition of evidence-based medicine has evolved over time to explicitly acknowledge
the integration of research with clinical expertise and patient values (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996).

Evidence-based practice involves the incorporation of evidence from research, clinical experience, patient experience, and the local context in the delivery of patient-centered care (Rycroft-Malone et al., 2004a). Optimally, EBP should enhance clinical effectiveness and positively affect the delivery of health care through the integration of research, clinical guidelines, and outcomes assessments in practice (DeBourgh, 2001). Rycroft-Malone and colleagues (2004a) define evidence in EBP as “knowledge derived from a variety of sources that has been subjected to testing and has been found to be credible” (p. 83). Exploring the factors that influence the implementation of evidence in practice, Rycroft-Malone and colleagues (2004b) noted that sources other than research evidence informed clinical practice changes that clinicians considered ‘evidence-based’. For example, patient preferences were found to drive practice changes around the delivery of hemofiltration to patients.

This broad understanding of evidence as being synonymous with knowledge is evident in both CIHR’s (2009) definition of KT and the description of KT found in pragmatistic models of knowledge transfer. Pragmatistic models extend the definition of evidence within KT even further to include individuals’ understandings of their needs, interests, values, beliefs, and responsibilities as types of knowledge (Dickinson, 2004). All types of knowledge are to be translated or communicated from clinicians to experts involved in implementing research evidence in practice. Communication should be geared towards ensuring that both parties achieve a mutual understanding regarding their values, beliefs, and
responsibilities, as well as how the new knowledge will affect those intended to use it in practice (Dickinson).

**Summary.** Knowledge translation is a unique concept distinct from that of knowledge transfer. The focus of this study is on KT because KT is (a) representative of a shift in understanding from knowledge as a product to knowledge generation and use as social processes; (b) accepting of broad and clinically realistic definitions of evidence; (c) situated in and specific to the context of practice; and (d) focused on the process of facilitating the use of evidence in practice by clinicians, rather than the identification of evidence alone. Evidence-based practice is a desired outcome of KT. The concept of EBP (Rycroft-Malone et al., 2004a) is in accordance with that of KT (CIHR, 2009; Davis et al., 2003; Dickinson, 2004) because it includes a similarly broad definition of evidence that equates evidence to knowledge. Knowledge in EBP includes research evidence, clinical experience, patient experience, and information from the local context (Rycroft-Malone et al., 2002). Individuals’ needs, values, and beliefs are also considered types of knowledge in KT that should be communicated from clinicians to researchers during the KT process (Dickinson). The holistic nature of KT, and associated clinically relevant definitions of knowledge and EBP, provides guidance for developing interventions that may better facilitate and sustain the use of acute pain assessment and management evidence in practice.

**Interventions to Improve Pain Practices in Nursing**

The availability of acute pain assessment and management evidence, a health care climate characterized by a growing attentiveness to evidence-based pain practices, and the frequently suboptimal state of pain assessment and management in nursing have prompted the implementation of interventions to improve the quality of nurses’ pain practices. This
section includes a review of these interventions. Summaries of combined individual and organizational level studies are presented in Appendix A. Summaries of individual-level studies are not included because they are examples of knowledge transfer and are therefore not a focus of this study. For this review, the term ‘pain practices’ includes pain assessment and pharmacological, psychological, and physical techniques for pain management.

**Individual-level interventions.** Interventions to improve nurses’ pain practices have been largely built on the understanding that the frequently suboptimal state of pain practices is a knowledge deficiency problem. Consequently, continuing education programs (de Rond, de Wit, & van Dam, 2001; de Rond, de Wit, van Dam, & Muller, 2000; Francke, Garssen, & Abu-Saad, 1996; Franke, Luiken, de Schepper, Abu-Saad, & Grypdonck, 1997; Francke, Luiken, Garssen, Abu-Saad, & Grypdonck, 1996; Ger et al., 2004; Howell, Butler, Vincent, Watt-Watson, & Stearns, 2000; Innis, Bikaunieks, Petryshen, Zellermeyer, & Ciccarelli, 2007; King Michaels, Hubbart, Carroll, & Hudson-Barr, 2007; Knoblauch & Wilson, 1999; Krystal, Carr, Gavaghan, Porterfield, & Turner, 1997; Lin, Chiang, Chiang, & Chen, 2008; Twycross, 2002), some of which include the implementation of clinical guidelines (Devine et al., 1999; Joyce, Keck, & Gerkensmeyer, 1999; Richardson, 2001; Treadwell, Franck, & Vichinsky, 2002), have dominated efforts to improve nurses’ pain practices.

Despite the variable incorporation of interactive components (e.g., group discussion, practical exercises), continuing education interventions are consistent with supplier push models of knowledge transfer (Davies et al., 2003) and passive methods of dissemination. A review of systematic reviews assessing the effectiveness of such passive knowledge transfer interventions indicated that they have a negligible effect on clinician behavior change (Bero et al., 1998). A recent systematic review suggested that continuing education had a small
effect on professional practice and patient outcomes, with education that is partially or largely interactive being more effective than didactic education alone (Forsetlund et al., 2009); however, generalizing these findings to nursing is problematic, as the vast majority of the studies included physicians and physician-related outcomes (Forsetlund et al.; Thompson, Estabrooks, Scott-Findlay, Moore, & Wallin, 2007).

Overall, continuing education interventions in pain have had inconsistent effects on nurses’ practices and/or patient outcomes and their long-term effectiveness is unclear. In their review of 12 continuing education programs that varied in content, Francke, Garssen, and Abu-Saad (1996) found that results were generally mixed; although most studies (n = 11) showed some positive effects on nurse and/or patient outcomes. The reviewers concluded that the true effectiveness of continuing education on outcomes was indeterminable due to the small number of studies reviewed and their methodological limitations, including (a) the neglected use of a control group design (n = 9), (b) a lack of testing statistics (n = 8), and (c) no pre-test measurements (n = 3). Evaluation of sustained effects on outcomes was precluded, as the majority of researchers (n = 8) took post-test measurements immediately following or within mere days/weeks of program implementation (Francke et al.). Past continuing education literature suggests a high probability of learned behaviour diminishing over time (Fielding & Llewelyn, 1987; Oliver, 1984).

These conclusions are supported by a review by Twycross (2002) and findings from studies exceeding the timelines of or absent from either review (de Rond et al., 2001; de Rond et al., 2000; Devine et al., 1999; Franke et al, 1997; Francke et al., 1996; Ger et al., 2004; Howell et al., 2000; Innis et al., 2007; Joyce et al., 1999; King Michaels et al., 2007; Knoblauch & Wilson, 1999; Krystal et al., 1997; Lin et al., 2008; Richardson, 2001;
Treadwell et al., 2002). Similar methodological flaws were identified, including the use of a one-group pre-test-post-test design with a single pre-test measure and no description of or statistical control for possible confounding factors (de Rond et al., 2001; Ger et al.; Knoblauch & Wilson; Howell et al.; Innis et al.; Krystal et al.; Richardson). A notable conclusion made by Twycross was that education alone might be insufficient to change behaviour due to the influences of contextual factors on nursing practice. Similarly, reflecting on the lack of sustained changes three months following an educational intervention, Howell and colleagues suggested that organizational influences unsupportive of effective pain practices might contribute to the lack of sustained knowledge retention from education. This assertion is echoed in the continuing medical education literature, where the general inattention to contextual factors is suggested to limit their capacity to effect sustained behavior change (Davis et al., 1999).

Individual persuasion efforts have also been employed to improve nurses’ pain practices (Duncan & Pozehl, 2001; Johnston et al., 2007). Like education, individual persuasion is characterized as a type of knowledge transfer intervention (Davis et al., 2003). Results of the two available studies are mixed and the investigators implemented heterogeneous interventions, making any comparison difficult. Duncan and Pozehl found that providing nurses (n = 30) with individual paper-based feedback on their past performance of three recommended pain practices (i.e., regular pain assessments, reassessments after analgesia and follow-up taken for unacceptable pain) significantly improved their documentation of those practices in the 15 weeks post-intervention (p ≤ 0.0001-0.010). However, the use of a one-group pretest-post-test design with one pre-test measure and no description of or statistical control for possible confounding factors precludes conclusions
regarding the true effectiveness of this intervention. Also, overgeneralizations regarding the effectiveness of this intervention are inappropriate due to the small sample size.

Johnston and colleagues (2007) conducted a cluster randomized controlled trial (RCT) and implemented a relatively more interactive intervention, where pain experts engaged pediatric nurses from six pediatric hospitals in ‘think aloud’ sessions based on the chart of a child currently under the nurse’s care to increase their knowledge and readiness to change regarding pain assessment and management. Analgesic administration did not change significantly from pre-test to post-test in the experimental group, but significantly decreased \((p \leq 0.0001)\) in the control group. Nurses’ knowledge significantly increased \((p \leq 0.0001)\) post-intervention in the experimental compared to the control group, as did the rate of documented pain assessments and use of non-pharmacological interventions \((p \leq 0.0001)\). However, the researchers noted significant site differences at baseline and post-intervention that could not be attributed to the intervention. Possible confounding factors related to site (e.g., context, culture, leadership) were neither identified \textit{a priori} nor statistically controlled for in the data analysis. The researchers concluded that the context of practice influenced the effectiveness of the intervention and that institution/unit culture may be a relatively more important influencer of nurses’ pain practices than acquired knowledge (Johnston et al.).

**Combined individual and organizational level interventions.** Individual-level studies highlight the potentially important roles of organizational context and culture in influencing nurses’ practices (Davies et al., 1999; Johnston et al., 2007). Fifteen interventions to improve nurses’ pain practices were located that, in some manner and to varying degrees, addressed the context of practice (Bach, 1995; Carr, 2002; Comley & DeMeyer, 2001; Dufault, Bielecki, Collins, & Willey, 1995; Dufault & Willey-Lessne, 1999; Ellis et al.,
These interventions were characterized as combined individual and organizational level interventions because they had, albeit most often implicit, the dual purpose of building nurses’ knowledge and addressing context.

Context was addressed by (a) involving staff in determining the content of the intervention and/or supporting its implementation (Bach, 1995; Carr, 2002; Comley & DeMeyer, 2001; Dufault et al., 1995; Dufault et al., 1999; Ellis et al., 2007; Hansson et al., 2006; Howell et al., 1996; Neitzel et al., 1999; Paice et al., 2006; Seers et al., 2004; Simons & Macdonald, 2006; Tracy et al., 2006; Woodward, 2005), (b) attempting to comprehensively restructure pain policies and practices on the unit (Bach; Jordan-Marsh et al., 2004; Neitzel et al.), and/or (c) working to extend practice changes organization-wide (Ellis et al.; Dufault et al., 1995; Dufault et al., 1999; Jordan-Marsh et al.; Tracy et al.).

Interventions were challenging to compare due to their heterogeneity, including a Collaborative Research Utilization program (Dufault et al., 1995; Dufault et al., 1999; Tracy et al.), an educational intervention with supportive implementation (Howell et al.), quality improvement strategies (Carr; Comley & DeMeyer; Hansson et al; Woodward), comprehensive pain programs (Ellis et al.; Neitzel et al.), action research approaches to change (Jordan-Marsh et al.; Simons & MacDonald), a Pain Resource Nurse (PRN) program (Paice et al.), and multifaceted (Bach) and interactive (Seers et al.) guideline implementations.
All 15 studies indicated mixed to positive results on nurses’ pain practices or patient outcomes, except the interactive guideline implementation (Seers et al., 2004), which resulted in no statistically significant changes. Overall, however, researchers used inappropriate evaluative designs. Only Seers and colleagues used a RCT to evaluate the effectiveness of the intervention; however, results should be viewed with caution, as the nature of the intervention made it challenging to standardize the intervention and control for contaminating and confounding factors (Seers et al.). These limitations are consequent to applying a traditional RCT methodology to a complex intervention, where such interventions may require alternative study designs to evaluate their effectiveness; standardization of the intervention may prove challenging and the randomization of individuals may be inappropriate due to potential contamination (Eccles, Grimshaw, Campbell, & Ramsay, 2003; Seers, 2007; Seers et al.).

Three researchers used an untreated control group design with pre-test and post-test measures (Dufault et al., 1995; Dufault et al., 1999; Tracy et al., 2006) and three used a one-group pre-test-post-test design with only one pre-test measure (Bach, 1995; Comley & DeMeyer, 2001; Jordan-Marsh et al., 2004). Undetectable individual and organizational confounding variables threaten the validity of findings resulting from these study designs, making it difficult to attribute changes to the intervention. The one-group post-test only design used by Howell and colleagues (1996) and Simons and Macdonald (2006) was inadequate for making causal inferences regarding outcomes due to the lack of pre-test or comparative scores; however, this design was appropriate for the identified primary purpose of conducting a process evaluation stated by Howell and colleagues. The validity of conclusions was also limited by only about half of the researchers using inferential statistics.
to support claims around effectiveness (Dufault et al., 1995; Dufault et al., 1999; Ellis et al., 2007; Hansson et al., 2006; Neitzel et al., 1999; Seers et al.; Tracy et al.).

Evaluation in KT studies should include process (e.g., changes in awareness, knowledge or attitudes, research utilization), practice, and patient outcomes (Donaldson, Rutledge, and Ashley, 2004; Estabrooks, 1999a). Only two researchers evaluated outcomes at each of these levels (Neitzel et al., 1999; Paice et al., 2006), with Paice and colleagues providing sparse, vague data on the practice outcome and only descriptive statistics for the patient outcome. Two researchers focused on patient outcomes alone (Carr, 2002; Dufault et al., 1999), which was insufficient to determine that changes in patient outcomes were a result of practice changes. Of those studies in which patient pain outcomes were measured, two reported the use of standardized, reliable, and valid tools (e.g., Brief Pain Inventory [Dufault et al., 1999], Numerical Rating Scale [Seers et al., 2004]).

Despite the implicit intent of all researchers to implement pain evidence in practice, only eight explicitly referenced this purpose (Bach, 1995; Dufault et al., 1995; Dufault et al., 1999; Ellis et al., 2007; Howell et al., 1996; Neitzel et al., 1999; Seers et al., 2004; Simons & Macdonald, 2006). Inattention to the true objective of implementing evidence in practice suggests that some investigators neglected to seriously consider the complexity of KT. Theory pertaining to evidence implementation was used for guidance in approximately half of the studies (Bach; Dufault et al., 1995; Dufault et al., 1999; Ellis et al.; Howell et al.; Jordan-Marsh et al., 2004; Neitzel et al.; Tracy et al., 2006), with the majority applying Roger’s Diffusion of Innovations theory and related adoption of innovations literature (Bach; Dufault et al., 1995; Dufault et al., 1999; Howell et al.; Neitzel et al., Tracy et al.). Application of Rogers’ framework requires research evidence to be conceptualized as a
product analogous to an innovation. Although this adaptation is plausible, conceptualizing evidence use as a process (as in KT) is less likely within the confines of this theory (Estabrooks et al., 2004). Moreover, whereas KT theory focuses on the role of the organization and the social elements of facilitating change, the Diffusion of Innovations theory is largely focused on the individual adoption of innovations.

Lastly, although the interventions were designed to be contextually relevant, none of the researchers gave a priori consideration to the effects of existing organizational factors on outcomes. Contextual factors were neither described nor statistically controlled in the reviewed studies. Insufficient consideration of the influence of context and culture on intervention effects may be a consequence of the neglected use of KT theory to comprehensively frame interventions. Culture cannot be untangled from the physical and social contexts that define an organization (Davies, Nutley & Mannion, 2000; Scott-Findlay & Golden-Biddle, 2005). Because the culture of a hospital unit is unique and impervious to control or constancy across units, units may respond differently to an intervention, resulting in spurious conclusions about its effectiveness. Describing the context in which a KT intervention has been implemented is necessary to enhance the generalizability and clinical utility of study results to other clinical settings (Eccles et al., 2005).

Summary. The majority of interventions to improve nurses’ pain practices can be classified as methods of knowledge transfer, rather than KT: the primary focus has been on knowledge building with general inattention to the context of practice and the process by which evidence is facilitated into clinical practice. Application of the concept of knowledge transfer by researchers has resulted in interventions targeted at individual factors, with notable neglect of organizational factors. Interventions that target the individual level alone
appear to have variable effects, at best, on implementing and sustaining evidence-based pain practices in nursing. The contention of knowledge transfer models that research is the key to promoting knowledge use in clinical practice is flawed because it ignores the many contexts (e.g. clinical, social, and organizational) that affect individual behaviour change and knowledge use (Lomas, 2004).

Translating pain evidence into practice requires attention to both individual and contextual determinants of evidence use (Grimshaw, Eccles, & Tetroe, 2004; Scott-Findlay & Estabrooks, 2006a); however, few interventions have had this dual focus. Those reviewed lack a comprehensive framing in KT theory and, in general, the determination of their true effectiveness is precluded by the heterogeneity of interventions and varying degrees of methodological inadequacies of the studies. Also, with one exception (i.e., Seers et al., 2004), none of the researchers fully engaged nurses in identifying the desired area of change or adopted an organizational perspective to facilitate and sustain change.

Future interventions to implement pain evidence in clinical practice require theoretical and methodological alterations to enhance their quality and clinical utility. KT interventions need to be grounded in theory and include articulation of the context in which results are applicable (Eccles et al., 2005). Emerging literature also highlights the imperative to conceptualize KT in health care as organizational change (Reay et al., 2002). A paucity of KT interventions implemented in the clinical setting have accounted for nurses working in organizations and the critical role organizational factors play in change initiatives (Reay et al.). Designing organizational interventions that support practice change may be more efficacious at changing clinicians’ practices than attempting to alter individual behavior (Johnston et al., 2007; Reay et al.; Solberg, 2000). Knowledge translation interventions
should also engage the relevant people, be attractive to participants, and address the main difficulties for achieving change in the area of interest (Grol & Grimshaw, 2003). Action research approaches that involve a committed group of nurses are recommended for future studies to implement pain evidence in nursing (Seers et al., 2004). Lastly, outcomes measurement should include process, practice, and patient outcomes (Donaldson et al., 2004; Estabrooks, 1999a), which should be monitored continuously and at regular intervals (Grol & Grimshaw). The recognized complexity of KT coupled with a developing understanding of its practice in health care supports the conduct of exploratory studies to select and refine future KT interventions for use in the clinical setting (Eccles et al.).

**Appreciative Inquiry**

There are currently no intervention studies to implement pain evidence in nursing that have comprehensively addressed recommendations for KT in health care (i.e., grounding in theory, description of the context, conceptualization of KT as organizational change, involvement of relevant people, attractiveness to participants, and selection of comprehensive outcome measures that are monitored continuously and at regular intervals). Appreciative Inquiry is a promising intervention in accordance with KT theory (Kavangh et al., 2008). Rooted in action research, AI is an interactive, organizational change intervention that engages those working in a specific context and is flexibly responsive to their needs. Objectives of the AI process are to discover, understand, and foster innovations in organizational processes and practices (Coghlan, Preskill, & Tazavaras Catsambas, 2003; Cooperrider et al., 2005). A key assumption of AI is that every organization has something that works well and strengths are the starting point for creating positive change. The focus of AI on identifying and developing the ‘best of what is’ in organizations to create a better
future contrasts traditional problem-oriented approaches to change that can limit inquiry, damage participant morale, and breed apathy and resistance to change (Fitzgerald, Murrell, & Miller, 2003; Coghlan et al.). The conscious choice to study the best of an organization is premised on a fundamental tenant of AI that human systems or organizations move towards what they study; that is, a positive focus may more likely result in positive action (Cooperrider et al.).

**History of AI.** AI emanated from David Cooperrider’s doctoral work on physician leadership in 1980 (Coghlan et al., 2003). Gathering data on the successes and failures of physician leaders, Cooperrider focused on the data describing physician leadership and the organization when they were operating most effectively. With the guidance of his advisor, Srivastva, the method of deliberatively appreciating successes and considering possibilities for the future of an organization was developed and coined ‘Appreciative Inquiry’ and conceptualized as a new method to facilitate organizational change. Over the past two decades, the theory and practice of AI have evolved into a comprehensive intervention framework that has been applied in diverse international settings (Cooperrider et al., 2005; Coghlan et al.).

**Principles and theory of AI.** AI is both a philosophy and method of change developed to explore the capacities and processes that give life and possibility to human systems or organizations (Cooperrider et al., 2005). AI is a philosophy of change because, beyond a method or technique, it is a way of living with, being with, and directly participating in the core of the social organization being studied (Cooperrider & Srivastva, 1987). The twofold purpose of AI is to generate theoretical knowledge (or ideas) within social systems and use knowledge to promote dialogue that leads to congruence between the
values of group members and their practices. The creation of collective action and vision are of vital importance to facilitating the evolution of group behaviour (Cooperrider & Srivastva).

Although rooted in action research, AI is positioned as a distinct method of inquiry by having a greater focus on the generation of new knowledge (or ideas) rather than action (Cooperrider & Srivastva, 1987). Ideas are assumed to be the most powerful vehicles to affect change in social systems. As such, AI is considered superior to action research in terms of its capacity to inspire organizational transformation and re-order social conduct. Additionally, AI contrasts the traditional problem-oriented perspective of action research (and typical organizational change initiatives) by operating on the metaphysical principle that social existence is a miracle that can never be fully comprehended (Cooperrider & Srivastva). A fundamental notion of AI is that a focus on successes and achievements within human systems will result in successful and sustained change efforts (Coghlan et al., 2003).

The paradigm underlying AI is sociorationalism, where social order is considered fundamentally unstable and all patterns of social action are amenable to change (Cooperrider & Srivastva, 1987). Within this paradigm, AI is premised on the social constructionist notion that social reality is a product of shared meanings within a social system. Alterations in conceptual practices are thought to hold tremendous potential for guiding changes in social order. Science is seen as a tool to shape meaning and practices within organizations (Cooperrider & Srivastva).

The focus of AI is on creating internally generated knowledge (Bushe & Kassam, 2005). Knowledge is viewed as a social construction that is co-produced by members of a social system and is dependent on the values and beliefs of that system. The locus of
knowledge is the relationship between individuals, as opposed to the isolated individual (Cooperrider & Srivastva, 1987). The social constructionist paradigm contrasts the traditional science view of knowledge, as it attributes no value to knowledge in and of itself. Rather, knowledge gains value only through its interpretation by potential users (Denis, Lehoux, & Champagne, 2004). The theory of social constructionism underlies the five core principles of AI (Cooperrider & Srivastva; Cooperrider et al., 2005), including:

(a) The Constructivist Principle: what is known about an organization is inseparable from the future of that organization; the future of the organization is conceived from the questions asked and leaders and facilitators are charged with understanding the organization.

(b) The Principle of Simultaneity: inquiry is one and the same as intervention; change stems from the questions asked, making the nature of inquiry critically important.

(c) The Poetic Principle: organizations are like open-books, whose stories are constantly being co-authored; consequently, members of an organization can choose which part of the story to study, including problems, needs, or successes.

(d) The Anticipatory Principle: the image of the future guides the current behaviour of individuals and organizations; consequently, collective imagination and discussion about the future generate constructive organizational change.

(e) The Positive Principle: momentum for change requires positive affect, social interaction, and inspiration; organizations, as human constructions, are largely affirmative systems that respond to positive thought and knowledge with positive action.

**Practice and process of AI.** The dynamics and process of AI are captured in the 4-D Cycle, which includes four phases: Discovery (positive elements of practice are illuminated), Dream (an ideal practice environment is envisioned), Design (processes are created that
support the ideal) and Destiny (strategies are implemented that strive for the ideal) (Cooperrider et al., 2005) (Appendix B). Within the 4-D Cycle, a strictly standardized method of AI has not been constructed because the process is intended to be flexibly responsive to the differing aims and needs of organizations (Bushe, 1995). At the core of the 4-D Cycle is the Affirmative Topic Choice, which provides a positive focus for inquiry (Cooperrider et al.). The Affirmative Topic Choice is the most important element of the AI process because the first questions of inquiry are considered determinative of the direction of change and future of the organization. Knowledge, and the way individuals know, is fateful, making symbols and language paramount resources in the change process. The practice and process of AI are founded on four guiding propositions (Cooperrider & Srivastva, 1987; Cooperrider et al.), including:

(a) Inquiry should begin with appreciation: every social system has positive elements and the primary task of research is to discover, describe, and explain those social innovations, however small, which activate members’ competencies and heighten the potential of an organization and the transformation of social realities. Valuing, learning, and inspired understanding are the aims of an appreciative spirit.

(b) Inquiry should be applicable: science should lead to the generation of theoretical knowledge that can be used, applied, and subsequently validated in action to have human significance. As such, inquiry should not be confined to academia or presented in ways with little relevance to the everyday language and symbolism to those for whom the findings might be applicable.

(c) Inquiry should be provocative: an organization is an indeterminate system capable of positive change and learning how to actively guide its own evolution. Appreciative
knowledge of ‘what is’ is provocative because the learning inspires members to action. AI enables systematic research to be used to help the members of an organization shape the social world according to their own imaginative and moral purposes.

(d) Inquiry should be collaborative: the process of inquiry and its content are inseparable. Unilaterally introducing something new into a social world is a direct negation of the phenomenon itself. Based on epistemological and practical/ethical grounds, a collaborative relationship between members of the research team and organization is essential.

**Evidence of effectiveness of AI.** In this section, evidence regarding the effectiveness of AI in the business, health care, and KT literature is discussed.

*AI in business.* AI is identified as an effective organizational change intervention in the business field; however, there is limited rigorous empirical evidence to support this claim. Descriptions of the capacity of AI to promote practice change in organizations have been predominantly presented in the form of case studies. A meta-case analysis of 20 cases was conducted by Bushe and Kassam (2005) to determine if (a) AI interventions were in accordance with AI theory, principles, and the 4-D Cycle; (b) stories collected during the AI interventions were based on an affirmative topic; (c) improvisational (i.e., collaborative and supportive) or implementation (i.e., top-down and directive) strategies were used by facilitators to change organizational processes; (d) important issues emerged from the AI interventions that had the possibility to change the groups’ ways of thinking and acting; (e) transformational change (i.e., alteration in ‘how people thought’, in addition to ‘what people do’) resulted from the AI interventions; and (f) new knowledge, rather than new processes alone, were generated through the AI interventions. The reviewers did not assess the
methodological quality of the case studies because they were designed and presented as business cases, not as research studies. Results may therefore have been biased as those writing the cases were also consultants to the organizations (Bushe & Kassam).

Consultants from all 20 cases reported successful results following the implementation of AI as an intervention to affect change in social systems (Bushe & Kassam, 2005). All cases, with one exception, were in accordance with the principles and practice of AI. Consultants from eight cases indicated that important issues were raised during the AI interventions, which had possibilities for changing group members’ ways of thinking and acting. There was evidence in seven cases that consultants focused on supporting, rather than directing, group members to implement change. Only seven cases indicated the creation of new knowledge or achievement of transformational change; however, the remaining cases indicated that new social processes had been generated through the AI interventions. Those cases that exhibited the presence of transformational outcomes were wholly aligned with AI theory, principles, and practice, rather than with more conventional organizational change or action research practices. The reviewers clarified, however, that not all applications of AI are meant to be transformational and that it is appropriate to use AI to implement new processes alone. Supportive, rather than directive, implementation of action plans, as well as the creation of new assumptions and meanings as a basis for action appear important to effecting transformational change (Bushe & Kassam).

Two cluster RCTs from the business literature examined the impact of AI on effecting practice change in social systems. Summaries of the studies are in Appendix C. Jones (1998) randomly assigned restaurants to three experimental groups and examined the effect of AI on enhancing restaurant management retention levels. Findings were favorable
with the AI intervention group (n = 33) demonstrating 30% to 32% higher retention rates than the control (n = 29) and ‘problem-solving’ (n = 32) groups, respectively. Moreover, members of the AI group indicated that they were less inclined to leave the organization than those from either the control or problem-solving groups. However, the validity of study conclusions is precluded by methodological flaws, such as a lack of description of the statistical techniques used to support data analysis and no indications of the methods of randomization or sample size calculations.

Bushe and Coetzer (1995) evaluated the effects of an AI team-development intervention compared with a task-oriented intervention and a didactic lecture on group processes (i.e., participation, cohesion, and decision-making) and outcomes (i.e., member satisfaction and task performance). Eight teams, each consisting of four organizational development students, formed the three experimental groups. Group processes were evaluated at two weeks post-intervention and group outcomes were measured at three months post-intervention. Both AI and the task-oriented intervention produced statistically significantly higher scores on all outcome measures compared to the control group (p ≤ 0.01 – p ≤ 0.05). The task-oriented intervention group also scored significantly higher than the AI group on task performance (p ≤ 0.05). AI was deemed an effective team-development intervention and, although the task-oriented intervention appeared more appropriate for simple task performance (at least in the short-term), AI was considered superior at generating positive group dynamics and enabling collective action. The researchers also noted that the more structured nature of the task-oriented intervention compared to that of the AI intervention could have been more favorable to group members because they were unfamiliar with each other and engaged in a short-term working relationship; AI may hold greater
applicability as a change strategy in groups that are established and longer-term in nature (Bushe & Coetzer). However, results should be viewed with caution, as there was no indication of the methods of randomization or sample size calculations.

**AI in health care.** Change efforts using AI have recently emerged within health care research. However, the majority of the studies have had an administrative focus, addressing leadership (Keefe & Pesut, 2004; Newman & Fitzgerald, 2001), departmental governance (Moody, Horton-Deutsch, & Pesut, 2007), program implementation/service delivery (Baker & Wright, 2006; Farrell, Douglas, & Siltanen, 2003; Reed & Turner, 2005), organizational values/philosophies of care (Lavender & Chapple, 2004), performance competencies (George, Farrell, & Brukwitzki, 2002; Mitchell, 2001), retention (Challis, 2009), and staff/team development (Carter et al., 2007; Wright & Baker, 2005). AI was used to develop clinical practices in nursing in two studies (Reed, Pearson, Douglas, Windburne, & Wilding, 2002; Shendell-Falik et al., 2007) (Appendix D). Reed and colleagues involved nurses, physicians, and lay people to develop practices surrounding hospital discharge for older persons, while Shendell-Falik and colleagues involved a senior leadership team and staff nurses to improve the patient-handover process from an emergency department to an inpatient telemetry unit.

The majority of the AI studies conducted in health care have used exploratory or descriptive designs. AI has been predominantly used as a guide for qualitative interviews, rather than as an intervention associated with measurable outcomes. Most studies in health care (and business [Golembiewski, 1998]) have been focused on the first three phases of AI (i.e., Discovery, Dream, and Design) with neglected examination of the Destiny phase. Results are therefore limited to descriptions of the themes generated by participants during
the AI process. Exceptions are limited to studies conducted by Shendell-Falik and colleagues (2007) and Wright and Baker (2005) (Appendix D). Shendell-Falik and colleagues developed five strategies through the AI process to improve patient-handover from an emergency department, including a welcome script to communicate transfer information, database for patient safety assessments, standardized transfer report, low-risk cardiac transport protocol, and program to foster relationships between nurses in emergency and telemetry departments. Patient satisfaction, nurse satisfaction and teamwork, nutritional and skin assessment, compliance with cardiac enzyme regime and medication administration record, and percent of telemetry patients transported without a cardiac monitor were measured pre and post-implementation. The length of the AI intervention and timing of post-test measures relative to the implementation of the action plan were not reported. Although there were small to moderate descriptive improvements in all outcomes post-implementation, the validity of conclusions is precluded by the use of a one-group pre-test post-test design with only one pre-test measure and no description of or control for confounding factors, no identification of outcome measures, and the absence of inferential statistical analysis.

Wright and Baker (2005) studied the effects and acceptability of AI on staff development in health care. Quantitative data were collected from an existing database on recruitment, resignation, vacancy information, and sickness absence rates for the AI ward and two control wards. Data collection occurred 25 months before and eight months following the implementation of the AI process. Vacancy rates significantly decreased ($p \leq 0.05$) on both the AI ward and one control ward post-intervention. Sickness absence rates significantly decreased ($p \leq 0.05$) on the AI ward during the intervention, although they rose again to previous levels upon its completion. Although statistically non-significant, there was
a trend towards increased resignation rates in the two control wards compared to the AI ward. Results should be viewed with caution, however, as internal validity was compromised by a lack of description of or statistical control for possible contaminating or confounding factors.

**AI in KT.** No empirical studies were located that used AI as a KT intervention, but two relevant theoretical papers were found (Kavanagh et al., 2008; Marchionni & Richer, 2007). Kavanagh and colleagues advanced an argument for the congruence between AI and KT theory, provided a practical example of its application in pain, and discussed its strengths and limitations as a potential KT intervention in pain. Marchionni and Richer proposed the use of AI to promote EBP in nursing and the potential role of the advanced practice nurse in leading and supporting the intervention. One theoretical paper was found that examined the use of AI for designing and applying knowledge management systems in health care (Avital, 2004). Knowledge translation is a subset of knowledge management, where knowledge management refers to the processes that deal with the creation, dissemination, and use of knowledge (Avital). Avital argued that, despite the discrepancy between their root disciplines and the orientation of their intentions, knowledge management and AI are intertwined and mutually reinforcing: AI is a method to motivate organization-wide adoption of knowledge management systems and provides language-based mechanisms to facilitate effective knowledge exchange.

**AI as a KT intervention.** Together, the theory and practice of AI have several elements characteristic of KT, including (a) an understanding of knowledge generation as a social process; (b) the valuing of and capacity to access multiple forms of evidence, including knowledge from clinical experience, patient experience, the local context, as well as the values, needs, and responsibilities of clinicians; (c) situation in and specificity to the
context of practice; and (d) a focus on the process of facilitating the use of evidence in practice. Moreover, AI is an intervention designed to engage the relevant people in the change process (e.g., nurses) and may be an attractive and pragmatic method of change due to its positive focus.

Using AI as a KT intervention is contingent on modifying the AI process to include the provision of acute pain assessment and management research evidence to participants. Although this contingency might initially appear to contradict the focus of AI on creating internally generated knowledge (rather than on implementing externally validated knowledge), closer consideration suggests differently (Kavanagh et al., 2008). Namely, AI is a change method that provides the capacity to interface with the ‘soft-periphery’ of research evidence (Kavanagh et al.). Innovations are considered to have a ‘hard-core’ that is fixed and unamenable to manipulations and a ‘soft-periphery’ that is flexible to manipulation by the adopting system (Denis et al., 2002). The soft-periphery refers to the ways that evidence can be implemented (Denis et al.). For example, the soft-periphery of pain evidence could include organizational arrangements to facilitate its use on a unit and defining when and how to apply the evidence in practice, as well as which particular elements of the evidence would be implemented (Kavangh et al.). The emphasis placed on creating applicable knowledge that is contextually relevant to a social system in AI opens possibilities for attention to the soft-periphery of acute pain assessment and management research evidence. Discussions related to the ‘soft-periphery’ may confer meaning to an innovation and render feasible practices that initially appeared destined for failure (Denis et al.). Contextualization of evidence has great value for implementing evidence-based acute pain practices in nursing; pain assessment and management research evidence has been typically construed as user-friendly and applicable
across settings with little attention paid to the need to contextualize research to particular clinical settings. Ultimately, facilitating the modification of research by attending to its soft-periphery may lead to the production of ‘situated knowledges’ (Lave & Wenger, 1991). Producing ‘situated knowledges’ is likely important to KT because purposeful action is promoted by rendering remote evidence more contextually relevant to users (Lave & Wenger). Clinicians do not simply apply abstract, disembodied research evidence; they actively interpret and re-construct its local validity and usefulness (Wood, Ferlie, & Fitzgerald, 1998).

Implementing AI as a KT intervention to facilitate the use of acute pain assessment and management evidence in nursing practice implies that the impetus for the intervention is problem-based: evidence-based acute pain practices in nursing need to be strengthened. It has been suggested that the creative energy associated with AI may not be realized when the process is applied through a problem-solving modality and that structural tensions may result from introducing AI in the context of problem-resolution (Newman & Fitzgerald, 2001). However, it can be argued that there is an important distinction between a problem-based catalyst for an AI intervention and the problem-based delivery of an AI intervention (Kavanagh et al., 2008). Problems and issues have consistently fuelled the implementation of AI interventions in both the business and health care literature. Moreover, the Poetic Principle of AI states that members of an organization can choose which aspects of their organizational life they would like to study, inclusive of problems and issues (Cooperrider & Srivastva, 1987; Cooperrider et al., 2005). The critical feature of AI practice appears to be how the issues of interest are framed. Because language is considered fundamental to shaping reality, the delivery of an AI intervention requires the abandonment of a “deficit-based
vocabulary” (Cooperrider et al., p. 17), which may inhibit positive change. Terms such as ‘suboptimal’, which have been used in the literature and this study to describe the frequent state of acute pain practices in nursing, should therefore be avoided during the delivery of an AI intervention. Instead, “affirmative vocabulary” (Cooperrider et al., p. 17) should be adopted by the facilitators and promoted in the group (e.g., a focus on ‘enhancing practices’). This vocabulary includes a language of positive valuing, hope towards the future, skill/competency, learning, cooperation, curiosity, action towards positive outcomes, envisioned ideas, and efforts to reframe negative emotions or actions in more positive terms.

Limitations of AI as a KT intervention. Several issues have been identified in the health care literature regarding the use of AI as a change strategy. First, without prior thinking, participants can find responding to AI questions difficult due to the atypical experience of focusing on the positive (Reed & Turner, 2005). In the current study, participants were given questions related to the main AI activities prior to the intervention to facilitate their comfort with the content. Second, participation by group members may fluctuate throughout the intervention and decrease as it progresses due to competing organizational demands and changing priorities (Reed et al., 2002). In the present study, AI sessions were held outside of staff nurses’ scheduled shifts to minimize the likelihood of competing clinical demands. Also, incentives were offered to promote nurses’ continued participation, such as an honorarium, refreshments, and a certificate affirming their participation in a research initiative. Third, some outcomes of an AI intervention may be difficult to measure due to their subtlety and ongoing nature (i.e., improved group dynamics) (Reed et al.). The intervention in the current study was designed with the purpose of transforming acute pain practices in nursing to be evidence-based and therefore the outcomes
of interest were well defined (e.g., nurses’ evidence-based acute pain practices). Although the potentially ongoing nature of changes resulting from the intervention was recognized, only those changes occurring over a discrete time period (i.e., six months) were critical due to the exploratory nature of this study. Fourth, some propositions generated by participants may not be amenable to the development of action plans (Reed et al.). The facilitators of the AI intervention in the present study guided participants to create realistic propositions and select an action item that was deemed feasible to implement by the group in their particular context. Lastly, the capacity of the group to affect change is mediated by the roles and power held by members in their organization (Reed et al.). For this reason, administrative and clinical leaders with influence over local practices were included as participants in the AI intervention in the current study.

Summary. The complexity of interactions between clinicians and the context of practice means that there are no ‘magic bullets’ for translating evidence into practice (Dopson, Fitzgerald, Ferlie, Gabbay, & Locock, 2002). AI is a promising theory-based KT intervention that addresses context by approaching the implementation of evidence in practice as organizational change. Moreover, through its roots in action research, AI engages participants in the development of context-specific KT strategies. Applying AI as a KT intervention initiates a shift from the assumption that the underlying problem of suboptimal acute pain practices in the clinical setting is a lack of knowledge. Rather, by engaging the end-users of research evidence in the change process, AI challenges the guiding assumptions of the prevailing culture to develop novel and contextually relevant practice strategies at the organizational level (Mantel & Ludema, 2000). Through attention to the social system in
which change is to be implemented, AI has the potential to create positive cultures capable of sustaining practice change (Bushe, 1995).

Despite the success of AI as an organizational change strategy and its growing application in health care research, it has neither been examined as a KT intervention nor directly applied to clinical issues, such as pain, in inpatient clinical settings. Given the significant promise of AI as a KT intervention and the recommendation that exploratory studies be conducted to choose and refine such interventions (Eccles et al., 2005), there is a need to explore the implementation process and beginning effects of AI as KT intervention for enhancing evidence-based acute pain practices in the pediatric clinical setting.
Chapter Three: Conceptual Framework

This chapter includes a description of the conceptual framing of the AI intervention (Appendix E). First, the Promoting Action on Research in Health Services (PARiHS) framework (Kitson et al., 1998; Kitson et al., 2008; Rycroft-Malone, 2004) is reviewed. Second, the evaluation framework for the AI intervention is discussed, which includes expected outcomes, as well as individual and organizational extraneous factors considered influential to the implementation and effects of the intervention (Sidani & Braden, 1998). The evaluation framework is based on the PARiHS framework and, where applicable, complementary KT theory.

The PARiHS Framework

The process of implementing evidence in practice has traditionally been conceptualized as linear and logical and, in general, over-simplified. The PARiHS framework (Kitson et al., 1998; Kitson et al., 2008; Rycroft-Malone, 2004) provides an alternative conceptualization that acknowledges the complexity of implementing evidence in practice and adopts an organizational perspective to the implementation process. Research teams within the Royal College of Nursing Institute (United Kingdom) inductively conceived this framework through practice development and quality improvement initiatives (Kitson et al., 1998; Rycroft-Malone). Theoretical and retrospective analysis of four case studies in which evidence was implemented in practice resulted in the original articulation of the elements of the framework (Kitson et al., 1998). The purpose of the PARiHS framework is to guide the design of change and development strategies to implement evidence in practice (Kitson et al., 1998; Kitson et al., 2008; Rycroft-Malone). In this study, the framework was applied to guide the selection and evaluation of the AI intervention.
The PARiHS framework outlines elements that enable the successful implementation of evidence in practice. The underlying assumption is that successful implementation of EBP is a function of the interplay of three core elements: the nature of the evidence, the context into which the evidence is to be implemented, and the method through which the process is facilitated. Each element of the PARiHS framework is attributed equal importance in the successful implementation of evidence in practice; however, because evidence production and use are social processes and organizational change requires key drivers, facilitation is considered a key element of the framework (Kitson et al., 1998, Rycroft-Malone et al., 2002). Subsets of each of the three core elements exist on a continuum ranging from ‘high’ to ‘low’. Each factor subset optimally ranks on the high end of the continuum for the successful implementation of EBP.

Evidence. Evidence is equated to knowledge in the PARiHS framework. As opposed to evidence, the term knowledge reflects the many sources that clinicians rely on to make decisions (Rycroft-Malone et al., 2004a). Evidence in EBP is defined as “knowledge derived from a variety of sources that has been subjected to testing and has been found to be credible” (Higgs & Jones, 2000, p. 311). The PARiHS framework incorporates four sources of evidence: research, clinical experience, patient experience, and local contextual information (Rycroft-Malone, 2004). Little is known about how these types of evidence are integrated in the clinical setting or the manner in which knowledge from clinical experience, patients, and the local context can be articulated and developed through critique (Rycroft-Malone).

Research evidence includes both qualitative and quantitative research, with the critical element of ‘high’ research evidence being that the research is well conceived,
designed, and conducted (Rycroft-Malone et al., 2002). Research evidence is recognized as socially constructed and dynamic (Rycroft-Malone et al., 2004a). Although research evidence is viewed as critical to improving patient care, it is not considered the sole informant of clinicians’ practices (Rycroft-Malone et al., 2004a; Thompson et al., 2001). Knowledge from clinical experience is essential to integrating other forms of evidence in practice. Clinicians draw on both their own and their colleagues’ experience in practice and this knowledge is often tacit and intuitive (Rycroft-Malone et al., 2004a). To attain high ranking on the evidence continuum, clinical experience must be made explicit and subject to critique and development (Rycroft-Malone et al., 2004a). Knowledge from patients consists of their previous experiences of care and knowledge of themselves, their bodies, and their social lives. These sources of patient knowledge should inform EBP, but melding patient experiences with other sources of evidence is complex and requires expertise (Rycroft-Malone et al., 2004a). Lastly, knowledge from the local context is information that is systematically and locally obtained. This type of evidence may include audit/performance data, patient stories, and information about the organizational culture, social/professional networks, and local/national policy (Rycroft-Malone et al., 2004a).

**Context.** The context of health care is infinite because it takes place in an array of settings, communities, and cultures that are all influenced by economic, social, historical, and psychosocial factors (McCormack et al., 2002). In the PARiHS framework, context is the environment or setting in which the proposed change is to be implemented (McCormack et al.; Rycroft-Malone, 2004). Context is dynamic and complex (McCormack et al.) and implies an understanding of the forces at work that give the physical environment its particular character and atmosphere (Kitson et al., 1998). Characteristics of context that promote the
successful implementation of evidence in practice include organizational culture, leadership, and evaluation.

Culture is considered a critical factor to facilitating clinical effectiveness, practice development, and successful outcome achievement (McCormack et al., 2002). The PARiHS framework includes preexisting definitions and understandings of culture. Culture is defined as “the way things are done around here” (Drennan, 1992). Moreover, culture is not something an organization has, but something an organization is (Bate, 1994). Cultures manifest themselves through the values, beliefs, and assumptions embedded in organizations (Bate). Within any given context, there may be multiple cultures, each with its own distinct set of values, beliefs, and assumptions (McCormack et al.). Organizations with a culture of learning are regarded as more conducive to implementing evidence in practice (Rycroft-Malone, 2004). Learning cultures attend to individuals, group processes, and organizational systems and are characterized by decentralized decision-making and a management style that is facilitative rather than directive. Within the PARiHS framework, it is necessary to understand the culture of a workplace before practice change can be effected and sustained. Moreover, researchers intending to effect cultural change should view the staff resource as central to the process (McCormack et al.).

Leadership summarizes the nature of human relationships in an organization (Kitson et al., 1998). Effective leadership leads to clear roles, as well as effective teamwork and organizational structures (McCormack et al., 2002). The benefits of transformational leadership are emphasized, where transformational leaders have the ability to transform cultures and create contexts more conducive to the integration of evidence in practice (Rycroft-Malone, 2004). Transformational leaders create a culture where all group members
are leaders (McCormack et al.) and inspire staff to have a shared vision through stimulating, challenging, and enabling them (Rycroft-Malone).

Finally, evaluation generates evidence on which to base practice and is part of a feedback process that demonstrates whether or not changes to practices are appropriate, effective, and/or efficient (Rycroft-Malone, 2004). Methods of evaluation should be varied to reflect organizational complexity and the individuals working within them (McCormack et al., 2002). Contexts that rely on multiple sources of evidence of effectiveness, including tangible outcomes, tend to be more receptive to change (Rycroft-Malone).

Facilitation. Facilitation is the process of enabling the implementation of evidence in practice (Harvey et al., 2002; Rycroft-Malone, 2004). Because research production and use are social processes, passively handing research evidence to clinicians is unlikely to promote its application in practice (Rycroft-Malone et al., 2002). Facilitators have key roles in assisting individuals and teams to identify areas that necessitate change, as well as methods to successfully affect change (Kitson et al., 1998; Kitson et al., 2008). Characteristics of effective facilitation are a clear understanding of purpose, and appropriate facilitator roles, skills, and attributes (Harvey et al.). Successful facilitation results from matching the purpose of facilitation and the roles, skills, and attributes of the facilitator(s) to the particular needs of the situation (Rycroft-Malone et al.).

Rycroft-Malone and colleagues (2002) distinguish between task-oriented and enabling facilitation. The purpose of task-oriented facilitation is to support others to achieve a concrete task, while enabling facilitation aims to guide others to change their attitudes and behaviors. These purposes are not mutually exclusive and are best represented as extreme points on the facilitation continuum (Harvey et al., 2002). Depending on the purpose of
facilitation, the role of the facilitator(s) can range from a focus on doing for others (i.e., task-based) to enabling others. Task-based facilitation aims to achieve specific, concrete goals, while enabling facilitation involves the development of both individuals and group processes (Harvey et al.). External agents with episodic contact, low intensity roles, and didactic teaching styles typify facilitation bent on doing for others (Rycroft-Malone et al.). Conversely, enabling facilitation involves internal or external agents in high intensity roles, employing interactive learning strategies (Rycroft-Malone et al.). The skills of the facilitator necessarily flow from the role of the facilitator. A task-oriented facilitator who does for others is marked by technical/clinical credibility and expertise. In contrast, an enabling facilitator is skilled at coaching individuals and groups, promoting critical reflection, and giving meaning to the implemented change (Rycroft-Malone et al.).

**Empirical Support for the PARiHS Framework**

Over the past eight years, the PARiHS framework has been subject to ongoing theoretical development (Kitson et al., 1998; Kitson et al., 2008; Rycroft-Malone et al., 2002, Rycroft-Malone, 2004). Concept analyses have been conducted for each element of the framework (i.e., evidence [Rycroft-Malone et al., 2004a], context [McCormack et al., 2002], and facilitation [Harvey et al., 2002]); however, few studies exist where the appropriateness, comprehensiveness, and/or utility of the framework are examined. An exploratory study was conducted to empirically scrutinize the content of the framework (Rycroft-Malone et al., 2004b). The examination of two cases where clinicians implemented evidence in practice validated the relevance of the elements of the framework to the implementation process. Interprofessional collaboration emerged as a new and important element influential to the success of change initiatives (Rycroft-Malone et al., 2004b).
The PARiHS framework has been used to structure reviews and conceptual discussions around enabling EBP (Brown & McCormack, 2005; Meijers et al., 2006; Milner, Estabrooks, & Myrisk, 2006), develop a measure of organizational context in health care settings (Estabrooks, Squires, Cummings, Birdsell, & Norton, 2009), and validate a measure of research utilization in nursing (Wallin, Estabrooks, Midodzi, & Cummings, 2006). It has also been applied in empirical research as a post-hoc evaluation tool for interventions designed to implement evidence in clinical practice (Ellis, Howard, Larson, & Robertson, 2005; Sharp, Pineros, Hsu, Starks, & Sales, 2004; Stetler et al., 2006) and used a priori to structure qualitative interviews regarding the experience of implementing EBP (Wallin, Rudberg, & Gunningberg, 2005). One study was located that used the framework as the underlying change model in a program evaluation aimed at developing and improving clinical services (Owen & Milburn, 2001). The objective of the program was to develop and improve services for women with serious and enduring mental health problems. The PARiHS framework was used in a broad manner to plan and implement the program, but was not applied to evaluate its effectiveness.

The robustness of the PARiHS framework requires enhancement by further examination of its content, purpose, and dynamics (Kitson et al., 2008; Rycroft-Malone, 2004). For example, the relationships amongst the elements of the framework and their relative importance are unknown (Kitson et al.; Rycroft-Malone). The PARiHS framework is also currently limited in its utility because, while it is useful to conceptualize the implementation of evidence in practice, it is far from being a detailed resource that provides concrete guidance for those aiming to do so or a means to understand the mechanisms through which an intervention worked or did not work. In an effort to address these
limitations, the developers of the framework have proposed its application as a preliminary
diagnostic measure of evidence and context to determine the most appropriate means of
facilitation. Evaluative questions are attached to the evidence and context elements of the
framework for consideration by those interested in initiating change (Kitson et al.).

**AI and the PARiHS Framework**

**Evidence.** Similar to the PARiHS framework, the theory of AI indicates that
knowledge is a social construction co-produced by members of a social system and therefore
dependent on the values and beliefs of that system. Knowledge in AI is amenable to virtually
any interpretive explanation, which is filtered through the prevailing values and beliefs of a
culture (Cooperrider & Srivtasva, 1987). The locus of knowledge is considered to be the
relationship between individuals, as opposed to the isolated individual (Cooperrider &
Srivtasva). AI has the capacity to address research evidence, clinical and patient experiences,
and local contextual information, as articulated in the PARiHS framework. The concept of
‘high’ pediatric acute pain assessment and management research evidence was
operationalized in the AI intervention as related knowledge derived from systematic reviews
and rigorous quantitative or qualitative studies. Research evidence was introduced to
participants in the Discovery phase of the AI process and further introduced in the Design
phase based on the specific topic choice. Despite the presentation of external knowledge (i.e.,
research evidence), the focus of AI on generating internal knowledge was maintained by
nurses providing concrete examples of what was working well for evidence-based acute pain
practices in their clinical setting and contributing their clinical experiential knowledge and
local contextual information to create internal, contextually meaningful knowledge
(Kavanagh et al., 2008).
Context. The theory of AI resonates with the conceptualization of context as dynamic and complex in the PARiHS framework and the practice of AI aims to address the complexity of context in effecting practice change. The roots of AI in organizational change and action research render it an intervention specific to the individuals and work environment where change is to be initiated. Of the three context sub-elements in the PARiHS framework, culture has particular relevance to AI. Appreciative Inquiry not only aims to generate applicable, context-specific knowledge, but also works to create a culture that will support the application of generated knowledge (Cooperrider & Srivastva, 1987). The PARiHS framework indicates that the culture of a practice context needs to be understood if meaningful and lasting change is to be achieved (McCormack et al., 2002). Appreciative Inquiry is a method for attaining an understanding of the local culture by seeking to determine the values, beliefs, and needs of individuals within a social system.

The theory and practice of AI are congruent with the tenant of the PARiHS framework that the staff resource is central to transforming organizational cultures (McCormack et al.). Emphasis on people providing the work context is implicit in the definition of organizations assumed in AI literature, which states that organizations are “indeterminate systems capable of evolution and learning how to actively participate in that evolution” (Cooperrider & Srivastva, p. 135). More explicitly, AI theory names organizations as “living, human constructions” (Cooperrider & Avital, 2004, p. 2). A focus on the human component of context, together with its roots in action research, gives AI particular value as a KT intervention that attends to the importance of the staff resource and the social dimension of KT (Kavanagh et al., 2008).
Although leadership and evaluation are of lesser foci in the AI intervention, they are addressed indirectly. Through engaging nurses in focusing on their current acute pain practices, AI can be considered a means to promote informal, internal evaluation of unit practices. Namely, AI is an intervention that engages nurses in a particular context to generate information on their acute pain assessment and management practices and determine how those practices could be improved. With respect to leadership, the AI process is aligned with the concept of transformational leadership because the aims are to generate a shared vision for EBP and challenge and enable group members to achieve that vision. Ultimately, the objective of AI is to create a network of local transformational leaders (i.e., participating nurses), who, through their involvement in the AI process, work to create a unit context that is more conducive to the integration of evidence in practice (Kavanagh et al., 2008).

Facilitation. AI is primarily an enabling method of facilitation because its focus is on guiding nurses to modify their working attitudes and behaviors by evoking participation, as opposed to dictating the desired outcome in a one-way transfer of information (Kitson et al., 1998; Rycroft-Malone et al., 2002). The change process is internally generated and flexible (Bushe, 1995) and can therefore evolve according to the needs of participants (Cooperrider & Srivastva, 1987). Based on the facilitator roles outlined for enabling facilitation in the PARiHS framework, the AI intervention involved an internal-external facilitator partnership, with facilitators working in high intensity roles and employing interactive learning strategies (Rycroft-Malone et al.). The external AI facilitator assumed a coaching role by guiding group members in discovering, understanding, and fostering innovations in social-organizational processes (Cooperrider & Srivastva) and supporting participants to collectively generate the
momentum needed for effective change (Fitzgerald et al., 2003). Due to the complexity of the clinical phenomenon of pain and abundance of acute pain assessment and management evidence, the implementation of evidence-based acute pain practices also requires a facilitator with substantive clinical expertise (Kavanagh, Watt-Watson, & Stevens, 2007). Therefore, the internal AI facilitator assumed a more task-based role by presenting acute pain assessment and management research evidence to the group.

**Evaluation Framework**

**Expected outcomes of the intervention.** Expected outcomes of the AI intervention were categorized as process, practice, and patient outcomes. Process outcomes were conceptualized as short-term outcomes of the intervention, which preceded the longer-term practice and patient outcomes and included participants’ knowledge and attitudes regarding pain. Knowledge was operationalized as participants’ understanding of pediatric pain and its assessment and management (adapted from Rogers, 2003). Attitudes were operationalized as participants’ feelings about pediatric pain and its assessment and management that predisposed them to use evidence in practice (adapted from Rogers). Knowledge and attitudes were not considered entirely distinct concepts, as nurses’ attitudes likely influenced their knowledge or understandings of pain and vice versa (Ferrell, personal communication, June 29, 2006). Outcomes measurement occurred six and three weeks prior to and three and six months following intervention implementation. Positive changes in participants’ knowledge and attitudes were expected to occur immediately post-intervention because evidence-based pain information was provided in the Discovery and Design phases of the intervention and discussed throughout and participants actively engaged in developing an action plan. Changes were expected to be maintained over time because knowledge was
intended to be learned and positive attitudes to the intervention formed during the interactive AI process.

The practice outcome of the AI intervention was represented by participants’ use of evidence in practice. Evidence-based pain practices were operationalized as the proportion of staff nurse participants who engaged in the particular evidence-based pain practice selected during the AI intervention (i.e., evidence-based pain assessment documentation). Children’s pain intensity on the unit was operationalized as any numerical pain intensity score documented in the medical records of all children on the study unit during the one-day audit period at each time point. Outcomes measurement occurred six and three weeks prior to and three and six months following intervention implementation. Positive changes in evidence-based pain practices and children’s pain intensity were expected to occur three months post-intervention, as nurses required time to implement the generated action plan on the unit, which may have in turn affected the pain intensity reported by children. Changes were expected to be maintained over time because the AI intervention had the theoretical capacity to transform the culture of the unit around evidence-based acute pain assessment and management (Cooperrider & Srivastva, 1987).

**Extraneous factors.** Extraneous factors included individual and organizational factors conceptualized as influential to the implementation and outcomes of the AI intervention (Sidani & Braden, 1998). Factors were organized according to the elements of the PARiHS framework.

**Evidence.** Two individual characteristics related to the concept of evidence were of interest in this study: nurses clinical experience and attitudes towards research. Knowledge derived from clinical experience is a source of evidence and important influencer of nurses’
practices in the clinical setting (Rycroft-Malone et al., 2004a); that is, nurses more often rely on clinical knowledge than that derived from research evidence (Estabrooks et al., 2004; Estabrooks et al., 2005). Experiential knowledge is a function of clinical experience, where clinical experience was operationalized as total years of nursing experience and months of employment duration on the study unit. Second, attitudes and beliefs are considered important sources of knowledge to be communicated in the KT process (Dickinson, 2004). Moreover, nurses’ attitudes towards research were identified in a systematic review as the only individual characteristic significantly and positively correlated with research utilization (Estabrooks et al., 2003); that is, a positive attitude towards research was directly associated with increased use of research findings in clinical practice. Nurses’ attitudes towards research are an individual characteristic operationalized as participants’ feelings about using research in practice (adapted from Champion & Leach, 1989).

**Context.** Context, culture, and leadership were operationalized at the unit-level. These organizational factors indirectly influence nurses’ use of evidence in practice by placing value on particular ideas, activities, or events (McCormack et al., 2002; Rycroft-Malone, 2004; Scott-Findlay & Golden-Biddle, 2005). Context was operationalized as staff nurse participants’ perceptions of the demands of their work environment (O’Brien-Pallas, Irvine, Peereboom, & Murria, 1997); culture was operationalized as the typical behaviours of participants that exist in and are particular to the unit of practice (Coeling & Simms, 1993a); and leadership was operationalized as the leadership style (i.e., transformational, transactional, or passive/avoidant) characteristic on the unit, as derived from self-assessment by the administrative nurse leader and evaluative assessment by staff nurse participants.
Facilitation. The method of facilitation was operationalized as the AI intervention. There is currently no empirical evidence relating to the facilitation of evidence-based pain practices (Brown & McCormack, 2005), but facilitation is identified as a key factor to implementing evidence in practice (Kitson et al., 1998). As part of the AI intervention, an external and internal facilitator assumed distinct roles and employed enabling and task-based skills, respectively, to promote the implementation of acute pain assessment and management evidence in practice. Clinicians have identified credibility and communication skills as facilitator skills and attributes that affect the successful implementation of evidence in practice (Rycroft-Malone et al., 2004b). Facilitation was explored using a semi-structured interview with questions regarding participants’ perceptions of the credibility and communication skills of the Content (internal) and Process (external) Facilitators.

Summary

In the PARiHS framework, evidence, context, and facilitation are identified as elements that contribute to the successful implementation of evidence in practice. As such, the complexity of KT is recognized. Although the relative importance of the elements of the PARiHS framework are unknown (Rycroft-Malone, 2004), facilitation may be a key factor (Kitson et al., 1998); the production and use of evidence are social processes and little change will happen in organizations without key drivers (Kitson et al.; Rycroft-Malone et al., 2002). Appreciative Inquiry is an enabling method of facilitation with the potential to address the nature of the evidence and context in which evidence is to be implemented. Specifically, knowledge derived from research, clinical and patient experiences, and the local context can be elicited from participants, challenged when appropriate, and incorporated into the AI intervention (Kavanagh et al., 2008). Appreciative Inquiry is a contextually specific process,
with a particular focus on the human element of context and culture of an organization. Through its accordance with the PARiHS framework, AI is a promising KT intervention to implement acute pain assessment and management evidence in clinical practice (Kavanagh et al.). The evaluation framework for this study is derived from the PARiHS framework and outlines the expected outcomes of the AI intervention, as well as the potential influence of individual and organizational extraneous factors on the implementation process and outcomes of the intervention.
Chapter Four: Methods

Research Objectives

Key objectives of this study included exploration of the implementation process of the AI intervention and preliminary analysis of the effects of the AI intervention and the relationships of extraneous factors with those outcomes to ultimately enable refinement of the intervention and outcome measures (Whittemore & Grey, 2002).

Study Purposes and Research Questions

One Primary and two Secondary Purposes, as well as ten corresponding Research Questions were addressed in this study.

Primary purpose. (1) To describe the process of implementing AI as an intervention to translate acute pain assessment/management evidence into pediatric nursing.

(a) What is the acceptability of AI regarding nurse participants’ perceived relevance and usefulness of the intervention for implementing acute pain assessment/management evidence in practice?

(b) What is the fidelity of the implementation of the AI intervention regarding (i) the consistency of intervention implementation with essential elements of the AI process and (ii) nurse participants’ perceptions of the factors that interfered with its implementation?

(c) What is the feasibility of the AI intervention with respect to (i) maintaining nurse participants’ attendance at the four three-hour AI sessions; (ii) completing the phases of AI in four three-hour sessions; (iii) maintaining the content focus of the AI intervention on acute pain assessment/management evidence; (iv) the number of times each AI session needs to be offered to accommodate all nurse participants; and (v) the total duration, in weeks, of the AI intervention needed to reach all nurse participants?
Secondary purposes. (1) To explore the beginning effects of the AI intervention on process, practice, and patient outcomes.

(a) Are there significant differences in the process outcome of nurse participants’ knowledge and attitudes regarding pain before and after implementation of the AI intervention?

(b) Are there significant differences in the practice outcome of the proportion of staff nurse participants who practice evidence-based acute pain assessment/management before and after implementation of the AI intervention?

(c) Are there significant differences in the patient outcome of children’s pain intensity scores on the unit, as documented in their medical records, before and after implementation of the AI intervention?

(2) To describe extraneous factors related to the concepts of evidence, context, and facilitation in the PARiHS framework and explore their relationships with the process and practice outcomes of the AI intervention.

(a) What are the relationships between nurse participants’ individual characteristics, including (i) attitudes towards research, (ii) years of clinical experience in nursing, and (iii) employment duration (in months) on the study unit and the process and practice outcomes of the AI intervention?

(b) What is the relationship between the number of AI sessions attended by nurse participants and the process and practice outcomes of the AI intervention?

(c) What is the relationship between staff nurse participants’ knowledge and attitudes about pain and the practice outcome of the AI intervention?
(d) What is the context and culture of the unit in which the AI intervention is implemented, as perceived by the nurse participants?

(e) What is the leadership style of the administrative nurse leader on the unit where the AI intervention is implemented, as perceived by staff nurse participants and the administrative nurse leader?

(f) What are nurse participants’ perceptions of the credibility and communication skills of the AI facilitators?

**Research Design**

A prospective, repeated-measures, mixed-methods case study design was used. Pragmatism was the worldview assumed in this study, where emphasis was placed on the critical application of different approaches to enhance understanding of the research questions (Creswell, 2009; Tashakkori & Teddlie, 1998). Case studies involve the collection of detailed information using a variety of data collection procedures over a sustained period of time (Stake, 1995). This case study used a concurrent transformative mixed-method strategy with a convergence triangulation model: a conceptual framework guided the research design and quantitative and qualitative data were collected separately and simultaneously, with the results integrated in the discussion (Creswell; Creswell & Plano Clark, 2007). The methodology for the qualitative aspect of this study was fundamental qualitative description, which was compatible with the pragmatic worldview underlying the mixed-methods case study design, as techniques from different methodologies can be explicitly combined to facilitate analysis and understanding (Sandelowski, 2000; Tashakkori & Teddlie).
The AI intervention was compatible with a mixed-methods approach because action research is an orientation to research, as opposed to a research method, and the principles of action research do not dictate decisions around the use of particular research designs or methods (Khanlou & Peter, 2005). A variety of quantitative and qualitative research methods are applicable, depending on the objectives and context of the research. Moreover, the designed AI intervention was rooted in and incorporated elements of action-research (e.g., engaging participants, striving for change), rather than being a wholly action research design: the general topic of evidence-based pain assessment/management was pre-selected by the investigator, instead of being determined by participants. Lastly, although the theory and practice of AI underlay the intervention design, the PARiHS framework informed its evaluation.

Two pre-test measures were taken at baseline (i.e., six and three weeks pre-intervention) to provide control data against which post-test results were compared (Louis, Lavori, Bailar, & Polansky, 1984; Martin & Thompson, 2000). A statistically significant change in outcomes was not expected between the two pre-test measures, enabling significant changes in outcomes between pre and post-test measures to be attributed to the effects of the AI intervention. It was neither feasible nor appropriate to establish a control group for comparison because (a) this study was exploratory and primarily focused on describing the implementation process of the AI intervention, (b) organizational culture is unique to a context of practice, (c) there was a high chance of intervention dissemination or contamination if a control group was established within the same institution, and (d) there was a high chance of institutional differences leading to initial group non-equivalence or selection bias if the control group was established in another institution. A repeated-measures
design is more powerful than a between-subjects design because it controls for inter-
individual and inter-institutional differences, which would have constituted a substantial 
source of error variance in the analysis (Louis et al.; Martin & Thompson).

Post-test measures were taken three and six months after the AI intervention to allow 
for the implementation of action plan generated by participants and to explore the beginning 
effects of the AI intervention on outcomes. A case study design was useful for exploring the 
acceptability, fidelity, and feasibility of the AI intervention to support evaluation of its 
effectiveness and providing in depth descriptive information regarding the process and 
outcomes of AI to support or refute its future use as a KT intervention. The principal 
limitation of a case study design is that findings are not statistically generalizable; however, 
generalizing findings to theory and generating theory-based hypotheses amenable to broader 
clinical testing are appropriate (Burns & Grove, 2001).

Setting

This study took place in a surgical unit at a university-affiliated pediatric hospital in 
central Canada. The study unit was largely dedicated to pediatric otolaryngology (ENT) and 
orthopedics. On average, the distribution of patients on the unit was 35% ENT and 65% 
orthopedics. There were 25 beds and the length of stay ranged from two to three days for 
ENT patients and three to four days for orthopedics patients. Both patient populations were 
typically discharged home from hospital (administrative nurse leader, personal 
communication, February 7, 2008).

The AI intervention sessions were delivered in hospital meeting rooms to facilitate 
discussion and avoid distractions on the unit. The study unit was selected because there was a 
high incidence of acute pain and nurses (i.e., staff nurses and nurse leaders) were interested
in improving the quality of their pain practices. Participant interest is essential to the successful implementation of change (Rogers, 2003) and the AI process requires that participants have an interest in the topic area to maximize their engagement in the process and commitment to implementing the action plan (Cooperrider et al., 2005). Buy-in from nurses in leadership positions was considered essential to selecting the study unit; their support brought attention to the study, facilitated activities such as recruitment and intervention scheduling, and influenced local practices. Support from a particular clinical nurse leader on the unit was considered critical because she was experienced at the hospital, previously a member of the pain service, and known for her advocacy of and passion for high quality pain management. The investigator and her supervisor first approached this nurse leader when the study was in proposal stages. The investigator reviewed the study with the clinical nurse leader to determine her views on the acceptability of the unit for the study. After confirming the congruence of study objectives with the interests of the unit, she provided feedback on design elements of the intervention (e.g., duration and scheduling of the sessions) to enhance its initial acceptability. Suitability of the study unit was further established through meetings with several nurse leaders on the unit in administrative, clinical, and education roles. The investigator re-connected with these nurse leaders after receiving ethics approval to establish local acceptability and feasibility and prepare for recruitment. They advised on the length of recruitment, recruitment strategies, and dates and times for the study presentations.

**Sample, Sampling Technique and Sample Size**

Purposive sampling was used to select nurse leaders and convenience sampling was used to select staff nurses on the unit.
Inclusion and exclusion criteria. Eligible individuals included nurse leaders (encompassing those in administrative, clinical, and education roles) and all staff nurses interested in participating. Nurse leaders were included because they were considered to have influence over local practices due to their professional roles on the unit. Staff nurses were included because (a) they were the target population; (b) the case under study was the unit, which was largely comprised of staff nurses; and (c) AI requires that as many members of a context as possible participate (Cooperrider et al., 2005). Eligible nurses had to be willing to work collaboratively to establish the same four days off over the AI intervention period to enable consistent group membership and avoid interference with their clinical responsibilities. Students and nurses intending to terminate their positions on the unit during the study period were ineligible for the study.

Nurse leaders in administrative, clinical, and education roles and a minimum of 15-20 staff nurses were required to express interest in participating following study presentations to ensure that the minimum sample of six staff nurses was recruited. Recruiting a minimum of six staff nurses increased the potential that, given the likelihood of attrition over time, at least four staff nurses would complete the AI intervention. This number ensured that, including the nurse leaders the optimal group size for facilitating small groups would be attained (i.e., 6-10 members [Rotem & Manzie, 1980; Steinert, 1996]). The maximum sample was only limited by the number of nurses that could be spared by the unit at once. An administrative nurse leader was consulted regarding the maximum number of nurses that could be involved in one AI session without adversely impacting the functioning of the clinical team or quality of patient care. There were 54 staff nurses on the surgical unit at the time of recruitment (administrative nurse leader, personal communication, December 11, 2007). Given this
estimation, it was expected to take four to eight weeks to generate interest from 15-20 staff nurses and obtain the minimum sample (clinical nurse leader, personal communication, December 4, 2007).

**Recruitment and Procedure**

After receiving approval from the university and hospital Research Ethics Boards, the investigator personally approached nurse leaders in administrative, clinical, and education roles to establish their interest in study participation. They were given a study summary (including inclusion/exclusion criteria) (Appendix F) and a Participant Interest form (Appendix G). They were invited to fill in the Participant Interest form immediately and give it to the investigator or complete it within a one-week period and place in an anonymous study box in a unit office pod.

The investigator informed staff nurses about the study and participant eligibility by (a) information sessions presented on the unit, (b) a study poster (Appendix H), and (c) a study summary that was also emailed to the nurses and posted on the communication board. Execution of these initiatives was arranged with the nurse leaders. The information sessions for the study consisted of a brief (10 minute) presentation to provide an overview of the AI process, roles of the participants, and study timeline. These presentations were delivered to staff nurses following the weekly staff meetings and on evenings and weekends at times determined by an administrative nurse leader. They were repeated over a three week period until all nurses had the opportunity to attend. Following each presentation, the investigator distributed the study summary and Participant Interest form. Nurses were invited to fill out the Participant Interest form immediately after the presentation or within one-week and place the form in an anonymous study box in a unit office pod. The investigator collected the forms
from the box on a daily basis and contacted all interested nurses to provide verbal and written explanations of the study. Written informed consent was obtained from nurses who chose to participate.

**AI Intervention**

AI is a strengths-based approach to facilitating organizational change and learning (Coghlan et al., 2003; Cooperrider et al., 2005). The AI process consists of the 4-D Cycle: Discovery, Dream, Design, and Destiny (Cooperrider et al.). This cycle informs all AI-based interventions; however, a strictly standardized method of AI has not been established because the process is intended to be flexibly responsive to the different aims and needs of organizations (Bushe, 1995).

The investigator originally proposed that participants independently collaborate to choose the session dates; however, during the study presentations, some nurses suggested it would be helpful if possible dates were provided to give them some guidelines as a group. The investigator first contacted the nurse leaders and Content Facilitator who indicated the most convenient days of the week given their schedules. A set of potential dates was selected based on this information, posted on the unit, and emailed to participants for their feedback. The investigator emailed those participants who did not respond within one week. A participant, who was also a member of the unit scheduling committee, informally assumed the role of liaison between the investigator and staff nurses to help determine the ‘best’ dates. Based on group feedback, the investigator established a new set of dates that accommodated the Content Facilitator’s changed availability and advanced-scheduling activities of the staff nurses who, at the time, were signing up for clinical shifts six-weeks in advance. Participants suggested delivering the Discovery and Dream phases over one day during the latter phases
of the scheduling process. The investigator forwarded this suggestion to the group who readily accepted it because it reduced the number of session days. It was implemented because it was also theoretically sound. Both phases involve positive brainstorming activities that are directly related: Discovery focuses on strengths and successes, while Dream focuses on supportive contextual factors for those successes (Cooperrider et al., 2005).

At the core of the 4-D Cycle is the Affirmative Topic Choice (Cooperrider et al., 2005). The four phases of the AI process were centered on the question: what is working well for practicing evidence-based acute pain assessment/management on your unit? A Content Facilitator and Process Facilitator co-delivered the intervention. The investigator was the Process Facilitator based on an understanding of AI theory and practice. A post-doctoral student with expertise in pediatric pain and KT was approached for the role of Back-up Facilitator, should the Process Facilitator be unable to deliver the intervention in part or entirety. The investigator approached a Master’s prepared nurse practitioner from the hospital Acute Pain Service to be the Content Facilitator. The Content Facilitator was selected based on (a) an expressed interest in participating; (b) a commitment to attending the AI intervention, including any necessary repetitions; (c) clinical expertise in acute pain assessment and management; and (d) familiarity with and time to access research evidence in acute pain assessment and management.

The Process and Content Facilitators delivered the 4-D Cycle to participants in four three-hour sessions over two weeks. They recorded their observations of group dynamics and interactions, as well as issues that arose pertaining to the facilitation of the intervention immediately after each AI session in a Facilitator Log. Each phase of the AI process was designed for completion in one session. The three-hour duration of each session allowed
sufficient time to cover the content of the AI phase and a brief refreshment break. The nurse educator was contacted to determine the possibility of integrating the AI sessions into the agenda for already scheduled education days attended by staff nurses, which was deemed unfeasible because the education days were already scheduled as full days. The maximum duration of AI intervention delivery was ideally considered to be four weeks, with at least one session delivered per week, to maximize continuity and minimize disassociation from the content and process of the intervention. Participants were encouraged to maintain their attendance over the four sessions because each session was designed to address one phase of the 4-D Cycle and therefore built on the process and content of the previous session.

The AI intervention is summarized in Table 1.
Table 1

*Summary of the AI Intervention*

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Discovery</th>
<th>Dream</th>
<th>Design</th>
<th>Destiny</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>To focus on the positive elements of using acute pain assessment/management evidence in practice</td>
<td>To envision an ideal context for using acute pain assessment/management evidence in practice</td>
<td>To create the structures and processes that support the ideal for using acute pain assessment/management evidence in practice</td>
<td>To implement strategies that strive for the ideal for using acute pain assessment/management evidence in practice</td>
</tr>
<tr>
<td>Activities</td>
<td>Introduction to the AI process; explanation of ‘high’ evidence applied to pediatric acute pain assessment/management; reframing evidence-based acute pain assessment/management as an Affirmative Topic; engagement in Appreciative Interviews</td>
<td>Consideration of Miracle Questions to envision the possibilities for using acute pain assessment/management evidence in everyday practice; selection of a specific topic</td>
<td>Formulation of a collective Provocative Proposition that realistically states the possibilities for using acute pain assessment/management evidence in everyday practice</td>
<td>Creation of an action plan to implement acute pain assessment/management evidence in everyday practice within a three-month period</td>
</tr>
<tr>
<td>Frequency and duration of sessions</td>
<td>1 3-hour session delivered in a 2 week period</td>
<td>1 3-hour session delivered in a 2 week period</td>
<td>1 3-hour session delivered in a 2 week period</td>
<td>1 3-hour session delivered in a 2 week period</td>
</tr>
</tbody>
</table>
Participants completed activity summary sheets during the sessions for the Discovery, Dream, and Design phases to provide the investigator with a record of the content generated by the group. Ground rules were established for small group participation during the introduction to the AI intervention to promote a safe and supportive environment (Crosby, 1996), especially in light of potential power relationships between nurse leaders and staff nurses. Rules included maintaining confidentiality of group discussion (excluding the outcomes of the AI activities), receiving contributions by all group members positively, and only one group member speaking at a time (Crosby). The Process Facilitator supported democratic group functioning during the AI sessions by encouraging quiet members to contribute and ensuring that others did not dominate the discussion (Jacques, 1986).

Refreshments were provided during the AI intervention sessions and participants were reimbursed for their parking expenses. Participants were also given $400 for completing all phases of the study to compensate them for their time and to promote their continued participation in the sessions so that the AI intervention could be evaluated. A rate of $100/session was provided because it represented staff nurses average hourly rate, as they were attending the AI sessions on scheduled days off. If a participant missed a session or terminated participation in the intervention, compensation was provided only for those sessions attended. Participants also received a certificate of participation and were invited to collaborate with the investigator in the dissemination of study results.

**AI Intervention Manual**

The investigator developed an AI Intervention Manual in accordance with the 4-D Cycle (Cooperrider et al., 2005). The manual provided detailed protocols for Process and Content Facilitators to ensure that the essential elements of the AI process were delivered as
designed. The investigator trained the Content and Back-up Facilitators prior to intervention implementation by reviewing the protocol, explaining their roles and responsibilities, outlining the structure of the intervention, and highlighting important readings. The AI intervention sessions were audio taped and transcribed verbatim. Quantitative content analysis was conducted on the transcripts to ensure fidelity of intervention delivery.

**Instruments**

**Summary of instruments.** The instruments used to measure the implementation process and outcomes of the AI intervention are summarized in Table 2 according to the measured variable, timing of measurement, and the individual(s) responsible for completing the measure.
Table 2

*Study Instruments*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Instrument</th>
<th>Timing</th>
<th>Completed By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptability of the AI intervention</td>
<td>Semi-structured interview guide</td>
<td>T4</td>
<td>Nurse participants</td>
</tr>
<tr>
<td>Fidelity of the AI intervention</td>
<td>Audio taped AI sessions</td>
<td>Each AI session</td>
<td>Investigator</td>
</tr>
<tr>
<td></td>
<td>Semi-structured interview guide</td>
<td>T4</td>
<td>Nurse participants</td>
</tr>
<tr>
<td>Feasibility of the AI intervention</td>
<td>Group Log</td>
<td>Each AI session</td>
<td>Investigator</td>
</tr>
<tr>
<td></td>
<td>Facilitator Log</td>
<td>Each AI session</td>
<td>Investigator and Content Facilitator</td>
</tr>
<tr>
<td></td>
<td>Audio taped AI sessions</td>
<td>Each AI session</td>
<td>Investigator and Content Facilitator</td>
</tr>
<tr>
<td>Outcomes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse participants’ knowledge and attitudes regarding pain</td>
<td>PKNAS</td>
<td>T1-T4</td>
<td>Nurse participants</td>
</tr>
<tr>
<td>Proportion of staff nurse participants who practice evidence-based acute pain assessment/management</td>
<td>Pain Audit Tool</td>
<td>T1-T4</td>
<td>Research assistant</td>
</tr>
<tr>
<td>Children’s pain intensity scores on</td>
<td>Validated self-report</td>
<td>T1-T4</td>
<td>Staff nurse participants and</td>
</tr>
<tr>
<td>Variable</td>
<td>Instrument</td>
<td>Timing</td>
<td>Completed By</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>--------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>the unit</td>
<td>measures; scores recorded using the Pain Audit Tool</td>
<td></td>
<td>Research assistant</td>
</tr>
</tbody>
</table>

**Extraneous factors**

**Evidence**

- Nurse participants’ attitudes towards research: RUQ - Attitudes Towards Research subscale; T1; Nurse participants
- Nurse participants’ years of clinical experience in nursing: Nurse Entry Form; T1; Nurse participants
- Nurse participants’ months of employment duration on the study unit: Nurse Entry Form; T1; Nurse participants

**Context**

- Context: ECS; T1; Staff nurse participants
- Culture: NUCAT-3; T1; Nurse participants
- Leadership: MLQ – 5x Short; T1; Administrative nurse leader and staff nurse participants
- Facilitation: Semi-structured interview guide; T4; Nurse participants
**Sample Characteristics**

Baseline demographic data for nurse participants were collected using the Nurse Entry Form, developed by the investigator. Questionnaire items included (a) gender, (b) age, (c) highest degree completed, (d) date of graduation from basic nursing degree/diploma, (e) years of nursing employment since basic nursing degree/diploma, (f) employment start date on the study unit, (g) current position on the unit, (h) current employment status on the unit, (i) attendance at pain conferences since completion of basic nursing degree/diploma, and (j) attendance at continuing education courses in pain since completion of basic nursing degree/diploma. Demographic characteristics for the patient sample were collected using the Pain Audit Tool (Taddio, Campbell, Stinson, & Palozzi, 2007) and included patients’ age, gender, type of surgery, number of days post-surgery, number and type of painful procedures performed, and pharmacological, psychological, and physical management of pain.

**Implementation Process of the AI Intervention**

Acceptability, fidelity, and feasibility of the AI intervention were measured by (a) recording participants’ reasons for declining study enrollment with the Participant Interest form; (b) documenting participants’ attendance at the AI sessions in a Group Log; (c) audio taping the AI sessions for comparison to the AI Intervention Manual to determine the fidelity of intervention delivery; (d) documenting the frequency and duration of the delivered sessions defined by the total number of times each AI session was delivered and the number of minutes per session, respectively, in the Facilitator Log; (e) recording the total duration, in weeks, of the AI intervention in the Facilitator Log; and (f) conducting individual face-to-face semi-structured interviews with participants to determine their views on the relevance
and usefulness of the AI intervention for facilitating evidence-based pain practices and related barriers.

Individual interviews were chosen to obtain qualitative data on participants’ perspectives of the AI intervention because staff nurses may limit the extent of their disclosure in a focus group due to the presence of nurse leaders and surveys may not provide the depth of feedback sought by the investigator regarding the AI intervention. If a nurse was unable to participate in a face-to-face interview due to competing demands, the research assistant conducted the interview via telephone at a convenient time. The semi-structured interview guide (Appendix I) was pilot-tested by the investigator with three pediatric nurses for relevance and clarity prior to use in the study. Questions that were originally considered optional probes were instead used as interview questions to enhance the clarity of the overarching questions and promote increased depth in participants responses.

**Outcomes of the AI Intervention**

**Process outcome (nurse participants’ knowledge and attitudes regarding pain).**

Participants’ knowledge and attitudes about pain was a process outcome measured using the Pediatric Nurses' Knowledge and Attitudes Survey Regarding Pain (PNKAS) (Manworren, 2000). The PNKAS was modified from an adult version (Ferrell, McGuire, & Donovan, 1993) and consists of 42 items, including true/false statements and vignettes with associated multiple-choice questions. The content of the PNKAS reflects the standards for pediatric pain management from the American Pain Society, World Health Organization, and Agency for Health Care Policy and Research (Manworren, 2000). Questions tested participants’ general knowledge and attitudes regarding pain assessment and management, including the use of analgesics (Manworren, 2000). A total score was computed using the number of correct
responses and ranged from 0 to 42. Higher scores reflected greater content mastery (Manworren, 2001). Six of the 42 items related to the management of cancer pain. For the purposes of this study and in collaboration with a doctorally-prepared nurse practitioner with expertise in pediatric pain management, those items were revised to assess nurses’ general pain management knowledge.

Content validity of the PKNAS was established by five national (United States) nurse experts in pain management (Manworren, 2001). Stability was evidenced over an eight-week period (r = 0.67, n = 12) and acceptable internal consistency was demonstrated in two samples of pediatric nurses (Cronbach’s alpha = 0.72 [n = 247] and 0.77 [n = 88], Manworren, 2001). Ferrell and colleagues (1993) cautioned against distinguishing between items as measuring either knowledge or attitudes because many items (e.g., frequency of pain assessments, administration of analgesics) measured both.

**Practice outcome (proportion of staff nurse participants who practice evidence-based pain assessment/management).** The precise practice outcome of the AI intervention could not be defined *a priori* because participants chose a specific evidence-based acute pain practice in the Dream phase. They selected the topic of evidence-based pain assessment documentation and developed a contextually tailored action plan to implement on the study unit. The action plan consisted of a multi-faceted KT strategy intended to enhance pain assessment documentation practices unit-wide and included a poster of the Provocative Proposition; a self-learning education module based on the associated hospital clinical practice guideline; and positive, nurse-to-nurse, same-day audit and feedback. The action plan is outlined in Appendix J.

The Pain Audit Tool (Taddio et al., 2007) was selected to anticipate and capture the
specific practice, as it is a general measure comprehensive of pain intensity scores, pain tools, painful procedures, and pharmacological, psychological, and physical therapeutic interventions. The Pain Audit Tool was originally developed for use in neonates and has established face and content validity (Carbajal et al., 2005; 2007). This tool was adapted for use in Canada (Johnston et al., 2008) and for general pediatrics (Taddio et al.) by a panel of clinical and research experts in pediatric pain.

**Patient outcome (children’s pain intensity scores on the unit).** Children’s pain intensity scores on the unit was a patient outcome measured and documented by staff nurses in their daily practice using validated self-report measures available on the unit and subsequently recorded using the Pain Audit Tool (Taddio et al., 2007). The assessment and documentation of pain by staff nurses was hospital policy and considered usual care. Any numerical pain intensity score documented in the medical records of all children on the unit for the 24-hour audit period corresponding to each of the four time points was extracted. Pain intensity scores were averaged for each child. Self-report measures (i.e., numerical rating scale, visual analogue scale, and Faces Pain Scale-Revised) and observational measures (i.e., FLACC) used on the study unit had a common 0-10 metric, which facilitated pooling and statistical analysis of data.

**Extraneous Factors of the AI Intervention**

**Evidence. Clinical experience.** Clinical experience was conceptualized as an individual extraneous factor and collected as part of the baseline demographic data using questions from the Nurse Entry Form regarding years of nursing employment since basic nursing degree/diploma and employment start date on the study unit.
**Attitudes towards research.** Participants’ attitudes towards research were an individual extraneous factor measured using the 21-item attitudes subscale from the Research Utilization Questionnaire (RUQ) (Champion & Leach, 1989). The RUQ consists of four subscales regarding perceived research support, availability, attitudes, and research utilization (Champion & Leach). This measure and its subscales have been used in several nursing studies (Champion & Leach; Hatcher & Tranmer, 1997; Humphris, Hamilton, O’Halloran, Fisher, & Littlejohhns, 1999; Lacey, 1994; Tranmer, Lochhaus-Gerlack, & Lam, 2002; Wallin, Bostrom, Wikblad, & Ewald, 2003). The attitudes subscale uses a Likert format (i.e., 1 = strongly agree and 5 = strongly disagree) to measure nurses’ views about incorporating research evidence in practice that were summed to obtain a total score of 105.

Content validity of the RUQ was established during its development by basing items on past research that empirically validated the relationship between perceived support, availability, attitudes, and research utilization (Champion & Leach, 1986) and by a review of scale items by experts (Champion & Leach, 1989). Evidence of content validity for the attitudes subscale was established through support from qualitative interview data from nurses at two hospitals (Lacey, 1994). The attitudes subscale also demonstrated the ability to detect variation in nurses’ attitudes towards research across hospital sites (Lacey). Acceptable internal consistency reliability was established for the attitudes subscale with a Cronbach’s alpha coefficient of 0.94 (n = 150) (Champion & Leach, 1989). Strong positive correlations have been demonstrated between the attitudes to research and research utilization subscales of the RUQ (r = 0.674) (Lacey).

**Context. Organizational context.** The Environmental Complexity Scale (ECS) (O’Brien-Pallas et al., 1997, O’Brien-Pallas et al., 2003) was used to measure the complexity
of the work environment. The ECS examines the push and pull that nurses experience while delivering patient care on a daily basis, which is consistent with the conceptualization of context as complex and dynamic in the PARiHS framework. The ECS consists of 22 items that measure three domains (a) unanticipated delays and re-sequencing of work in response to others, (b) unanticipated delays due to changing patient acuity, and (c) characteristics and composition of the caregivers (O’Brien-Pallas et al., 1997, O’Brien-Pallas et al., 2003). Items on each subscale were coded from 0 to 10 (0 = high decrease and 10 = high increase) and summed to obtain final subscale scores. The first two domains reflect the demand aspect of environmental complexity, while the third reflects supply (O’Brian-Pallas et al., 1997).

Content validity of the ECS was addressed during its development through the collection of qualitative data from nurses on the factors that caused variability in how they completed their work (O’Brien-Pallas et al., 1997) and by subsequent exploratory and confirmatory factor analyses, which supported the three domains of the measure (O’Brien-Pallas et al., 2003). Acceptable internal consistency was established with Cronbach’s alpha reliabilities for the three subscales being 0.81-0.87, 0.84-0.88, and 0.75-0.84, respectively (Estabrooks et al., 2008; O’Brien-Pallas et al, 1997; O’Brien-Pallas et al, 2003). The ECS has also demonstrated association with levels of research use (Estabrooks, Kenny, Adewale, Mallidou, & Cummings, 2005).

Organizational culture. Organizational culture was measured using the Nursing Unit Cultural Assessment Tool-Version 3 (NUCAT3) (Coeling & Simms, 1993a). The NUCAT was developed for use in nursing units and has been used in several studies (Coeling & Simms, 1993b; Estabrooks et al., 2008; Goodridge & Hack, 1996; Rizzo, Gilman, & Mersmann, 1994; Spence & Lau, 2006; Urden, 1996; Webb, Price, & Coeling, 1996). It is a
50-item measure that assesses how important or acceptable work-related behaviours are to nurses on a unit. Each question is rated on a five-point Likert scale (1 = not at all and 5 = extremely) (Coeling & Simms, 1993a). The items are defined as cultural behaviours important to nurses that differ between units (Coeling & Simms, 1993a). Within the NUCAT, culture is defined as “how we get things done around here”, which is conceptually consistent with the definition of culture in the PARiHS framework. Although data are collected at the individual level, the group is used as the unit of analysis by calculating a mean score for each of the 50 items. Scores with a mean below 2.3 or above 2.7 indicate behaviours that are unacceptable and important to the group, respectively (H. Coeling, personal communication, June 26, 2006; Rizzo et al.). The group is used as the unit of analysis because culture is a collective phenomenon (Scott, Mannion, Davies, & Marshall, 2003; Seago, 1997).

Content validity was established during the development of the NUCAT by a three-month participant observation and interview study with 35 nurses from two inpatient units to identify relevant cultural variables (Coeling & Wilcox, 1988). The variables were expanded in a series of discussions with experts and by an open-ended questionnaire that was administered to 168 staff and head nurses in eight inpatient units (Simms, Erbin-Roesemann, Darga, & Coeling, 1990). The NUCAT was pretested using the ‘Imele and Atwood’ procedure for retaining qualitative validity, while gaining quantitative reliability and validity (Coeling & Simms, 1993a) and has demonstrated the ability to detect variation in culture among nursing units (Coeling & Simms, 1993b; Rizzo et al., 1994). Acceptable internal consistency was demonstrated for responses reflecting descriptions of subjects’ typical group behaviours (Cronbach’s alpha = 0.92) and preferred behaviours (Cronbach’s alpha = 0.78) (Coeling & Simms, 1993a).
Leadership. The abbreviated Multifactor Leadership Questionnaire (MLQ [5X-Short]) (Avolio & Bass, 2004) was used to measure the leadership style on the unit. The MLQ (5X-Short) is a 45-item, 12-subscale instrument that uses a 5-point Likert response scale (i.e., 0 = not at all and 4 = frequently, if not always) to enable leader self-assessment and assessment of that leader by associates. Transformational, transactional, and passive/avoidant leadership are the three leadership constructs of the scale. The concept of transformational leadership is highlighted in both the PARiHS framework and the MLQ as being the most effective leadership style, characterized by the development of all members of a working group into leaders (Avolio & Bass; Rycroft-Malone, 2004). Five of the 12 leadership subscales reflect transformational leadership (i.e., idealized influence [attributed], idealized influence [behaviour], inspirational motivation, intellectual stimulation and individual consideration), two subscales are related to transactional leadership (i.e., contingent reward, active management by exception), and two subscales reflect passive/avoidant leadership (i.e., passive management by exception and laissez-faire subscales) (Avolio & Bass). Other characteristics related to leadership outcomes are extra effort, effectiveness, and satisfaction. Scoring the MLQ involved summing and averaging the items to yield subscale scores. Scores for items in the five transformational leadership subscales, two transactional subscales, and two passive/avoidant subscales were summed and averaged for each participant to produce one score for each of the three leadership styles.

The original long version of the MLQ has well-established psychometric properties (Avolio & Bass, 2004; Huber et al., 2000) and has been used in several nursing studies (Colyar, 1996; Cunningham & Kitson, 2000a; Cunningham & Kitson, 2000b; Dunham-Taylor, 2000; Medley & Larochelle, 1995; Stordeur, Vandengerghe, & D’hoore, 2000;
Morrison, Jones, & Fuller, 1997; Skinner & Spurgeon, 2005); however, the abridged, updated version of the measure is considered more relevant for use in research studies (Avolio & Bass). The short-form of the MLQ has been used to measure leadership in several nursing studies (Gullo & Gerstle, 2004; Larrabee et al., 2003; Larrabee et al., 2004; Ohman, 2000; Spinelli, 2006). Content validity of the MLQ (5X) was addressed during its development through its basis in the conceptual model of the full range of leadership, which spans transformational, transactional, and passive/avoidant leadership styles (Bass, 1985). Six scholars in the field of leadership reviewed the content of the measure based on the conceptual model and confirmatory factor analysis was used to establish construct validity (Avolio & Bass). The MLQ has evidence of acceptable reliability in the business (i.e., Cronbach’s alpha = 0.74-0.94 for the total items and for each leadership factor subscale) (Avolio & Bass) and nursing (Cronbach’s alpha = 0.67-0.95 for the total items and for each leadership factor subscale) (Jones, 1995; Larrabee et al., 2004; McDaniel & Stumpf, 1993) literature. The original version of the MLQ demonstrated responsiveness to change following an intervention to develop leadership in nursing (Cunningham & Kitson, 2000b).

**Facilitation.** No specific scale was found that measured the communication skills and perceived credibility of the facilitators. Related questions were included in the semi-structured interview guide, along with questions regarding the relevance and usefulness of the AI intervention (Appendix I). The interview guide was pilot-tested by the investigator with three pediatric nurses for relevance and clarity prior to conducting the study. Questions that were originally considered optional probes were instead used as interview questions to enhance the clarity of the overarching questions and promote increased depth in participants responses.
Procedures for Data Collection

After obtaining written consent, the investigator provided each participant with a verbal description of the AI intervention and package outlining the main activities for each phase. The package included explanations and instructions for (a) conducting Appreciative Interviews (Discovery phase), (b) envisioning an ideal context for practicing evidence-based acute pain assessment/management (Dream phase), (c) developing Provocative Propositions (Design phase), and (d) generating an action plan (Destiny phase). Participants were encouraged to read the information sheets in advance of the associated AI session.

Nurses not interested in participating were invited to answer some questions on the Participant Interest form pertaining to reason(s) for declining, which were provided in checklist format. The form was handed out to all nurses attending the study presentations with instructions that they were to place the completed form in an anonymous study box in a designated unit office pod. Nurses not interested in participating were also invited to consent (Appendix K) to completing the demographics and Attitudes Towards Research questionnaires to facilitate comparison between those nurses who declined participation and those recruited based on individual characteristics of interest (i.e., clinical experience, attitudes towards research). On the advice of the nurse leaders, study summaries were left at the nurses’ station along with Participant Interest forms and envelopes. The investigator retrieved completed forms every day over three weeks from the anonymous study box and maintained a journal to record these data, as well as any issues encountered during data collection and thoughts generated during the study.

The investigator informed participants about each data collection time point (i.e., T1-T4) via email and left data collection packages in their unit mailboxes in sealed envelopes.
Each data collection package contained (a) the relevant measure(s), (b) instructions and deadlines for completion, and (c) a blank envelope to return the completed measure(s). An email or phone reminder was provided by the investigator within one week of distributing the package to complete and return the measure(s). Participants completed the questionnaires on their own time so as not to interfere with their clinical responsibilities. The administrative nurse leader completed the self-assessment MLQ and staff nurse participants evaluated the nurse leader’s leadership style using the MLQ. The administrative nurse leader was selected to represent leadership on the unit because staff nurses reported to her directly regarding professional and clinical issues. Staff nurse participants were informed that their evaluations of the administrative nurse leader were confidential and would not be discussed with the nurse leader.

Data on extraneous factors related to the concepts of evidence and context in the PARiHS framework were collected six weeks before implementation of the AI intervention (T1). Outcome variables were measured at four time points: six weeks pre-intervention (T1), three-weeks pre-intervention (T2), three months post-intervention (T3), and six months post-intervention (T4). The Process Facilitator completed the Group Log at each AI session and audio taped each session. Both facilitators completed the Facilitator Log following the AI sessions. A research assistant conducted (a) a retrospective audit of the patient medical records for the shift worked by each staff nurse participant closest to each of the four time points for the purpose of assessing the practice outcome, (b) a retrospective audit of patient medical records belonging to all children on the unit over a 24-hour period at each of the four time points for the purpose of assessing the patient outcome, and (c) individual interviews in
an empty unit room at T4 to ensure confidentiality and that nurses were able to accurately report on their perceptions of the AI intervention and facilitators.

Children on the study unit were typically discharged within two to ten days (administrative nurse leader, personal communication, February 7, 2008). Patient medical records were therefore accessed at least two weeks following each of the four time points to classify the audit as retrospective (and therefore not requiring informed consent from patients). The research assistant consulted a copy of the staff nurse clinical schedule (obtained from the administrative nurse leader) to determine the shift worked by each staff nurse participant that fell closest to each of the four time points for the practice outcome. Data on the practice outcome were only collected from staff nurse participants because they delivered direct patient care and the objective was to determine the change in their evidence-based acute pain practices over time.

Medical records for the entire patient census were audited for the patient outcome, rather than limiting the audit to children cared for by staff nurse participants because the AI intervention was meant to promote cultural change at the unit level. All numerical pain intensity scores recorded in children’s medical records were collected for the 24-hour period corresponding to each of the four time points. The resultant data were intended to provide a ‘snap-shot’ of children’s pain intensity scores at the unit-level. At each time point, nurse participants were informed that data for the practice and patient outcomes would be collected sometime in the coming two weeks to minimize potential for the Hawthorne effect. The study schema, which outlines recruitment, outcomes measurement, and intervention delivery is presented in Figure 1.
Figure 1. Recruitment, outcomes measurement, and the AI intervention.
Data Analysis

This section reviews analytic procedures used to address instrument psychometrics, study purposes, triangulation, and missing data. SAS 9.2 was used to generate descriptive and inferential statistics and NVivo 8.0 was used to facilitate qualitative content analysis.

Psychometric analysis. Internal consistency reliability coefficients were calculated for multiple item measures using Split-half correlations and Cronbach’s alpha coefficients depending on the number of cases available. Acceptable reliability coefficients range from 0.70 to 0.90 (Streiner & Norman, 2003).

Sample characteristics. Descriptive statistics (e.g., distribution, central tendency, dispersion) were used to describe baseline characteristics for nurse participants and the types of patients on the unit at each time point. The patient groups were independent at the four time points. Individual characteristics of the four patient groups were compared to assess the appropriateness of pooling the data for descriptive analysis. Analysis of Variance (ANOVA) or the non-parametric equivalent (i.e., Kruskal Wallis test) was used to compare continuous factors across the four patient groups, including age, number of days post-surgery, and number of painful procedures administered. Chi-square tests were used to compare categorical factors, including sex, surgery type (major or minor), and type of pharmacological pain management (single or multimodal). Two nurse practitioners from the Pain Service and a unit-based clinical nurse leader were consulted to determine and categorize the types of surgery and pharmacological pain management.

Implementation Process of the AI intervention. Data relating to the implementation process of the AI intervention were analyzed using descriptive and comparative analyses incorporating both quantitative and qualitative techniques. Results
were used to support the generalizability of the findings derived from the inferential statistics.

**Acceptability of the AI intervention.** Qualitative content analysis was conducted on transcripts of the individual semi-structured interviews. The methodology for the qualitative aspect of this study was fundamental qualitative description (Sandelowski, 2000) and the analytic method was qualitative content analysis. Fundamental qualitative description is a valuable method for obtaining minimally transformed or theorized answers to practical questions about the nature of an event or experience (Sandelowski). Techniques described by Ritchie, Spencer, and O’Connor (2007) and Corbin and Strauss (2008) were used to guide the analysis. Work by Ritchie and colleagues provided the investigator with practical instruction for conducting the content analysis, from data management through to developing descriptive and explanatory accounts of the data. Work by Corbin and Strauss was used to orient the investigator in the analytic process by adopting their ‘open approach’ to content analysis. An exploration of the ‘possibilities of the data’ and the interpretive process were facilitated by using their techniques of open coding and memo writing, as well as employing major analytic tools, like questioning and making comparisons (Corbin & Strauss).

Within fundamental qualitative description, it is acceptable to use techniques associated with other methodologies, such as grounded theory, to facilitate analysis (Sandelowski, 2000). The results may therefore have grounded theory overtones without producing a theoretical or highly abstract rendering of the data. The techniques used to guide content analysis in this study were ultimately compatible with fundamental qualitative description because they emphasized staying close to the data during the interpretive process.
and were applicable to developing descriptive accounts (Corbin & Strauss, 2008; Ritchie et al., 2007).

The investigator began the analysis by conceptualizing its overarching purpose as explaining the experience of participating in the AI Intervention from the perspectives of the nurse participants. This general stance to the data was purposefully assumed to remain open to hearing information beyond that which was specifically asked in the interview guide (Corbin & Strauss, 2008). The aim was to maximize the understanding gained regarding the experience of participating in the AI intervention and its perceived applicability as a KT intervention in pain. Within this open approach, however, the investigator was also mindful that specific research questions were addressed in the interviews (Corbin & Strauss). These questions related to the acceptability of the AI intervention regarding its perceived relevance and usefulness as a KT intervention in pain (1a), the fidelity of the AI intervention with respect to the factors that interfered with its implementation (1b[ii]), and the credibility and communication skills of the facilitators (2f). As the mixed-method study purposes required that these questions be answered through the interviews, the broader results were ultimately organized according to these overarching questions.

The primary focus of the analysis was to capture and interpret common sense, substantive meanings in the data (Ritchie et al., 2007). It is important to note that the analytic process used in this study was not a linear one, but rather involved constant movement between the raw data and analytic concepts (Corbin & Strauss, 2008; Ritchie et al.). Given this, the first phase of the analytic process was data management. Data management involved (a) identifying the initial concepts/themes in the data, (b) labeling the data by concepts/themes, (c) sorting the data by concepts/themes, and (d) summarizing the data in a
thematic chart (Ritchie et al.). To identify preliminary concepts/themes in the data, the investigator selected the two interviews with the most extensive responses. The investigator read the transcripts in entirety and used topic changes as cut off points to examine chunks of data (Corbin & Strauss). These cut offs were dictated by the participant’s line of talk, rather than the questions that were asked, so as not to impose limits on the content of the data. Concepts were derived inductively from the data using open coding (Corbin & Strauss) and assimilated into a conceptual index. More then one concept was often applied to a single excerpt. Data that were conceptually similar were grouped together using NVivo 8.0.

The conceptual index consisted of a hierarchical list of main themes and sub-themes derived from the data (Ritchie et al., 2007) (Appendix L). The investigator wrote memos as part of the interpretive process to develop the conceptual index. The purpose of the memos was to have a record of the way the data were considered and concepts were developed for each chunk of data, as well as the potential relationships between concepts (Corbin & Strauss, 2008). Questioning and making comparisons were two major analytic tools used when writing memos to help develop the provisional concepts in the conceptual framework (Corbin & Strauss). The investigator asked sensitizing questions such as ‘what is going on/being described here?’ to get at what each excerpt of data might be indicating from the participants’ perspectives. Constant comparison was used to compare incidents and classify the data. Incidents found to be conceptually similar were grouped together under higher-level descriptive concepts to allow for the differentiation of categories and identification of beginning properties and dimensions of that category or theme (Corbin & Strauss). In most cases, in vivo themes/concepts were used, which were based on the language of the participants, but the investigator also chose some concepts that were common-sense terms
she felt captured the essence of the data (e.g., democratic approach to change) (Corbin & Strauss; Ritchie et al.). Theoretical concepts were not used in this early stage of analysis so as to remain grounded in the data. Recurring concepts were sorted and grouped under broader, higher-level themes or categories to construct the conceptual index. Each theme/category and concept within the index was defined. The conceptual index was comprehensive of the data, while avoiding redundancies, and considered amenable to refinement during the analytic process (Ritchie et al.).

The conceptual index was refined during the analysis in terms of adding new concepts, dividing concepts that were too broad, or collapsing concepts that were too narrow (Ritchie et al., 2007). All analytic decisions, including the rationales for these changes, were discussed in the memos and the related conceptual definitions were revised. Transcripts that had already been indexed were revisited to make labeling consistent. The investigator met with a post-doctoral student, with experience in pediatric pain and content analysis, who independently coded two transcripts using the conceptual framework. The purpose of this meeting was to ensure that the conceptual index was comprehensive and grounded in the raw data. In the case of discrepancy, the analysts discussed the ways in which they developed the concept and the investigator returned to the raw data to resolve the issue. The investigator recorded all analytic decisions in a journal. Resolutions included (a) maintaining the investigator’s original language for and meaning of a concept, (b) changing the language the investigator used for a concept to more accurately reflect the meaning of a phenomenon, or (c) adding a new concept to the investigator’s index to more comprehensively reflect the content of the data.
To develop a descriptive account of the data, the investigator developed thematic charts for each of the concepts across the participants (Ritchie et al., 2007). The purposes of the thematic charts were to summarize the key elements of each piece of data to ensure that they were examined in entirety and further reduced for later analysis and representation, and to compare similar concepts across participants and identify their properties and dimensions (Corbin & Strauss, 2008; Ritchie et al.). A chart was generated in Word for each theme, with the following headings: participant, data, dimensions, and sub-theme/theme. Data representing each concept were summarized in a minimally interpretive way, retaining the language of the participants. The concepts were refined as descriptive data were assigned to them. Higher-level, more abstract concepts (or themes) were used to group sub-themes and concepts (Ritchie et al.). For example, the theme of ‘effects of the AI intervention’ was generated to subsume the sub-theme of ‘team spirit’, which included the concepts of ‘teamwork’ and ‘appreciative spirit’ (see Appendix L).

An explanatory account of the data was developed by revisiting memos to determine where to search for possible relationships between concepts and returning to the thematic charts to compare concepts across participants. The investigator explored cases that supported and refuted potential patterns and relationships found in the data. Explanations were open to those explicitly stated by participants and those inferred by the investigator based on patterns and relationships in the data or the underlying logic in participants’ responses. In some cases, findings were related to existing literature; however, integration of the results with literature was largely left for the discussion due to the mixed-methods nature of the study. The purpose of developing explanations was to indicate why patterns and
outcomes occurred in the data and to clarify the nature and interrelationships of different factors or influences (Ritchie et al., 2007).

Methods for establishing validity were largely based on the work of Whittemore, Chase, and Mandle (2001). This source provided a comprehensive synthesis of contemporary viewpoints on validity criteria in qualitative research and a re-conceptualization of those considered particularly meaningful. Moreover, the criteria were congruent with the methodological objectives of fundamental qualitative description (Sandelowski, 2000). Primary criteria for validity addressed in this study included credibility, authenticity, criticality, and integrity. Credibility and authenticity relate to the methodological objectives of fundamental qualitative description, which are descriptive and interpretive validity (Sandelowski; Whittemore et al.). Descriptive validity is an accurate account or interpretation of the data and interpretive validity is an accurate portrayal of the meanings and experiences perceived by participants (Sandelowski). Techniques for establishing credibility and authenticity included using verbatim transcription, using constant comparison to develop concepts, constructing a conceptual index and thematic charts to reduce the data in a minimally interpretive way, and incorporating all of the cases into the analysis.

Criticality and integrity involved attending to the interpretations, assumptions, and knowledge of the investigator that could potentially influence the analytic process (Whittemore et al., 2001). To address these criteria, the investigator wrote memos to note methodological decisions during analysis and maintained a reflexive journal to record her reactions to the data and examine her biases (Birks, Chapman, & Francis; 2008; Finlay, 2002). The work of Corbin and Strauss (2008) facilitated an open inquiry of the data and their analytic tools, such as asking questions and exploring negative instances, helped the
investigator maintain a critical stance during the interpretive process. Provisional concepts derived from the data were discussed with a colleague with experience in pediatric pain and content analysis and the conceptual index was subsequently refined. The raw data were revisited throughout the interpretive process to ensure that interpretations were accurate and grounded in the data.

Secondary criteria for validity addressed in this study are auditability, vividness, and congruence (Whittemore et al., 2001). Auditability refers to the ability to follow the interpretive effort of the investigator (Whittemore et al.). The investigator addressed this criterion by writing memos that documented her interpretations of the data and keeping a reflexive journal during the analytic process. The results of the analysis were explicitly presented to provide evidence of and support for the inferences made by the investigator. This latter point also relates to the criterion of vividness, where rich descriptions were presented in the results to portray the essence of the themes derived from the data.

Congruence refers to correspondence between the research questions, method, and findings, as well as between the data collection and analysis (Whittemore et al.). Fundamental qualitative description is a valuable method for addressing practical questions about the nature of an experience from the perspectives of participants (i.e., the acceptability and fidelity of the AI intervention) (Sandelowski, 2000). Qualitative content analysis is a compatible analytic method because it is oriented towards summarizing the content of the data and concepts can be derived directly from the data. Results of the analysis were reported as a descriptive summary of the participants’ experiences, rather than an abstract rendering of events, in line with the methodology of fundamental qualitative description (Sandelowski).
**Fidelity of the AI intervention.** A yes/no checklist was created from the AI Intervention Manual that outlined the essential elements of the AI process to be delivered by the Process Facilitator in each session (Appendix P). The transcripts from the four intervention sessions were compared to the template using quantitative content analysis to determine the consistency of implementation with the elements of the AI process. The total number of activities missed out of those designed were counted. The Facilitator Log was used to identify rationales for any missed elements. Qualitative content analysis was conducted on transcripts of the individual semi-structured interviews using the methodology described under ‘Acceptability of the AI intervention’.

**Feasibility of the AI intervention.** Descriptive statistics (e.g., distribution, central tendency, dispersion) were used to describe the feasibility of implementing the AI intervention with respect to the frequency with which each session was delivered; the duration of each session delivered compared to planned, in minutes; and the total duration of the AI intervention delivered, in weeks. The sample was described with respect to the extent of full participation of the target population (i.e., nurse participants’ attendance at each of the four three-hour AI sessions), reasons for non-participation, the number of participants recruited/declined, and a comparison of nurse participants and non-participants based on individual characteristics of interest (i.e., clinical experience, attitudes towards research). Participants and non-participants mean attitudes towards research scores and employment duration on the study unit (continuous variables) were compared using independent t-tests or the non-parametric equivalent (i.e., Mann-Whitney U test). Years of clinical experience in nursing (categorical variable) were compared between participants and non-participants using a Fisher’s exact test (in lieu of a chi-square test due to the small sample size in some
cells). The actual duration of each phase of the AI intervention, in minutes, was determined from the audiotapes and Facilitator Log and compared to that designed.

Quantitative content analysis was conducted on transcripts of the audio taped AI sessions to determine the feasibility of completing the intervention in four three-hour sessions and the Content Facilitator maintaining a focus on acute pain assessment/management evidence. Transcripts from each AI intervention session, where each session was designed to reflect one phase of the AI process, were analyzed against a yes/no checklist of planned activities for the Content Facilitator to determine if all activities were delivered as designed (Appendix Q). The total number of activities missed out of those designed was counted. The length of time, in minutes, it took to complete each AI phase was derived from the audiotapes and confirmed with the Facilitator Log.

**Outcomes of the AI intervention.** *Process outcome (nurse participants’ knowledge and attitudes regarding pain).* Data included staff nurse participants’ total scores on the PKNAS (total score of 42) (Manworren, 2000) and PKNAS subscale scores for questions specifically related to pain assessment and documentation (total score of 5). Pain assessment subscale scores were calculated post-study because the PKNAS is a general measure of pain knowledge and attitudes, while the formal teaching provided by the Content Facilitator during the AI intervention was limited to pain assessment and documentation. The nurse practitioner from the Acute Pain Service and the investigator independently reviewed the 42 PKNAS questions and selected five that addressed pain assessment and documentation, with 100% agreement (Appendix M). Data were analyzed using Repeated Measures Analysis of Variance (RM-ANOVA). The within-subjects factor was time, with four levels (i.e., T1-T4). If the overall F test was significant, post-hoc comparisons were conducted using paired t-tests
to determine the time point(s) at which the means differed (Hazard Munro, 2002). Given the exploratory nature of this study and number of comparisons made, p values were maintained at 0.05 to reduce the potential for Type II error and are reported such that they can be interpreted with an appropriate degree of caution.

**Practice outcome (proportion of staff nurse participants who practice evidence-based pain assessment/management).** Staff-nurse participants’ pain assessment documentation practices were measured using the Pain Audit Tool (Taddio et al., 2007). Four indicators representative of the practice outcome were generated by the investigator and are described in Table 3. The practice indicators included (a) ‘evidence-based pain assessment documentation’, (b) ‘documentation of pain intensity score and tool’, (c) ‘documentation of pain intensity score’, and (d) ‘pain assessment documentation effort’.

The objective of using four practice indicators was to capture any change in the relative quality of staff nurse participants’ pain assessment documentation over time. The practice indicator ‘evidence-based pain assessment documentation’ reflects the highest quality of evidence-based pain assessment documentation in the context of this study, denoting perfect correspondence between staff nurse participants’ practices and the associated hospital clinical practice guideline. The clinical practice guideline was considered the gold standard for practicing evidence-based pain assessment documentation, as it was the basis of the action plan developed by the staff nurse participants. The guideline recommended that pain assessment documentations include a numerical pain intensity score, the associated evidence-based tool, and be conducted at particular times (i.e., on admission; start of shift; with vital signs; before, during, after invasive procedures; one hour after administration of analgesia). Each of the following practice indicators subsequently loses an
element of quality from this gold standard. The practice indicator ‘documentation of pain intensity score and tool’ loses the quality aspect of timing outlined in the guideline; the practice indicator ‘documentation of pain intensity score’ excludes the recommended timing and documentation of the associated tool; and the practice indicator ‘pain assessment documentation effort’ represents the lowest quality of evidence-based pain assessment documentation, foregoing all recommendations and encompassing any record of pain assessment documentation, inclusive of anecdotal comments.

Table 3

*Practice Indicators*

<table>
<thead>
<tr>
<th>Practice Indicator</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Evidence-based pain assessment documentation’</td>
<td>The proportion of the actual number of evidence-based pain assessment documentations and the expected number of evidence-based pain assessment documentations. The formula for evidence-based pain assessment documentations was based on the hospital clinical practice guideline, which specifies the documentation of a pain intensity score using an evidence-based tool, at particular times (i.e., on admission; start of shift; with vital signs; before, during, after invasive procedures; one hour after administration of analgesia).</td>
</tr>
<tr>
<td>‘Documentation of pain intensity score and tool’</td>
<td>The proportion of the actual number of documented pain intensity scores and the associated evidence-based tool (excluding the quality indicator of timing) and the expected number of evidence-based pain assessment documentations.</td>
</tr>
<tr>
<td>‘Documentation of pain intensity score’</td>
<td>The proportion of the actual number of documented pain intensity scores (excluding the quality indicators of timing and evidence-based tool) and the expected number of evidence-based pain assessment documentations.</td>
</tr>
<tr>
<td>‘Pain assessment documentation effort’</td>
<td>The proportion of the actual number of documented pain assessments, including anecdotal comments (and excluding the quality indicators of timing, evidence-based tool, and pain intensity score) and the expected number of evidence-based pain assessment documentations.</td>
</tr>
</tbody>
</table>
The denominator for each practice indicator was derived from the formula: Expected number of pain assessments = a (start of shift) + b (vital signs) + c (procedures) + d (interventions), where the parameters a, b, c, and d had numerical limits set by the clinical practice guideline (Appendix N). The numerator for each practice indicator was the actual number of pain assessments completed by each staff nurse participant based on the different quality levels being considered (Table 3). The purpose of the formula was to individualize and contextualize the number of pain assessments expected for each patient and control for variation in patient complexity (e.g., number of procedures, number of administered analgesics). Basing the formula on the clinical practice guideline was also an objective and reliable way of determining the expected number of pain assessment documentations. If a participant had more than one patient on the clinical shift he/she worked at each time point, an average proportion was calculated across his/her patients. Data were analyzed using RM-ANOVA as described in the analysis for the ‘Process Outcome’.

**Patient outcome (children’s pain intensity scores on the unit).** Pain intensity scores from the medical records of all children on the unit for the 24-hour period corresponding to each of the four time points were averaged. An Analysis of Covariance (ANCOVA) was conducted to examine if children’s average pain intensity scores on the unit differed across the four patient groups, controlling for the type of pharmacological pain management (single or multimodal). Type of pharmacological pain management was used as a covariate in the ANCOVA due to the statistically significant difference across patient groups and its clinical relevance as a correlate of pain intensity (clinical nurse leader, personal communication, June 9, 2009).
**Extraneous factors of the AI intervention.** Exploratory analyses were conducted to examine relationships between nurse participants’ individual characteristics and the process and practice outcomes of the AI intervention. Analyses were conducted on Time 3 data; participants indicated that the action plan took them approximately two months to implement and was subsequently abandoned, which made Time 3 a more meaningful post-test measure of the effects of the AI intervention and action plan compared to Time 4. Statistical tests used to examine relationships amongst the factors depended on the nature of the variables (i.e., continuous or categorical) and included Pearson correlation coefficients, ANOVAs, independent t-tests, and Fisher’s exact tests (Appendix O). Correlation coefficients (r) of 0.10, 0.30, and 0.50 were interpreted as small, medium, and large, respectively (Green & Salkind, 2005; Streiner & Norman, 2003). Where Pearson correlation coefficients were not appropriate due to the nature of the data, the strength of relationships was determined through calculating effect sizes (i.e., eta-square [$\eta^2$]). Conventional cut-offs for eta-square are 0.01 (small), 0.06 (medium), and 0.14 (large) (Green & Salkind; Streiner & Norman).

Descriptive statistics (e.g., distributions, central tendency, dispersion) were used to describe extraneous factors related to the overarching concept of context in the PARiHS framework. Despite being included in the intervention theory, the potential relationships between organizational extraneous factors and the outcomes of the AI intervention were not quantitatively explored because there was no variability in setting. Qualitative content analysis was conducted on the transcripts of the individual semi-structured interviews to provide an understanding of the extraneous factor of facilitation in the PARiHS framework (i.e., participants’ perceptions of the credibility and communication skills of the facilitators).
The qualitative methodology followed that described in the section on the ‘Acceptability of the AI intervention’.

**Triangulation**

A convergence triangulation model was used, where quantitative and qualitative data were collected separately and the results were integrated in the discussion by comparing and contrasting the different findings (Creswell & Plano Clark, 2007). The convergence of findings was used to substantiate conclusions (Creswell & Plano Clark). Any inconsistent or conflicting results were used to elaborate findings, support more complex and contextually-specific explanations, or initiate new lines of thinking (Creswell & Plano Clark; Miles & Huberman, 1994). The primary purpose of triangulating data was completeness rather than confirmation; triangulation was used to add breadth and depth to the analysis, not to find an objective truth (Sim & Sharp, 1998).

**Missing Data**

The investigator gave nurse participants an email and/or phone reminder to complete questionnaires if they were not received within one week. Logic and range checks were conducted immediately after questionnaires were collected to ensure that they were accurate and complete. The investigator returned questionnaires with missing values to participants for completion and provided them with a telephone and/or email reminder. Additionally, mean scores were computed, which allowed missing data to be managed without imputing values into the dataset.

**Ethical Considerations**

Ethical approval for this study was obtained from the university and hospital Research Ethics Boards. All eligible nurses received a full explanation of the study and their rights and were
informed that their decision to participate would not affect their employment standing or status in any way. Participants were asked to sign written consent forms for study participation and the audio taping of the AI sessions (Appendix K). They were instructed to return the consent forms to the investigator in a sealed envelope. Participant confidentiality and anonymity were maintained by assigning each nurse participant a study code number to identify questionnaires and track data for the same participants across the four time points. Completed data forms were kept in a locked filing cabinet in the investigator’s office in accordance with institutional policies. Access to data on the computer was password protected, encrypted, and accessible to the investigator only. Only group data were reported.

Audiotapes were duplicated in case of accidental deletion (Morse & Field, 1995). Each audiotape was labeled with the corresponding AI intervention phase and date immediately after recording was completed. The investigator emphasized the confidential nature of the data to the transcriptionist and a formal contract, developed in collaboration with the hospital legal department, was signed (Morse & Field). All identifiers were removed from the transcripts by the transcriptionist based on a transcribing protocol provided by the investigator. Transcribed interviews were checked for accuracy by the investigator and photocopied three times to provide back-up copies. These copies were filed in the locked drawers with the other data forms.

Additional ethical considerations are required for case study research because it involves an intense interest in personal views and circumstances (Stake, 2000). Participants who share their experiences may risk exposure and embarrassment, as well as loss of standing, employment, and self-esteem (Stake). Beyond the protection of human subjects, the investigator avoided low-priority probing of sensitive issues (Stake). Rules for group
participation were established at the first AI session, where the concepts of confidentiality and anonymity were defined and discussed (Khanlou & Peter, 2005). Potential coercion to participate was addressed by having the investigator present the study to staff nurses and provide them with a study summary and Participant Interest form to be left in an anonymous study box, rather than having a nurse leader recruit participants. Also, nurses were informed during the study presentations that participation in the AI intervention was solely based on interest.
Chapter Five: Quantitative Results

This chapter includes results related to the characteristics of the sample and the quantitative aspect of the study. First, the sample is described in terms of the nurse participants and the types of patients on the study unit. Second, results relating to the quantitative research questions are presented, including the (a) fidelity of the AI intervention (Primary Purpose, Question 1bi); (b) feasibility of the AI intervention in terms its structure and nurse participant attendance (Primary Purpose, Questions 1ci and 1cii); (c) beginning effects of the AI intervention on process, practice, and patient outcomes (Secondary Purpose, Questions 2a-c); and (d) the context, culture, and leadership on the unit (Secondary Purpose, Questions 2d-e).

Derivation of the Sample

Nurses. Fifty-four staff nurses were practicing on the study unit during the recruitment period (March 6-27, 2008). Over the three-week recruitment period, ten presentations were delivered on the unit, which were attended by 34 staff nurses (63.0%). Nurse leaders in clinical, administrative, and education roles did not attend these presentations because they had previously received information on the study in meetings with the investigator. One presentation was delivered to a group of 15 staff nurses in clinical leadership positions on the study unit and its neighboring surgical unit, and included nurse leaders from administrative and education roles from the study unit. This group was targeted to interest potential staff nurse participants and garner awareness of and support for the study. The administrative nurse leader scheduled all presentations and sent the dates and times to the investigator throughout the recruitment period based on the unit workload and staffing patterns, with the goal of ensuring the highest number of attendees.
Twenty-four staff nurses (44.4% of the total nursing staff; 70.6% of those who attended the study presentations) expressed interest in participating in the study by filling out a Participant Interest form. Nine of the 24 staff nurses (37.5%) decided not to participate after receiving further information on the study. Reasons for deciding not to participate included maternity/paternity leave during the study period (n = 3), vacation during the intervention period (n=3), transportation issues (n = 2), and a scheduling conflict (n = 1). The estimated length of recruitment to generate interest from 15-20 staff nurses and obtain the minimum sample of six staff nurses was four to eight weeks (clinical nurse leader, personal communication, December 4, 2007). The recruitment rate was significantly higher than estimated; recruitment took three weeks and the final sample size was double the minimum estimated number for the required sample.

Fifteen nurses (27.8% of the total nursing staff; 62.5% of those interested in participating) were eligible and consented to participate. They included 12 staff nurses and three nurse leaders in administrative, clinical, and education roles. Three participants withdrew prior to the first AI intervention session. The reasons for withdrawal were insufficient time to dedicate to the study, an unspecified personal issue, and a scheduling conflict despite requesting the intervention session dates off. The remaining 12 participants completed all phases of the study. A schema summarizing the derivation of the sample is presented in Figure 2.

**Patients.** Demographic and pain related information was collected from the medical records of all patients on the unit for the 24-hour period that corresponded with each time point of interest (i.e., T1-T4). Twenty-six records were accessed at Time 1, 25 records at Time 2, 31 records at Time 3, and 18 records at Time 4 (see Figure 2).
Figure 2. Derivation of the sample.
Sample Characteristics

Nurses. The majority of participants were staff nurses, female, and employed in full-time positions on the study unit. Half of the participants were diploma-prepared and most (n = 8, 66.7%) had greater than six years of experience in nursing. Employment duration varied in the group, ranging from 6 months to 25.17 years (Median [Mdn] = 7.96 years). Approximately half of the sample reported that they had not attended any pain conferences or continuing education since completing their entry level nursing degree. Nurses’ characteristics are summarized in Table 4.
Table 4

*Nurse Characteristics*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>(n = 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)*</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>11 (91.67)</td>
</tr>
<tr>
<td>Male</td>
<td>1 (8.33)</td>
</tr>
<tr>
<td>Employment duration on the acute care unit (months),</td>
<td></td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>95.50 (177.50)</td>
</tr>
<tr>
<td>Experience in nursing (years)</td>
<td></td>
</tr>
<tr>
<td>0-2 years</td>
<td>3 (25.00)</td>
</tr>
<tr>
<td>2.1-6 years</td>
<td>1 (8.33)</td>
</tr>
<tr>
<td>&gt; 6 years</td>
<td>8 (66.67)</td>
</tr>
<tr>
<td>Employment position on the acute care unit</td>
<td></td>
</tr>
<tr>
<td>Staff Nurse</td>
<td>9 (75.00)</td>
</tr>
<tr>
<td>Nurse Leader</td>
<td>3 (25.00)</td>
</tr>
<tr>
<td>Highest level of nursing education</td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>6 (50.00)</td>
</tr>
<tr>
<td>Baccalaureate</td>
<td>4 (33.33)</td>
</tr>
<tr>
<td>Masters</td>
<td>2 (16.67)</td>
</tr>
<tr>
<td>Employment type on the acute care unit</td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>10 (83.33)</td>
</tr>
<tr>
<td>Part-time</td>
<td>2 (16.67)</td>
</tr>
<tr>
<td>Pain conferences attended since basic nursing degree</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>7 (58.33)</td>
</tr>
<tr>
<td>1-3</td>
<td>3 (25.00)</td>
</tr>
<tr>
<td>&gt;3</td>
<td>2 (16.67)</td>
</tr>
<tr>
<td>Continuing pain education classes since basic nursing degree</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>7 (58.33)</td>
</tr>
<tr>
<td>1-3</td>
<td>3 (25.00)</td>
</tr>
<tr>
<td>3.1-7</td>
<td>0 (0.00)</td>
</tr>
<tr>
<td>&gt;7</td>
<td>2 (16.67)</td>
</tr>
</tbody>
</table>

*Percentages within characteristics may not add to 100% due to rounding*
Patients. The total patient sample consisted of 100 patients across the four time points; however, seven patients were excluded from the analysis because they were admitted to the unit for medical diagnoses or pre-operatively, yielding a final sample of 93 patients. ANOVAs or Kruskal Wallis tests and chi-square tests indicated no statistically significant differences on most patient characteristics, including age (months) ($F [3, 89] = 0.78, p = 0.508$), number of painful procedures administered ($\chi^2 = 1.38, p = 0.711$), number of days post-surgery ($\chi^2 = 2.94, p = 0.402$), sex ($\chi^2 = 6.14, p = 0.105$), and type of surgery ($\chi^2 = 3.79, p = 0.285$) across the four patient groups; however, there was a statistically significant difference in type of pharmacological pain management ($\chi^2 = 12.45, p = 0.006$). Patient data were considered largely comparable and appropriate to pool for descriptive analysis. Type of pharmacological pain management was included in the ANCOVA to examine changes in children’s pain intensity on the unit across the four patient groups (Secondary Purpose, Research Question 2c).

For the total patient sample ($n = 93$), the average age was 10.07 years (SD = 5.11 years). Approximately half of the sample was male ($n = 50, 53.8\%$) and had minor surgery ($n = 62, 66.7\%$). Minor surgery included soft-tissue cutting surgeries that were less extensive in nature (e.g., cochlear implants, thyroglossal duct cyst) (nurse practitioner, Acute Pain Service, personal communication, June 11, 2009). Major surgery was largely orthopedic (or bone-cutting), but also included some of the more extensive soft-tissues cutting surgeries (e.g., laparotomy and ovarian bilateral cystectomy) (nurse practitioner, Acute Pain Service). Patients varied on their number of days post-surgery and administered painful procedures. Although most patients were on the day of surgery (where 0 = day of surgery) and administered no painful procedures, ranges were from 0-2 and 0-6, respectively. Painful
procedures administered included tape removal (n = 18, 19.4%), Foley catheter insertion (n = 8, 8.6%), primary tube or catheter removal (n = 5, 5.4%), peripheral intravenous insertion (n = 3, 3.2%), chest physiotherapy (n = 2, 2.2%), and other procedures, which included graft-site massage and esophageal dilatation (n = 2, 2.2%). Approximately half of the sample (n = 48, 51.6%) was given multimodal pharmacological pain management, which included (a) opioids and non-opioids (n = 38, 40.9%); (b) opioids, adjuvants, and other (n = 1, 1.1%); and (c) opioids, non-opioids, adjuvants, and other (n = 9, 9.7%). The category ‘other’ included sedatives used in combination with opioids to manage painful muscle spasms in children undergoing orthopedic surgery (nurse practitioners, Pain Service, personal communications, June 11, 2009). The specific categories of pharmacological pain management are presented in Table 5. More patients were administered multimodal pharmacological pain management pre-intervention (n = 30, 32.3%) compared to post-intervention (n = 18, 19.4%).

Table 5

*Types of Pharmacological Pain Management*

<table>
<thead>
<tr>
<th>Category</th>
<th>Drug</th>
<th>Route of Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opioid analgesics</td>
<td>Fentanyl</td>
<td>Epidural continuous infusion, IV, oral</td>
</tr>
<tr>
<td></td>
<td>Morphine</td>
<td>IV</td>
</tr>
<tr>
<td></td>
<td>Hydromorphone</td>
<td>Oral</td>
</tr>
<tr>
<td></td>
<td>Oxycodone</td>
<td>Oral</td>
</tr>
<tr>
<td></td>
<td>Codeine</td>
<td>Oral</td>
</tr>
<tr>
<td>Non-opioid analgesics</td>
<td>Ketalorac</td>
<td>IV</td>
</tr>
<tr>
<td></td>
<td>Acetaminophen</td>
<td>Oral</td>
</tr>
<tr>
<td></td>
<td>Non-steroidal anti-inflammatory drugs</td>
<td>Oral</td>
</tr>
<tr>
<td>Adjuvants</td>
<td>Gabapentin</td>
<td>Oral</td>
</tr>
<tr>
<td>Other</td>
<td>Diazepam</td>
<td>Oral</td>
</tr>
<tr>
<td></td>
<td>Lorazepam</td>
<td>Oral</td>
</tr>
<tr>
<td></td>
<td>Phenobarbital</td>
<td>Oral</td>
</tr>
</tbody>
</table>
Implementation of the AI Intervention

1b(i). Fidelity of the AI intervention regarding the consistency of intervention implementation with the elements of the AI process. A yes/no checklist outlining the essential elements of each AI phase was used to analyze the transcripts of each intervention session to examine the extent to which the content covered was comparable to that specified in the AI Intervention Manual (Appendix P). The Process Facilitator delivered all 23 activities (100%) as designed over the course of the four three-hour sessions. Each activity was delivered according to the related script in the intervention manual. Beyond the defined content for each phase of the AI process, the Process Facilitator repeated and clarified explanations and instructions around the AI process, answered participants’ questions relating to AI, and facilitated the development of ideas.

1c(i). Feasibility of the AI intervention with respect to maintaining the participants’ attendance at the four three-hour sessions. (a) Extent of full participation of the target population and reasons for non-participation. The majority of participants (n = 11, 91.7%) attended all four sessions, with the exception of one nurse leader who missed the last session (Destiny) due to medical reasons. Participants documented their attendance in the Group Log at the beginning of each AI session. The investigator recorded details regarding the nature and extent of their attendance in the Facilitator Log after each session. There was a pattern for nurse leaders to arrive late, leave early, or come in and out of the sessions. Nurse leaders inconsistent participation was a result of their continued work demands through the intervention, as they indicated that they were not able to attend on days off due to the structure of their schedules and workloads. Ultimately, however, none of the participants missed key elements or content addressed in the sessions.
(b) **Number of participants recruited vs. declined and comparison on individual characteristics.** Nine eligible nurses decided not to take part in the study due to personal or logistical reasons, but consented to complete the Nurse Entry form and RUQ – Attitudes Towards Research subscale (Champion & Leach, 1989). These nine nurses were compared to the 12 participants on individual characteristics related to the use of research evidence in practice, including clinical experience and attitudes towards research.

**Clinical experience.** Data for employment duration for participants and non-participants did not meet the assumption of normality. A Mann-Whitney U test was used to determine if the two groups differed in terms of their employment duration on the unit. Although the median employment duration suggested that participants (Mdn = 95.50 months, Range = 6.00 - 301.00 months) had a longer employment duration than non-participants (Mdn = 40.00, Range = 5 - 222.00 months), this difference was not statistically significant (p = 0.385).

Years of experience in nursing were categorized by increments of two on the Nurse Entry Form, but re-grouped because there were only a small number of nurses with 2-6 years of experience. Although a higher proportion of participants had longer experience in nursing compared to non-participants, results from the Fisher’s Exact test indicated that these differences were not statistically significant (p = 0.262) (Table 6).
Table 6

*Years of Nursing Experience for Participants and Non-Participants*

<table>
<thead>
<tr>
<th>Years of Nursing Experience</th>
<th>Participants (n =12)</th>
<th>Non-Participants (n=9)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
<td>No. (%)</td>
</tr>
<tr>
<td>0-2 years</td>
<td>3 (25.00)</td>
<td>3 (33.33)</td>
</tr>
<tr>
<td>2.1-6 years</td>
<td>1 (8.33)</td>
<td>3 (33.33)</td>
</tr>
<tr>
<td>6.1 and greater years</td>
<td>8 (66.67)</td>
<td>3 (33.33)</td>
</tr>
</tbody>
</table>

*Attitudes towards research.* In this sample of nurses, the internal consistency of RUQ – Attitudes Towards Research subscale (Champion & Leach, 1989) was acceptable with a Cronbach’s alpha coefficient of 0.88 and Split-half correlation coefficient of 0.83. The scores were approximately normally distributed. An independent samples t-test indicated a statistically significant difference in mean scores for participants and non-participants (t [19] = -2.93, p = 0.009), with participants (Mean [M] = 89.92, Standard Deviation [SD] = 7.03) having more positive attitudes towards research than non-participants (M = 81.89, SD = 4.88).

1c(ii). *Feasibility of completing the phases of AI in four three-hour sessions.* The AI sessions were designed to be three hours long. Each session was dedicated to completing one phase of the AI process (i.e., Discovery, Dream, Design, and Destiny). The activities outlined for the facilitators had pre-specified completion times. The actual length of each session was 180 minutes (3 hours), with the AI process completed within a total of 720 minutes (12 hours); however, completing the Dream and Design phases required more time than anticipated and activities for these phases ‘spilled over’ into their subsequent sessions.
The Dream phase was longer than anticipated because group feedback on the Miracle Questions and topic selection required more time than estimated (60 minutes allocated; 100 minutes in actuality). In the Design phase, explaining the concept and development of a Provocative Proposition took longer than expected (10 minutes allocated; 15 minutes in actuality), as did discussing the participant’s individual Provocative Propositions and deciding on collective key ingredients (25 minutes allocated; 50 minutes in actuality). Developing a collective Provocative Proposition required 95 minutes, compared to the estimated 60 minutes, so the activity was continued in the Destiny phase. To accommodate this increased time, brainstorming for the action plan and selecting an action item were shortened by 10 minutes each. This left the original 85 minutes to develop the action plan, which was completed with 5 minutes to spare. A comparison of estimated and actual completion times for each phase of the AI intervention is presented in Table 7.

Table 7

<table>
<thead>
<tr>
<th>AI Phase</th>
<th>Estimated Time (Minutes)</th>
<th>Actual Time (Minutes)</th>
<th>Difference between Estimated and Actual Times (Minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discovery</td>
<td>180</td>
<td>180</td>
<td>0</td>
</tr>
<tr>
<td>Dream</td>
<td>180</td>
<td>210</td>
<td>+ 30</td>
</tr>
<tr>
<td>Design</td>
<td>180</td>
<td>205</td>
<td>+ 25</td>
</tr>
<tr>
<td>Destiny</td>
<td>180</td>
<td>125</td>
<td>- 55</td>
</tr>
</tbody>
</table>

1c(iii). Feasibility of maintaining the content focus of the AI intervention on acute pain assessment/management evidence. A yes/no checklist that outlined the essential
activities to be delivered by the Content Facilitator was used to analyze the transcripts of each AI intervention session to examine the extent to which the content covered was comparable to that specified in the AI Intervention Manual (Appendix Q). The Content Facilitator was trained to deliver formal presentations in Discovery and Design on evidence-based pain assessment and management. The majority of her activities were less structured in nature and entailed maintaining a focus on evidence-based pain practices in group discussions, rather than clinical anecdotes. Since participants selected the specific topic of evidence-based pain assessment documentation in the Dream phase, the Content Facilitator maintained this focus in the Design and Destiny phases. The Content Facilitator delivered all 12 activities (100%) as designed over the course of the four three-hour sessions and maintained a focus on pain assessment and management evidence throughout the AI intervention. Structured activities were delivered according to the detailed scripts in the intervention manual. Beyond the defined content for each phase of the AI process, the Content Facilitator answered participants’ questions relating to pain and facilitated the development of ideas.

1c(iv). **Number of times each AI session was offered to accommodate all of the participants.** Each of the four AI intervention sessions was delivered once to accommodate the 12 participants; a nurse leader indicated that involving this number of staff nurses in one group would not adversely impact the functioning of the clinical team.

1c(v). **Total duration, in weeks, of the AI intervention needed to reach all of the participants.** The four AI intervention sessions were offered over two-weeks to reach all participants. The Discovery and Dream phases were held together on the first day, the Design
phase was delivered three days later in the same week, and the Destiny phase occurred seven
days later.

**Outcomes of the AI Intervention**

1a. Process outcome (nurse participants’ knowledge and attitudes regarding pain). **PKNAS total scores.** In this sample of nurses, the internal consistency of the total PKNAS measure was acceptable at each of the four time points, with Cronbach’s alpha coefficients of 0.90, 0.89, 0.84, and 0.77, respectively, and Split-half correlation coefficients of 0.83, 0.76, 0.72, and 0.69, respectively. A RM-ANOVA was conducted to examine changes in mean PKNAS total scores over time. The data were normally distributed and met the assumption of sphericity (p ≥ 0.050). Participants’ mean knowledge and attitudes scores increased over time (Time 1 [M = 31.17, SD = 7.44]; Time 2 [M = 32.35, SD = 6.89]; Time 3 [M = 32.58, SD = 5.70]; Time 4 [M = 34.33, SD = 4.38]) with a statistically significant time effect (F [3, 33] = 4.93, p = 0.006). Post-hoc paired t-tests indicated no statistically significant difference between pre-intervention mean scores at Times 1 and 2 (t [11] = 1.82, p = 0.097). Post-intervention, no statistically significant differences were found between Times 2 and 3 (t [11] = 0.42, p = 0.682) or Times 2 and 4 (t [11] = 2.03, p = 0.067); however, mean scores were significantly different between Times 1 and 3 (t [11] = 2.20, p = 0.050), Times 1 and 4 (t [11] = 2.86, p = 0.016), and Times 3 and 4 (t [11] = 2.40, p = 0.035). These results suggest that the participants had improved knowledge and attitudes regarding pain post-intervention compared to pre-intervention.

**PKNAS pain assessment subscale scores.** In this sample of nurses, the Cronbach’s alpha coefficients for the PKNAS pain assessment subscale were acceptable at Times 1-3, with Cronbach’s alpha coefficients of 0.74, 0.73, 0.77, but lower (0.49) at Time 4. Given that
the scores were not normally distributed and more than half of the sample had scored five (out of a possible high of five), the data were categorized into two subgroups: those participants with scores of five (i.e., 100% correct) and those with scores of less than five. This categorization enabled examination of differences in the two subgroups using a Generalized Estimating Equation. Findings suggested an increase in the proportion of participants with a subscale score of five post-intervention (Times 3 and 4): five (41.7%) participants had scores of 100% at Time 1, seven (58.3%) at Time 2, and nine (75.0%) at Times 3 and 4. However, this upward trend was not statistically significant (Time 1, \( p = 0.089 \); Time 2, \( p = 0.308 \); Time 3, \( p = 1.000 \)).

1b. Practice outcome (proportion of staff nurse participants who practice evidence-based pain assessment documentation). RM-ANOVAs were conducted to examine changes over time in the four practice indicators representing the practice outcome. The RM-ANOVA assumption of sphericity (or equal variances) was tested and, where violated, a Greenhouse-Geisser adjustment was made to the F-statistic.

‘Evidence-based pain assessment documentation’. This practice indicator represented the total number of times participants documented pain assessments according to the hospital clinical practice guideline, which included documenting a pain intensity score and the associated evidence-based tool, with the recommended timing. There was a relative decrease in participants scores at Time 4 (Time 1 \([ M = 0.21, SD = 0.19 ]\); Time 2 \([ M = 0.26, SD = 0.17 ]\); Time 3 \([ M = 0.23; SD = 0.21 ]\); Time 4 \([ M = 0.14, SD = 0.22, Mdn = 0.00, Range = 0.67 ]\); however, there was no statistically significant time effect (\( F [3, 24] = 0.93, p = 0.442 \)). Due to a notable positive skew in the data at Time 4, a non-parametric Friedman test was also conducted and confirmed the results of the RM-ANOVA.
‘Documentation of pain intensity score and tool’. This practice indicator represented the total number of times participants documented numerical pain intensity scores and the associated evidence-based tools. This indicator excluded the quality aspect of the timing of pain assessments, as recommended in the hospital clinical practice guideline. Higher scores occurred at Times 2 (M = 0.32, SD = 0.23) and 3 (M = 0.31, SD = 0.23) relative to Times 1 (M = 0.22, SD = 0.19) and 4 (M = 0.24, SD = 0.36, Mdn = 0.15, Range = 1.11), but there was no statistically significant time effect (F [3, 24] = 0.37, p = 0.776). Due to a notable positive skew in the data at Time 4, a non-parametric Friedman test was also conducted and confirmed the results of the RM-ANOVA.

‘Documentation of pain intensity score’. This practice indicator reflected the total number of times participants documented pain intensity scores and excluded the quality aspects of timing and documentation of the associated evidence-based tools, as indicated in the hospital clinical practice guideline. There was no apparent trend in the data (Time 1 [M = 0.75, SD = 0.50]; Time 2 [M = 0.69, SD = 0.11]; Time 3 [M = 0.59, SD = 0.20]; Time 4 [M = 0.69, SD = 0.35]) or statistically significant time effect (F [3, 24] = 0.27, p = 0.681, Greenhouse-Geisser adjusted for violation of the assumption of sphericity).

‘Pain assessment documentation effort’. This practice indicator represented the total number of times participants made an effort to document pain assessments, inclusive of anecdotal comments. Higher scores occurred at Times 1 (M = 0.93, SD = 0.38) and 4 (M = 0.89, SD = 0.32) relative to Times 2 (M = 0.71, SD = 0.12) and 3 (M = 0.72, SD = 0.26), but there was no statistically significant time effect (F [3, 24] = 1.32, p = 0.295, Greenhouse-Geisser adjusted).
1c. Patient outcome (children’s pain intensity scores on the unit). An ANCOVA was conducted to examine differences in children’s pain intensity scores in the four patient groups, controlling for the type of pharmacological pain management (single or multimodal). Type of pharmacological pain management was used as a covariate in the ANCOVA due to the statistically significant difference across patient groups at the four time points (see section on patient sample) and its clinical relevance as a correlate of pain intensity (clinical nurse leader, personal communication, June 9, 2009). Although type of surgery was also considered to be a clinically relevant factor (clinical nurse leader, personal communication, June 9, 2009; nurse practitioners, Acute Pain Service, personal communication, June 9, 2009), it was not incorporated into the ANCOVA due to the small sample size and unbalanced number of cases across the cells; however, this factor was likely captured within type of pharmacological pain management. Descriptive statistics for children’s average pain intensity scores by type of pharmacological pain management are presented in Table 8.

There was no statistically significant interaction between type of pharmacological pain management and patient group on children’s average pain intensity; that is, the relationship between type of pharmacological pain management and children’s average pain intensity did not differ significantly as a function of patient group ($F[3, 72] = 1.82, p = 0.151$, partial $\eta^2 = 0.10$). There was no statistically significant main effect of patient group ($F[1, 77] = 1.88, p = 0.174$), indicating no difference in children’s average pain intensity scores on the unit before and after the AI intervention. Due to the non-normality of the data, a non-parametric Freidman test was also conducted (controlling for type of pharmacological pain management) and confirmed the results of the ANCOVA.
Table 8

Children’s Average Pain Intensity by Type of Pharmacological Pain Management

<table>
<thead>
<tr>
<th>Type of Pharmacological Pain Management</th>
<th>Time 1 M (SD)</th>
<th>n</th>
<th>Time 2 M (SD)</th>
<th>n</th>
<th>Time 3 M (SD)</th>
<th>n</th>
<th>Time 4 M (SD)</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>1.06 (1.24)</td>
<td>10</td>
<td>0.93 (1.01)</td>
<td>6</td>
<td>1.18 (1.98)</td>
<td>15</td>
<td>0.31 (0.52)</td>
<td>5</td>
</tr>
<tr>
<td>Multimodal</td>
<td>2.96 (2.06)</td>
<td>13</td>
<td>2.06 (1.60)</td>
<td>15</td>
<td>0.95 (1.06)</td>
<td>8</td>
<td>2.34 (2.26)</td>
<td>8</td>
</tr>
</tbody>
</table>

2a. Relationships between nurse participants’ individual characteristics and the process and practice outcomes of the AI intervention. All of the nurse participants (n = 12) had data for the process outcome, while only the staff nurses (n = 9) had data for the practice outcome. Continuous data were normally distributed. Results of the analyses are in Appendix O.

Process outcome. A large, positive, statistically significant correlation was found for participants’ Attitudes Towards Research subscale scores and their PKNAS total scores (r [10] = 0.68, p = 0.016). There were no statistically significant relationships between participants’ knowledge and attitudes regarding pain and their years of nursing experience (F [2, 9] = 2.75, p = 0.117) or months of employment duration (r [10] = 0.07, p = 0.835); however, there was a large effect size for the relationship between participants’ years of nursing experience and their knowledge and attitudes regarding pain ($\eta^2 = 0.38$).
No statistically significant relationships were found between participants’ PKNAS pain assessment subscale scores and their attitudes towards research ($t \[10\] = -1.24, p = 0.245), years of nursing experience ($p = 0.727$), or months of employment duration ($t \[10\] = -1.00, p = 0.339). Participants who scored less than 100% on the pain assessment subscale tended to have longer employment durations and lower attitudes towards research, while those who scored 100% on the pain assessment subscale had shorter employment durations and higher attitudes towards research. Effect sizes were small for the relationship between participants’ PKNAS pain assessment subscale scores and their employment duration ($\eta^2 = 0.04$) and moderate for the relationship between participants’ pain assessment subscale scores and their attitudes towards research ($\eta^2 = 0.07$).

**Practice outcome.** A large, positive, statistically significant correlation was found for participants’ Attitudes Towards Research subscale scores and the practice indicator ‘documentation of pain intensity score’ ($r \[7\] = 0.78, p = 0.013$). Correlations between participants’ attitudes towards research and the remaining practice indicators (i.e., ‘evidence-based pain assessment documentation’, ‘documentation of pain intensity score and tool’, ‘pain assessment documentation effort’) were small to moderate and statistically non-significant ($r \[7\] = -0.01 – 0.48, p = 0.194-0.793$). Among these, the largest correlation coefficient was between participants’ attitudes towards research and the practice indicator ‘pain assessment documentation effort’ ($r \[7\] = 0.48, p = 0.194$), indicating that those with more positive attitudes towards research exhibited greater effort to document pain assessments.

Moderate, positive correlations that were statistically non-significant were found for participants’ employment duration and the four practice indicators ($r \[7\] = 0.25 – 0.48, p =
Relationships between years of nursing experience and the practice indicators were also statistically non-significant (F [7, 1] = 0.01-1.33, p = 0.286-0.914), with small to large effect sizes ($\eta^2 = 0.00 – 0.16$). Among these, the largest effect size was between participants’ years of nursing experience and the practice indicator ‘evidence-based pain assessment documentation’, with more years of nursing experience associated with lower proportions of evidence-based pain assessment documentations.

2b. Relationships between the number of AI sessions attended by nurse participants and the process and practice outcomes of the intervention. This question was omitted from the exploratory analyses because there was insufficient variation in attendance at the AI intervention sessions. All participants attended all sessions, with the exception of one nurse leader, who missed one session.

2c. Relationship between staff nurse participants’ knowledge and attitudes about pain and the practice outcome of the AI intervention. This analysis used the subsample of nine staff nurse participants because it pertained to the practice outcome. Continuous data were normally distributed and results are presented in Appendix O.

A large, positive, statistically significant correlation was found for participants’ PKNAS total scores and the practice indicator ‘pain assessment documentation effort’ ($r [7] = 0.77, p = 0.014$). Positive, statistically non-significant correlation coefficients were small for participants’ PKNAS total scores and the practice indicators ‘evidence-based pain assessment documentation’ ($r [7] = 0.14, p = 0.714$) and ‘documentation of pain intensity score and tool’ ($r [7] = 0.04, p = 0.927$) and large for participants’ PKNAS total scores and the practice indicator ‘documentation of pain intensity score’ ($r [7] = 0.61, p = 0.082$).
The relationship between participants’ PKNAS pain assessment subscale scores and the practice indicator ‘pain assessment documentation effort’ was also statistically significant \((t [7] = -2.46, p = 0.043)\), with a large effect size \((\eta^2 = 0.27)\). Pain assessment documentation effort was lower in the group that scored less than 100% on the pain assessment subscale and higher in the group that scored 100% on the subscale. This trend held for the relationships between participants’ PKNAS pain assessment subscale scores and the remaining practice indicators, which were statistically non-significant. Effect sizes ranged from small to large \((\eta^2 = 0.00-0.18)\), with the largest of these occurring between participants’ PKNAS pain assessment subscale scores and the practice indicator ‘documentation of a pain intensity score’.

2d. Context and culture of the unit, as perceived by the nurse participants.

**Context.** In this sample of nurses, the re-sequencing of work (0.71) and changing patient acuity (0.80) subscales of the ECS (O’Brien-Pallas et al., 1997; O’Brien-Pallas et al., 2003) had acceptable internal consistencies; however, the caregiver composition subscale had a lower internal consistency with a Cronbach’s alpha coefficient of 0.57. Overall, participants viewed their unit as a relatively complex work environment. The participants’ typical workloads were increased by unanticipated delays and re-sequencing of work in response to others \((M = 7.60, SD = 0.97, n = 9)\), unanticipated delays due to changing patient acuity \((M = 7.72, SD = 1.01, n = 9)\), and the composition of the caregiver staff \((M = 6.67, SD = 1.53, n = 8)\).

**Culture.** In this sample of nurses, internal consistency of the NUCAT-3 (Coeling and Simms, 1993) was acceptable with a Cronbach’s alpha coefficient of 0.84 and a Split-half correlation coefficient of 0.73. The three behaviours with the highest mean scores and levels
of perceived importance included being comfortable with monitoring for life-threatening situations, teaching patients, and making patients comfortable (Table 9). There was relatively more variability among the behaviours considered unacceptable to the group. On average, refusing to help a colleague and having one person, rather than the group, decide on the nursing care for a patient had the lowest scores and were considered the most unacceptable behaviours to participants on their unit (Table 10).

Table 9

**NUCAT-3 Behaviors Important/Acceptable to Nurse Participants**

<table>
<thead>
<tr>
<th>NUCAT-3 Question</th>
<th>M</th>
<th>SD</th>
<th>25P</th>
<th>Mdn</th>
<th>75P</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>(41) How important is it to be comfortable in watching for life-threatening complications?</td>
<td>4.83</td>
<td>0.39</td>
<td>5.00</td>
<td>5.00</td>
<td>5.00</td>
<td>1.00</td>
</tr>
<tr>
<td>(44) How important is it to teach patients?</td>
<td>4.83</td>
<td>0.58</td>
<td>5.00</td>
<td>5.00</td>
<td>5.00</td>
<td>2.00</td>
</tr>
<tr>
<td>(46) How important is it to make patients comfortable?</td>
<td>4.83</td>
<td>0.39</td>
<td>5.00</td>
<td>5.00</td>
<td>5.00</td>
<td>1.00</td>
</tr>
<tr>
<td>(5) How important is it to be competent?</td>
<td>4.75</td>
<td>0.45</td>
<td>4.50</td>
<td>5.00</td>
<td>5.00</td>
<td>1.00</td>
</tr>
<tr>
<td>(19) How acceptable is it to call in sick when you are physically ill?</td>
<td>4.75</td>
<td>0.45</td>
<td>4.50</td>
<td>5.00</td>
<td>5.00</td>
<td>1.00</td>
</tr>
<tr>
<td>(29) How important is it to have fun while you are working?</td>
<td>4.67</td>
<td>0.49</td>
<td>4.00</td>
<td>5.00</td>
<td>5.00</td>
<td>1.00</td>
</tr>
<tr>
<td>(33) How important is it to care for you co-workers?</td>
<td>4.67</td>
<td>0.49</td>
<td>4.00</td>
<td>5.00</td>
<td>5.00</td>
<td>1.00</td>
</tr>
<tr>
<td>(39) How acceptable is it to ask a co-worker for help directly, rather than indirectly, when you are falling behind?</td>
<td>4.67</td>
<td>0.65</td>
<td>4.50</td>
<td>5.00</td>
<td>5.00</td>
<td>2.00</td>
</tr>
<tr>
<td>(1) How important is it to understand the patient’s feelings?</td>
<td>4.58</td>
<td>0.51</td>
<td>4.00</td>
<td>5.00</td>
<td>5.00</td>
<td>1.00</td>
</tr>
<tr>
<td>(9) How important is it to work hard?</td>
<td>4.58</td>
<td>0.51</td>
<td>4.00</td>
<td>5.00</td>
<td>5.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*25P = 25th percentile and 75P = 75th percentile*
Table 10

NUCAT-3 Behaviors Unimportant/Unacceptable to Nurse Participants

<table>
<thead>
<tr>
<th>NUCAT-3 Question</th>
<th>M</th>
<th>SD</th>
<th>25P</th>
<th>Mdn</th>
<th>75P</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2) How acceptable is it to refuse to help your co-worker when they ask for help?</td>
<td>1.92</td>
<td>0.90</td>
<td>1.00</td>
<td>2.00</td>
<td>2.00</td>
<td>3.00</td>
</tr>
<tr>
<td>(26) How important is it to have one person, rather than the whole group, decide what nursing care is needed for a particular patient?</td>
<td>1.92</td>
<td>1.08</td>
<td>1.00</td>
<td>1.50</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>(22) How important is it to go along with peer pressure in giving nursing care?</td>
<td>2.00</td>
<td>1.04</td>
<td>1.00</td>
<td>2.00</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>(25) How acceptable is it to compete with your co-workers?</td>
<td>2.08</td>
<td>1.00</td>
<td>1.00</td>
<td>2.00</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>(12) How acceptable is it to do your work by yourself rather than working together with others?</td>
<td>2.17</td>
<td>0.72</td>
<td>2.00</td>
<td>2.00</td>
<td>3.00</td>
<td>2.00</td>
</tr>
<tr>
<td>(45) How acceptable is it to tell others directly what to do, rather than give them ideas about what they could do?</td>
<td>2.25</td>
<td>1.14</td>
<td>1.00</td>
<td>2.00</td>
<td>3.00</td>
<td>3.00</td>
</tr>
</tbody>
</table>

2e. Leadership style of the administrative nurse leader on the unit, as perceived by staff nurse participants and the nurse leader. The majority of the subscales for the MLQ (5X-Short) (Aviolo & Bass, 2004) had acceptable internal consistencies, with Cronbach’s alpha coefficients ranging from 0.70 to 0.88; however, the leadership subscales for idealized influence – behavior, inspirational motivation, management by exception – passive, and laissez-faire had lower internal consistencies, with Cronbach’s alpha coefficients ranging from 0.17 to 0.57. The results of the administrative nurse leader’s self-assessment were omitted to maintain confidentiality. Overall, however, the staff nurse participants’ assessments of the nurse leader corresponded with the leader’s self-assessment; they
considered her to have a tendency towards a transformational leadership style, as compared to transactional and passive-avoidant styles. The highest mean scores were for the idealized influence-attributed (M = 2.88, SD = 0.65) and inspirational motivation (M = 2.88, SD = 0.46) subscales, which fall within the larger construct of transformational leadership.

Descriptive results are presented in Table 11.

Table 11
*Staff Nurse Participants’ Ratings of the Administrative Nurse Leader on the MLQ*

<table>
<thead>
<tr>
<th>MLQ Leadership Style</th>
<th>M</th>
<th>SD</th>
<th>25P</th>
<th>Mdn</th>
<th>75P</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transformational</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Idealized influence - attributed</td>
<td>2.88</td>
<td>0.65</td>
<td>2.75</td>
<td>3.00</td>
<td>3.00</td>
<td>2.25</td>
</tr>
<tr>
<td>Idealized influence - behavior</td>
<td>2.20</td>
<td>0.61</td>
<td>2.00</td>
<td>2.00</td>
<td>2.50</td>
<td>1.92</td>
</tr>
<tr>
<td>Inspirational motivation</td>
<td>2.88</td>
<td>0.46</td>
<td>2.50</td>
<td>2.75</td>
<td>3.00</td>
<td>1.25</td>
</tr>
<tr>
<td>Intellectual stimulation</td>
<td>2.22</td>
<td>0.84</td>
<td>2.50</td>
<td>2.50</td>
<td>2.50</td>
<td>2.75</td>
</tr>
<tr>
<td>Individualized consideration</td>
<td>2.14</td>
<td>0.74</td>
<td>2.00</td>
<td>2.25</td>
<td>2.75</td>
<td>2.25</td>
</tr>
<tr>
<td>Transactional</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contingent reward</td>
<td>2.14</td>
<td>0.75</td>
<td>1.50</td>
<td>2.25</td>
<td>3.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Management by exception - active</td>
<td>1.91</td>
<td>0.98</td>
<td>1.50</td>
<td>1.67</td>
<td>2.25</td>
<td>3.00</td>
</tr>
<tr>
<td>Passive/Avoidant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management by exception – passive</td>
<td>0.79</td>
<td>0.57</td>
<td>0.75</td>
<td>0.75</td>
<td>1.00</td>
<td>1.75</td>
</tr>
<tr>
<td>Laissez-faire</td>
<td>0.44</td>
<td>0.45</td>
<td>0.00</td>
<td>0.50</td>
<td>0.50</td>
<td>1.25</td>
</tr>
</tbody>
</table>
Summary of Quantitative Results

The AI intervention consisted of four three-hour sessions delivered over two weeks. Twelve nurses participated, while nine declined due to personal or logistical reasons. Participants had statistically significantly more positive attitudes towards research than non-participants. The AI intervention was implemented with high fidelity; 100% of the designed activities for the Process and Content Facilitators were delivered as designed. Attendance was maintained throughout the AI intervention sessions, with the exception of one participant who missed the Destiny phase. Participants perceived their unit context to be relatively complex, with a culture focused on comfort with monitoring for life-threatening situations, teaching and making patients comfortable, working as a group, and a transformational leadership style.

There was a statistically significant improvement in participants’ overall knowledge and attitudes regarding pain (i.e., PKNAS total scores) post-intervention. Although statistically non-significant, participants’ pain assessment knowledge and attitudes (i.e. PKNAS pain assessment subscale scores) also increased post-intervention. There were no statistically significant changes in participants’ pain assessment documentation practices or children’s pain intensity scores on the unit (controlling for type of pharmacological pain management) over time. Exploratory analyses revealed large, positive, statistically significant correlations between participants’ attitudes towards research and both their general pain knowledge and attitudes and documentation of pain intensity scores. Participants overall pain knowledge and attitudes and those specific to pain assessment were also statistically significantly and positively related to their efforts to document pain assessments.
Chapter Six: Qualitative Results

This chapter includes results related to the qualitative research questions, which addressed participants’ perceptions of the (a) acceptability of the AI intervention (Primary Purpose, Question, 1a); (b) fidelity of the AI intervention, with regards to the factors that interfered with its implementation (Primary Purpose, Question 1bii); and (c) credibility and communication skills of the AI facilitators (Secondary Purpose, Question 2f). All nurse participants participated in an in-depth, semi-structured interview. Eleven interviews were conducted face-to-face and one by telephone, as the participant was away on leave. Face-to-face interviews were conducted in an empty patient room on the unit during participants’ lunch breaks or before or after their clinical shifts to avoid interruptions. The door was closed and a sign was posted to ensure privacy. A research assistant conducted the interviews because participants were asked about their perceptions of the facilitators (one being the investigator). The interviews were audio taped and lasted from 30-60 minutes.

The interviews were exploratory and the analytic objective was to provide a descriptive account of nurse participants’ views related to each of the qualitative research questions. Themes were ultimately organized according to these questions due to the mixed-methods study design. A thematic diagram is presented in Figure 3. Results are specific to this group of participants in this particular context; however, participants provided contextual descriptions of the study unit (i.e., culture, resources), which were incorporated into the discussions of the themes and considered to support the transferability of the results by allowing others to assess the congruence of this context with their own (Firestone, 1993; Lincoln and Guba, 1985).
Acceptability of the AI Intervention

Relevance or ‘Likes’
- A refreshing approach to change
  - Positive approach
  - Democratic nature
  - Focus on expanding on existing practices

Usefulness or ‘Effects’
- Positive reception to change
- Broadened horizons
  - Knowledge
  - Evaluation
  - Awareness
  - Practices
- Team spirit
  - Teambuilding
  - Appreciative learning culture

Fidelity of the AI Intervention

Barriers
- Change overload
- Logistics
- Busyness
- Lack of organized follow-up

AI Facilitators

Credibility
- Communication skills

Communication skills
- Breaking it down
  - Coaching
    - Guiding, not telling
    - Positive focus
    - Demeanor

Figure 3. Qualitative research themes and sub-themes.
Implementation Process of the AI Intervention

1a. Acceptability of AI regarding nurse participants’ perceived relevance and usefulness of the intervention for implementing acute pain assessment/management evidence in practice. Participants discussed the acceptability of the AI intervention in terms of their views on the AI process and the intervention sessions. The AI process is distinguished from the intervention sessions in that the process refers to the broad theory and principles underlying the 4-D Cycle, whereas the intervention sessions consist of the concrete activities and structural elements used to bring the theory of AI into practice for the purpose of this study. In general, participants did not use the terms ‘acceptability’, ‘relevance’, or ‘usefulness’ to discuss the AI process and intervention sessions. Rather, they talked about what they liked (at times, offering suggestions for change), which the investigator classified as ‘acceptability’ and ‘relevance’ and noted the effects of the AI process and intervention sessions on various individual, group, and unit factors, which the investigator considered ‘usefulness’. Participants overarching views on the acceptability of the AI process and intervention sessions are presented first, followed by their perceived effects or usefulness.

Views on the AI process: A refreshing approach to change. This overarching theme was derived in vivo and revealed that participants liked the AI process, enjoyed participating in it, and found it a valuable way to approach practice change. The AI intervention was considered distinct from typical change initiatives in which they had participated, and appealing in its atypicality.

Well when we first heard about a study being done, none…I don’t think any of us thought it was going to take…[we thought] it was going to be the opposite process. It’s usually, ‘here’s what we’re working with, what can we change’ as opposed to ‘this is what you guys are doing and doing well, how can we expand and make it better...than what it already is’. It was actually for a lot of us, I think it was quite exciting to have this sort of study being done as opposed to the usual ones that we do. (Interview 09, p. 1, lines 22-25)
I think the approach of the AI was good in that it built on the positive and built on the organization. I think that’s where most problems do occur when we’re trying to implement practice changes in that we always focus on the negative and what we’re doing wrong so…and it’s always like the nurse’s behaviour, her attitudes, her knowledge. So I think it took the focus on blaming like…not blaming but focusing on the nurse and saying like this is what you need to change. The AI looked at it in a positive manner and I think people are more willing to change. (Interview 04, p. 3, lines 38-43)

Consequent to their positive feelings towards the AI process, some participants indicated that they would readily participate in another AI intervention or that it would behoove other interventionists to assume an AI approach. AI was considered a clinically useful intervention because it was applicable to other areas besides pain, as described in the following example:

I think more studies should be done this way, put forth and sort of open it up to anyone and everyone and not just dealing with pain but I think dealing with other issues and situations that, you know, you come across…quite frequently. It think it would be so much easier and better if we had this sort of approach to dealing with different issues rather than saying ‘you know what, that doesn’t work, we’re scrapping it, we’re changing, we’re starting from scratch, we’re gonna do it all over’. (Interview 09, p. 29, lines 26-40)

Participants considered AI to be a refreshing approach to change due to three factors characteristic of the process: the positive approach, democratic nature, and focus on expanding on existing practices. A general description of these themes is followed by the participants’ views on the AI intervention sessions, and the perceived effects of the AI process and intervention sessions.

*The positive approach of the AI process.*

It’s good in the way that it acknowledges what we’re doing right and the strengths that we have and then it just helps us to strengthen whatever it is that we’re already doing well into something better, and I really like that part of the whole process. (Interview 05, p. 1, lines 12-14)

This theme was derived *in vivo* as participants repeatedly praised the positive approach of the AI process. Within the AI intervention, focusing on the positive included
giving attention to strengths and successes on the unit related to pain and other clinical areas.

Engagement in this positive approach was described as a rewarding, motivating, and empowering experience. Although the group liked holding a positive focus through the AI intervention, this task was not necessarily felt to be effortless; it was considered a novel approach in a context (i.e., society and work environment) that was seen as being more attentive to the negative. Although it was a noted challenge to focus on the positive at the outset of the intervention, this was felt to diminish over time. One participant noted that the constant attention given to the positive was beneficial to altering her way of thinking:

And that was the thing, we did keep focusing and we would move on from it and try to think of something positive but it would always come back to ‘okay, we need to make this better because this is where the gap is’. So it kind of kept going in a circle, back to where we didn’t want to be but I think it…like I think it was good - it made us change our way of thinking and I think it was more encouraging to say ‘okay, no, we need to focus on the positive stuff’. (Interview 04, p. 5, lines 6-14)

When introducing the AI intervention to the participants, the Process Facilitator purposefully noted that, although the focus was on exploring strengths and successes, it was acceptable to talk about issues and challenges; the contingency was that the group would work together to re-frame issues in a more constructive manner. In some cases, this acknowledgment of challenges was considered an important element in avoiding negative sentiments around maintaining a strictly positive focus.

Like even though we were talking positive, positive, positive but we were looking at all the negative aspects and trying to make that positive. So I don’t think that anybody in the group actually felt anything different or felt negative about only talking about positive and not the negative aspect of what we do on the floor. (Interview 08, p. 2, lines 6-9)

The democratic nature of the AI process. There was widespread enthusiasm about the democratic nature of the AI process amongst participants, but especially from the staff nurses. The investigator developed this theme from the data, as staff nurse participants often
contrasted the AI process to the more dictatorial approaches to change (speaking explicitly about being ‘dictated to’) that they were accustomed to on the unit.

I don’t know of any other [approaches to change] other than being sort of told what we should do. And this was a nice refreshing approach to collecting information. I think it worked well because like I said, I was very impressed with it because I guess a lot of times when we’re the ones that are actually doing the work, we’re not the ones that are asked questions about what we should be doing or how we should do it – we’re being told what we should do, right? And it’s nice to be able to give the input because a lot of us, like I said have many years of experience and knowledge behind this stuff…and it does support, you know, the changes, you know? (Interview 06, p. 6, lines 28-45)

Staff nurse participants discussed their appreciation of being involved in the AI intervention from the outset and the equal participation of staff nurses and nurse leaders alike. Being leaders of the change was relished and the experience of working together as equals in a group was described as fun, exciting, and rewarding. In some cases, staff nurses spoke about their experience in the context of autonomy, indicating that they appreciated the control afforded them through the AI intervention. Implementing the action plan on their unit without outside assistance was considered an empowering experience; overall, they noted that a continued relationship with the facilitators was not desired and felt that they had enough support amongst themselves to move forward with the plan. The nurse leaders spoke to the benefit of involving staff nurses in the change initiative, including the uncompromised value of gaining contributions from those who will use the practice, their ideal position on the unit to defend the change to their colleagues during the implementation, and the positive influence on their professional esteem.

The main thing is there needs to be buy-in from nurses and this is the best way to do it rather than going in and saying ‘okay, this is what has shown to work so you have to use it’…And that’s very important because nurses are the ones that use it and a lot of times nurses are always saying ‘well [the] people that made these tools, or [the] people that are doing this or that [nurse leader], or that [nurse leader] or whoever they’re putting forth but they’re not taking care of the patients…we’re the ones that do it’. So then looking at it from when I was a bedside nurse as well and then looking at it from the [nurse leader] perspective too…it’s a
win-win situation because you’re putting the power into the hands of the nurses…and they feel like they’re having a voice and they’re making the change or the difference. (Interview 07, p. 1, 18-44)

Approaching change in a democratic way was viewed not only as advantageous, but also essential. For example, one staff nurse participant noted: “I think you need to have people that work on the unit to implement because [they] know what’s needed and what’s positive about what’s going on here” (Interview 01, p. 1, lines 38-40). Working together and including input from staff nurses was considered a means to make the change more effective for everyone. Despite the increased workload associated with this approach, some of the staff nurse participants remarked that it felt less burdensome relative to more dictatorial initiatives; the load of change was lightened by the fun associated with their involvement in the initiative, not being told what to do and how to do it, and working with their colleagues. However, one of the novice staff nurse participants commented that she found the responsibility of implementing the plan challenging to manage due to time constraints. She used protected time from another role she assumed on the unit to implement her audits and felt that, although it was likely not practical and might not be accepted by others, implementing the action plan outside of work time might be easier.

A focus on expanding on existing practices. Expanding or improving on the existing practices of the unit, rather than implementing something entirely new, was viewed as a more practical and realistic way to approach change. This was an in vivo theme and sometimes discussed in light of the more typical approach of targeting individuals, rather than existing structures, processes, and practices in the change process. For example:

If you’re focusing on structures and processes like documentation instead of, I guess trying to change attitudes on the unit…it’s…it’s…I guess it’s more realistic to do it that way because it’s really hard to change someone’s attitudes about something or even someone’s ()…knowledge because that can be received differently. But if you’re trying to improve on
certain processes like documentation that’s something you have to do, you know what I mean? (Interview 05, p. 3, lines 10-15)

Staff nurse participants noted that they had been doing pain assessment documentation on the unit already and that the nurse leaders had also routinely done audits to evaluate their clinical practices. This audit template was modified and used by the staff nurse participants for the purpose of the pain assessment documentation audit in their action plan. Overall, participants noted that expanding on existing practices eased and supported their implementation of the action plan as an independent group; they were already doing the practice and therefore were confident and comfortable with the change they were putting forth. However, another participant noted disappointment around the topic choice of pain assessment documentation for this very reason, stating that it “wasn’t a far stretch to implement it on the unit” (Interview 02, p. 3, line 5). The prospect of implementing a new practice, while not impossible, was seen as a bigger challenge. One participant noted that:

I think the biggest the most key thing in this whole study was that it was an actual positive approach. It was…no matter what it was or how familiar we were with it or unfamiliar or how new or old, I don’t think that matters. I think the fact that we’ve taken something that we’re already doing whether it’s something fairly new or something that we’ve, you know…done forever, taking that and just expanding that no matter how big or how little, I think it’s that positive approach to change that makes the difference. (Interview 09, p. 6, lines 27-32)

In addition to expanding on their existing clinical practices, the AI process was viewed favorably by participants because it supported building on their ways of practicing on the unit. Participants purposefully developed pain assessment documentation audits that were delivered colleague-to-colleague (i.e., staff nurse participants provided feedback to the other staff nurses on the unit). This element of the action plan was considered important because it made the feedback less intimidating to their colleagues and enjoyable to the participants because it gave them an informal leadership role on the unit. Moreover, informal interactions
with their colleagues were considered a natural and usual way of addressing practices on their unit. As one participant said: “Just talking about improving practices and that kind of thing, like, we do it everyday” (Interview 05, p. 13, lines 18-19).

**Views on the AI sessions.** The participants commented on several factors related to the acceptability of the AI intervention sessions, including the structure of the sessions (i.e., number, frequency, and duration), nature of the group (i.e., group size, mix, and dynamics), and facilitator partnership. These themes were developed by the investigator based on the data and are described below.

**Structure of the sessions.** Overall, participants liked the number, frequency, and duration of the AI intervention sessions. The duration of the sessions was cited as a particularly important element of the intervention design. For example, one participant noted that: “I felt comfortable sharing my thoughts and views and I don’t think that would have been possible if it felt very rushed” (Interview 07, p. 15, lines 32-34). In general, the participants noted that they could have talked for a longer time during the sessions, but mostly because they enjoyed the experience, not because they needed more time. Despite this general desire for more time, it was considered important to have a cut-off for the purpose of productivity. The three-hour duration of each session was considered an acceptable and reasonable amount of time, as indicated in the following example:

I thought it was a good amount [of time]. Like I thought…like sometimes we seemed to be a little short on time but I think you have to have a time limit and it works well so that you work within the limit and get stuff done. So it’s most productive. So I thought the time and amount of sessions were good in terms of like getting our maximum productivity without being too much of a …being too much. (Interview 02, p. 6, lines 20-27)

The one exception was the Design phase, which was felt to require more time due to the nature of the activity in that phase; everybody had contributions to the Provocative
Proposition and the group was intent on creating a statement that was an accurate reflection of their thoughts and intentions. For example, one participant stated:

[I think the Design phase could be a little bit longer] because that’s the phase where you’re trying to come up with different ideas and especially with such a large group it’s hard to kind of fully decide...what you want to do. Even coming up with the [Provocative Proposition]...it was [a challenge] to agree on a single sentence and people had different opinions...so I think you sort of need a lot more time for that. (Interview 05, p. 9, lines 22-29)

Another participant suggested that a practical solution to accommodate the need for more time would be to add more sessions, rather than lengthening each one. With regards to the frequency of the sessions, there was general disagreement around the acceptability of the full-day session that covered the Discovery phase in the morning and the Dream phase in the afternoon. Some participants thought it was a good day because: “It focused on what we did well and wanted to do better” (Interview 05, p. 8, line 16), they felt the material was fresh in their minds, and they liked reducing the number of session days. More commonly, however, participants found it to be a long day, tiring, and not as productive as a result. The nurse leaders remarked that they found the full day to be too long because they were also working during the AI intervention sessions. They noted they were unable to free themselves up for the sessions due to the structure of their work and nature of their professional roles.

Keeping the sessions closely spaced was felt to be essential for maximizing continuity and minimizing disassociation from the content and process of the AI intervention. Overall, participants indicated that they liked completing the intervention within a two-week period and felt that decreasing the frequency to even one session per week might make it too long and compromise their productivity. Emphasis was placed on the cumulative nature of the AI phases and the value of closely spaced sessions to keep them mindful of the material covered in each session so that time was not wasted trying to refresh their memories. However, one
participant noted the tension between the theoretical preference for closely spaced sessions and the practical realities imposed by their work environment:

[The spacing of the sessions] was good that way because it didn’t…we didn’t have much time between each session which was the good part because all the stuff that we talked about in the session before, it was quite fresh in our minds. I think if we had done once a week it would have taken us a little bit longer to get back to where we were…when we did the previous one. On the other hand, having them that close together is hard because you have to do it on your days off. And it’s hard to get…I mean it’s a pretty big group and it’s hard to get everybody off at the same time without compromising…the unit…Scheduling-wise it’s easier to do once a week but thought-wise…closer together [is better]. (Interview 09, p. 15. lines 13-22)

Nature of the group. Overall, participants were satisfied with the size of the group. A fine balance was noted between group size and productivity, and a recurrent view was that the size was at its maximum in terms of effectiveness: more people would have meant more opinions, which might have become unmanageable. Based on the plethora of opinions expressed during the sessions, one participant felt that the group size was too large. She acknowledged that the larger group was helpful for implementing the action plan, but that a smaller group could have managed by simply selecting a smaller area for change. However, it was more commonly noted that there was strength in numbers and the impact made by a relatively large group was important for carrying the change forward on the unit.

I think because there were quite a few of us and because we sent out emails and we had the slide show and everything people were looking and listening out for it. And they knew quite a few of us were interested in it so I think having us act as leaders and being involved and interested, it showed that ‘why are they interested in that? Well, maybe I should be too.’ And I don’t know, I think it really…that sort of thing works well on our unit - just having the numbers sort of speak for themselves. (Interview 12, p. 8 lines 44-46; p 9, lines 1-3)

The value of the relatively large group size was often discussed in the context of group mix. The diversity of experiences and professional roles in the group was considered an asset to the process and potentially compromised by involving fewer participants.
I think the [number of participants] was a good thing. Because there were twelve participants it gave feedback from a variety of nurses because the nurses that were there, like I said there were [nurse leaders] so they have a different perspective. And from the bedside nurses themselves, even in the bedside nurses there’s different personalities, different views on things. And with having twelve participants it gave very different views…that came in because I think the more participants involved the more views…the more ideas you have. (Interview 07, p. 17, lines 24-32)

Several participants noted that the group dynamic was one of equality and open communication. Certain techniques used by the Process Facilitator were felt to promote this dynamic by increasing participants’ comfort with making contributions, eliciting input from the quieter participants, and generally stimulating discussion. These techniques included individual, paired, and group approaches to activities and addressing the quieter participants by name. The positive focus of the AI intervention and the Process Facilitator’s attention to it were also felt to facilitate open communication within the group. Some staff nurses noted that, in the presence of the nurse leaders, their comfort with discussing their practices and the unit might have been compromised by a focus on deficits. For example, one staff nurse participant remarked:

And the way that everybody framed the sentences also was again to reflect more the positive than the negative because as [the Process Facilitator] kept on saying…‘think about the positive aspects, we are not here for the negative ones’. So that again influenced the way we brought information out to the table without having to fear that my [nurse leader] is sitting here or my [other nurse leader] is sitting here. (Interview 08, p. 14, 19-23)

Ultimately, the group dynamic was felt to support interactive discussion, which was commonly noted as an enjoyable aspect of the AI intervention sessions.

*Facilitator partnership.* This theme refers to the pairing of the Process and Content Facilitators to guide participants through the AI intervention sessions. A Back-Up Facilitator was present, but mainly recorded participants’ contributions during group discussions.

Although the Process Facilitator was identified as the main facilitator, participants spoke
about both the Process and Content Facilitators as being valuable and necessary to the process. Their partnership, as well as their distinct roles within it, was emphasized as being essential to the AI intervention sessions. An important aspect of the Process Facilitator’s role was considered to be her provision of theory-based information in simple language around the AI process. Important elements of the Content Facilitator’s role were her contributions of pain-related information and, as one participant articulated, “a practical sense of what we do on the unit” (Interview 10, p. 22, line 5). Their partnership was considered valuable because they contributed different perspectives, ideas, and experiences to the group. They were noted to operate as a team, communicate effectively, and complement each other well. Their good relationship was mentioned as being influential to group functioning and the prevention of conflict.

In light of the group size, one participant noted the value of having the Back-up Facilitator who could focus solely on recording the results generated in the group discussions. Recording these results on mural paper in real time was considered an important facilitator role and a valuable design feature of the AI intervention sessions that facilitated the development of ideas, focused the group, provided reminders of material covered, and gave an overview of the contributions of the team. Other facilitator-led features of the AI intervention that were discussed as being helpful were the Process Facilitator providing summaries of the activities before the sessions and handing out synopses of the discussion points from the previous session to start the next session. These elements were felt to increase productivity in the sessions by focusing the participants, introducing new ideas early on, and refreshing them on material that had been covered. One participant noted that these techniques were helpful because they made her feel like she was “part of the group and part
of the activity” (Interview 06, p. 32, line 12), while another emphasized that the combination of facilitation aids used by the Process Facilitator (visual, audio, written) supported the various learning styles in the group.

**Effects of the AI process and intervention.** It improved our practices definitely and it also showed it is something that, you know there are so many different venues that this could influence. It can influence a nurse’s practice, it can influence her knowledge, it can influence her attitude, it can influence the way she talks about it… to others and even promoting it can be influenced because we identified it like something, let’s say as a talent right, a hidden talent that was brought out through this pain study. So I think it was good. (Interview 08, p. 5, lines 9-14)

Participants framed the usefulness of the AI intervention according to the effects of the positive approach of the AI process, its democratic nature, and the focus of expanding on existing practices. More specifically, they discussed the effects on the AI process and intervention sessions on individual, group, and unit factors. These effects were organized under three main themes, including positive reception to change, broadened horizons, and team spirit.

**Positive reception to change.** This theme was derived *in vivo* and reflects the dominant view that the AI process resulted in a positive reception to change from the participants and their colleagues on the unit. The number of participants in the AI intervention was viewed as surprisingly large and evidence of this positive reception, with one participant remarking that with “other studies [that] have been done, it’s always very difficult to get that much…that many people” (Interview 07, p. 10, lines 7-8). Some noted that the number of participants could have been even greater; several colleagues had wanted to participate but were unable due to scheduling constraints or had expressed regrets that they had not signed up to participate once they heard about the AI experience. This positive reception to the AI intervention and the change it sought to promote were explicitly linked to
the themes of the positive approach of the AI process, its democratic nature, and the focus on expanding on existing practices.

The positive approach of the AI intervention was felt to bolster the overall inclination to change on the unit. For example, one participant stated: “I think people are more willing to integrate change into their practice if they’re optimistic about it” (Interview 04, p. 1, lines 11-12). More emphatically, however, participants talked about the air of excitement created by the positive focus of the AI intervention: “How can you not get excited about something positive, something that’s gonna praise you?” (Interview 09, p. 21, lines 38-39) This excitement was not only linked to an increased acceptance of the intervention and change on the unit relative to more typical approaches (i.e., deficit-based), but it was also considered a motivating factor for participants through the intervention process.

I guess it was a totally different approach than what we were used to. It’s usually … it’s completely opposite from like people telling you ‘okay, this is what you’re doing wrong so you need to fix it’. But this sort of approach sort of helps us get excited about what we’re doing and it sort of builds … and I think that excitement sort of builds our drive to help make it better. So I like that part of it, that whole intervention because it really … it really does like get you excited because it’s like ‘wow we’re really doing a really good job but you know what there’s still room for improvement so let’s try and make it better’ and it sort of fuels that drive. (Interview 05, p.1, lines 18-25)

In addition to cultivating excitement, the AI intervention was felt to stimulate curiosity on the unit. This curiosity was largely attributed to the democratic nature of the AI process and the fact that the ‘higher ups’ (e.g., management or other colleagues in leadership positions) did not drive the initiative. Overall, participants felt that the democratic nature of the intervention positively influenced the responsiveness of their colleagues to the practice change, eased the task of encouraging the change, and increased the acceptability of integrating the change on the unit.
So I think our colleagues are more responsive to hear from us as co-workers what we think we need to change rather than having it come from above and telling us what we have to change. As well as like working on the floor, we have a bird’s eye view on what works well and how our co-workers would be accepting of whatever we say that we thought should be changed. But not only…but not only implementing but to create what we thought needed to be changed. They would be more understanding, I think, hearing it from us that we think as a group, as a whole that this needs to be changed rather than somebody from up above is telling us that we have to change this. (Interview 04, p. 1 lines 33-41; p. 2, lines 1-4)

Lastly, expanding on existing practices, rather than implementing something entirely new, was considered an important contributor to the positive reception to change by participants and their colleagues. This approach was viewed as less overwhelming and burdensome. For example, one participant stated: “It wasn’t like this huge cliff we had to go up. We were already there. We just wanted to make it a little bit better” (Interview 04, p. 5, lines 27-28). Ultimately, easing this burden of change by expanding on what already existed on the unit was considered an important element to decreasing resistance to change.

I find that we do have some of our senior nurses as they call themselves who are not … and it’s not just the seniors, I mean we have you know a wide range but there are some people who just don’t like change and I find … I think it’s easier to deal with enhancing something rather than changing. (Interview 09, p. 5, lines 9-12)

This element of the intervention was felt to be especially important in light of all of the hospital-driven changes occurring on the unit at the time of implementation, which one participant noted decreased their threshold for receiving new information to use in their practice (see Barriers – change overload).

**Broadened horizons.** This theme was derived *in vivo* and encompasses the participants’ sentiments that the AI intervention facilitated an increase in the range of things they knew, were aware of, and were able to do related to pain assessment and management. It contains the following effects of the AI intervention, as perceived by the participants: an
expanded knowledge base around pain, the informal evaluation of their pain knowledge and practices on the unit, an increased awareness of pain, and practice changes.

While the majority of participants indicated that the information presented to them was not new, some noted that their knowledge base for pain increased as a result of the AI intervention. This was, in part, attributed to the Content Facilitator’s formal and intensive review of the hospital pain assessment and documentation clinical practice guideline. They viewed this exercise as valuable because it refreshed them on information that had become routine. As a result of their action plan, participants felt there was an increase in knowledge on the unit. They considered their staff nurse-colleagues to be more knowledgeable about a wider variety of pain scales and to have a greater understanding of their available resources for pain assessment.

I think the AI process just made us fine tune it a bit and look at how better we could use the tools that we already have in place, how better we can use our pain assessment sheets, how well do we know the actual things that are available like the scales and using it the way we need to be using it. So it was fine tuning things. We just built on what we already had … and made sure that people didn’t forget it was there. Because a lot of those scales we started reminding people even I had forgotten about them and it really got people into thinking ‘I have a baby so maybe I should really think about what scale I should be using’. (Interview 10, p. 2, lines 29-35)

It was more commonly viewed, however, that their knowledge was increased through the more informal knowledge sharing that occurred during the group discussions. These discussions were felt to expose participants to different points of view about pain assessment and management evidence from the facilitators, as well as from each other.

I guess just having the different policies and having different people there with different…different views and different ways of interpreting … different interpretations, I think for all of us it’s expanded our knowledge base. Having different views … I mean we … we all have our ways of thinking. We’re set in our own ways but I think having [the Content and Process Facilitators]…they were there for the same reason but I think they brought…put forth different ideas…which I think was quite helpful because it opened up our…like it
broadened our horizons too and it gave us different ways of looking at things. (Interview 09, p. 7, lines 44-45; p. 8, lines 1-15)

Additionally, the knowledge sharing in the AI intervention sessions was discussed as providing an informal means for participants to evaluate each other’s knowledge, provide feedback, and collect baseline information on and appraise their current practices before proceeding with a change initiative. The Discovery phase was considered a valuable means to these ends:

When we were brainstorming in the Discovery phase talking about what…what practices were effective, I think that’s the kind of knowledge that you bring back to the unit and you’re sort of reenergized. Like all those ideas, all those practices that we do well and we were able to share it in an open forum you come back and think ‘oh okay, we’re doing awesome’ like…and…yeah, I think you do gain a little bit of knowledge coming back to the unit just by everyone sharing…best practices…and stuff like that. (Interview 05, p. 5, lines 5-10)

In this context of evaluation, participants commented on the dual value of discussing the positive and negative aspects of their practice. Talking about the positives was felt to highlight some existing issues or challenges that needed to be addressed. And, focusing on what worked well on their unit was considered to be a facilitator in their consideration of those issues and creation of an achievable plan for the unit.

Participants also felt that the AI intervention sparked a general increased awareness around pain. This increased awareness was, in part, attributed to the AI intervention sessions that removed them from their everyday work and gave them an opportunity to focus on pain. For example, one participant noted that her involvement in the sessions was helpful because it was “like a little pinch or reminder not to forget pain” (Interview 12, p. 9, line 24) and that “after the pain study I found that I was thinking about pain as more of a priority than maybe I had before” (Interview 12, p. 7, lines 27-28).
At the unit level, the implementation of the action plan was noted to result in an audible ‘buzz’ around pain amongst the staff nurses. This buzz was attributed to the implementation of the action plan by the staff nurse participants (by and large), the visual provided by their Provocative Proposition poster, and the purposeful colleague-to-colleague nature of their audits. In general, pain assessment and management were felt to become more prominent points of discussion on the unit, as stated in the following example:

I think with the repetition and just everyone talking about pain, everyone being so focused on the optimal pain management and all these factors that we’re doing gives everyone a better awareness when they’re thinking…like when they come on their day and they have their assignments and they’re giving their meds, it’s just in the back of your mind. I think it makes your work, you know easier because of this or more awareness, I think as time goes on that that’s what they….and they’re focusing and the nurses are teaching other students and there are student nurses that are working on the unit and people who are precepting people…and I’ve noticed that’s a big thing because that’s what I’ve been implementing in my practice with the students that I have to work with and stuff is to pass it on, you know to pass it on to them how important it is. (Interview 03, p. 18, lines 41-46; p. 19, lines 1-4)

However, despite these positive sentiments, there were mixed feelings on the effects of the AI intervention on actual pain assessment documentation practices. The majority of participants felt unsure if it had helped their pain assessment documentation; a few felt more confident that it had – if not concretely, it made them more thoughtful around their practices.

There was a notable increase in the reminders given on the unit to document pain assessment scores post-intervention. These reminders were said to come from participants, especially those in leadership roles on the unit, as described in the following example: “I’ve definitely noticed that people are reminded more often and there’s more talk of writing down pain scores…it’s something that’s sort of spread now, at least that I’ve noticed from a few different nurses in charge”. (Interview 12, p. 4, lines 43-46)

Beyond pain assessment documentation, participants noted other practices that were affected by the AI intervention, including thinking about pain assessment in a more
individualized and comprehensive way and re-assessing pain post-analgesics. Several participants noted that they and their colleagues also began using pain assessment tools that were not used in the past.

But yeah, I think … we’ve had … I mean ever since we’ve started this we’ve had a lot more of the scales pop up. People are more familiar with the different types that we have and are using a greater variety…You see a lot more people running around and looking for the different pain scales and making sure that they’ve got that which is not something that happened all that often before but ever since we’ve done this it’s now…you can see a change. (Interview 09, p. 5, lines 22-28; p. 7, lines 29-31)

*Team spirit.* This theme was developed by the investigator and includes participants’ explicit references to the AI intervention being a team building experience and allusions that it contributed to creating a more appreciative learning culture. An appreciative learning culture is a theoretical concept that denotes a culture with a spirit of ongoing inquiry that is attentive to successes (Cooperrider et al., 2005). This concept was briefly presented to participants in the concluding remarks of the AI sessions when they were encouraged to implement the action plan on the unit and use the AI process to drive a continued evolution towards positive change.

The teambuilding effect of the AI intervention was largely discussed as a result of participating in the sessions, but was also remarked on as spreading to the unit. For example, one participant stated: “It has made me think a lot more and helped my colleagues to do things together as groups” (Interview 08, p. 8, lines 13-14). Participants emphasized the enjoyment and value of sitting down together and working towards a shared goal. The sameness of their visions was described as a pleasant discovery in light of their different levels of experience and professional roles on the unit.

But certainly the intervention itself…like I mean the first [session, Discovery] where we talked things and what we did well and I think that was really positive, that was really teambuilding…and people really, you know got excited and thought about all the good things
they do and I think that was really positive. And then...having them come up with that...[Provocative Proposition]...so that was really exciting and again the teambuilding that went on with that and I think it brought a lot of the people closer together and it was nice to see like staff nurses, you know plus [the nurse leaders] all with a common goal...and at the time about how we were gonna improve it. So it was really, really good for teambuilding, I think. (Interview 11, p. 1 lines 30-44; p. 2, lines 1-4)

In light of this varied group mix, the capacity of the group to commiserate on equal footing was spoken about with pride and satisfaction, as expressed in the example: “It was a group of staff from different levels, but the levels don’t matter, we all worked as a team, side by side to come up with something we thought was gonna work for the entire unit” (Interview 09, p. 29, lines 42-44). Approaching the discussion as equals and focusing on the positive were felt to cultivate respect and trust for each other’s judgment, closer relationships, revelation of strengths, and a general appreciation for each other as individuals and as a team. As one participant articulated: “I think it brought out a lot of qualities in our team and as individual nurses” (Interview 08, p. 24, lines 27-28).

One of the nurse leaders noted how participating in the AI intervention sessions did “wonders” for her “reputation on the floor” (Interview 10, p. 11, line 16) because the staff nurses saw her as an equal with a practical opinion. Ultimately, the team building that occurred during the AI intervention was viewed as a supportive factor to the dissemination of the action plan on the unit; there was considered to be greater strength in unified numbers. And it’s good on the unit that we can all discuss it because the group brings it back to your colleagues and to everyone so we share the ideas but I think also it was good that they know that there was a team that was focused on this that was trying to bring it. And it’s an everyday thing now, it’s not gonna be like just because of that study. (Interview 03, p. 20, lines 22-26)

Fostered in part by this enhanced appreciation for each other and their team, allusions were made to the evolution of an appreciative learning culture on the unit. Several participants indicated that the positive spirit of the AI process was purposefully carried
forward in the implementation of their action plan. This spirit was felt to catalyze an
inclination towards being more positive in their everyday interactions on the unit, as
described in the following example:

It was almost a kick to say ‘you know what? I think maybe we’re not [discussing things in a
positive way] as often as we should’ as well. So it sort of brought us back to centre and say
‘okay, you know what, maybe we should continue on this way as well and not just, you know
…just for [the study] but as a whole too’. (Interview 09, p. 4, lines 38-44)

One of the nurse leaders brainstormed about different initiatives that could be
implemented to enhance pain practices on their unit, all of them having a notably positive
approach. Another staff nurse participant remarked on her newfound focus in everyday
practice of building on what was available (rather than on deficits) and the inspirational
effect of the AI intervention on pursuing other projects with her colleagues:

Well I think it has stimulated us to think about a lot of other things besides pain. It did cause
us to think a lot more which means a lot of…our recommendations are basically…like I’m
doing something right now, reviews, so I’m kind of motivating people or writing notes or
making suggestions so that people could do group work. (Interview 08, p. 8, lines 5-8)

Several participants noted that they went above and beyond the items in the action
plan by creating a binder of pain assessment policies and guidelines and making hard copies
of the pain scales accessible at the nurses’ station and on the charting clipboards.

1b(ii). Fidelity of the implementation of the AI intervention regarding nurse
participants’ perceptions of the factors that interfered with its implementation.
Participants described several barriers that adversely affected their participation in the AI
intervention sessions and the implementation of the action plan on the unit, including change
overload, logistics, busyness, and a lack of organized follow-up. There was frequently a
divide in perspectives on barriers between the staff nurses and nurse leaders. Overall,
however, participants stated that the action plan was implemented in full and as planned, with
the exception of a minor delay at the outset (described under Logistics). The implementation was noted to be a discrete event that ended once the plan was implemented.

**Change overload.** The thing is when we were trying to implement it, it was a really tough time because there were so many things on the unit that were changing…[the] IV pumps, the whole change of the computer system. It was just everyone was going through change overload…(Interview 05, p. 6, lines 1-3)

This theme was derived *in vivo* and reveals the context of change on the unit during the implementation of the action plan. This context was attributed to several hospital initiatives being implemented concurrently. Participants mentioned the introduction of new IV pumps and a computer system, as well as staff nurse orientees. While some indicated they felt no effect of the hospital initiatives on the implementation process, the widespread sentiment was that they slowed their progress. However, this was largely attributed to the impact of the ‘change overload’ on one of the nurse leaders, rather than on themselves:

And I think that’s where we ran into that issue about not being able to get our [education module]…the email sent out on time…because whoever was doing that was dealing with IV pumps and it was just …it was a bit too much from that end, I think but from our end because we weren’t all…all of us were not that involved with the IV pumps, I think, you know if we got the email out we would have been able to stick to [the timeline]. (Interview 09, p. 24, lines 13-17)

In spite of this transient context of change on the unit during the implementation of the action plan, participants noted that the long-standing culture on the unit was one of ‘passion for pain management’. In general, this culture was referenced as making them an appropriate group for the AI intervention, facilitating their participation in the intervention sessions, and supporting their implementation of the action plan in the face of contextual barriers. Managing pain was considered a usual way of practice on the unit and a high priority of care. For example, one participant stated: “It’s part of our culture that poor pain management is unacceptable here and we intervene as best we can” (Interview 11, p. 10,
This culture was attributed to the nature of the patient population, which was regarded as one that demanded attention to pain management. Additionally, participants felt it was an expectation that was handed down from the senior nurses. This culture around pain management was also noted to be a growing presence at the hospital level.

I think we do a really good job here. We’re passionate about pain control, we always have been. It just comes down from senior nurses and it’s our culture here so we’re proud of that. It should be at [the hospital] and they’re really promoting that also. I just went to the pain day and pain service is really involved throughout the whole hospital with all the kids but as for [our unit] we have…that’s our culture here. We’re surgical and that’s just the way it is. We have a lot of pain champions like through the RNAO we have like five here on the unit.

(Interview 01, p. 4, lines 34-36; p. 5, lines 1-4)

Several participants remarked on their passion for pain management in the context of the monetary compensation provided for participating in the study. The money was largely seen as a bonus, but not the driving factor, for their participation. Rather, a pure interest in and commitment to pain management were noted as the dominant incentives, as evident in the following example: “I think the money was a motivator for sure but I also think that people were keen because it was pain and that’s something people are passionate about”

(Interview 11, p. 17, lines 11-13).

They also discussed their culture around pain management with respect to their pre-intervention pain knowledge and practices. For the most part, the pain assessment and documentation information presented in the AI intervention sessions was not considered new. A novice staff nurse noted that she had learned the material in orientation, while others mentioned being familiar with it through the online guidelines. However, opinions on their pre-intervention pain assessment documentation practices were mixed. For example, one participant remarked that they had been in the process of working on this practice area and were, therefore, already doing a relatively good job. Others noted that pain assessment
documentation was not necessarily done in practice and, although the guidelines and pain scales were available, they were not necessarily used.

Participants also described cultural features outside of pain they felt made their unit a favorable setting for the AI intervention. For example, one participant noted that, consequent to it being a teaching hospital, there was a curiosity on the unit around new initiatives. Another remarked that it was a “fairly young unit, a kids hospital, we like to have fun and stuff like that, and people are fairly positive on the unit anyways” (Interview 02, p. 13, lines 26-27). Others affirmed this pre-established tendency towards the positive on the unit, and one participant added that there was also a dynamic of equality and teamwork, and a sense of autonomy amongst the staff nurses to approach tasks independent of outside assistance.

See the thing…as a unit we’re very self-sufficient as a unit…very familiar with each other and so when we get our heads together to do something we don’t very often go outside of…we don’t need to go outside. We don’t need to access our, you know [nurse leaders]. We don’t…we manage amongst ourselves and answer our own questions basically. (Interview 09, p. 9, lines 22-26)

We’re all part of the same team and it’s not ‘I’m the nurse and you’re the [nurse leader]’…and it’s not even…like there aren’t…I don’t think there’s any real levels of boundaries. (Interview 09, p. 16, lines 30-32)

**Logistics.** The investigator developed this theme to refer to barriers related to the organizational details around the coordination and implementation of the action plan, as well as those relating to participants’ attendance at the intervention sessions. Summer holidays were often cited as interfering with the implementation of the action plan, as some of the participants were away for extended periods of time. Overall, however, the staff nurse participants discussed the effect of a delay resulting from a nurse leader delivering late on an early phase of the action plan. This caused mild frustration on the part of some staff nurses, who felt it decreased the momentum of the process. Others expressed understanding that the
delay was a function of the nurse leader’s workload, which was compounded by the unexpected leave of another nurse leader who was meant to be her support for the task. One staff nurse participant noted that this delay was a judicious decision in the context of change on the unit:

There were so many things all at the same time… that I think that’s why [nurse leader] decided to hold back … because otherwise you do get, you know people not doing it…there’s not compliance, they don’t care, you know it’s just too much all at one time, yeah.

(Interview 06, p. 23, lines 7-9).

Ultimately, some staff nurses reported that they pushed forward with the plan in spite of this delay, in an effort to stay on target with their deadlines.

Conversely, the nurse leaders tended to focus on the logistical barriers of their professional roles and practice. They indicated that the structure of their schedules and nature of their responsibilities made it difficult to free up the necessary time for the AI intervention sessions. For example, one nurse leader noted:

From my perspective it was kind of hard to be away from what I had to do because it was different … like for the staff nurses it was actually off-days. So they came in on an off-day to do it…where as I would have to leave my stuff, my duties for that day to go and be away for a period…I couldn’t stay for the whole [full-day session]. I had to leave for a bit of it. Because it was part of my workday and it was just…I tried to see if I could free myself up for that time but I couldn’t. (Interview 10, p. 8, lines 39-42; p. 9, lines 25-26)

They discussed the inconsistency of their participation with some frustration and one nurse leader emphasized that it was unfair to the staff participants. A staff nurse participant echoed this sentiment and felt that all participants should be expected to maintain an equal and full level of participation in the intervention sessions.

Despite their frustrations with the logistics of participating in the AI intervention sessions, the nurse leaders articulated an overall commitment to pain management on the unit: “We were already on [the unit] doing…doing pain management and had it as a top thing
for the [nurse leaders]…to have pain management as one of the biggest things on the unit” (Interview 07, p. 4, lines 41-43). One nurse leader manifested her commitment to helping the staff nurse participants navigate some of the logistical barriers around participating in the intervention sessions; she and a staff nurse who influenced shift scheduling worked to accommodate the schedules of interested staff nurses.

**Busyness.** This theme was derived *in vivo* and refers to participants’ perceptions of juggling their work with the implementation of the action plan, within the time limits of their day. In general, staff nurse and nurse leader participants differed on their views related to this theme. Some staff nurses mentioned the adverse impact of a busy day on their efforts to complete their audits: patient care was the priority of their daily work, which affected their ability to commit to other tasks. Overall, however, the work of the action plan was considered feasible due to its concrete and realistic nature. The ‘doable’ nature of the action items and their associated deadlines were described as facilitators to implementing the plan in a timely manner, despite the reality of their clinical demands. The staff nurse participants ultimately achieved their goals by making a conscious effort to include them in their daily work:

I think we find a way of just implementing it as part of our daily routine. And once you get organized and you know that that’s what you’re gonna do…and you put it down there, like it’s on your worksheet and it’s on your…[daily agenda]. (Interview 03, p. 21, lines 15-19)

Moreover, they noted that their efforts were helped by the availability and accessibility of pain assessment and management resources. These resources included the pain service, pain assessment tools, and pain policies and guidelines. Pain assessment tools and guidelines were online. Human resources were also mentioned as being valuable to supporting participants’ pain assessment and management practices; colleagues were
considered a trusted source of and expedient means to information in light of their daily busyness.

Conversely, the nurse leaders noted a stronger effect of everyday busyness on their efforts to implement the action plan. Amidst juggling their administrative or clinical tasks, the implementation process was discussed as challenging. As one nurse leader stated:

I know I didn’t get to all the [audits] I was supposed to do it and it was just other…other…priorities that got in the way…Just busy, you know just everyday like stuff going on the floor and whether or not I took time so then I kept thinking ‘well I should do it, I should do it’ and then I just never did it and forgot about it. (Interview 11, p. 19, lines 10-11, p. 20, lines 4-6)

This nurse leader was the only participant who indicated that she did not implement her action item and her line of talk in the interview suggested that she was removed from the process and unaware of the accomplishments reported by the other participants. Another nurse leader, despite finding the implementation process a challenge, named the work a priority and completed her action items (with a minor delay).

**Lack of organized follow-up.** A recurrent theme that was derived *in vivo* was the lack of organized follow-up post-implementation of the action plan. This was felt to impede participants’ continued efforts to improve pain assessment documentation on their unit. They desired a group discussion around what was implemented and how it worked, and also noted that a group discussion would have given the process a conclusion. For example, one participant stated:

I think we’re missing that part…what’s happened after you had the audits and what came out of it. Like to go back and just give feedback as to what people [felt] came about in their little, you know practices that they had to do on the unit so that everybody feels like there is some sort of closure, yeah. (Interview 03, p. 12, lines 19-22)

In the concluding remarks of the last AI intervention session, the Process Facilitator emphasized that the group was to implement the action plan on their unit and continue to
improve this practice area, as well as apply the AI process to any other practice areas of interest. This positive momentum for change within the group is a theoretical outcome of participating in the AI process and an aspect of creating an appreciative learning culture (Cooperrider et al., 2005). However, there was notable confusion amongst participants regarding who was responsible for organizing a follow-up discussion. As stated by one nurse leader:

I think that maybe if we’d had another opportunity to go back as a group that might have helped just keep the momentum going. And I don’t know whether that’s something that maybe the [other nurse leader] and I should have done formally or we should have utilized [the facilitators] to help with that, I’m not sure…but I think that would have helped. (Interview 11, p. 2, lines 44-45; p. 3, lines 1-2)

This confusion was linked to the democratic approach of the AI process: because the group dynamic was one of equality, when the group went forward without the guidance of the facilitators, there were no identified leaders to assume organizational roles and direct the progression of the practice change. Several participants indicated that they were relying on the facilitators to organize a meeting, rather than taking charge of the situation as a group.

That’s where I said like before that leadership, like if [the Process Facilitator] was to come and say ‘hey let’s meet one more time for a short time to say what do we do now, or what do you want to do, or do you just want to leave it at that, or do you want to pick something else, or should we do this every three months?’ Like, there needs to be a little bit of leadership involved in that…it could be…it could be anybody, right? It could be really anybody. It just needs somebody…well I mean she knows the process. It doesn’t need to be her specifically but it just needs somebody to guide the group because if there’s no leader or nobody to tell you to do something then you don’t do it, right? (Interview 06, p. 16, lines 12-23)

Interestingly, one nurse leader spoke about the hypothetical leadership role she could have taken to evaluate the implementation process and the nurses’ experience with it. She added that their momentum could have been sustained by incorporating the initiative into their yearly objectives on the unit.
Extraneous Factors of the AI Intervention

2f. Nurse participants’ perceptions of the credibility and communication skills of the AI facilitators. Credibility was an in vivo theme that participants spoke about directly and also made allusions to by discussing certain facilitator attributes, like knowledge. Participants perceptions of the communication skills of the facilitators were organized according to the in vivo sub-themes of breaking it down and coaching.

Credibility. Participants were asked about the credibility of the facilitators and often responded by linking the concept to that of knowledge. It was a strongly held view that both facilitators were credible and knowledgeable. The concept of credibility was a particular focal point when participants discussed the Content Facilitator. They spoke about her credibility in terms of her knowledge, passion, and commitment to pain management at the hospital. She was named a mentor in pain management and affectionately called the ‘pain guru’. Overall, she was respected for her experience and work in pain management (both clinically and in research) and trusted for her judgment. Some of the more seasoned nurse participants noted their long-time relationship with her, while others noted her familiar presence on the unit. Her familiarity and shared experience with the group were considered assets to the AI intervention and important elements of her credibility:

Well, [the Content Facilitator] is…she’s done a lot of work in pain management. She’s in the pain service at [the hospital] so her…she has vast knowledge. She has a lot of experience in it so was…I guess that was a good choice that [the Process Facilitator] made in having her on board…with this. And I think it was a positive for the overall thing and because [the Content Facilitator] is frequently on [the unit] and she is aware of the patient population, the nurses are familiar with [her], they know [her]…so they already had a rapport with her. (Interview 07, p. 20, lines 41-46)

The Content Facilitator was described by one participant as having a “bird’s eye view” (Interview 04, p. 18, line 34) of the unit due to her position at the hospital. She was
therefore considered to have an important role in contextualizing presented pain assessment evidence to make it practical to the unit and relevant to their patient population. Additionally, her practical sense of ‘what was done on the unit’ was felt to be a general help during the AI intervention.

Since the Process Facilitator was unfamiliar to the participants, her credibility was discussed in terms of her knowledge around the AI process and general competence as a facilitator. The Process Facilitator was perceived to be very knowledgeable about the AI process, a skilled facilitator, and a good mediator. The ease with which she facilitated the process was emphasized, as described in the following example:

I never would have guessed that that was her first AI study that she had done based on what I had seen and heard…the way she presented herself and the information it was just…but you know it was unreal, like she was doing this forever. That’s how easily it seemed to flow from her. (Interview 09, p. 24, lines 26-27; p. 26, lines 22-23)

Despite the Process Facilitator being an ‘outsider’ to the unit, several participants noted that their interactions with her were comfortable, with one staff nurse participant noting that her trust around disclosing ‘inside information’ developed over time. Her position as an outsider was considered valuable to the AI intervention, as it enabled her to provide new ideas and perspectives to the group. One participant noted that, although she was internal to the hospital, the Content Facilitator was ultimately an outsider to the unit, and the advantage of both facilitators was that, in spite of this position, they shared a similar perspective with the group:

It was nice to have [the Process and Content Facilitators] there because we were a little bit stumped with the Provocative Proposition. It was nice to have them who weren’t a formal part of our unit and be able to draw that picture for us and put the pieces together. And they were quite accurate too so it was nice to see that somebody thought of us in the same way we did. (Interview 08, p. 11, lines 17-27)
**Communication skills.** Whereas participants focused on the concept of credibility when discussing the Content Facilitator, they focused on the concept of communication skills in their descriptions of the Process Facilitator. Since the Process Facilitator led the AI intervention sessions, she ultimately dedicated more time to the task of communication. Two themes emerged from the data regarding the communication skills of the facilitators: breaking it down and coaching.

*Breaking it down.* This was a commonly used term to describe the process by which the facilitators made information understandable to participants. It tended to be applied to the approach taken by the Process Facilitator to explain the phases of the AI process; however, the Content Facilitator was also noted to explain pain management evidence in simple terms, make it practical to the unit, and answer questions clearly. The review of the pain assessment and documentation clinical practice guideline by the Content Facilitator was considered to be a valuable exercise, despite participants’ familiarity with the material; it was felt to shed new perspectives on information with which they were already familiar and had become routine, as well as save them time from having to review the evidence on their own.

Sometimes I think it’s a lot easier to have somebody who can actually stand there and say or sit there and be a part of your group and say ‘you know what? This is, you know part of the guidelines and this is what it says’ or...I mean she could...and I’m sure she could point out what page and what section it was in that’s how well versed and knowledgeable she was about the guidelines. And it made it a lot easier. It was a lot...it saved us a lot of time too from having to go through and flip through all those pages...figure things out because she was able to provide...you know, answer our questions quickly rather than have us flip, and flip and flip. (Interview 09, p. 27, lines 10-16)

The ability to explain the steps of the AI process in a manageable and simple way was emphasized as a helpful attribute of the Process Facilitator. Despite AI being a novel and, at times and on paper, vague process, participants commonly noted that they understood the process. The Process Facilitator’s strong presentation skills, use of plain language, and
openness and ability to answer questions gave clarity to the process. Her provision of examples was considered a key factor in this regard:

Oh she knew it in and out. She was really helpful even with us developing the [Provocative Proposition]. It…on paper it seemed really vague but she was able to break it down for us and just how she was able to provide examples…like an example of…of a good [proposition] or whatever. So she was able to explain that really well and even the different phases because really on paper they’re sort of wishy-washy…(Interview 05, p. 16, lines 42-45; p. 17, lines 1-2)

Others found it helpful that the Process Facilitator communicated clear expectations for each session and refreshed them on their progress as they proceeded forward in the process. This provided the necessary direction to make their tasks in each session more manageable.

**Coaching.** This term was used by participants to describe the function and approach of the facilitators in the AI intervention sessions, including the concepts of guiding, not telling; positive focus; and demeanor. Although this theme was derived *in vivo*, it was found to closely coincide with the understanding of coaching in the literature post-analysis.

Coaching is defined as the provision of support and guidance for people to use their existing skills more effectively, whereby coaches approach change in a goal-oriented and positive manner, provide encouragement, and share the enthusiasm of the group (Bentley, 1995).

The overall sentiment amongst participants was that the facilitators were there in a guiding, rather than directive role. As one participant stated:

It’s not until after the fact it’s like okay, you know what? When you sit back and think about it, I mean [the Process and Content Facilitators] were there as guides. We’re the ones that came up with all of these different, you know, [ideas]…We went out and did it without having [the facilitators] or anybody and it’s like ‘oh my gosh you know what? We just completed the study!’(Interview 09, p. 30, lines 12-14, 32-34)

The facilitators were simply considered members of their team and on equal footing with the participants. Some participants noted that the Content Facilitator guided them by
leading them through the clinical practice guideline, providing feedback, and directing them
to relevant pain assessment and management resources during the AI intervention sessions.
Overall, however, they focused on the guiding role of the Process Facilitator during the
intervention sessions. As described in the following example, the Process Facilitator was felt
to work with and lead the group, without telling them what to do:

She was excellent. She gave us a chance to think, a chance to make…she did not just throw
ideas into there because you know how you come filled with all the ideas and including [the
Content Facilitator] with what…they already have a lot more experience than we have. And
it was nice in a way that we were able to express how we feel and [the Process Facilitator]
gave a lot of feedback and tried to pull ideas from us within the group before…just not like
just giving us all the information that you need to know ahead of time. She worked with us.
And even on a one-to-one basis like to come around and to ask how you think. (Interview 03,
p. 22, lines 19-25)

Key actions taken by the Process Facilitator that were considered to characterize this
guiding role included listening intently to their comments; asking questions to stimulate
critical thinking and discussion; and reflecting back, summarizing, and extrapolating their
ideas. Although the Process Facilitator did not assume a directive role, an important aspect of
her role was felt to be adhering to the objectives of the sessions and focusing and re-focusing
the group on the task at hand.

I mean there were certainly many times that we went off topic, off focus and they were
both…well mostly [the Process Facilitator] was very good about pulling us back onto the
focus…about what we were here for, and what we were talking about and moving things
along. So she was very good at pulling that together. (Interview 06, p. 10, lines 5-9)

The Process Facilitator was also noted to maintain a positive focus during the AI
intervention sessions. Participants remarked that she reminded them to stay positive and was
able to find the positive in their comments and re-phrase their ideas in a positive way.
Participants emphasized the enthusiasm and excitement of the Process Facilitator, which
were described as contagious and encouraging and motivating forces for the participants during the sessions.

I think she was like very excited to hear some of the experiences that people had and the things they’ve done so…and her excitement…by the end of the day everybody was ‘oh really, you did that?’ So I think just her excitement in the project was a great catalyst in getting things going and keeping it moving. (Interview 10, p. 19, lines 12-16)

The demeanor of the two facilitators was also mentioned as a favorable aspect of their communications with the group. Both facilitators were referred to as being approachable and personable. This approachableness was noted as being particularly important in light of the Process Facilitator being an outsider to the group and in the context of the sessions. She was considered easy to open up to, which some nurses attributed to elements of her personality, including that she was soft-spoken and not intimidating. Other participants stated that the Process Facilitator acknowledged each participant, genuinely valued their contributions, and never belittled their experiences. One nurse leader participant emphasized her respectful and appreciative approach as being an important aspect of the receptivity of the nurses to the AI intervention.

I thought for somebody who was coming in and not knowing any of us…and like she was very enthusiastic, she was always respectful…actually she was always thankful and appreciative of us being involved in the whole process…She was always very appreciative and I think even the staff found that…so I think that kept them wanting to do it…as opposed to… I mean we do a lot of studies where people are like ‘okay can you get this done, can you get this done?’ or whatever. (Interview 10, p. 22, lines 28-35)

**Summary of Qualitative Results**

Overall, participants liked the AI intervention and considered the process a refreshing approach to change due to its positive approach, democratic nature, and focus on expanding on existing practices. Participants felt the AI intervention promoted a positive reception to change, broadened their horizons around pain, and built team spirit. Although the AI
intervention sessions were generally well accepted, several participants found the full-day session that combined the Discovery and Dream phases too long. Nurse leaders found it challenging to maintain consistent participation in the intervention sessions due to the structure of their work and nature of their professional roles. The group mix was considered essential to the process, but the size was felt to be at capacity. Overall, the action plan was implemented in full and close to the designated timeline; however, the context of change on the unit, busyness, logistics, and lack of organized follow-up were felt to interfere with its implementation and progression. The partnership between the Process and Content Facilitators was considered valuable to AI intervention delivery; they were viewed as credible with effective communication skills. Despite being important to organizing a follow-up session, their continued support was generally undesired by participants during the implementation of the action plan.
Chapter Seven: Discussion

This chapter includes a discussion of key findings related to the main purposes of the study in light of existing literature. The discussion is organized according to the evaluation framework for the study. Quantitative and qualitative results are integrated throughout to give breadth, depth, and completeness to the discussion (Creswell, 2009; Sims & Sharp, 1998). Finally, the strengths and limitations of the study are presented.

Implementation Process of the AI Intervention

Acceptability of the AI intervention. Overall, participants considered the AI process to be a refreshing approach to change due to its positive approach, democratic nature, and focus on expanding on existing practices. Although the positive focus of the AI intervention was a unique approach to implementation research in nursing, participants’ satisfaction with its other defining elements (i.e., democratic nature, focus on expanding on existing practices) fit with select findings from a larger qualitative study on lessons learned regarding the implementation of evidence-based guidelines in nursing (Ploeg, Davies, Edwards, Gifford, & Miller, 2007): administrators (n = 59), nursing staff (n = 58), and project leaders (n = 8) considered collegial collaboration and congruence of evidence with existing knowledge and practices to be important facilitators of the implementation process. In the present study, these three key aspects of the AI intervention were noted to make it atypical of the participants’ usual experience with change initiatives. Historically, interventions to implement pain evidence in practice have involved didactic education and/or individual persuasion (e.g., Franke et al., 1997; Johnston et al., 2007; Twycross, 2002). Support for the future use of AI as a KT intervention compared to typical approaches was strong, both for pain practices and in other clinical areas.
Participants preferred the positive focus of the AI intervention compared to traditional problem-based approaches to change. They remarked on the generative effects of this novel approach, emphasizing its capacity to create a positive reception and increase willingness to change amongst themselves and their colleagues. The high recruitment rate and relatively large group size, which several participants noted were unusual, supported this finding. Discussions around people’s preference for and their positive reception to AI have mainly been theoretical or anecdotal (Cooperrider et al., 2005; Preskill & Coghlan, 2003); however, recent empirical evidence indicates that an AI approach to change may generate positive affect and enhance readiness to change compared to traditional problem-focused or diagnostic approaches (Sekerka, Brumbaugh, Rosa, & Cooperrider, 2006; Sekerka, Zolin, & Goosby Smith, 2009). These findings are considered non-trivial to implementation research; staff engaging in organizational change can find the experience both difficult and threatening (Bryant & Wolfram Cox, 2006) and resistance to change has been isolated as a barrier to successful guideline implementations in nursing (Ploeg et al., 2007). As organizational readiness for change is considered a critical precursor to implementing complex change in health care (Kotter, 1996; Weiner, 2009), AI might have an important function in this regard.

Team spirit was another generative effect of the AI intervention. The capacities of AI to build collegial relationships and enhance aspects of group functioning have been reported both qualitatively (Baker & Wright, 2006; Messerschmidt, 2008; Wright & Baker, 2005) and quantitatively (Bushe & Coetzer, 1995; Shendell-Falik et al., 2007). This effect appears to be related to the participatory nature of the AI process, which participants enthusiastically described in terms of democracy. Where collaboration is increasingly touted as an important element of KT (CIHR, 2009; Dickinson, 2004; Brown & McCormack, 2005), this study
provides first-hand qualitative evidence that an interactive intervention was not only valued by, but also acceptable to nurse participants working in an inpatient clinical setting. This intervention is unique from other interactive approaches to improving pain practices (Bach, 1995; Carr, 2002; Comley & DeMeyer, 2001; Dufault et al., 1995; Dufault et al., 1999; Ellis et al., 2007; Hansson et al., 2006; Howell et al., 1996; Neitzel et al., 1999; Paice et al., 2006; Seers et al., 2004; Simons & Macdonald, 2006; Tracy et al., 2006; Woodward, 2005) in its relative intensiveness: the staff nurses and nurse leaders were ultimately responsible for designing a multifaceted KT strategy (i.e., action plan) to effect unit-wide change and autonomous in its implementation. Staff nurse participants in particular expressed value for the high-level of participation demanded by the AI intervention. Despite the increased workload associated with this approach, some commented that it felt less burdensome relative to more dictatorial initiatives, which was in part attributed to the ‘fun’ of collaborating with their colleagues.

Expanding on existing practices, rather than implementing new ones was considered important to the acceptability of the AI intervention. At first glance, this preference challenges its wider acceptability (e.g., what if a new area of practice was selected?) and also poses a fundamental problem to future implementation research (e.g., in light of the often-cited research-to-practice gap, how frequently are there existing EBPs available for expansion?); however, a closer look suggests differently. First, while participants felt that implementing a new practice was a bigger challenge, it was not considered impossible, with one participant desiring a more novel change topic and another indicating that the most important aspect of the AI intervention (over and above familiarity) was the positive approach. Second, qualitative comments suggested that the favorability of expanding on
existing practices might have been more reflective of the advantages of a contextually specific intervention, rather than the corollary that evidence-based clinical practices already existed on the unit; that is, the clinical practice could have been new, but the implementation strategies would be tailored to the unit based on what worked in the past. The influence of contextual factors on the effectiveness of KT interventions (Gordon, Grimshaw, Eccles, Rowe, & Wyatt, 1998; Grimshaw et al., 2004; Jamtvedt, Young, Kristoffersen, O’Brien, & Oxman, 2006; Thomson O’Brien et al., 1997) and promise of integrating initiatives into existing strategies (Dopson et al., 1999) have been discussed in the KT literature.

AI appears to have value as a contextually specific intervention that not only enables participants to build on existing practices, but also on their ways of practicing. Participants noted that the AI process enabled them to capitalize on informal knowledge sharing with their colleagues both within the AI intervention sessions and during the implementation of the action plan. The informal knowledge sharing around evidence-based pain assessment and management that occurred during the intervention sessions supports the assertion that AI has the capacity to negotiate with the soft-periphery of research evidence (or the ways it can be implemented) and maintain attention towards generating internal knowledge, despite the introduction of external research evidence (Kavanagh et al., 2008). The collegial dialogue around evidence-based pain assessment and documentation that participants incorporated into their action plan was described as a usual way of addressing practices on the unit. Colleagues were considered a trusted source of and expedient means to information in light of their daily busyness. Thompson and colleagues (2001) found that clinical experience was afforded the highest weighting in nurses’ clinical decision-making, with experienced colleagues considered convenient, credible, and trusted sources of information. Findings
from a recent integrative review support nurses’ predominant use of informal, interactive sources of knowledge in the provision of direct patient care (Spenceley, O’Leary, Chizawsky, Ross, and Estabrooks, 2008). The AI intervention appears to be aligned with recommendations that KT interventions tap into human sources of knowledge, maximize interactivity, and be contextually sensitive (Estabrooks et al., 2004; Spenceley et al.).

Overall, participants’ contributions regarding the acceptability of the AI intervention pertained to their likes and its benefits; however, they also shed important insights on issues requiring attention in future implementations. First, results of this study substantiate the finding that, without prior thinking, participants can find responding to AI questions difficult due to the often unusual experience of focusing on the positive (Reed & Turner, 2005). Participants noted that, although a novel experience, focusing on the positive took less effort over time and was facilitated by efforts of the Process Facilitator, including provision of activities in advance of the sessions, comprehensive explanations of the activities, addressing questions, and maintaining a positive focus during group discussions. Second, addressing issues and challenges was considered important to avoiding negative sentiments around maintaining a strictly positive focus. This was a purposeful aspect of the designed AI intervention raised in the theoretical literature (Cooperrider et al., 2005; Coghlan et al., 2003; Rogers & Fraser, 2003). Participants stated that they operated within a context (i.e., society and work environment) that was more attentive to the negative. Likewise, the Process Facilitator noted that their tendency to veer off-topic was oftentimes related to digressions from more abstract reflections relating to the positive (i.e., values, beliefs), to problems and potential concrete solutions. This finding may be related to the proposition that nursing culture places greater importance on practical knowledge and has lesser value for more
reflective activities (Scott-Findlay & Golden-Biddle, 2005). Arguably, the practical, clinical work of nursing is problem-focused and to ignore concrete issues and challenges may be an unnatural state of being and a false representation of reality. However, to be true to the AI process, the contingency remains that the group collaborates to re-frame issues in a more constructive manner (Cooperrider et al.).

Fidelity of the AI intervention. The Process and Content Facilitators delivered the intervention with a high degree of fidelity. Although it was laborious to develop, there was immense value in having an intervention manual that could be followed in each session. The manual outlined the essential activities, indicated allotted completion times, and provided detailed scripts for the facilitators, which helped to maintain focus and enhance productivity. Articulation of the main objectives for all activities and associated timelines were especially useful in light of participants’ remarks that discussion tended to veer off topic, with the potential to extend beyond what was useful. The intervention manual also enables replication of the AI intervention in future implementations and by other facilitators.

Participants described several barriers that adversely affected their participation in the AI intervention sessions and implementation of the action plan, including change overload, logistics, busyness, and a lack of organized follow-up. An insight provided by the in vivo theme of ‘change overload’ is the real problem posed by organizational changes to intervention fidelity in implementation research. For example, the institution of new IV pumps and a computer system, as well as new staff orientees resulted in diminished human resources and nurse leader support during the implementation of the action plan. Other qualitative findings attest to the negative impact of organizational changes on guideline implementations, including staff turnover and rotation and structural renovations (Ploeg et
al., 2007). Such changes are identified as problematic to KT because they take priority in terms of resource allocation and management support, and their additional demands can create resistance to the implementation process (Ploeg et al.). Moreover, change initiatives require focus and energy and alternations in work tempo and work-related exhaustion may negatively impact commitment to improving care (Wallin, Ewald, Wikblad, Scott-Findlay, & Arnetz, 2006).

Busyness was an *in vivo* theme that referred to participants’ perceptions of juggling their clinical/administrative work with the implementation of the action plan, within the time limits of their day. Lack of time has been frequently cited as a hindrance to research utilization (e.g., Hutchinson & Johnston, 2006; Retsas, 2000). Recently, however, there have been theoretical discussion (Scott-Findlay & Golden-Biddle, 2005) and empirical findings (Ellis et al., 2007; Thompson et al., 2008) regarding the related, but more complex notion of busyness. Busyness is defined as “an individual perception of internalized pressure created by a situation where there is a shortage of time to accomplish valued work and often results in a reduced energy level” (Thompson et al., p. 542). Busyness is influenced by environmental complexity (O’Brien-Pallas et al., 1997), which participants rated as being relatively high using the ECS (O’Brien-Pallas et al., 1997; O’Brien-Pallas et al., 2003).

Interestingly, the barriers of change overload, busyness, and logistics were not ‘critical fail factors’ (Hulscher, Laurent, & Grol, 2003) to the fidelity of the AI intervention in terms of participants’ overall attendance at the sessions or their implementation of the action plan in full in a timely manner. Given their busyness, participants alluded to the value of the AI intervention sessions in terms of creating ‘space’ for reflection and collaboration regarding pain assessment and management (Scott-Findlay & Golden-Biddle, 2005). They
also emphasized the importance of having a unit culture congruent with the objectives and philosophy of the AI intervention, available and accessible resources, and a ‘doable’ (e.g., concrete, detailed, realistic) action plan. Culture (Kitson et al., 1998; McCormack et al., 2002; Scott-Findlay & Golden-Biddle; Scott-Findlay & Estabrooks, 2006b), organizational fit (Rycroft-Malone et al., 2004b), and resources have been identified as important facilitators to guideline implementations (Kitson et al., 2008; Ploeg et al., 2007; Rycroft-Malone et al.). However, the value of a concrete action plan contradicts more recent AI literature, where there has been digression from establishing defined implementation strategies to a more abstract ‘giving away’ of AI to group members with the expectation of results (Cooperrider et al., 2005). Once called the Delivery phase, the final phase of the AI process was thus renamed Destiny (Cooperrider et al.).

The emphasized usefulness of a defined action plan may be particular to implementing the AI intervention in nursing, given the recognized culture of task-completion and busyness (Scott-Findlay & Golden-Biddle, 2005; Thompson et al., 2008). The action plan may have had an important function in providing role clarity, supported by the fact that participants did not carry forward with their efforts beyond what was outlined in the plan or organize the desired follow-up session. Role clarity has been previously identified as an important influencer of nurses’ success as champions of EBP (McCleary, Ellis, & Rowley, 2004). This element of the AI intervention can be strengthened in future implementations by addressing the barrier of a lack of organized follow-up, which, unlike the others, was identified as a ‘critical fail factor’ to participants continued motivation and progression with practice enhancements on the unit. The action plan designed in the Destiny phase should therefore include a specific date and time for a follow-up session to be attended by all
participants and the facilitators. Qualitative findings indicate that the follow-up session should include discussion around participants’ perceived success with the action plan, any issues encountered during its implementation, actions that might enhance success, and next steps toward continued practice enhancement. A new action plan could be created in the follow-up session that outlined specific tasks and timelines for participants and specified the date and time for another follow-up session (e.g., in three months). This arrangement would not only provide the necessary role clarity and momentum for participants to carry forward with their efforts, but it would be minimally taxing on facilitators in terms of time burden.

**Feasibility of the AI Intervention.** Overall, the structure of the designed AI intervention was feasible to implement on the study unit. Its basic structure will be retained for future applications, as participants felt the sessions were reasonable to schedule in an inpatient setting, allowed sufficient time for discussion, maximized their productivity, and minimized their dissociation from the AI process. However, although four three-hour sessions were ultimately sufficient to complete the intervention, each phase of the AI process was not delivered as designed in one session: the Dream and Design phases required more time than anticipated. The extra time required for these phases was not problematic, as it was accommodated within the total time allotted for the AI intervention (i.e., 12 hours). To anticipate the need for extra time in future implementations, one participant suggested that it was more practical to add another session, rather than lengthen each one. This solution appears feasible, as participants were satisfied with scheduling the sessions well in advance of the AI intervention, before their clinical shifts were determined. The extra session could be forgone if the AI intervention was completed in the planned four three-hour sessions.
In the Dream phase, gathering group feedback on the Miracle Questions and topic selection were time consuming due to the volume of opinions. Specific topic selection at the end of the Dream phase was a modification to the typical format of the AI process: topic selection usually occurs before the initiation of the 4-D Cycle in a meeting attended by a large and diverse number of organization members (Cooperrider et al., 2005). In this case, the investigator pre-selected a general and beginning topic because the objective was to use AI to facilitate evidence-based pain practices. Areas of pain assessment and management with high evidence (Rycroft-Malone et al., 2004a) were provided to the group at the time of specific topic selection (e.g., pain assessment [Breau, 2003; Stinson, Kavanagh, Yamada, Gill, & Stevens, 2006], sucrose in infants [Stevens, Yamada, & Ohlsson, 2004], distraction in children [Stinson et al., 2008]). They were invited to suggest topics beyond those presented and the facilitators would investigate the quality of the related evidence. Brainstorming activities in the Discovery and Dream phases were centered on the general topic of evidence-based pain assessment/management, rather than the specific topic of evidence-based pain assessment documentation. This was considered to facilitate increased dialogue regarding successes on the unit and promote broader and more creative thinking in terms of the ideal context for enhancing evidence-based pain practices.

Using AI for pre-selected topics is condoned in the theoretical literature (Cooperrider et al., 2005); however, it no doubt challenges the requisites of interest in and commitment to implementing the practice change by organizational members. The investigator purposefully selected the unit based on its known dedication to pain management, which was later supported by participants’ descriptions of the unit culture. A strong commitment to pain management has been identified as an important influencer of success in pain implementation.
research (Dufault, 2004; Seers et al., 2004; Tracy et al., 2006). Purposeful selection of settings is therefore recommended to facilitate the adoption and integration of new practices (Seers et al.; Tracy et al.). Arguably, however, the clinical utility of AI as a KT intervention in pain would be severely limited if it could only be implemented in contexts with an existing commitment to pain management. Two features of the AI intervention may facilitate its implementation in less favorable contexts. First, brainstorming around successes in the Discovery phase was not limited to evidence-based pain practices (although participants had sufficient examples for this focus), but was open to other success stories regarding EBP. Supportive contextual factors could then be applied to the topic of evidence-based pain practices. Second, participants noted that the AI intervention was positively received by and inspired intrigue in the majority of their colleagues due its positive approach, democratic nature, and focus on expanding on existing practices. This suggests that the nature of the AI process alone may be sufficient to stimulate a certain level of interest and participation in such an intervention.

In the Design phase, explaining the concept and development of a Provocative Proposition took longer than expected. Although not previously reported in the literature, the investigator brought in examples of Provocative Propositions (related to other clinical topic areas so as not to sway the thinking of the group) to illustrate the outcome of the exercise. This effort was valuable to the group because it made an abstract concept more concrete and understandable. Having each participant write an individual Provocative Proposition before creating a collective one enabled a diversity of contributions, structuring of thoughts, and the happy surprise of seeing how similarly fellow participants approached the topic. These
elements of the AI intervention will be retained for future implementations, with an optional, extra session accommodating the need for any additional time.

Although participants were satisfied with the structure of the AI intervention from a scheduling perspective, facilitating the process was a challenge. Contrary to the original proposition that participants independently collaborate to choose the session dates and times, they indicated preference for the investigator to organize the schedule. Finalizing a schedule that was acceptable to the participants and Content Facilitator bore a significant time burden to the investigator. Individual schedules and preferences were valued and consequently, each participant was contacted by email and phone multiple times. These efforts were considered important given the democratic nature of the AI intervention and desire to maximize the number of participants, and reasonable given the investigators primary focus on the study. In the absence of these efforts, there was the potential to lose some participants. Key factors to minimizing the time burden and maximizing group size were early organization and accessing the appropriate human resources; however, the use of these strategies should be enhanced in future implementations to further expedite the process. Although participants were given early notice of the intervention sessions because they scheduled their clinical shifts six-weeks in advance, both happened concurrently, which meant some participants already had plans in place. The Content Facilitator also had a full schedule well into the future, as she was juggling multiple personal and professional responsibilities. The support of a nurse leader and staff nurse with influence over scheduling activities was pivotal to facilitating the final schedule, but came unsolicited later in the process. In the future, sessions will be scheduled further in advance (e.g., 12 weeks) and individuals that can facilitate the process will be purposefully sought out at the beginning.
During the latter phases of the scheduling process, some participants suggested holding the Discovery and Dream phases in a one-day session (i.e., Discovery delivered in the morning and Dream in the afternoon). As the suggestion was theoretically sound (Cooperrider et al., 2005), the investigator forwarded it to the rest of the group who readily accepted it because it reduced the total number of session days. Ultimately, however, most participants and the facilitators considered it a long and tiring day, which diminished productivity. Nurse leaders remarked on the challenge of attending the full-day session, as they were also maintaining their administrative/clinical responsibilities. One session per day, with each session spaced as closely as practically possible (ideally with two sessions per week) was regarded as the most feasible and acceptable structure by nurse leaders and staff nurses alike to maintain productivity and engagement in the AI intervention and will be implemented in the future.

Although attendance was high with ninety-seven percent (n = 11) of the participants attending all four sessions, nurse leaders’ participation was inconsistent due to their continued work demands. Nurse leaders and staff nurse participants alike described this varying level of participation as frustrating. One participant noted that there should be an expectation of equal and full participation by all group members. From the perspective of the Process Facilitator, the in and out nature of their attendance was distracting and detracted from the cumulative process and content of the AI intervention. Ultimately, this variable level of participation may have hindered both the process and outcomes of the AI intervention; nurse leaders were, at the very least physically less engaged in the sessions and may therefore have had diminished commitment to implementing the action plan on the unit. Qualitative results indicated that a nurse leader that was relatively less present at the sessions...
was also less involved in the implementation of the action plan compared to the other participants.

Fluctuating participation has been noted in the AI and health care literature, relating to competing organizational demands and changing priorities (Reed et al., 2002). Although consistent attendance is ideal and important, excluding nurse leaders based on their perceived inability to carve out protected time for the intervention was considered of greater detriment to the study; organizational support is a key factor in KT success (Rycroft-Malone et al., 2002; Stetler, 2003) and the inclusion of nurse leaders was essential to gaining entrance to the unit and establishing commitment. A realistic solution for future implementations of the AI intervention is to acknowledge the likelihood of such fluctuating membership and build it into the process (Reed et al.). Given the inclusive spirit of AI, future implementations should include all individuals interested in participating (Cooperrider et al., 2005); however, a core group of those who maintain consistent attendance could be charged with leading the implementation of the action plan. Although a core group has the potential to conflict with principles of democracy because some members may exert more influence over the process than others, it is a practical solution to a real challenge of implementing AI in health care. Moreover, staff-nurse participants in this study essentially self-assembled into a core group, which was critical to the full and timely implementation of the action plan and may have been perceived with less frustration had their pivotal role been acknowledged.

**Outcomes of the AI Intervention**

**Process outcome (nurse participants’ knowledge and attitudes regarding pain).**

Nurse participants’ mean PKNAS total scores ranged from 72%-84% correct. A passing score has been conceptualized as 80% (McCaffery, 2002), while a value of 85% is reported
as being clinically relevant for competency testing (Rieman & Gordon, 2007). Overall, participants’ average PKNAS scores were on the high end of those reported in larger samples, which range from 66-74% correct (Le May et al., 2009; Manworren, 2000; Rieman & Gordon). Modifying cancer-related questions to be more reflective of general pain management may have inflated scores in this sample of nurses because they were likely less familiar with cancer pain management given the patient population on the study unit.

There was a statistically significant increase in nurse participants’ overall pain knowledge and attitudes (i.e., PKNAS total scores) post-intervention. The lack of statistically significant difference between pretest measures of nurse participants’ mean PKNAS total scores supports the statistical conclusion that the AI intervention sessions led to a gain in participants pain knowledge and attitudes. The clinical significance of this finding is supported by social validation and effect size analysis (Le Fort, 1993; Norman & Streiner, 2008).

Social validation, or the use of qualitative methods to determine the impact of the intervention on participants (Le Fort, 1993), suggests that the AI intervention expanded participants’ general knowledge base around pain assessment and management (as captured under the in vivo theme of ‘broadened horizons’). Participants noted that they gained external knowledge regarding pain assessment and management from the facilitators during the AI intervention sessions and emphasized the derivation of significant general pain knowledge from the informal dialogue within the group. This finding is aligned with the implementation of the AI intervention, where discussions in the Discovery and Dream phases were co-facilitated around the general topic of evidence-based pain assessment/management, rather than the specific topic of evidence-based pain assessment documentation.
A large effect size was found for participants’ PKNAS mean scores across time; however, this finding needs to be considered in light of the fact that the greatest, statistically significant increase in mean scores was seen between Times 1 and 4. One explanation for this is testing effects consequent to conducting repeated measures (Greenwald, 1976; Twisk, 2003). The PKNAS consisted of right and wrong answers, which participants may have continued to improve on over time through independent learning or discussions with colleagues. This explanation supports the lack of statistically significant increases in participants’ mean scores between Times 2 and 3 and Times 2 and 4. Another rationale relates to possible delayed or longer-lasting effects of the AI intervention. Dialogue and learning may have continued in the group following the intervention sessions and participants noted the evolution of an appreciative learning culture. Although anecdotal discussion with a nurse leader approximately six-months after the study indicated that no formal pain initiatives had been concurrently implemented on the unit, qualitative results and anecdotal discussions with participants suggested that they pursued other projects, including a pain assessment and management quality improvement initiative around Time 4. Involvement in this project may have improved their pain knowledge and attitudes, supported by the statistically significant increase in their mean PKNAS total scores between Times 3 and 4.

The increase in participants’ total PKNAS scores may also be reflective of the upward trend in the specific outcome of participants’ knowledge and attitudes regarding pain assessment documentation; the number of participants who scored 100% on the PKNAS pain assessment subscale notably increased over time. The statistical non-significance of this increase may be attributable to the ceiling effect, where over half of the participants had scores of 100% and there was little variability amongst the remaining scores, particularly at
posttest. Qualitative findings converge with these quantitative results, supporting the clinical significance of this upward trend in scores; participants stated that they gained formal knowledge regarding pain assessment and documentation from the Content Facilitator’s intensive review of the hospital clinical practice guideline during the AI intervention sessions.

**Practice outcome (proportion of staff nurse participants who practice evidence-based pain assessment documentation).** No statistically significant changes were found in staff nurse participants’ evidence-based pain assessment documentation practices over time. This lack of statistical significance could be related to the small sample of nurses and related likelihood of Type II error (Norman & Streiner, 2008; Sidani & Braden, 1998). The small sample size was congruent with the exploratory nature of the study and its focus on the implementation process of the AI intervention. However, quantitative and qualitative findings collectively indicated no clinically important increases in participants’ evidence-based pain assessment documentation post-intervention.

Relatively stable and high mean values for the two practice indicators reflective of lower quality practices (i.e., ‘documentation of pain intensity score’ and ‘pain assessment documentation effort’) and consistent, lower mean values for the two practice indicators representative of higher quality practices (i.e., ‘evidence-based pain assessment documentation’ and ‘documentation of pain intensity score and tool’) over time suggested that staff-nurse participants maintained high levels of their usual way of practicing pain assessment documentation through the study period, without adopting the added recommendations of the clinical practice guideline. Qualitatively, the majority of participants felt unsure if the AI intervention had concretely helped their pain assessment documentation,
although it may have made them more thoughtful around their practices. And, although other practice effects were noted (i.e., using pain assessment tools that were not used in the past, re-assessing pain post-analgesics, and thinking about pain assessment in a more individualized and comprehensive way) the validity of these claims is undeterminable; only pain assessment documentation practices were measured and the abstract nature of increased thoughtfulness regarding pain assessment documentation is inherently difficult to measure.

Results of effect size analysis converged with participants’ comments that the action plan was implemented over a discrete, two-month period and subsequently abandoned. Large effect sizes were found for the two practice indicators representative of the highest (i.e., ‘evidence-based pain assessment documentation) and lowest (i.e., ‘pain assessment documentation effort’) levels of EBP, which can be attributed to a notable drop in the former and increase in the latter at Time 4. Ultimately, this finding may reflect participants decreased adherence to the clinical practice guideline and return to usual practices in the three months following the implementation of the action plan and highlights the importance of incorporating the desired follow-up session immediately after the implementation period.

The process outcome was conceptualized as preceding the practice outcome in the intervention theory. Although there was a statistically and clinically significant increase in participants’ pain knowledge and attitudes over time and they attained theoretically acceptable scores on the PKNAS (McCaffery, 2002; Rieman & Gordon, 2007), this knowledge did not appear to be used in practice. Discrepancies between nurses’ pain knowledge and attitudes and their actual clinical practices have been reported in the literature (Dihle et al., 2006; Jacob & Puntillo, 1999; Twycross, 2006; Van Hulle Vincent & Deynes, 2004; Watt-Watson et al., 2001). A potential explanation for this knowledge-practice
discrepancy is that the facilitators did not review the patient flow sheet with participants in the Destiny phase. Although the Content Facilitator explained the clinical practice guideline and informed participants of what and when to document, a practical example was not provided using the patient flow sheet; it was assumed unnecessary, as all of the participants had been previously trained on its use and it was part of their usual practice. The relatively low, similar values for the two practice indicators representative of the highest quality of practices (i.e., ‘evidence-based pain assessment documentation’ and ‘documentations of pain intensity score and tool’) and higher values for those reflective of the lowest quality (‘documentation of pain intensity score’ and ‘pain assessment documentation effort’) suggest that the challenge to practicing evidence-based pain assessment documentation lay more with participants’ consistent documentation of pain assessment tools, rather than conducting assessments, documenting pain intensity scores, or using the timing outlined in the clinical practice guideline. Providing a concrete example of how and where to document pain assessment tools on the flow sheet may therefore have been especially important to enhancing results for the practice outcome.

Another possible explanation for the knowledge-practice discrepancy is the capacity for nurses’ clinical experience to override the use of any proposed or established research-based protocols in practice (Thompson et al., 2001). The barriers of change overload and busyness during the implementation of the action plan may have led staff nurse participants to rely on previously learned information and experiential knowledge. One participant emphasized that expanding on existing practices was especially advantageous given the context of change overload, as staff nurses were overwhelmed and therefore unreceptive to hearing or using new information. These barriers highlight the importance incorporating a
sustained facilitator relationship in the AI intervention to support nurses to effect positive change in their practices despite complex work environments and fluctuating workloads, which may lead them to practice based on what they already know.

In spite of these plausible explanations, the underwhelming effect of the AI intervention on the practice outcome raises important questions regarding its usefulness for effecting task-based changes. Contrary to the results of this study, cumulative results from several traditional quality improvement efforts in pain have demonstrated increased frequency of pain assessment documentations over time (e.g., Gordon et al., 2002; Hansson et al., 2006; Woodward, 2005). However, a critique of the methods used in these studies is that researchers have only counted the number of pain assessments, rather than comparing the rate of documentation to pre-established standards (Gordon et al.). In this study, analysis relating to the practice outcome was built around a formula that the investigator derived from the hospital clinical practice guideline to capture changes in the relative quality of participants’ documentation practices over time. The purpose of this approach was to individualize and contextualize the number of pain assessments expected for each patient and control for the variation in patient complexity (e.g., number of procedures, number of administered analgesics). Results regarding the practice outcome are therefore incomparable to others, as they reflect a different standard of measurement and are more conservative.

Although the AI process is posited as superior to traditional problem-based approaches in terms of generating positive reception to change, supporting positive group dynamics, and enabling collective action, there are empirical examples of its inferiority for facilitating simple task-performance relating to organizational outcomes (Bushe & Coetzer, 1995; Sekerka et al., 2006). Sekerka and colleagues thus proposed an integration of AI and
typical diagnostic (or problem-based) approaches to change: AI could be used to reduce the negative sentiments associated with change and encourage creativity, while diagnostic methods could be used to reduce change into discrete steps. Reconciling the theoretical and practical particularities of these two methods, which have been historically cast as discrete and divergent in the AI literature (Cooperrider & Srvivasta, 1987; Cooperrider et al., 2005), seems a conceptually questionable and unnecessarily complex undertaking. Rather, the results of this study suggest that the answer lies in returning to a more concrete Destiny phase that focuses on developing and delivering a realistic and detailed action plan. Regular follow-up sessions (e.g., every three months) that include the development of updated action plans, which outline next steps and timelines may provide the necessary structure to make concrete changes and maintain participants motivation through the change process.

It is important to note that, although their effects cannot be unraveled, the action plan produced and implemented by the participants was conceptualized as having a more direct effect on the practice outcome than the AI intervention sessions themselves because AI is a process to promote change. Participants used the AI process to develop a multifaceted KT strategy to enhance pain assessment documentation, which included audit and feedback with education. They purposefully integrated elements of the AI process into their strategy, such as making their Provocative Proposition visible on the unit and adopting a positive approach to feedback provision. In the most recent review on the effects of audit and feedback on professional practice and health care outcomes, Jamtvedt and colleagues (2006) concluded that audit and feedback, with or without education, was variably effective in improving professional practice, with effects being small to moderate in magnitude. Similarly, in a comprehensive review of several guideline implementation strategies, Grimshaw and
colleagues (2004; 2006) concluded that audit and feedback alone resulted in modest improvements in guideline implementations when compared to no intervention, with only a small effect on practices when combined with educational meetings and materials. Although Duncan and Pozehl (2000) reported positive results on nurses pain assessment practices using individual paper-based feedback, results must be interpreted within the confines of methodological limitations, including the use of a one-group pretest-post-test design with only one pre-test measure and a small sample size.

There is currently little empirical basis to guide the provision of audit and feedback, which must be largely guided by contextual and pragmatic factors (Foy et al., 2005; Jamtvedt et al., 2006). This process was enabled by the 4-D Cycle and resulted in an audit and feedback intervention that had several theoretically favorable elements. First, in their review of audit and feedback, Jamtvedt and colleagues (2006) concluded that its effects might be larger when clinicians are actively involved in and have specific, formal responsibilities for implementing change. Second, based on qualitative results regarding the characteristics of audit and feedback in high performing versus low-performing medical centres, Hysong, Best, and Pugh (2006) proposed that audit and feedback should be delivered in a timely, individualized, and non-punitive manner. Each of these elements was included in the audit and feedback strategy designed by the participants, which was delivered colleague-to-colleague, same-day, and in a positive manner based on the hospital clinical practice guideline.

Despite the potential advantages of the designed audit and feedback strategy, possible limitations relate to the relative quality of participants’ existing practices and its dose: audit and feedback may have greater effectiveness where baseline adherence to the recommended
practice is low and the feedback is delivered more intensively (e.g., frequency, duration) (Jamtvedt et al., 2006). Although participants’ baseline practices did not highly coincide with the clinical practice guideline, their pain assessment and documentation practices were relatively good according to the practice indicators ‘documentation of pain intensity score’ and ‘pain assessment documentation effort’. More importantly perhaps, qualitative results and anecdotal discussions with participants suggested that many had positive perceptions of their existing pain assessment documentation practices. Although positive sentiments around practices are essential to the AI intervention, indications that some participants felt they were ‘already there’ for practicing evidence-based pain assessment documentation may have dampened their motivation to change. Although ultimately less generative than focusing on strengths, having practical concerns may be valuable to instilling motivation for concrete change; concern can counteract apathy and prompt individuals to take a critical look at the organization and improvements (Sekerka et al., 2009). Participants also noted that their implementation of the audit and feedback strategy was a discrete event, rather than continued as an iterative process, which was linked to the lack of organized follow-up. The practical value of instituting one round of audit and feedback is questionable; however, the optimal dose is currently unknown (Jamtvedt et al.).

**Patient outcome (children’s pain intensity scores on the unit).** No statistically significant changes were found for children’s average pain intensity scores on the unit across the four patient groups, controlling for type of pharmacological pain management. This lack of statistical significance may be attributed to the relatively small sample size and reduced statistical power (Green & Salkind, 2005). However, because the practice outcome was conceptualized as preceding the patient outcome in the intervention theory, the lack of
statistically and clinically significant changes in the practice outcome may have negated changes in the patient outcome. Moreover, in hindsight, the patient outcome was not entirely relevant to the specific area of practice enhancement selected by nurse participants (i.e., evidence-based pain assessment documentation); the effect of improving nurses’ pain assessment documentation on children’s pain intensity scores is questionable. A recent review indicated a lack of good quality evidence for the efficacy and effectiveness of standardized pediatric pain assessment tools in relation to process (i.e., frequency of documentation) and patient (i.e., pain intensity, satisfaction) outcomes (Franck & Bruce, 2009). Likewise, Van Hulle Vincent and Denyes (2004) found that the only statistically significant predictor of children’s pain intensity was the amount of analgesia administered by nurses. Targeting participants’ pain management practices may therefore have had a more marked and direct effect on the patient outcome.

Another possible explanation for the lack of change in the patient outcome is the floor effect. Children’s average pain intensity scores were relatively low across the four patient groups. Reports on mean pain intensity scores for pediatric surgical patients are not absolutely comparable to the results of this study, as they have been measured using scales with different metrics (e.g., 5-point Oucher, 100-point VAS); however, they have been typically interpreted as moderate (Polkki et al., 2003; Rheiner et al., 1998; Tesler, Holzemer, & Savedra, 1998), compared to the mild level of pain observed in the present study (Palos, Mendoza, Mobley, Cantor & Cleeland, 2004). The floor effect can lead to Type II error and it might be easier to decrease high median values of pain intensity than proportionately low ones (Hansson et al., 2006). A literature review of quality improvement efforts in pain management revealed that researchers failed to detect statistically significant decreases in
patients’ pain intensity over time, which was attributed to inadequate commitment to and ineffective pain management that exceed targeted health care provider and patient factors (Gordon et al., 2002). This assertion is plausible given the increasing recognition that the barriers to high quality pain practices are complex and likely include contextual factors (Manias et al., 2002; Willson, 2000).

**Extraneous Factors of the AI Intervention**

Several individual and organizational factors were conceptualized as influencing the implementation and outcomes of the AI intervention (Sidani & Braden, 1998). These factors were organized according to the PARiHS framework (Kitson et al., 1998; Kitson et al., 2008; Rycroft-Malone, 2004). This study was not designed to provide construct validity for the PARiHS framework; however, results support the elements of the framework and, in some cases, may enhance their conceptual clarity.

**Evidence.** Two individual characteristics were explored relating to the concept of evidence: nurse participants’ clinical experience and attitudes towards research. On average, nurse participants’ attitudes towards research scores were higher than those in other studies (Lacey, 1994). This quantitative finding is aligned with qualitative comments that the larger hospital valued EBP; however, scores may also have been biased by social desirability, as participants may have represented a particularly keen group eager to present a favorable image of themselves in terms of their views on using evidence in practice (van de Mortel, 2008). Interestingly, participants were found to have statistically significantly higher attitudes towards research scores compared to non-participants and had relatively more experience in nursing and on the study unit. These findings suggest that the AI intervention was more appealing to seasoned nurses with more favorable views of using research in practice. It is
reasonable that those with more positive attitudes towards research would participate in the AI intervention, as that was its focus. And, it was more seasoned nurses who emphasized the vast experiential knowledge and acquired practice perspectives that they could contribute to practice enhancements.

Large, positive, statistically significant correlations were found between participants’ attitudes towards research and their overall pain knowledge and attitudes. This finding was supported by the moderate effect size found for the relationship between nurse participants’ attitudes towards research and their pain assessment knowledge and attitudes. Although this relationship has not been previously reported, it is plausible that positive views on using evidence in practice may result in information seeking around pain information. This claim is especially viable given the culture of the study unit, where pain was a priority and there were related learning opportunities.

There was also a large, positive, statistically significant correlation between staff nurse participants’ attitudes towards research and their documentation of pain intensity scores, and a moderate correlation that was statistically non-significant between staff nurse participants’ attitudes towards research and their efforts to document pain assessments. It is interesting that the largest correlations were found for the practice indicators reflective of the lowest quality of EBP. Although more positive attitudes towards research were not significantly associated with adherence to the clinical practice guideline, the results suggest that those with more positive attitudes to research may still have a greater propensity to conduct pain assessments and use pain assessment tools to derive pain intensity scores, relative to those with less positive attitudes.
Other relationships between measures of clinical experience and the process and practice outcomes were statistically non-significant; nonetheless, there were some interesting findings that bear discussion. First, a positive relationship and large effect size were found for participants’ years of nursing experience and their overall pain knowledge and attitudes, indicating that participants with greater nursing experience tended to have higher pain knowledge and attitudes. Although statistically significant relationships have not been found between nurses’ knowledge and attitudes regarding pain and years of nursing experience in larger samples (Manworren, 2000; Rieman & Gordon, 2007), Rieman and Gordon found that pediatric nurses with zero to two years experience scored significantly lower on the PKNAS than the more experienced groups of nurses. It is plausible that the relationship between increased clinical experience and pain knowledge and attitudes may be specific to this sample of nurses because experienced nurses spent the majority of their careers on the study unit, which had an evidenced commitment to pain management and offered related learning opportunities; however, the validity of this proposition is compromised by the negligible correlation between participants’ employment duration and their overall pain knowledge and attitudes.

In contrast, moderate effect sizes supported the finding that participants with lower levels of nursing experience had higher values for those practice indicators reflective of higher quality EBP (i.e., ‘evidence-based pain assessment documentation’ and ‘documentation of pain intensity score and tool’). In an observational study of pediatric nurses’ post-operative pain management practices, Twycross (2007) noted that nurses with less than five years of experience were also those observed using pain assessment tools. A more experienced staff nurse participant from the present study perceived the more novice
nurses to be relatively more comfortable with accessing online guidelines and policies, which may be related to an increased propensity to practice accordingly. Certainly, in the past decade, there has been an increased focus in nursing to develop evidence-based nursing skills amongst students (Dunbar-Jacob, 2005) and online versions of guidelines may be more congruent with the information seeking behaviours of younger nurses. Ultimately, while those nurses with the most experience in a specific clinical area may be the least confident in handling research-based products (Thompson et al., 2001), results from a systematic review suggest that nursing experience is not a statistically significant predictor of research use in nursing (Estabrooks et al., 2003).

**Context.** Participants rated their work environment to be relatively complex due to interactions with others, changing patient acuity, and the composition of the caregivers (O’Brien-Pallas et al., 1997, O’Brien-Pallas et al., 2003). The in vivo theme of busyness corroborated with this quantitative finding of environmental complexity. Although the ECS was not considered to provide a comprehensive evaluation of context, it was considered sufficient given the primary purpose of exploring the implementation process of the AI intervention. The relatively low Cronbach’s alpha coefficient found for the caregiver composition subscale is congruent with results of a recent study on factors affecting evidence-based procedural pain management in hospitalized neonates (Latimer, Johnston, Ritchie, Clarke, & Gilin, 2009) and may be due the limited number of items (n = 3) and homogeneity of responses (McKennell, 1978; Voss et al., 2000).

Qualitative findings underscored the importance and dynamism of the human resource, rather than the emphasis placed on the physical elements of setting and organizational infrastructures in the PARiHS framework (i.e., boundaries, decision-making,
authority, information, feedback systems) (Kitson et al., 2008; McCormack et al., 2002; Rycroft-Malone, 2004). Vacation, medical leaves, increased patient demands, and organizational changes were all cited as impacting the available people support for nurse participants during the implementation of the action plan. The changing nature of the context during the implementation period also suggests that while a context may be receptive to change at the outset of an intervention, the same may not hold true over even a discrete intervention period. This fluctuating nature of context is not substantively captured in the PARiHS framework, but has important implications for designing KT interventions: where the variability between contexts has already complicated the picture for implementation research, the spontaneous variability within contexts, including the human element, adds an additional and significant layer of complexity.

**Culture.** Quantitative and qualitative findings indicated congruence between the unit culture and the nature of the AI intervention and implementation of evidence-based pain practices. The NUCAT-3 (Coeling & Simms, 1993a) enabled measurement of subgroup culture at the unit level. There is a paucity of evidence to guide a more interpretive synthesis of results from the NUCAT-3; analysis has been limited to reports of specific behaviours that are important and unacceptable to groups of nurses (e.g., Coeling & Simms, 1993a; Goodridge & Hack, 1996; Rizzo et al., 1994) or limited to interpretation within the confines of specific results (e.g., Estabrooks et al., 2008). However, findings from the present study follow a pattern collectively supportive of clinical competence (e.g., importance of being comfortable with monitoring for life-threatening situations), family-centered care (e.g., teaching patients, making patients comfortable), and teamwork (e.g., unacceptability of refusing to help a colleague; having one person, rather than the group, decide on the nursing
care for a patient). Family-centered care is a key philosophy embraced by the study hospital, which includes expectations that nurses are sufficiently skilled and experienced to support, teach, and empower families (Hutchfield, 1999; Nethercott, 1993). This value, as well as that of clinical competence, is aligned with a desire to enhance pain practices through the AI intervention. Participants’ appreciation of teamwork is complimentary to the collaborative nature of the AI intervention and identified in the interviews as an existing attribute of their group dynamic that was enhanced through the AI process.

Participants also qualitatively referenced the interest of the larger hospital in EBP, as was the focus of the AI intervention. University-affiliated hospitals (like the setting in this study) may value research use more than non-academic settings (Scott-Findlay & Golden-Biddle, 2005) and an organizational culture supportive of EBP may be critical to sustaining nurse-led guideline implementations (Davies et al., 2006). Participants also described the culture on their unit as one of ‘passion for pain management’. Relevance and organizational fit have been identified as contextual factors that influence the successful implementation of evidence in practice (Rycroft-Malone et al., 2004b). Moreover, a commitment to improving pain practices is considered a key factor to implementation research in pain (Dufault, 2004; Seers et al., 2004; Tracy et al., 2006). Last, the AI process seemed well matched with the people on the unit, who were self-described as fun, curious, and relatively positive, with a sense of autonomy amongst the staff nurses. Ultimately, this supportive unit culture appeared to moderate the adverse impact of identified barriers (i.e., context overload, logistics, busyness) on the implementation of the action plan.

**Leadership.** Staff nurse participants rated their administrative nurse leader as having a tendency towards a transformational leadership style using the MLQ (5X-Short) (Avolio &
Bass, 2004). Relatively low internal consistencies found for the idealized influence–behavior, inspirational motivation, management by exception–passive, and laissez-faire subscales may be attributable to the homogeneity of responses, evidenced by the relatively narrow range of responses. Contexts with transformational leaders are considered more conducive to the implementation of EBP (Kitson et al., 2008; McCormack et al., 2002). From an investigator perspective, the administrative nurse leader was instrumental for purposes of organization and support. She arranged recruitment sessions and facilitated participants’ attendance at the AI intervention by accommodating their clinical schedules. The investigator spoke to this nurse leader informally throughout the study regarding issues like increasing staff-nurse participants’ response rates to the questionnaires. Moreover, she was an active participant in the intervention sessions and made substantive contributions to the activities.

In a study evaluating the implementation of nursing best practice guidelines over a four-year period, Davies and colleagues (2006) concluded that nursing leadership was critical to sustaining and expanding the use of clinical practice guidelines. Leadership was necessary at all levels, including staff nurses, advanced-practice nurses, managers, and senior executives. Arguably, all of the participants in this study exhibited a degree of leadership by their involvement in the AI intervention; it was a voluntary initiative that required them to participate in the sessions outside of their working hours and to implement the action plan in addition to their usual workloads. Ultimately, the results of this study provide beginning support for the theoretical proposition that the AI intervention is aligned with the concept of transformational leadership (Kavanagh et al., 2008): participants reflected on the leadership roles afforded to them through the AI intervention and worked to create a context that was more conducive to the integration of evidence in practice (McCormack et al., 2002).
However, sustained and formal leadership was a challenge to maintain. Commitment from nurse leaders dwindled post-intervention because of logistical barriers related to balancing the action plan with the demands of their professional roles and responsibilities. Given the democratic nature of the AI intervention and absence of the facilitators, leadership was not assumed within the group during the implementation of the action plan to organize the desired follow-up session. The leadership component of the AI intervention will be enhanced in future implementations by including a continued facilitator relationship; however, for the purpose of clinical utility, this relationship will be focused on the organization of and participation in periodic follow-up sessions. Given the iterative nature of the KT process (CIHR, 2009; Davies et al., 2006), future implementations of the AI intervention should therefore also include the identification of local leaders from within the group to act as central resources for participants and serve as communication hubs during the implementation period. To minimize the burden of this role, it should be limited to fielding questions and comments from the group that can be immediately addressed or retained for discussion at the follow-up session, and acting as a liaison between the participants and facilitators should immediate assistance be required. Ultimately, the efforts of the local leaders could replace the sustained organizational role of the facilitators.

**Evaluation.** Evaluation is an essential organizational element for the successful implementation of EBP (Rycroft-Malone, 2004; Rycroft-Malone et al., 2002). This construct was neither measured in the quantitative aspect of this study nor asked about directly in the qualitative portion; however, participants provided information in their interviews that supported the existence of a context familiar with evaluation. Staff nurse participants noted that nurse leaders had routinely done audits on the unit to evaluate their clinical practices.
Existing evaluative structures and processes facilitated their development and implementation of the action plan; the audit template was modified and used for their audit and feedback strategy.

The results of this study support the assertion that AI is a means to promote informal, internal evaluation of unit practices by focusing nurses on reflection and dialogue around their pain practices (Kavanagh et al., 2008). Under the theme of ‘broadened horizons’, participants noted that the informal knowledge sharing enabled by the AI process (particularly the Discovery phase) provided a way to evaluate each other’s knowledge, provide feedback, and collect baseline information on and appraise their current practices. AI is purported to be a valuable method for conducting organizational evaluations because problems are often easier to address by taking an appreciative stance (Coghlan et al., 2003; McNamee, 2003; Reed et al., 2002). Participants affirmed this conclusion, stating that the positive focus enabled them to discuss issues in the presence of the nurse leaders and provided a constructive and realistic way to consider and address challenges. The AI process was also considered a method to subject evidence to scrutiny, regardless of its source (Kavanagh et al.). The Content Facilitator was instrumental in discussing participants’ contributions relating to clinical experience, patient preferences, and local data in light of current pain research evidence.

The evaluation component of AI can be enhanced in future implementations of the intervention, with particular relevance for contexts relatively less conducive to the implementation of EBP, by discussing strategies that exist within or outside of the organization that may support practice enhancements (Cooperrider et al., 2005). Such benchmarking activities are often introduced in the Dream phase and can inspire and guide
positive change. Exploring best practices and possibilities from other organizations resembles the ‘positive deviant’ approach to quality improvement (Bradley et al., 2009). This approach involves identifying innovative strategies from ‘positive deviants’ or organizations known for exceptional performance and promoting the uptake of those practices. A central assertion of this approach congruent with that of AI is that many strategies and resources for best practices already exist in the community, which can be capitalized on by other organizations. However, the positive deviance approach is a substantive method in itself and in the absence of information of ‘what works’ from other organizations, alternate sources of benchmarking data (e.g., from literature or within the organization) can be included in the AI intervention to support practice enhancements, depending on their contextual relevance.

Facilitation. The facilitators ‘made things easier for others’ (Kitson et al., 1998) during the delivery of the AI intervention sessions, with participants emphasizing their value in guiding them through the process, providing the necessary information, and making it understandable. Interestingly, participants indicated that they did not want a continued relationship with the facilitators while they implemented their action plan, but rather enjoyed operating as an autonomous team; however, this preference may have been more reflective of their appreciation of the democratic nature of the AI intervention and level of control it afforded them (mentioned by staff nurse participants in particular), rather than the true value of a continued relationship with the facilitators. Namely, they appeared to be relying on the facilitators to organize the desired follow-up they felt was important to giving closure to the intervention and promoting their continued progress. Their responses around the need for, but lack of organized follow-up suggest that facilitation fell short during the implementation of
the action plan, which will be addressed in future implementations by scheduling a facilitator-led follow-up session in the original action plan.

Participants spoke highly of the facilitators and affirmed the importance of several reported characteristics, including credibility, communication skills, and a positive and enthusiastic approach (Rycroft-Malone et al., 2004b). Credibility was often discussed in relation to that of knowledge and sometimes competence in mediation. In accordance with clinicians’ association between credibility and status (Rycroft-Malone et al.), participants paid more attention to concept of credibility when discussing the Content Facilitator, emphasizing her organizational reputation. Her involvement was seen as important because she had an existing rapport with the staff and was able to contextualize research evidence based on knowledge of the unit and patient population. Conversely, the Process Facilitator had a more important coaching role. Coaching and enabling facilitation are conceptually similar, as both aim to provide support and feedback during a goal-oriented change process (Bentley, 1995; Harvey et al., 2002). Participants valued the positive approach maintained by the Process Facilitator and her enthusiasm. Maintaining a positive approach is a critical part of the AI process that is also described as important to both coaching (Bentley) and facilitating (Rycroft-Malone et al.).

Ultimately, both facilitators appeared to operationalize their roles as designed, which participants viewed as equally important, but for different reasons. From the perspective of the Process Facilitator, the support of the Content Facilitator was vital during the AI intervention sessions due to the emotional and cognitive labor of facilitation. Constant attention was required towards maintaining a positive stance and actively listening to and developing participants’ contributions. The intensive nature of the AI intervention sessions is
thus considered to require at least two facilitators and there was added benefit to having a third facilitator (i.e., Back-up) focused on recording results real-time. In the absence of a third facilitator in future implementations, participants will be asked to share the scribing tasks, as originally planned in this study.

**Strengths**

This study is the first to use AI as a KT intervention for a clinical issue in an inpatient clinical setting. A major strength of this study was its basis in KT theory (The Improved Clinical Effectiveness through Behavioural Research Group [ICEBeRG], 2006; Sidani & Braden, 1998; Thompson et al., 2007). Theory use has been uncommon in the field of implementation research (ICEBeRG; Davies, Walker, & Grimshaw, 2003) and researchers seeking to implement pain evidence in practice have neglected the comprehensive use of theory to guide intervention design and evaluation. Interventions have been criticized as taking a ‘black box’ approach to implementing evidence in practice because collected data do not support an understanding or explanation of the findings (Mittman, 2004). In this study, a theory-based approach guided AI intervention selection, delivery, and evaluation (ICEBeRG; Sidani & Braden). In spite of the small sample size, the theory-based approach inferred internal validity, increased external validity, and enhanced the clinical utility of study results (Sidani & Braden). It also facilitated conclusions regarding the effects of the AI intervention on outcomes, including explanations of statistical non-significance (ICEBeRG; Sidani & Braden). Through its basis in the PARiHS framework, this study advanced the conceptual understanding of KT in pain.

Despite a growing awareness that getting evidence into practice is a complex, multifaceted process, there remains a lack of clarity around what interventions are effective,
with whom, and in what contexts (Kitson et al., 2008). Reviews examining a range of interventions to implement clinical practice guidelines indicate that they are selectively effective in different contexts (Gordon et al., 1998; Grimshaw et al., 2004; Jamtvedt et al., 2006; Thomson O’Brien et al., 1997). This study implemented and explored a novel intervention that enabled participants to create a contextually tailored intervention. Although the sample size, sampling technique, and setting preclude the generalization of results to other inpatient clinical settings and pediatric nurses, the AI process is intended to be generalizable. The detailed intervention manual created in this study can be used as a general model across contexts and clinical practices to develop KT strategies that reflect the needs and interests of various organizations and their members. The exploration of individual and organizational extraneous factors supports the transferability and clinical utility of results by allowing others to make judgments regarding the congruence of this context and its members with their own (Eccles et al., 2005; Firestone, 1993; Lincoln and Guba, 1985).

This study is unique to the field of pain implementation research because it included a process evaluation of the AI intervention. Process evaluations are considered important to gaining insight into why and how quality improvement interventions work (Hulscher et al., 2003). Results regarding the acceptability, fidelity, and feasibility of the AI intervention provided important insights into barriers to and facilitators of the implementation process. Awareness of barriers and facilitators supported a valid interpretation of findings, assisted the development of strategies to address barriers, and ultimately helped to refine the AI intervention for future evaluations (Sidani & Braden, 1998). As such, the chances for Type III error, or making erroneous conclusions about the effectiveness of an intervention that was inappropriately implemented, were minimized (Basch & Gold, 1986).
The mixed-methods approach of this study enhanced the depth, breadth, and completeness of discussion regarding the implementation process and beginning effects of the AI intervention (Creswell, 2009; Sims & Sharp, 1998). Quantitative data were collected systematically and, where available, reliable and valid tools were selected for the purpose of outcomes measurement. Outcomes were measured at the process, practice, and patient levels (Donaldson et al., 2004; Estabrooks, 1999a). Primary and secondary criteria for qualitative validity were met in this study by applying the analytic techniques described in the methods. Transferability was addressed by providing both quantitative and qualitative descriptions of the participants and context under study (Eccles et al., 2005; Firestone, 1993; Lincoln and Guba, 1985).

**Limitations**

There are several limitations associated with this study. The small sample size increased the likelihood of Type II error, which precludes conclusions regarding the statistical significance of results. Generalizability of results to the larger population of pediatric nurses and inpatient clinical settings is limited by the small sample size and volunteer bias (Streiner & Norman, 1998). However, this study was exploratory with the primary objective of examining the implementation process of the AI intervention. Moreover, the repeated-measures design used in this study is more powerful than a between-subjects design because it controls for inter-individual and inter-institutional differences, which would have constituted a substantial source of error variance in the analysis (Louis et al., 1994; Martin & Thompson, 2000). Ultimately, the objective of the AI intervention was to involve those with a vested interest in the change initiative (be they representative of others or not) and a larger sample may not be desirable due to its intensive participatory nature.
The clinical utility of the AI intervention is potentially threatened by the significant time burden incurred by the participants and investigator. Staff nurse participants attended the intervention sessions on days off and implemented the action plan during their clinical shifts. Overall, the staff nurse participants felt that their involvement in all aspects of the AI intervention was manageable and liked the autonomy of the process, but the nurse leaders found the added workload difficult to manage. The challenges faced by the nurse leaders may have impeded the implementation process and adversely affected the sustainability of the AI intervention. Although they may be less suited than staff nurses for consistent participation and concrete roles in action plan implementation, their visibility in the intervention sessions was vital to the overall success of the study. The investigator dedicated significant time in terms of scheduling the intervention sessions in light of nurses’ clinical shifts. Early organization and support from local nurses with influence over scheduling activities aided the process and can be capitalized on further in the future.

The honorarium and other incentives (i.e., refreshments, parking passes) provided to participants for their involvement in the AI intervention also challenge its clinical utility. Health care organizations have relatively few resources for quality improvement initiatives and their benefits should be weighed against their costs (Grimshaw et al., 2004; 2006). Compensation was considered important in this study, as it was the first time use of a novel intervention in an inpatient clinical setting, with staff nurse participants attending the intervention sessions on their days off. Qualitative results suggested, however, that the money was largely seen as a bonus and not the driving factor for participation; rather, several participants considered the dominant incentives to be their interest in and commitment to pain management. One staff nurse mentioned that the compensation was relatively
insignificant because it could have been more easily accrued by working an extra shift. As such, it appears that a group of clinicians interested in championing an initiative may be inclined to do so without such substantial compensation.

Several limitations relate to outcomes measurement in this study. Measurement has been identified as a challenge in AI studies; the theoretical mechanisms underlying the AI process are complex and dynamic, often yielding outcomes that are difficult to measure (Messerschmidt, 2008; Reed et al., 2002; Serkerka et al., 2006). Measurement of EBP (or the practice outcome) was especially challenging because a specific outcome measure could not be established a priori; participants selected the particular topic of interest in the Dream phase. Fortunately, the Pain Audit Tool (Taddio et al., 2007) was comprehensive and captured the topic of pain assessment documentation well. However, the process and patient outcomes were arguably less relevant post-intervention; participants’ overall pain knowledge and attitudes was a general measure of the specific focus on evidence-based pain assessment documentation, which likely had minimal influence on children’s pain intensity scores on the unit. Additionally, several outcomes were unanticipated and/or abstract (e.g., increased thoughtfulness around pain practices, team spirit, increased awareness of pain assessment and management). Qualitative methods were valuable for capturing these unintended outcomes (Chen, 1990).

Participants’ overall research use may have been underestimated in this study. Although there was a specific measure of participants’ evidence-based pain assessment documentation practices, there was no measure of the general construct of research utilization (Estabrooks, 2009; Thompson et al., 2007). Incorporating a general measure of research utilization is aligned with the overall impetus of the PARiHS framework to promote
evidence use in practice, including that derived from research. Three forms of research utilization have been identified: instrumental (i.e., the concrete use of research in practice), conceptual (i.e., the use of research to change thinking, but not necessarily action), and symbolic/persuasive (i.e., the use of research to change policies or decisions) (Beyer, 1997; Estabrooks, 1999b). The practice outcome likely reflected instrumental research use, but its exclusive measurement precluded assessment of other forms of research utilization (Estabrooks, 2009). For example, participants’ reference to the abstract outcome of increased thoughtfulness around pain assessment documentation may have been reflective of conceptual research use.

Further issues relating to measurement include the potential effects of social desirability response bias on participants’ responses on subjective measures, such as the RUQ-Attitudes Towards Research subscale (Champion & Leach, 1989), ECS (O’Brien-Pallas et al., 1997; O’Brien-Pallas et al., 2003), NUCAT-3 (Coeling & Simms, 1993a), and MLQ (5X-Short) (Aviolo & Bass, 2004). Social desirability response bias is defined as the tendency of participants to misrepresent their responses to give answers consistent with social norms and values (Streiner & Norman, 1998; van de Mortel, 2008). Influence from this bias was likely, given increased professional expectations around practicing EBP (Kitson et al., 2008); the known commitment to pain on the study unit; and, the value placed on positivity in the AI intervention, which may have led participants to skew their responses towards the positive. Participants were informed that their responses were anonymous to minimize this bias; however, they may have been eager to present a favorable opinion of their unit and themselves despite such assurances (Collins, Shattell, & Thomas, 2005; van de Mortel). There was also a notable response burden for participants. Strategies to address
response burden included having a research assistant complete certain instruments (e.g., Pain Audit Tool) and using short versions of instruments to measure outcomes where possible (e.g., MLQ [5X-Short], RUQ-Attitudes Towards Research subscale). Testing effects may have resulted from the repeated-measures design. In an effort to minimize this, post-test measures were spaced three-months apart and participants were asked to complete instruments on their own time, rather than during their clinical shifts (Greenwald, 1976).

There are limitations to note with respect to the qualitative aspect of the study. First participants were asked to give retrospective accounts of their experiences with the AI intervention. Interviewing participants at Time 4 was originally considered appropriate based on the assumption that their efforts to implement the action plan would have lasted through the study period; however, the plan was actually implemented over a two-month period and subsequently abandoned. Nonetheless, participants provided rich and detailed descriptions of their experiences that corroborated with each other in terms of the more factual aspects (e.g., structure of the sessions, organizational changes on the unit, timing of implementation). There was also the potential for social desirability (Collins et al., 2005) to influence participants’ accounts of their experience with the AI intervention and its effects based on professional expectations around EBP, a context attentive to excellence in pain management, and possible inclinations to report on a positively focused intervention in a positive way. Efforts were made to minimize the effects of this influence by informing participants that their responses would be kept confidential, there were no right or wrong answers to the interview questions (Collins et al.), and both positive and negative feedback was important to future implementations of the AI intervention. Lastly, there was the possibility for researcher influence during analysis consequent to the role of the investigator as the Process Facilitator.
in the AI intervention. A reflexive journal was maintained during the analytic period to capture assumptions. Although the investigator was aware that she had an underlying desire for the intervention to succeed due to her intense involvement with the group, she also had an equal interest in learning about areas for improvement for future implementations.

This study did not address pain management as an interprofessional responsibility, which may have limited its capacity to effect and sustain practice enhancements. Interprofessional collaboration is considered an important element in the successful implementation of EBP (Rycroft-Malone et al., 2004b) and, among other factors, it has been found to impact on nurses’ pain management decisions (Brown & McCormack, 2006; Willson, 2000). Nurses were the target population because they have a pivotal role in pain management (Van Hulle Vincent, 2005). It has also been argued that because nurses form the largest single group of healthcare practitioners, increasing the extent to which they use research in practice could significantly affect patient care (Scott-Findlay, Estabrooks, Allen, & Pollock, 2008). Participants ultimately selected a topic that was relevant and specific to usual care practices in nursing (i.e., pain assessment documentation). Nonetheless, clinicians from other health care professions could have influenced this practice through co-creating the culture on the unit. For example, if pain assessment scores were not valued by physicians or an integral part of the interprofessional report process, their relevance and nurses’ practice of collecting them might be diminished. Pediatric nurses have described the low priority given to pain by medical staff as a barrier to providing optimal pain management (Van Hulle Vincent & Denyes, 2004). Including all members of the health care team fits with the AI tenant that the process should involve a microcosm of the context (Cooperrider et al., 2005).
Lastly, the onus of sustaining the action plan may have been placed too heavily on the participants. The importance of a continued facilitator relationship has been proposed in KT literature (Rycroft-Malone et al., 2002) and highlighted by the iterative nature of the KT process (CIHR, 2009; Davies et al., 2006). A hybrid model of facilitation was conceptualized as important for KT in pain (Kavanagh et al., 2007) that included a longer-term facilitator relationship, but this conceptualization of facilitation was not fully operationalized in practice. The decision to forgo a sustained facilitator relationship was based on two factors: more than action planning, the Destiny phase is intended to provide participants with the momentum to connect, cooperate, and co-create (Cooperrider et al., 2005) and the clinical utility of the intervention was felt to be diminished if it required continued facilitation throughout the implementation process. Although participants indicated that they liked the autonomy of implementing the action plan without facilitator involvement, there was an ongoing need for the organizational efforts of the facilitators to arrange a follow-up session and for stronger local leadership to support sustainability.
Chapter Eight: Implications and Conclusions

Study Summary

This study was the first to use AI as a KT intervention and directly apply AI to a clinical issue in an inpatient clinical setting. Appreciative Inquiry is an innovative KT intervention that is compatible with the PARiHS framework (Kitson et al., 1998; Kitson et al., 2008; Rycroft-Malone, 2004). A prospective, repeated-measures, mixed-methods case study was conducted to primarily explore the implementation process of AI as a KT intervention in pain. Secondary purposes included examining the beginning effects of AI on pain related outcomes (i.e., pain knowledge and attitudes, pain assessment documentation, children’s pain intensity scores) and exploring factors related to the PARiHS framework that influenced the implementation and outcomes of the AI intervention. Outcomes were measured at six and three weeks pre-intervention and three and six months post-intervention, ending with a semi-structured interview on the acceptability of the AI intervention to the participants.

Findings regarding the use of AI as a KT intervention in pain are promising, despite a lack of conclusive evidence regarding its effectiveness. The AI intervention was implemented with high fidelity and proved acceptable and feasible for use in an inpatient clinical setting. Nine staff nurses and three nurse leaders participated in the intervention. They perceived their context to be relatively complex, with a culture focused on clinical competence, family-centered care, and teamwork, and a transformational leadership style. Participants had statistically significantly more positive attitudes towards research compared to non-participants and trended towards greater years of nursing experience. A Process and Content Facilitator delivered the AI intervention sessions, with a Back-up Facilitator acting
mainly as a recorder. The four phases of the AI process (i.e., Discovery, Dream, Design, and Destiny) were covered in four three-hour sessions, cumulatively delivered over two-weeks. Most participants (n = 11) attended all four sessions in which they developed a contextually tailored action plan to enhance evidence-based pain assessment documentation.

Overall, participants were satisfied with the AI intervention. The AI process was considered a refreshing approach to change due to its positive nature, democratic approach to change, and focus on expanding on existing practices. Participants outlined several elements of the designed AI intervention that should be retained, including three hour duration of each session, the close spacing of the sessions (preferably two sessions per week), methods used by the Process Facilitator to enhance participation and productivity (e.g., individual, paired, and group activities; giving activities in advance; recording results real-time; and providing synopses), the eclectic group mix, an internal-external facilitator partnership, and developing a concrete action plan. Several modifications will be made for future evaluations of AI as a KT intervention in pain. First, an additional session will be scheduled to accommodate the potential need for more time, especially given the excess time demands of the Dream and Design phases. Second, only one three-hour session will be offered per day to respect the intensive nature of the activities. Third, a facilitator-led follow-up session and the identification of local leaders will be included in the action plan to enhance sustainability. Fourth, group membership will be expanded to interprofessional members of the health care team. And last, monetary compensation will be decreased to increase the clinical utility of the intervention.

Quantitative results suggested that the AI intervention affected a statistically significant increase in nurse participants’ pain knowledge and attitudes over time. The
clinical significance of this increase was supported by a relatively large effect size and convergent qualitative findings. There were no statistically significant trends in the practice outcome over time, which corroborated with participants’ underwhelming sentiments on the concrete effects of the AI intervention on their pain assessment documentation. Relatively large effect sizes for differences in the practice indicators ‘evidence-based pain assessment documentation’ and ‘pain assessment documentation effort’ over time are attributable to a sharp decrease in the latter and corresponding increase in the former at Time 4. These results may be reflective of participants’ abandonment of the action plan after the discrete implementation period. Despite these findings, participants highlighted several perceived effects of the AI intervention, including that it generated a positive reception to change; increased their team spirit; and broadened their horizons, including expanding their pain knowledge and awareness, providing informal evaluation of their pain practices, and effecting various concrete and abstract practice changes related to pain.

Exploratory analyses revealed large, positive, statistically significant correlations between participants’ attitudes towards research and their overall pain knowledge and attitudes and the practice indicator ‘documentation of pain intensity score’. Participants overall pain knowledge and attitudes and those specific to pain assessment were also positively and statistically significantly related to their ‘pain assessment documentation effort’. Although not statistically significant, relatively large effect sizes were found for the relationships between participants’ years of nursing experience and their overall pain knowledge and attitudes.

Results of this study are encouraging and warrant an evaluated implementation of the AI intervention in other contexts and for other clinical practices. The AI intervention requires
only minor revisions before it is applied in future research. AI appears to be an acceptable and feasible KT intervention in pain, with the capacity to affect outcomes beyond those measured in this study. AI may have particular importance for promoting a positive reception to change, which is an essential first step in any change initiative. The apparent influences of individual (i.e., attitudes towards research, clinical experience) and organizational (i.e., context, culture, leadership) extraneous factors on the implementation and outcomes of the AI intervention and its generative effects support the continued use of a mixed-methods, theory-based approach in future evaluation.

**Implications for Policy**

Implications for policy are conservative given the exploratory nature of this study and primary focus on examining the acceptability, fidelity, and feasibility of the AI intervention. However, the AI intervention is congruent with the national KT agenda for collaborative, action-oriented research that addresses the co-production of knowledge by researchers and knowledge users to enhance knowledge generation and translation (CIHR, 2009). Because the AI process is flexible to the context in which it is implemented and capitalizes on contextual strengths to affect change, it may provide a general model for KT with broad applicability across organizations, health care disciplines, and clinical practices. Ultimately, AI may provide a bridge between research and policy; it is an intervention with the capacity to engage stakeholders from policy, clinical practice, research, and administration to implement accreditation guidelines (e.g., CCHSA, JCAHO) and recommendations from national health care agencies (e.g., AAP, CPS) to enhance evidence-based pain practices.

**Implications for Theory**
Results of this study support the conceptual robustness of the PARiHS framework and its utility for conceptualizing and evaluating KT interventions. Qualitative findings support the assertion that clinicians value multiple sources of evidence during the implementation process (Rycroft-Malone et al., 2004b). Participants discussed the usefulness of formal research evidence, informal experiential knowledge, and local contextual information to designing and implementing a strategy to promote EBP. They also shared success stories relating to patient preferences in the Discovery phase.

The importance and impact of context, culture, leadership, and evaluation on implementation activities was highlighted (Kitson et al., 1998, McCormack et al., 2002; Rycroft-Malone, 2004). Overall, the context and culture of the study unit were relatively conducive to the implementation of evidence in practice and appeared to be important moderating factors to overcoming barriers (e.g., change overload, busyness, logistics). The in vivo theme of ‘change overload’ highlighted the dynamic and human elements of context (Kitson et al., 2008). The sub-element of context in the PARiHS framework has been historically described in terms of relatively standing, physical attributes of a setting (Kitson et al., 1998; Rycroft-Malone). Although a recent update includes the appropriate allocation of human resources (Kitson et al., 2008), the influence of organizational changes and resultant fluctuation in the quality of context is not adequately captured. Consideration of these factors may strengthen the comprehensiveness of this sub-element of the framework and its utility for those considering an implementation project.

The factors of organizational changes and contextual dynamism have implications for applying the PARiHS framework as a diagnostic and evaluative tool to implement EBP (Kitson et al., 2008). Standardized questions have been developed from the framework to
assess the quality of a context and nature of the evidence pre-intervention to select the most appropriate means of facilitation (Kitson et al.). The results of this study emphasize the importance of iterative contextual evaluation during the implementation process, as a context of change overload occurred during the latter phases of the study period. Contextual fluctuations may alter the conduciveness of a context to the implementation of evidence from the start of a KT intervention through to the end. Consequently, the role of the facilitator is not static and cannot be concretely decided at the outset of an intervention, but rather, facilitators need to be flexible in their strategies to meet the changing demands of individuals in a particular context over time (Bero et al., 1998).

Qualitative findings provide beginning empirical evidence on the relative importance of appropriate facilitation to improve the likelihood of KT success. The weighting of the elements in the PARiHS framework is currently unknown (Kitson et al., 2008), with the overarching importance of facilitation hypothesized (Kitson et al., 1998; Rycroft-Malone et al., 2002). In the present study, even where the quality of the evidence and the context could be rated as relatively strong, participants emphasized the importance of a continued facilitator relationship to maintain their progress and motivation. This relationship may have been especially important given the fluctuating quality of the context, which became less conducive to evidence implementation over time due to an onslaught of organizational changes. The important role of facilitation in improving outcomes in the face of contextual challenges has been noted in implementation research (Ellis et al., 2005; Sharp et al., 2004).

The importance of a continued facilitator relationship in this study supports the theoretical proposition that the key to successful facilitation is to match the purpose, role, and skills of the facilitator(s) to the needs of the situation (Kitson et al., 1998; Rycroft-Malone,
Facilitation in pain was hypothesized as requiring a hybrid approach that was both task-based and enabling (Kavanagh et al., 2007). The internal (task-based)-external (enabling) facilitator partnership employed in the AI intervention proved to be acceptable and valuable to participants; however, this conceptualization was not operationalized in full, with the longer-term facilitator relationship characteristic of enabling facilitation foregone. This lack of consistency in matching the role of the facilitator with the purpose of facilitation appeared to have an adverse impact on participants’ sustained commitment to the initiative, perhaps to the detriment of intervention effectiveness.

Lastly, qualitative findings support the importance of particular facilitator characteristics, such as knowledge, status or credibility, positive and enthusiastic approach, and good communication skills (Rycroft-Malone et al., 2004b). This study suggests that internal facilitators may have a primary and critical role in bringing credibility to an intervention and contextualizing evidence-based information. Conversely, the main function of the external facilitator may be to coach participants through the change process. While the results of this study shed little light on the relative importance of the different skills necessary for effective facilitators, it supports the significance of a combination of personal attributes and interpersonal group management skills (Harvey et al., 2002).

**Implications for Research**

The primary objective of this exploratory study was to determine the acceptability, fidelity, and feasibility of using AI as a KT intervention. Rather than proving statistical significance for all of the factors evaluated, the overarching goal was to determine the appropriateness of future implementations and evaluations of the AI intervention. Mixed-methods results support future-multisite studies to evaluate AI as a KT intervention in pain.
and for other clinical practices. It is imperative that the AI intervention is implemented in different contexts where its effectiveness can be comparatively evaluated. The nature of the context in which the proposed change is implemented may be a key determinant of the success of an initiative (McCormack et al., 2002). Findings suggest that the AI intervention was relatively well received due, in part, to the perceived fit of the intervention with the existing organizational context and culture (Dopson et al., 2002; Rogers, 2003; Rycroft-Malone et al., 2004b). Implementing the AI intervention in different settings would also evaluate growing evidence regarding its capacity to foster a positive reception to change (Sekerka et al., 2006; Sekerka et al., 2008). This aspect of the AI intervention would be especially interesting to test in contexts initially diagnosed as relatively less conducive to the implementation of EBP.

Elements of the AI intervention to be both retained and modified necessitate further evaluation of its implementation (i.e., acceptability, fidelity, feasibility) and effectiveness. Participants considered the internal-external facilitator partnership important to the implementation of the AI process; however, the feasibility of finding interested and qualified facilitators in other contexts requires further investigation. The concrete interpretation of the Destiny phase used in this study, where participants constructed a tangible and realistic action plan was felt to be essential to the implementation of the AI intervention (especially given the culture of busyness in health care [Scott-Findlay & Golden-Biddle, 2005; Thompson et al., 2008] highlighted by the qualitative findings) and is one solution to evaluate remaining questions around the capacity of AI to affect concrete practice changes (Bushe & Coetzer, 1995; Sekerka et al., 2006). Prior to evaluating refinements to the AI intervention, the intervention manual requires modifications. The acceptability and feasibility
of incorporating a sustained facilitator relationship and local leaders into the intervention requires feedback from both facilitators and participants. Opening participation to the interprofessional team was not a modification suggested by the participants and may significantly complicate the practical application of an AI intervention given the potential challenge of engaging group members with different professional demands, priorities, and interests. Although supported by qualitative results from the present study, the acceptability and feasibility of decreasing monetary compensation and involving only those passionate about championing an AI initiative may affect issues like recruitment and levels of participation.

Despite the need for a larger-scale study to evaluate the effectiveness of the AI intervention, a RCT design does not appear the optimal choice. Although this design is traditionally viewed as the most appropriate to obtain robust evidence on effectiveness, its suitability for the evaluation of complex interventions is questionable due to limitations around standardization and the influence of extraneous factors (Seers, 2007; Seers et al., 2004). Moreover, accruing the large number of participants required by a RCT may be contrary to the intensive nature of the AI intervention: participants felt a group no larger than 12 participants balanced the volume of individual contributions with productivity. Alternative designs such as a prospective cohort comparative design with repeated measures (used by Stevens and colleagues [2008] to evaluate the effectiveness of a complex KT intervention) may be more appropriate to evaluate the AI intervention amongst different contexts. Moreover, a theory-based approach is recommended for evaluating implementation processes, extraneous factors, and outcomes to enhance understanding of the ‘black box’ of complex intervention implementation (Hulscher et al., 2003; Mittman, 2004; Sidani &
Mixed-methods design is congruent with a theory-based approach and appears especially important to future evaluations of the AI intervention (Messerschmidt, 2008). Qualitative methods were critical for exploring the implementation process and capturing unintended and/or abstract outcomes of the AI intervention (Chen, 1990; Messerschmidt). Qualitative methods should be used more purposefully in combination with quantitative methods to provide a richer understanding of extraneous factors, such as culture (Scott-Findlay & Estabrooks, 2006b). Where available, valid and reliable quantitative instruments should be used to measure outcomes. There is room for more comprehensive measurement of quantitative outcomes in future research. For example, context could be measured using additional scales, such as the Alberta Context Tool (ACT) (Estabrooks et al., 2009) and Project Research in Nursing 80 Workload Measurement Tool (PRN) (Tilquin, Saulnier, & Lambert, 1981). Also, some of the generative effects of the AI intervention could be measured, such as empowerment, using Spreitzer’s Psychological Empowerment scale (Spreitzer, 1995). Although little is known regarding appropriate and relevant measures of research utilization (Estabrooks, 2009), administering a more general measure (e.g., Research Utilization Survey [Estabrooks, 1997; 1999b]) may capture some of the more abstract outcomes of this study related to conceptual research use (Thompson et al., 2007).

Longitudinal outcomes measurement is important to determine the optimal timing and frequency of the evaluation and sustainability of intervention effects (Thompson et al., 2007). Outcomes were measured at three and six-months post-intervention. Due to the exploratory nature of this study and relatively short and discrete nature of participants’ implementation of the action plan, six months was an adequate measure of sustainability; however, had the
implementation of the action plan been a more iterative process, evaluation should have continued for a greater duration. Moreover, generative effects of the AI intervention, such as the evolution of an appreciative learning culture, may be better captured over time. Including a sustained facilitator relationship in future applications of this intervention may increase the relevance of longitudinal outcomes measurement by supporting participants in their implementation efforts. Although knowledge translation literature currently provides little guidance on longitudinal outcomes measurement for interventions (Thompson et al.), evaluating outcomes at one-year post-intervention seems prudent for future evaluations of AI. This timing would enable evaluation of participants continued efforts to implement the action plan and any longer-term effects of the AI intervention on outcomes.

Although choosing a quantitative practice outcome measure before participants select a particular topic of interest is challenging, there are practical solutions for addressing this issue in future research. First, as in this study and if available, a general and comprehensive measure of the broad topic area can be selected (i.e., Pain Audit Tool [Taddio et al., 2007]). Second, topic selection could occur in a session before the commencement of AI intervention evaluation and implementation (Cooperrider et al., 2005). A potential methodological flaw associated with participants selecting the specific topic before pre-test measures are taken is the potential for the Hawthorne effect (Streiner & Norman, 1998). Facilitator experience from this study also indicates the value of having a broad discussion, rather than one specific to a narrow topic, in the Discovery and Dream phases to enable creativity and innovation around possibilities for enhancing practices; however, discussion could be maintained as general despite pre-selecting a specific topic, if it was considered useful.

Given the growing impetus for EBP in health care, it seems prudent to attend to the
potential influence of social desirability in future implementation research (Collins et al., 2005; Streiner & Norman, 1998; van de Mortel, 2008). In this study, participants’ quantitative responses on the attitudes towards research questionnaire and qualitative responses regarding the effects of the AI intervention on outcomes may have been skewed to present themselves and their unit more favorably. Social desirability can be measured and its effects estimated on participants’ responses using validated scales (e.g., Marlowe-Crowne Social Desirability Scale [Crowne & Marlow, 1960]) (Sidani & Braden, 1998; van de Mortel, 2008). Additionally, comparing quantitative and qualitative findings to direct observation may provide a more accurate account of actual practice changes occurring post-intervention (Spenceley et al., 2008).

**Implications for Practice**

The AI process provides a general model for change that is applicable across contexts. Adaptations made to the broad and flexible process of AI in this study to render it a KT intervention for a clinical issue in an inpatient clinical setting, provide a model for implementing evidence in health care organizations, irrespective of clinical area. Dissemination of this adapted change process in health care organizations holds importance for stimulating EBP. The 4-D Cycle of AI can be used as formally and intensively as an organizational intervention involving every stakeholder to as informally and rapidly as a conversation between two colleagues trying to make a difference in their practice setting (Cooperrider et al., 2005). Qualitative results and anecdotal discussions with participants post-intervention attested to the informal value of AI for stimulating interaction and innovation on the study unit. The practical benefit of learning about AI should be promoted
in future implementations; it may be a valuable tool for nurse leaders and staff nurses alike to effect local change and engage in positive dialogue about practice enhancements.

To date, there is no available evidence regarding facilitation and pain management (Brown & McCormack, 2005). Results support the use of a hybrid model of facilitation for KT in pain (Kavanagh et al., 2007), where a credible clinician is the internal facilitator and an individual skilled in coaching is the external facilitator. Although a discrete facilitator relationship that is limited to the duration of the AI intervention sessions is practically preferable (as tried in this study), it appears necessary to follow through on the sustained role indicated for enabling facilitators, especially given the potential dynamism of context. Promisingly, qualitative findings suggest that this relationship need not be overly onerous or intensive; participants appeared to desire the continued involvement of the facilitators for ongoing organizational support only, making it reasonable to limit a longer-term relationship to pre-scheduled follow-up sessions to maintain the momentum and progression of the group.

Promoting EBP in nursing is a dynamic, long-term, and iterative process that requires ongoing and supportive leadership to ensure sustainability (Davies et al., 2006). The absence of formal, consistent leadership by facilitators during action plan implementation supports the identification of local leaders from within the AI intervention group. These leaders should be voluntary, and qualitative findings suggest that staff nurses may be better positioned to assume this role compared to nurse leaders. Although buy-in and support are essential from nurse leaders (Dufault, 2004; Rycroft-Malone et al., 2002; Stetler, 2003; Tracy et al., 2006), their professional roles and responsibilities may preclude them from effectively championing external initiatives in concrete ways on a long-term basis. To ensure role clarity (McCleary et al., 2004), the action plan should delineate the specific roles and tasks (e.g., sending a semi-
weekly email to fellow participants regarding any feedback around the implementation process, maintaining a record of feedback for the follow-up session, contacting the facilitators in the face of significant and urgent implementation issues) of leaders. Limiting tasks to communicating within the participant group and between participants and facilitators minimizes the burden placed on these individuals. Ultimately, local leaders could assume the sustained follow-up function initially provided by the facilitators.

The inconsistent participation of nurse leaders in the AI intervention sessions was distracting, but likely a practical reality of implementing AI in a clinical setting. Fluctuating group membership has been noted as a challenge to implementing AI in health care (Reed et al., 2002), which was avoided in the staff nurse contingent by their attendance on days off. Qualitative findings highlighted the cumulative nature of the AI intervention and that full participation should be mandated from all participants; however, the inclusion of nurse leaders was critical to its practical success. Involving a variety of stakeholders is said to build anticipation, provide a greater richness of dialogue and possibility, and enhance the organization’s commitment to the process (Coopperrider et al., 2005). Participants attested to the importance of an eclectic group mix in their interviews. Serious conversations should be held with all interested individuals regarding the importance of consistent attendance. Scheduling the AI intervention further in advance than in the present study may enable nurse leaders to carve out protected time. Moreover, practical incentives for nurse leaders to maintain consistent participation could be learning about the AI process for professional use and its team building effects. If protected time is impossible, the likelihood of variable attendance could be integrated into the AI invention by establishing a core group (Reed et al.)
that consistently attends the sessions and is given a leadership role in the implementation process.

Integrated KT was addressed in this study through implementing an interactive intervention that engaged participants throughout the translational process (CIHR, 2009). Related activities included participants’ selection of the specific topic choice for enhancing evidence-based pain assessment on their unit and their design and implementation of a contextually tailored action plan. Moreover, participants contributed to the refinement and future implementations of the AI intervention by providing feedback on the process.

The overarching purpose of end of project KT is to make potential knowledge users aware of the main study findings (CIHR, 2009). Activities will include the development of a one-page report outlining the main messages, a three-page executive summary, and a 25-page fuller report for distribution to key stakeholders, including participants, those in administrative, clinical, and education leadership positions, pain services, and researchers based in pediatrics, pain, and/or KT. Reports will be written in plain language. The main study messages will be presented in interactive discussion forums at hospital grand rounds or appropriate nursing and population health sciences research rounds in interested health care centres. Study results will be presented more broadly at major pediatric, pain, and/or KT peer-reviewed conferences. One publishable paper will be produced addressing the study objectives and others regarding the development of the AI intervention and its refinement. The investigator will disseminate the findings. Because value was placed on interactive and collaborative models of KT in this study, participants were invited to and expressed interest in participating in the dissemination of study results at the hospital site.
Conclusions

The AI intervention was implemented with high fidelity, well accepted by participants, and considered feasible for use as a KT intervention for pain in an inpatient clinical setting. Minor refinements to the AI intervention gleaned from the results of this study may enhance its acceptability, feasibility, and clinical utility as a KT intervention in health care. The small sample size of this exploratory study precludes firm statistical conclusions regarding the effectiveness of the AI intervention on outcomes. Nonetheless, results indicated a statistically significant improvement in participants’ overall pain knowledge and attitudes post-intervention and upward trends in their pain assessment knowledge and attitudes. Moreover, several abstract and/or unintended outcomes of the AI intervention were reported in the qualitative aspect of the study, including a positive reception to change, broadened horizons around pain, and increased team spirit. Given these promising results and the overall favorable perception of the AI intervention by participants, a larger, multi-site study is warranted to evaluate the implementation process and effectiveness of AI as a KT intervention in pain or for other clinical practices.
References


Nursing, Third Quarter (Supplement), 41-51.


Dworkin, R.H., Backonja, M., Rowbotham, M.C., Allen, R.R., Argoff, C.R., Bennett, G.J., et


2: CD003030. DOI: 10.1002/14651858.CD003030.pub2.


Scholarship, 25(1), 57-62.


Books.


Directions for Evaluation, 100, 5-22.


using measures of unit culture and work characteristics. *Journal of Nursing Administration, 24*(5), 32-37.


Sackett, D.L., Rosenberg, W.M.C., & Gray, M.J.A. Haynes, B.R., & Richardson, S.W.


Health care professionals’ pediatric pain management decision-making strategies.
Poster session presented at the 10th International Nursing Research Symposium, Montreal, Quebec, Canada.


Spinelli, R.J. (2006). The applicability of Bass’s Model of transformational, transactional,
and laissez-faire leadership in the hospital administrative environment. Hospital Topics, 84(2), 11-18.


undergoing painful procedures. *Cochrane Database of Systematic Reviews, 3*, CD001069.


participation in a clinical nursing research project on attitude towards, access to, support of and use of research in the acute care setting. *Canadian Journal of Nursing Leadership, 15*, 18-26.


Appendices
Appendix A

Summaries of Combined Individual and Organizational Level Studies in Pain Management

Adult-care Studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Purpose</th>
<th>Design</th>
<th>Conceptual Framework</th>
<th>Sample &amp; Setting</th>
<th>Intervention</th>
<th>Outcome Measures</th>
<th>Results &amp; Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bach (1995)</td>
<td>To implement an acute pain management guideline in a hospital using a research utilization approach</td>
<td>One-group pretest-posttest</td>
<td>Eight-step research utilization approach</td>
<td>Convenience; 30 nurses at pretest, 22 6 months posttest &amp; 25 10 months posttest; 20 patients pretest &amp; 6 months posttest</td>
<td>Multi-faceted guideline (AHCPR) implementation: (1) problem identification (evaluation of hospital’s current pain management practices by Research Utilization team); (2) identifying, gathering &amp; critiquing research (AHCPR guidelines &amp; pain management interventions); (3) relevance of research to setting (multidisciplinary group reviewed guideline); (4) transformation of knowledge into practice (availability of pain assessment tools, development of pain flow sheet, revision of pre &amp; post-op assessment</td>
<td>Process outcomes: documentation of pain location, use of a pain assessment scale, pain relief documentation after intervention &amp; meeting standards for frequency of pain assessment: retrospective chart review</td>
<td>Patient outcomes: patient satisfaction with pain relief, patient satisfaction with staff’s response to pain relief &amp; numerical rating of pain intensity by patients: concurrent chart review &amp; interviews</td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Design</td>
<td>Conceptual Framework</td>
<td>Sample &amp; Setting</td>
<td>Intervention</td>
<td>Outcome Measures</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>--------</td>
<td>----------------------</td>
<td>-----------------</td>
<td>--------------</td>
<td>------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&amp; teaching forms, updating of computerized care plans to include guidelines, revision of patient education materials, assessment of needed resources; (6) defining expected outcomes; (7) education &amp; implementation of practice change (provision of guidelines &amp; mandatory inservice); (8) evaluating outcomes &amp; modifying practice changes</td>
<td></td>
<td>Process outcomes assessed pre (T1) &amp; 6 (T2) &amp; 10 months (T3) post guideline implementation; patient outcomes assessed pre &amp; 6 months post guideline implementation; knowledge assessed pre and post-education (timing not indicated)</td>
<td>respondents with rating of good increased from 60% to 80% &amp; fair decreased from 25% to 10% (2) patient satisfaction with staff’s response to pain relief: number of respondents with rating of good increased from 70% to 80%, fair remained at 20% &amp; poor decreased from 10% to 0%; (3) numerical rating of pain intensity by patients: continuous PCA patients rated pain from 4.91-2.45 &amp; bolus patients rated pain from 7.62-2.42 following surgery Knowledge: increased from 72% to 100%, addiction from 40% to 80%, &amp; respiratory depression from 68% to 84%</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Design</td>
<td>Conceptual Framework</td>
<td>Sample &amp; Setting</td>
<td>Intervention</td>
<td>Outcome Measures</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------------------------------------------------------</td>
<td>---------------------</td>
<td>----------------------</td>
<td>---------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Carr, (2002)</td>
<td>To evaluate the number of patients refusing analgesia before &amp; after a continuous quality improvement project on a 28-bed surgical ward</td>
<td>Pretest posttest</td>
<td>Not reported</td>
<td>Convenience sample: 133 surgical patients at pretest &amp; 167 at posttest</td>
<td>PDSA process: Continuous Quality Improvement team of 3 ward nurses were guided by a facilitator; conducted a chart audit to evaluated reasons for patients’ refusal of analgesia, introduced a patient information sheet, instituted regular pain assessment on drug rounds using a verbal rating scale, staff education about pain management, tip of the week</td>
<td>Number of patients refusing analgesia Outcomes assessed at pretest &amp; 4 months posttest</td>
<td>Number of patients accepting analgesia increased from 40 (30%) to 63 (44%) (p = 0.005) Different patients from pretest to posttest; no description of the sample or context/culture; small sample size; no description of audit tool; no outcomes measured relating to nurses’ knowledge or pain assessment practices; no control for confounding factors</td>
</tr>
<tr>
<td>Comley &amp; DeMeyer (2001)</td>
<td>To evaluate patient satisfaction with pain</td>
<td>Quasi-experimental: one-group pretest posttest</td>
<td>Not reported</td>
<td>Convenience sample; 83 at pretest &amp; 89 at posttest; eligible</td>
<td>FOCUS/PDSA process: Continuous Quality Improvement team</td>
<td>Patient perceptions about pain management: Patient Outcome</td>
<td>13% of patients pretest and 10% posttest reported no pain; 19% of</td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Design</td>
<td>Conceptual Framework</td>
<td>Sample &amp; Setting</td>
<td>Intervention</td>
<td>Outcome Measures</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>--------</td>
<td>----------------------</td>
<td>------------------</td>
<td>--------------</td>
<td>-----------------</td>
<td>----------------------</td>
</tr>
<tr>
<td></td>
<td>management before &amp; after a continuous quality improvement project in a large university medical centre</td>
<td></td>
<td></td>
<td>patients were receiving inpatient or ambulatory care at medical centre for cardiovascular, medicine, trauma or surgery; psychiatric diagnosis &amp; patients younger than 18 excluded</td>
<td>of nurses formed to establish consistent method for assessing pain, evaluating efficacy of interventions on patient outcomes &amp; documenting data; physicians consulted; current pain management &amp; cause &amp; effect diagram created; pain assessment tools reviewed &amp; 3 combined (NRS, WDS, Wong/Baker Faces); pain assessment policy drafted; nursing education task force developed to implement nursing inservice education on pain assessment &amp; new tool; self-paced learning module developed for pain assessment and management, ethical issues &amp; misconceptions; 2 hour class taught to nurses selected to represent their units as ‘super trainers’ (distributed modules, answered</td>
<td>Questionnaire</td>
<td>patients pretest &amp; 37% posttest reported severe pain; 34% of patients pretest and 44.6% posttest reported their worst pain in the last 24 hours was severe; 9.6% of patient pretest &amp; 6.7% posttest indicated little or no relief from treatment; 38.5% of patient at pretest &amp; 41.6% at posttest reported complete relief; no significant difference in patient reported satisfaction, physician/nurse-led discussion on the importance of pain treatment or request that pain be reported, or promptness &amp; effectiveness of treatment at posttest (ρ values not reported)</td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Design</td>
<td>Conceptual Framework</td>
<td>Sample &amp; Setting</td>
<td>Intervention</td>
<td>Outcome Measures</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>---------------------------------------------</td>
<td>----------------------</td>
<td>------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Dufault, Bielecki, Collins, &amp; Willey (1995)</td>
<td>To develop and evaluate the collaborative research utilization (CRU) model to promote the process of research utilization within the context of nurses’ pain assessment of</td>
<td>Quasi-experimental: two group pretest-posttest 2 units randomly assigned to be control or experimental groups</td>
<td>Nursing research utilization literature; adoption of innovations literature (Kim 1988)</td>
<td>Convenience sample; nurses from 4 patient care units (12 nurses in experimental group &amp; 15 in control group); CRU Team consisted of faculty, nurse administrator from medical centre, oncology</td>
<td>6 phase CRU process (28 weeks): (1) identification of problem and assessment of research (students &amp; staff nurses met with researchers to identify problem - 4 weeks); (2) relevance of research (graduate students &amp; university faculty)</td>
<td>Nurse demographics Nurses’ pain assessment practices: Use of Innovations questionnaire; patient record audit instrument (Ferrell, 1991) (3 records audited for each subject /168 charts)</td>
<td>No significant differences in age, sex, degree, years of nursing experience, average years employed as a nurse, or research experience; significantly lower attitude to research in experimental group ($p&lt;.05$) at</td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Design</td>
<td>Conceptual Framework</td>
<td>Sample &amp; Setting</td>
<td>Intervention</td>
<td>Outcome Measures</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>--------</td>
<td>----------------------</td>
<td>------------------</td>
<td>--------------</td>
<td>------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>cancer patients</td>
<td>CNS, graduate student, 8 undergraduate nursing students, &amp; nurses on the experimental unit</td>
<td>conducted literature search, investigators and Research Dissemination Committee selected 3 instrument development studies to evaluate, 1-hour research roundtable with nurses to critique research - 5 weeks; (3) innovation design (research team consisting of CNS, nurses &amp; principal investigator adapted tool to include behavioural &amp; quality of life components – 4 weeks); (4) evaluation of innovation (nurses tested tool on 5 patients - 9 weeks); (5) decision to adopt (proposal made by research team to revise standard of care &amp; baseline nursing assessment - 2 weeks); (6) extending innovation (hospital-wide inservices on using tool &amp; research newsletter -</td>
<td>competency &amp; attitudes toward in research utilization: Competency &amp; Attitudes Toward Research Utilization scales (Kim, 1998) Pretest outcomes measured in Phase 1 &amp; posttest outcomes at end of Phase 5</td>
<td>pretest; significant positive pain assessment practice change self-reported by nurses in experimental group from pre to posttest ($p&lt;.05$); significantly more indicators of pain assessment, use of behavioural descriptions, types of pain medications used, pain relief from treatment &amp; pain effects on sleep in experimental compared to control group’s charts at posttest ($p&lt;.05$); no significant differences in use of adjunct meds, use of non-drug treatment, follow-up evaluation, pain’s effect on concentration, pain’s effect on mood, pain’s effect on walking ability; significant positive change in nurse competency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Design</td>
<td>Conceptual Framework</td>
<td>Sample &amp; Setting</td>
<td>Intervention</td>
<td>Outcome Measures</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>--------</td>
<td>----------------------</td>
<td>------------------</td>
<td>--------------</td>
<td>------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Dufault &amp; Willey-Lessne (1999)</td>
<td>To evaluate the effects of CRU model on patient pain, satisfaction and quality of life outcomes</td>
<td>Quasi-experimental: two group pretest-posttest</td>
<td>Adoption of Innovations literature (Caplan, 1988)</td>
<td>Purposive; 239 surgical and oncology patients with a history of pain in month before hospitalization, all socioeconomic levels, genders and ages; 102 clinicians &amp; students consisting of 47 nurses, 6 physicians, 2 pharmacists, 2 social workers, 2 physical therapists, 1 pastoral care chaplain, 2 research scientists, 4 clinical faculty, 4 graduate students &amp; 32 senior undergraduate students</td>
<td>6 phase CRU process (22 weeks): identification of problem &amp; assessment of research (2 months); relevance of research (2 months); guideline design (4 months); evaluation of guideline (9 months); decision to adopt/reject/alter guideline (2 months); disseminating guideline inside &amp; outside setting (3 months)</td>
<td>Patient demographic data &amp; attitudes in experimental group from pre to posttest ($p&lt;.05$)</td>
<td>No description of context/culture; small sample size</td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Design</td>
<td>Conceptual Framework</td>
<td>Sample &amp; Setting</td>
<td>Intervention</td>
<td>Outcome Measures</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>----------------------------</td>
<td>----------------------</td>
<td>------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hansson, Fridlund, &amp;</td>
<td>To evaluate the effects of a QI program on pain management</td>
<td>Cross-sectional intervention study; control group assignment for</td>
<td>Not reported</td>
<td>Control group: 400 patients, 86 nurses, 16 physicians; QI program: self-section of nurses and physicians to form QI group; development of pain</td>
<td>Patient pain questionnaire; Nurses’ &amp; physicians’</td>
<td>Statistically significant increase in nurses’ assessment of pain at rest &amp; with</td>
<td></td>
</tr>
<tr>
<td>Hallstrom, (2006)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>QI program: self-section of nurses and physicians to form QI group; development of pain</td>
<td></td>
<td>No description of context/culture; evaluated the effectiveness of the guideline, rather than the effectiveness of the CRU model for improving patient outcomes</td>
</tr>
</tbody>
</table>

Patient care units appropriate to their pain management type; partnerships examined AHCPR guidelines and research conducted after 1992 to generate recommendations for care & integrate these into 12 clinical pathways and then test their effectiveness in improving patient outcomes.

Model satisfaction with responsiveness of nurses & satisfaction with interventions between control and experimental groups from Day 1 to 3; significant increases in measures of pain in the experimental group from Day 3 to discharge Day 1 ($p=.0001-.0101$); significant decrease in patient satisfaction from Day 3 to discharge Day 1 ($p=.0001-.0007$).
<table>
<thead>
<tr>
<th>Study</th>
<th>Purpose</th>
<th>Design</th>
<th>Conceptual Framework</th>
<th>Sample &amp; Setting</th>
<th>Intervention</th>
<th>Outcome Measures</th>
<th>Results &amp; Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neitzel, Hogan Miller, Shepherd, &amp; Belgrade, (1999)</td>
<td>To evaluate the effects of implementing evidence-based pain management content &amp; strategies on patient, provider, and fiscal outcomes</td>
<td>Pretest-posttest</td>
<td>Diffusion of Innovations (Rogers, 1995) &amp; Detailing theory (Soumerai &amp; Avorn, 1990)</td>
<td>118 TKR/THR patients (57 before &amp; 61 after implementation); 28 orthopedic nurses</td>
<td>8-hour educational program taught by a multi-disciplinary team; revised post-op pain management orders developed by pharmacists &amp; physicians; copy of pain management standards available on unit; revised pain management flowsheet in charts; nurse champions; patient education booklet</td>
<td>Patient pain experience: Patient pain interview</td>
<td>No statistically significant differences in patient pain intensity, satisfaction, opioid-related side effects, patient function; significant increase in appropriate analgesic use, IV administration, documentation of plans of care (p&lt;.05); no statistically significant increase in pain assessment</td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Design</td>
<td>Conceptual Framework</td>
<td>Sample &amp; Setting</td>
<td>Intervention</td>
<td>Outcome Measures</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>--------</td>
<td>----------------------</td>
<td>------------------</td>
<td>--------------</td>
<td>------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Paice, Barnard, Creamer, &amp; Omerod, (2006)</td>
<td>To evaluate the effects of a PRN program on participants’ knowledge and attitudes and retention, as well as patient satisfaction, pain prevalence, and compliance with documentation</td>
<td>Pretest-posttest</td>
<td>Not reported</td>
<td>Sample not described; tertiary care hospital</td>
<td>PRN program: At least 2 PRNs trained per unit; self-selected or selected by manager; participated in a 2-day educational workshop; monthly to quarterly presentations on pain; receipt of newsletters; networking via listserv; development of strategies by each PRN along with manager and program director to improve pain on their unit; clinical experience to reinforce teaching</td>
<td>Pain knowledge and attitudes: NKAS</td>
<td>Statistically significant increase in PRNs’ pain knowledge &amp; attitudes immediately and 8 months posttest (p = 0.001); lower turnover for PRNs relative to other nursing staff; statistically significant improvement in patient satisfaction from 6 month pretest to 6 months (p = 0.03) and three years (p &lt; 0.004) posttest; improvements in patient reports of discussing pain with clinicians (4%) and presence of pain (6%); close to 100% with documentation standards 18 month posttest</td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Design</td>
<td>Conceptual Framework</td>
<td>Sample &amp; Setting</td>
<td>Intervention</td>
<td>Outcome Measures</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>--------</td>
<td>----------------------</td>
<td>------------------</td>
<td>--------------</td>
<td>-----------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Seers, Crichton, Carroll, Richards, &amp; Saunders (2004)</td>
<td>To assess whether implementing evidence-based pain management improved postoperative pain outcomes</td>
<td>Randomized controlled trial</td>
<td>Not reported</td>
<td>Convenience; 120 patients included in baseline audit; complete data obtained from 110 patients (69 female; age $M=59, SD=20.96$); 51 patients from 3 wards returned completed diaries</td>
<td>4 interactive sessions (6 weeks): (1) detailed feedback of baseline audit data and discussion (2 hours); (2) discussion of systematic reviews, analgesic league tables &amp; choice of drugs to develop an algorithm (2 hours), (3) principles of EBHC, including critical appraisal (2 hours), (4) facilitation &amp;</td>
<td>Pain: 10-point NRS (at rest &amp; on movement), analgesics administered, pain diary (document pain on a 4-point VRS &amp; analgesic consumption for 8 days post-discharge)</td>
<td>No significant differences in pain level or analgesic use between experimental &amp; control groups at posttest; no significant difference in pain scores in the intervention group at posttest; significant increase of 2 algorithm drugs in intervention group at posttest ($p&lt;.05$); most outcomes; no description of sample or setting; inconsistent use of inferential statistics; no description of or control for confounding factors; variable timing of outcomes measurement</td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Design</td>
<td>Conceptual Framework</td>
<td>Sample &amp; Setting</td>
<td>Intervention</td>
<td>Outcome Measures</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>--------</td>
<td>----------------------</td>
<td>------------------</td>
<td>--------------</td>
<td>------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>hospital with medical &amp; surgical patients</td>
<td>change workshop (1/2 day; facilitated by external expert)</td>
<td>pain in the nursing &amp; medical notes</td>
<td>outcomes measured at baseline &amp; 3 months posttest</td>
<td>significant decrease of 1 non-algorithm drug in intervention group at posttest ($p&lt;.05$); significant decrease in pain at rest, pain on movement &amp; worst pain on movement in control group at posttest ($p&lt;.05$); significant increases in 2 algorithm drugs &amp; decrease in 2 non-algorithm drugs in control group at posttest ($p&lt;.05$)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Topic chosen by participants; intent to have pain link nurses &amp; as many others as possible at sessions</td>
<td></td>
<td></td>
<td>No description of context/culture; sample size calculations, methods of randomization, &amp; psychometric properties of measures not reported; challenging to standardize intervention &amp; control for contaminating/confounding factors</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Study</th>
<th>Purpose</th>
<th>Design</th>
<th>Conceptual Framework</th>
<th>Sample &amp; Setting</th>
<th>Intervention</th>
<th>Outcome Measures</th>
<th>Results &amp; Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracy et al., (2006)</td>
<td>To evaluate the effects of the CRU model in changing patients’ knowledge and attitudes and use of non-drug interventions in pain management</td>
<td>One group pretest posttest descriptive design</td>
<td>Diffusion of Innovations (Rogers, 1995)</td>
<td>Convenience: 46 surgical patients aged 50 years or older 148-bed urban community Magnet hospital</td>
<td>6 phase CRU process (6 months): identification of problem &amp; assessment of research (focus groups with staff nurses; chart audit of nondrug interventions; literature review); relevance of research (research roundtable on evidence); design of evidence-based standards (development of protocols, training of nursing staff, patient teaching materials, revision of Nursing Care Plans); evaluation of protocol implementation; decision to alter, sustain or discontinue protocol (adopted); dissemination (integrated into continuing education, presentations)</td>
<td>Patients’ knowledge attitudes and ability to use non-drug therapies: Non-Drug Complementary Pain Interventions Survey Patient’s information coping style: Miller Behavioral Style Scale</td>
<td>Statistically significant increases in patients’ knowledge and attitudes regarding non-drug therapies (p &lt; .05); increased frequency of use over the 4-day hospital stay; increased satisfaction from first to third post-op day (p &lt; 0.01) Small sample size; no outcomes measurement for process or practice variables; no control for or description of confounding factors</td>
</tr>
<tr>
<td>Woodward, (2005)</td>
<td>To evaluate patient satisfaction and</td>
<td>Pretest Posttest</td>
<td>Not reported</td>
<td>Convenience sample: 23 patient charts at PDSA process: Pain Performance Team established with</td>
<td>Patient satisfaction: hospital patient satisfaction survey;</td>
<td></td>
<td>Consistent patient satisfaction scores; 35%</td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Design</td>
<td>Conceptual Framework</td>
<td>Sample &amp; Setting</td>
<td>Intervention</td>
<td>Outcome Measures</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>--------</td>
<td>----------------------</td>
<td>------------------</td>
<td>--------------</td>
<td>------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td></td>
<td>perspectives of pain management and nurses’ pain assessment practices on a 29-bed oncology unit</td>
<td></td>
<td></td>
<td>pretest &amp; 26 at posttest; 24 patient surveys at pretest and 30 at posttest for patient perceptions</td>
<td>members of the oncology team; nurse educator assumed leadership role through change; conducted a chart audit to evaluate outcomes, developed program goals, held a brainstorming session to determine strategies: nursing staff wrote a signed a personalized snapshot of their behaviours to demonstrate accountability for pain management &amp; a patient pain management brochure was developed</td>
<td>administered quarterly by hospital Nurse’ pain assessment: chart reviews Patient perceptions of pain management: patient surveys Outcomes measured at pretest and approximately 6 months posttest</td>
<td>improvement in numerical pain ratings q4h; 30% increase in admission pain assessments; 30% increase in assessments post-medication; 3% increase in patient reports of assessments; 10% increase in patient reports of re-evaluation post-analgesia; 12% increase in patient reports of pain control Different charts and patients from pre to posttest; no inferential statistics; no description of the samples or context/culture; small sample size; no description of audit tool or surveys; no control for confounding factors</td>
</tr>
</tbody>
</table>
## Pediatric Studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Purpose</th>
<th>Study Design</th>
<th>Conceptual Framework</th>
<th>Sample &amp; Setting</th>
<th>Intervention</th>
<th>Outcome Measures</th>
<th>Results &amp; Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ellis, J., et al. (2007)</td>
<td>To evaluate the implementation of a comprehensive program to improve pain management practices in a pediatric hospital</td>
<td>Pretest-posttest</td>
<td>Ottawa Model of Research Use (Logan &amp; Graham, 1998)</td>
<td>Convenience: 366 nurses &amp; 8 physicians; 120 nurses completed the measures both pretest and posttest</td>
<td>Comprehensive Pain Management Program: 4 hour pain education workshop delivered to nursing staff hospital-wide; included the introduction of a new pain documentation tool, history guide, and pain assessment scales; unit-based PRNs served as coaches and mentors during the implementation phase; advocate was designated at each shift to answer questions and support the program</td>
<td>Nurse demographics; Nurses’ perceptions of current pain management practices: items from a questionnaire on institutional support; Nurses’ assessment and management of pain: self-report questionnaire (knowledge and clinical questions); Nurses’ beliefs and perceptions of children in pain: 17-item scale; Nurses’ pain assessment practices: audit tool developed (pilot-tested)</td>
<td>Statistically significant improvement in nurses’ perceptions of their pain assessment (p = 0.004) and management (p = 0.017) practices; no significant changes in nurses’ scores on the knowledge or clinical items, or nurses’ beliefs of children in pain; statistically significant increase in use of pain scales (P&lt;0.005) and narrative documentation (P&lt;0.001)</td>
</tr>
<tr>
<td>Howell, Foster, Hester, Vojir, &amp; Miller (1996)</td>
<td>To evaluate the research utilization process of an educational program to integrate state-of-the-art pain assessment &amp; management strategies into the clinical practices of pediatric nurses</td>
<td>Process evaluation (one-group posttest only design)</td>
<td>Rogers' (1995) innovation-decision process model</td>
<td>Convenience; 39 nursing personnel (16 RNS, 9 LPNs, 6 nursing assistants) participated in all or parts of the program; 21 nursing personnel formed the core group of participants (12 RNS, 7 LPNs, 2 nursing assistants); 20-47 years old; all but one had a BScN; 1-28 (M = 7, SD = 8.4) years of employment. Pediatric unit; 25 beds with average census of 40%-50% 6-month pain management educational program &amp; 5-month assisted implementation follow-up; program educators delivered five formal 30-minute classes to all staff nursing personnel to implement Pain Experience History (PHS), Poker Chip Tool (PCT), Pain Observation Scale (POS) &amp; Pain Flow Sheet (PFS); ongoing education in the form of posters, distraction materials, case studies &amp; literature; program educators on-site 3-4 days a week to role model desired behaviors &amp; obtain nurse feedback; unit-based nurse functioned as a liaison between the unit &amp; educators</td>
<td>6-month pain management educational program &amp; 5-month assisted implementation follow-up; program educators delivered five formal 30-minute classes to all staff nursing personnel to implement Pain Experience History (PHS), Poker Chip Tool (PCT), Pain Observation Scale (POS) &amp; Pain Flow Sheet (PFS); ongoing education in the form of posters, distraction materials, case studies &amp; literature; program educators on-site 3-4 days a week to role model desired behaviors &amp; obtain nurse feedback; unit-based nurse functioned as a liaison between the unit &amp; educators</td>
<td>Staff-nurse satisfaction with program: interviews, participant observation, open-ended survey</td>
<td>Staff-nurse assessment of program feasibility: Feasibility Rating Scale, open-ended survey, interviews</td>
</tr>
</tbody>
</table>
sessions (14/21 completed all 5 sessions) & FRS (15/21); analysis of practice outcomes limited to descriptive statistics


To improve pain management for children with systematic assessment & appropriate analgesia

Participatory action research design (one-group pretest-posttest)

Social ecological model to change [(3 levels of leverage: downstream (individual), upstream (unit & organization), & mainstream (society)]

Purposive; sample size N.R.; staff nurses, physicians, pharmacists & child life

1 unit in a university-affiliated public hospital

4 phases of intervention delivered over 4 years: (1) initiation, (2) intense intervention, (3) routinization, (4) evaluation

Individual level: focus groups to determine education needs of clinicians; self-guided continuing education module; mini-classes presented on each shift; policy created for new/rotating staff; informal leaders recruited as role models; protocol for pain assessment/management; bedside poster for pain assessment scores & parents reported strategies; PCT selected as primary tool; Surprise Box with

Pain intensity assessment: chart audit on 10% sample of charts

Analgesic administration: pharmacy records of drugs dispensed to clinical ward

Data collected on cohorts rather than individuals; outcomes assessed at Phases 1-4 of intervention

30% increase in documentation of PCT pain intensity scores & 9% increase in documentation of treatment effectiveness from pretest to posttest; 98% increase in number of doses of analgesia (morphine, meperidine, acetaminophen with codeine) dispensed from pretest to posttest; 100% increase in doses of acetaminophen with codeine ($p<.002$), 250% decrease in doses of meperidine ($p<.0001$) & 45% increase in doses of morphine ($p<.0001$) from pretest to Intense Intervention Phase;
<table>
<thead>
<tr>
<th>nonpharmacological strategies; patient care rounds on pain management; role modeling of collaborative interaction; policy change to allow nurses to administer IV morphine; no meperidine on unit</th>
<th>Meperidine dispensing decreased from 41% of surveyed medications to 1%, morphine increased from 35% to 62% &amp; acetaminophen with codeine increased from 24% to 36% from pretest to posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit/organizational level: buy-in from key leaders across disciplines; discussions between pharmacy &amp; medicine about analgesics; recognition for achievements; spread of strategies across organization; initiation of Pain Team</td>
<td>No description of context/culture; sample size not reported; sample not described; measurement of drugs dispensed, not dose administered; exact timing of evaluations unclear; analysis of assessment and proportion of analgesic type data limited to descriptive statistics; inferential statistics only conducted to compare the number of analgesics dispensed between Phase 1 &amp; Phase 2 (not pre &amp; post intervention)</td>
</tr>
<tr>
<td>Societal level: comparison to national standard; encouragement for conference presentations</td>
<td></td>
</tr>
</tbody>
</table>
| **Simons & MacDonald (2006)** | **To implement validated pain assessment tools across 10 wards of a tertiary care hospital using an action research approach** | **Action research; one-group posttest only** | **Not reported** | **Technique N.R. (convenience); 23 nurses at T1 & 20 at T2; 97 children at T1 & 67 at T2; children’s mean age was 6.9 years at T1 & 6.1 years at T2 10 wards of a tertiary care hospital** | **Action research cycle: (1) negotiation & assessment (meeting with senior ward managers & pain link nurses, survey of 100 nurses re. views of pain assessment tools); (2) planning (selection of 3 age-appropriate validated tools - FLACC, Wong-Baker, VAS); (3) action (permission sought from senior nursing sisters to implement tools; teaching sessions held on wards to explain use of tools; pain study days run by the Pain Control Service re. pain assessment & tools; daily support provided by Pain Control Service to nurses re. purpose & use of tools; (4) evaluation; (5) withdrawal (continued, but less intensive, support by Pain Control Service)** | **Nurse’ use of pain assessment tools: chart audit of how many pain assessment tools were in use for children on the ward that day  
Nurses’ views of the use of the pain tools: 12-item survey  
Outcomes assessed at 6 (T1) & 12 (T2) months post-intervention** | **Pain tools used with 22/97 (23%) children at T1 and 27/67 (40%) children at T2; 9% of nurses found pain tool very easy to use at T1 & 40% at T2; 39% of nurses reported they used a pain assessment tool for all children at T1 & 55% at T2; 65% of nurses stated they started using a pain tool on admission at T1 & 80% at T2  
No description of context/culture; posttest-only design; no conceptual framework; differences in patient numbers at T1 & T2 precludes determination of an actual change in nurses’ use of pain assessment tools; analysis limited to descriptive statistics** |
Appendix B

4D Cycle of AI

1. DISCOVERY
   - Process expert introduces AI and reframes evidence-based acute pain management as an Affirmative Topic
   - Content expert presents on pediatric acute pain management evidence
   - Participants conduct Appreciative Interviews

2. DREAM
   - Participants consider Miracle Questions to envision changes to their unit that would help them to use acute pain management evidence in everyday practice

3. DESIGN
   - Participants develop individual Provocative Propositions that realistically state the possibilities for practicing evidence-based acute pain management on their unit
   - Participants construct a shared Provocative Proposition

4. DESTINY
   - Participants design and commit to an action plan to implement evidence-based acute pain management practices on their unit within a 3-month period
   - Content expert supplies relevant acute pain management evidence

AFFIRMATIVE TOPIC:
What is working well for practicing evidence-based acute pain assessment/management on your unit?
Appendix C
Summaries of AI Intervention Studies in Business

<table>
<thead>
<tr>
<th>Study</th>
<th>Purpose</th>
<th>Conceptual Framework</th>
<th>Design</th>
<th>Sample &amp; Setting</th>
<th>Intervention</th>
<th>Outcome Measures</th>
<th>Results &amp; Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bushe, G., &amp; Coetzer (1995)</td>
<td>To determine the effects of an AI intervention on salaried restaurant management retention levels</td>
<td>Not reported</td>
<td>Pretest-posttest single blinded randomized controlled trial</td>
<td>Convenience sample; 96 university students attending a 13-week introductory course in organizational behavior; 56 students (14 teams) with a mean age of 21.87 years in 1st semester; 40 students (10 teams) with a mean age of 22.02 years in 2nd semester; stratified by gender</td>
<td>Target population randomly assigned to: 1) AI group 2) Task-oriented team development group 3) Expert presentation on group dynamics (control) group</td>
<td>Group process: pretest and posttest surveys measuring participation, cohesion, conflict management, decision-making, &amp; confidence in team ability Group outcomes: posttest survey measuring satisfaction with membership &amp; satisfaction with team performance Task performance: project grade</td>
<td>AI &amp; TOTD groups scored significantly higher than control group on all measures (p&lt;.01) with the exception of AI/Control for Conflict Management; TOTD scored significantly higher than AI on Task Performance (p&lt;.05) Ethics approval not reported; primary outcome not defined; small sample size &amp; no power analysis’ homogeneous sample; concealment of allocation sequence, assignment &amp;</td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Conceptual Framework</td>
<td>Design</td>
<td>Sample &amp; Setting</td>
<td>Intervention</td>
<td>Outcome Measures</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>----------</td>
<td>-------------------------------------------------------------------------</td>
<td>----------------------</td>
<td>----------------------------------</td>
<td>------------------</td>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Jones (1998)</td>
<td>To determine the comparative effects of an AI intervention, a task-oriented team development intervention &amp; a didactic lecture on group processes, outcomes and performance on students in an organizational behaviour class</td>
<td>Not reported</td>
<td>Pretest-posttest cluster randomized controlled trial</td>
<td>Convenience sample of all fast-food restaurant level salaried management personnel within 94 restaurants in a major metropolitan area; 57 subjects (46 from internal community and 11 from external)</td>
<td>Target population randomized to: 1) AI group 2) Normal problem-solving approaches to retention group 3) Usual business without any interventions targeted at retention group</td>
<td>Management retention and turnover rates: historical documents; survey  Management retention 32% higher in AI group than usual business group &amp; 30% higher than normal problem-solving group at posttest</td>
<td>Management blinding not reported; analysis not intent-to-treat</td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Conceptual Framework</td>
<td>Design</td>
<td>Sample &amp; Setting</td>
<td>Intervention</td>
<td>Outcome Measures</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>----------------------</td>
<td>--------</td>
<td>------------------</td>
<td>--------------</td>
<td>------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>community); 43</td>
<td></td>
<td></td>
<td>sample size calculation; concealment of allocation sequence, participant assignment, &amp; researcher blinding not reported; intervention inadequately outlined; reliability &amp; validity of measures not indicated; analysis not intent-to-treat; alpha levels and statistical analyses not reported</td>
</tr>
</tbody>
</table>
Appendix D

Summaries of AI Clinical Practice Studies in Health Care

<table>
<thead>
<tr>
<th>Study</th>
<th>Purpose</th>
<th>Conceptual Framework</th>
<th>Study Design</th>
<th>Sample &amp; Setting</th>
<th>Data Collection &amp; AI Process</th>
<th>Results &amp; Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reed, Pearson, Douglas, Swinburne, &amp; Wilding (2002)</td>
<td>To examine &amp; develop hospital discharge for older people, &amp; to report on the methodological complexities of conducting the study</td>
<td>Action research</td>
<td>AI; exploratory</td>
<td>Purposive; invitations sent to 71 groups &amp; individuals expressed interested who were involved or interested in discharge process; 22 participants at first &amp; 55 at final workshop</td>
<td>3 AI workshops with additional activities to be carried out between workshops; 35 individual interviews &amp; 1 focus group completed during Workshop 1</td>
<td>Themes identified during AI process: understanding, coordination, empowerment, &amp; evaluation; provocative propositions &amp; action plans developed for each theme; Minimal description of participants and study design; sampling technique &amp; setting not reported; inconsistent levels of participation between workshops</td>
</tr>
<tr>
<td>Shendell-Falik et al. (2007)</td>
<td>To improve the patient hand-off process from</td>
<td>Not reported</td>
<td>AI: one-group pretest posttest with two posttest</td>
<td>Convenience: Medical centre emergency</td>
<td>Appreciative interviews between nurses on both units</td>
<td>Short-term outcomes: Development of 5</td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Conceptual Framework</td>
<td>Study Design</td>
<td>Sample &amp; Setting</td>
<td>Data Collection &amp; AI Process</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>----------------------</td>
<td>--------------</td>
<td>------------------</td>
<td>-----------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td></td>
<td>emergency to a telemetry unit</td>
<td>measures</td>
<td>department and telemetry unit</td>
<td>over 4-weeks; one and a half day working session for Dream, Design, &amp; Destiny</td>
<td>improvement projects: welcome script, safety assessments, standardized transfer report, low-risk cardiac transport protocol, interpersonal relationships</td>
<td>Intermediate outcomes: 10.2% increase in patient satisfaction, 2.4-9.3% increase in nurse satisfaction and teamwork, 11% increase in nutritional and skin assessment, 9.2% increase in compliance with cardiac enzyme regime and medication admin. record, 60% increase in percent of telemetry patients transported without cardiac monitor Minimal description of participants and study design; sampling technique</td>
</tr>
<tr>
<td>Study</td>
<td>Purpose</td>
<td>Conceptual Framework</td>
<td>Study Design</td>
<td>Sample &amp; Setting</td>
<td>Data Collection &amp; AI Process</td>
<td>Results &amp; Limitations</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>----------------------</td>
<td>--------------</td>
<td>------------------</td>
<td>-----------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Wright &amp; Baker (2005)</td>
<td>To obtain preliminary data on the short and medium term effects and personal acceptability of AI in staff development in health care</td>
<td>Not reported</td>
<td>AI; one-group pretest posttest with exploratory component</td>
<td>Purposive; 32 ward staff including all nursing staff on the liver ward, 1 pharmacist, 1 dietician, 1 play therapist</td>
<td>One-to-one interviews (1 hour) 4 questions based on Discovery &amp; Dream: (1) when you saw health care delivered at its best? (2) when a patient, parent or family received health care at its best? (3) when you made the difference to what happened? (4) what or who inspired you to become a professional?</td>
<td>Recruitment, resignation, vacancy data, &amp; sickness &amp; absence rates obtained from an existing database 25 months pre-AI and 8 months post-AI; compared with data on two alternate wards (general pediatric &amp; pediatric surgical) and size not reported; methods of outcomes measurement and data analysis not reported</td>
</tr>
</tbody>
</table>
Appendix E
Conceptual Framework

INPUT

PARIHS FRAMEWORK

EVIDENCE
• Clinical experience
• Attitudes to research

CONTEXT
• Work environment
• Organizational culture
• Leadership

FACILITATION
• Communication skills
• Credibility

PROCESS

APPRECIATIVE INQUIRY

Discovery

Affirmative Topic:
What is working well for practicing evidence-based pain assessment/management on your unit?

Destiny

Dream

Design

OUTCOMES

PROCESS
Nurses’ knowledge and attitudes regarding pain

PRACTICE
Proportion of nurses who practice evidence-based pain assessment/management

PATIENT
Children’s average pain intensity on the unit
Appendix F

Study Summary

Purpose
The Primary purpose of this study is to describe the implementation process of the AI intervention. The Secondary Purposes are to: (a) explore the beginning effects of the AI intervention on process, practice and patient outcomes, and (b) describe extraneous factors related to the concepts of Evidence, Context and Facilitation in the PARIHS framework and/or explore their influence on the process and practice outcomes of the AI intervention. This information may contribute to improving child and health care outcomes by advancing the use of acute pain management evidence in the clinical setting.

Description of the Research
You will be involved in 4 3-hour Appreciative Inquiry sessions over a 4-week period. Each session will be facilitated by a nurse familiar with the AI process (Tricia Kavanagh) and a local Advanced Practice Nurse (name) familiar with acute pain management evidence. To prepare for the intervention, you will be asked to read a 1-page explanation of the session activities in advance of each session. You will have to coordinate a day off with fellow participants on those days that the sessions are held.

In the first session you will talk with a partner about a time when you felt that you or a colleague were the most successful in managing a child’s acute pain based on evidence. The second session will involve talking with a partner about possibilities for practicing evidence-based acute pain management practices on your unit. In the third session, you and your colleagues will create a statement that realistically describes the possibilities for practicing evidence-based acute pain management on your unit. The last session will involve creating a group action plan to use acute pain management evidence in everyday practice on your unit, which can be accomplished in 3 months. You will receive monetary compensation in acknowledgement of your time, in the amount of $400 for completing all phases of the study. Also, refreshments will be provided during the AI sessions and you will be reimbursed for your parking expenses at the hospital.

Six weeks prior to the intervention you will be asked to complete 6 measures that assess your demographic information, knowledge and attitudes regarding acute pain management, attitudes towards research, and views on the organizational context, culture and leadership on your unit. The APN will not be required to complete the leadership questionnaire. Filling out these measures should take you approximately 1 hour. At 3 weeks prior to the intervention and 3 and 6 months after the intervention, you will be asked to complete the measure regarding your knowledge and attitudes regarding acute pain management. This measure should take you approximately 20 minutes to complete. A research assistant will conduct a chart audit regarding the acute pain management practices of all the staff nurses on the unit for each of the 4 data collection periods. One week following the 6-month follow-up of the intervention, you will be asked to engage in an interview with a research assistant regarding your views on the intervention and facilitators. The interview will last approximately 30 minutes and will take place at a time and place convenient for you.

Exclusion Criteria
Nurses intending to terminate their position on the unit during intervention implementation or follow-up periods and students will be ineligible for the study.

For more information, please contact:
Tricia Kavanagh, RN, PhD(c), (address), (phone number), (email).
Appendix G

Participant Interest Form

A research study is being carried out that is entitled: ‘Appreciative Inquiry: An Interactive Organizational Intervention to Translate Acute Pain Management Evidence into Pediatric Nursing Practice’. The purpose of this study is to explore the implementation process and beginning effects of Appreciative Inquiry as a method to translate acute pain management evidence into pediatric nursing practice. This information may ultimately contribute to improving child and health care outcomes by advancing the use of acute pain management evidence in the clinical setting.

Please indicate your interest in meeting with the investigator (Tricia Kavanagh) to learn more about the study. If you are not interested, we would appreciate it if you could indicate the reason(s) for your disinterest as outlined below.

I, (name)________________________, am interested in participating in this study. Please contact me at (phone)_______________________ or (email)_________________________ with more information about the study.

I am not interested in participating in this study. Reasons for my disinterest in study participation include (please check off all options that are applicable):

- [ ] Time commitment required to participate in the AI intervention
- [ ] Lack of interest in the described AI intervention
- [ ] Lack of interest in the topic area of evidence-based practices
- [ ] Lack of interest in the topic area of acute pain management
- [ ] Other: ____________________________________________________________

Please place your completed form in the anonymous study box.

Thank you.
Appreciative Inquiry: An Interactive Organizational Intervention to Translate Acute Pain Management Evidence into Pediatric Nursing Practice

PURPOSE: To explore the implementation process of AI, beginning effects of AI on process, practice and patient outcomes, and influence of extraneous factors related to the concepts of Evidence, Context and Facilitation in the PARiHS framework on the outcomes of AI.

HOW WILL THE STUDY AFFECT YOU?
The AI intervention involves 4 3-hour sessions over 4-8 weeks. You will coordinate mutual days off with fellow participants to attend the sessions. You will receive an honorarium of $400 for completing all phases of the study and be reimbursed for parking during the intervention. Six weeks before the intervention you will complete 5 measures that assess your demographic information, knowledge and attitudes about acute pain management, attitudes to research, and views on the culture and leadership on (unit). Filling out these measures will take 1 hour. Three weeks before the intervention and 3 and 6 months after the intervention, you will complete the measure about your knowledge and attitudes regarding acute pain management. This will take 20 minutes. One week after the 6-month follow-up of the intervention, you will engage in an interview with a Research Assistant about your views on the intervention, which will take 30 minutes.

WHEN WILL THE STUDY TAKE PLACE?
Preparation for this study will begin in February 2008 and the AI Intervention will be delivered in May 2008.

WHAT WILL THE STUDY ACCOMPLISH?
This study will help us to learn more about using AI as a KT intervention for acute pain management.

For more information contact Tricia Kavanagh, RN, PhD(c) at (phone number) or (email)
Appendix I

Interview Guide

Thank you for taking the time to discuss your experience with participating in the AI and Pain intervention with me. For this interview, I’d like to talk about your views on the AI intervention as a way to implement pain assessment and management evidence in nursing, as well as the communication skills and credibility of the facilitators. The purpose of this interview is to get a better sense of the acceptability (i.e., what you liked and didn’t like) and feasibility (i.e., what worked and didn’t work) of AI as a knowledge translation intervention in pain since this was the first time it was used in this way. I’d like to tape our conversation so that I don’t forget anything you tell me. This interview will be as brief or as long as you like, depending how much you want to talk.

As per your consent form, this interview is voluntary. Even though our conversation will be taped, your name will not be used in any written transcripts. All information collected during this study will be kept confidential by using only a code number on all written information. The tapes will be stored in a secure, locked location. Only members of the research team will have access to them. Do you have any questions or concerns before we begin?

1. **Question One. This question is about your views on the relevance of the AI intervention as a method to implement pain evidence in nursing. By relevance, I mean if you think AI is a suitable way to implement pain evidence in nursing.**
   (a) Can you tell me your thoughts on the positive perspective of the AI process? Do you think it’s a suitable perspective for implementing pain evidence in practice? Please explain.

   (b) Can you tell me how you feel about the participatory/interactive nature of the AI intervention? Do you feel this is a suitable way to implement pain evidence in practice? Please explain.

   (c) Can you tell me your thoughts on AI’s focus on organizational and contextual factors? Do you think this is a suitable focus for implementing pain evidence in practice? Please explain.

   (d) Is there anything else you would like to say about the relevance/suitability of AI as an intervention to implement pain evidence in nursing?

2. **Question Two. This question is about your views on the usefulness of the AI intervention as a method to implement pain evidence in nursing. By usefulness, I mean if you think AI is a practical/realistic way to implement pain evidence in nursing.**
   (a) Did you feel that the group had enough positive examples of using pain evidence in practice and the factors that supported those practices to build on in the intervention? Please explain.

   (b) Can you tell me your thoughts on your knowledge of evidence-based pain assessment documentation after the AI sessions? Did you feel you had enough knowledge to bring back to your unit and implement in practice? Please explain.
(c) Did you feel you had enough support to implement evidence-based pain assessment documentation on your unit and change practices? Please explain.

(d) Can you tell me your views on the most useful/helpful aspects of the AI intervention for implementing evidence-based pain assessment documentation into your practice?

(e) Did you feel anything was missing from the AI intervention that would have helped you to implement evidence-based pain assessment documentation into your practice? Please explain.

(f) Is there anything else you would like to say about the usefulness of AI as an intervention to implement pain evidence in your practice?

3. Question Three. This question is about your views on the factors that affected (i.e., helped or interfered with) your participation in the four AI intervention sessions (i.e., Discovery, Dream, Design, Destiny).

(a) Can you tell me your feelings about the number of sessions?

(b) Can you tell me your feelings about the length of the sessions?

(c) Can you tell me your feelings about the frequency of the sessions?

(d) Can you tell me your feelings on scheduling the AI sessions on your days off?

(e) Can you tell me your feelings about the number of participants involved in the sessions?

(f) Is there anything else you would like to say about factors that facilitated/interfered with your participation in the four AI intervention sessions?

4. Question Four. This question is about your experience with implementing the action plan on your unit. Specifically, I would like you to discuss the factors that helped you to implement the action plan and the factors that interfered with the implementation of your action plan.

(a) Were you able to implement all of the elements of your action plan on the unit according to the timelines you proposed? Please elaborate.

(b) Can you tell me if you felt it was enough to have the participants from the AI sessions lead and be responsible for implementing evidence-based pain assessment documentation on the unit? Please explain.

(c) Can you tell me about the availability of resources on your unit that were necessary to implement the action plan?

(d) Can you tell me about the response of your nursing colleagues on your unit to the action plan, meaning those nurses who did not participate in the AI intervention?
(e) Can you tell me about any competing demands on your unit that impacted the implementation of your action plan?

(f) Can you tell me about any hospital or unit events that affected the implementation of your action plan?

(g) Is there anything else you would like to say about your experience with implementing your action plan on the unit?

5. Question Five. This question is about your views on the credibility of the AI facilitators (Process and Content Facilitators).
   (a) Do you feel that the facilitators were credible in their roles? Please explain.

   (b) Can you tell me about the Process Facilitator’s knowledge on the AI process?

   (c) Can you tell me about the Process Facilitator’s ability to maintain a positive approach during the AI process?

   (e) Can you tell me about the Process Facilitator’s ability to guide group discussion through the AI process?

   (e) Can you tell me about the Content Facilitator’s knowledge on pain assessment and management research evidence?

   (f) Is there anything else you would like to say about the credibility of the facilitators?

6. Question Six. This question is about your views on the communication skills of the AI facilitators?
   (a) Can you tell me about the Process Facilitator’s ability to make the AI process understandable for each of the AI sessions?

   (b) Can you tell me about the Content Facilitator’s ability to provide relevant research evidence and make it understandable during the AI process?

   (c) Can you tell me your thoughts on having two facilitators guide the group through the AI process?

   (d) Is there anything else you would like to say about the communication skills of the two AI facilitators?

7. Is there anything else you would like to say that we have not talked about?

    Thank you for your time and input
## ACTION PLAN: AI & HIGH QUALITY EVIDENCE-BASED PAIN ASSESSMENT DOCUMENTATION

<table>
<thead>
<tr>
<th>ACTION</th>
<th>IMPLEMENTATION DETAILS</th>
<th>ASSIGNED TO</th>
<th>STATUS COMMUNICATION</th>
<th>TARGET DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Self-Learning Module for Unit Nurses: Clinical Practice Guideline (CPG) for Pain Assessment &amp; Documentation</td>
<td>The Self-Learning Module provides a brief overview of high quality evidence-based pain assessment &amp; documentation practices for unit nurses based on the CPG for pain assessment. The module will be created in PowerPoint and will be brief (maximum of 10 slides). Elements of the module include: (a) <strong>Introduction</strong>. This section includes a: (a) brief statement on the participation of the group in the AI process, &amp; the resulting interest in &amp; commitment to enhancing high quality evidence-based pain assessment documentation on unit based on the CPG; (b) brief overview of the action</td>
<td>Participant</td>
<td>The Self-Learning Module Committee will correspond via email</td>
<td>Prior to June 6, 2008</td>
</tr>
<tr>
<td>ACTION</td>
<td>IMPLEMENTATION DETAILS</td>
<td>ASSIGNED TO</td>
<td>STATUS COMMUNICATION</td>
<td>TARGET DATE</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------</td>
<td>-------------</td>
<td>----------------------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td>(How will it be done? What are the necessary structures &amp; processes on the unit, resources, people support, etc.?)</td>
<td></td>
<td>(Who does the assignee need to communicate with, what needs to be communicated, when &amp; how often will contact be made, how will contact be made?)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>plan to enhance evidence-based pain assessment documentation on unit [e.g., Learning Module, Provocative Proposition Poster, Audit &amp; Feedback (NB: there should be transparency around the Audit &amp; Feedback process on unit)]</td>
<td>Participant</td>
<td></td>
<td>Prior to June 6, 2008</td>
</tr>
<tr>
<td></td>
<td>(b) Overview of high quality evidence-based pain assessment tools used on unit based on the CPG for pain assessment. This section includes a: (a) brief overview of the pain assessment tools outlined in the CPG for pain assessment (NB: CPG for pain assessment found online &amp; hardcopy handed out by Tricia during the AI &amp; Pain intervention); (b) statement indicating that these tools are based on high-quality evidence and provide the standard for pain assessment on unit</td>
<td>Participant</td>
<td></td>
<td>Prior to June 6, 2008</td>
</tr>
<tr>
<td></td>
<td>(c) Overview of high quality evidence-based pain assessment documentation based on the CPG for pain assessment. Include a: (a) list of the guidelines from the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACTION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPГ for pain assessment that are specifically related to pain assessment documentation (NB: use the Word document that Tricia gave you during the AI &amp; Pain intervention in which she extracted the specific guidelines pertaining to pain assessment documentation); (b) statement that the guidelines are from the CPГ for pain assessment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assimilate slides into one PowerPoint presentation &amp; email to Participants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edit PowerPoint slides to create final version of Self-Learning Module</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make Self-Learning Module available to unit nurses to review by: (a) sending a group email to unit nurses with a copy of the PowerPoint presentation attached; (b) burning CD(s) of the presentation for those nurses who prefer to review it on unit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IMPLEMENTATION DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(How will it be done? What are the necessary structures &amp; processes on the unit, resources, people support, etc.?)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ASSIGNED TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant</td>
</tr>
<tr>
<td>Participants</td>
</tr>
<tr>
<td>Participants</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STATUS COMMUNICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Who does the assignee need to communicate with, what needs to be communicated, when &amp; how often will contact be made, how will contact be made?)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TARGET DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 6, 2008</td>
</tr>
<tr>
<td>Prior to June 13, 2008</td>
</tr>
<tr>
<td>June 13, 2008</td>
</tr>
<tr>
<td>ACTION</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>2. Provocative Proposition Poster for Unit</td>
</tr>
<tr>
<td>3. Positive, Nurse-to-</td>
</tr>
<tr>
<td>ACTION</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Nurse, Same-Day Audit &amp; Feedback (A&amp;F) for High Quality Evidence-based Pain Assessment Documentation by Unit Nurses based on the CPG</td>
</tr>
<tr>
<td>the A&amp;F Process Committee (i.e., Participants)</td>
</tr>
<tr>
<td>Send a master list of unit nurses to the A&amp;F Process Committee (i.e., Participants)</td>
</tr>
<tr>
<td>Finalize the process for implementing A&amp;F on unit, including: (a) Make a schedule for the A&amp;F Implementation Committee that indicates when each committee member is scheduled to audit and provide feedback on nurses pain assessment documentation practices; (b) use the master list of nurses to create a checklist to track unit nurses whose practices have been audited and who have received feedback by committee members; (c) get a folder to store the schedule &amp; checklist &amp; email the A&amp;F Implementation Committee to indicate where the folder will be stored</td>
</tr>
<tr>
<td>ACTION</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Implementation details include:</strong></td>
</tr>
<tr>
<td>Each member of the A&amp;F Implementation Committee will audit 5 nurses/week, 1 patient/nurse &amp; provide in-person, same-day feedback</td>
</tr>
<tr>
<td>A&amp;F will occur over an 8-week period</td>
</tr>
<tr>
<td>Ensure that the A&amp;F process is specific to the CPG for pain assessment documentation</td>
</tr>
<tr>
<td>(NB: use the Word document given to you by Tricia during the AI &amp; Pain intervention that indicates the guidelines specific to pain assessment documentation; note that although the policy is to assess pain once per shift, the group is interested in implementing the guidelines outlined in the document that call for more frequent pain assessment &amp; documentation)</td>
</tr>
<tr>
<td>Feedback will be given in a positive manner, using positive language to bring the AI spirit to unit and create an Appreciative Learning Culture</td>
</tr>
<tr>
<td>ACTION</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Feedback will be specific to unit nurses pain assessment documentation practices relative to the CPG to maintain objectivity around the feedback process (NB: use the Word document given to you by Tricia during the AI & Pain intervention that outlines the guidelines specific to pain assessment documentation)

The script for providing positive feedback based on the CPG for high quality evidence-based pain assessment documentation is first to say “This is what you are doing well for practicing high quality evidence-based pain assessment documentation based on the Clinical Practice Guideline” & second to say “This is what you could do to enhance your practices around high quality evidence-based pain assessment documentation based on the Clinical Practice Guideline”

The results from the audit will be disposed of after feedback is given to nurses by members of the committee

*Note: Participant, unit, and hospital names have been removed for the purpose of confidentiality.*
Appendix K

Research Consent Forms

Administrative Nurse Leader

**Appreciative Inquiry: An Interactive Organizational Intervention to Translate Acute Pain Management Evidence into Pediatric Nursing Practice**

**Principal Investigator:**
PhD Supervisor

**Co-Investigators:**
PhD Committee

**PhD Candidate:**
Tricia Kavanagh, RN, PhD(c)

**Purpose of the Research:**
The Primary purpose of this study is to describe the implementation process of the AI intervention. The Secondary Purposes are to: (a) explore the beginning effects of the AI intervention on process, practice and patient outcomes, and (b) describe extraneous factors related to the concepts of Evidence, Context and Facilitation in the PARiHS framework and/or explore their influence on the process and practice outcomes of the AI intervention. This information may ultimately contribute to improving child and health care outcomes by advancing the use of acute pain management evidence in the clinical setting.

**Description of the Research:**
You will be involved in 4 3-hour Appreciative Inquiry sessions (total of 12 hours) over a 4-8 week period. Each session will be facilitated by a process expert familiar with the AI process (Tricia Kavanagh) and a local Advanced Practice Nurse familiar with acute pain management evidence. With your permission, each session will be audiotaped. To prepare for the intervention, you will be asked to read a 1 page explanation of the session activities in advance of each session.

In the first session you will engage a partner in a conversation about a time when you felt that you or a colleague were the most successful in managing a child’s acute pain based on evidence. The second session will involve talking with a partner about possibilities for practicing evidence-based acute pain management practices on the unit. In the third session, you will individually create a statement that realistically describes the possibilities for practicing evidence-based acute pain management on your unit. The group will then come together to create one vision statement. Finally, in the last session, you and the other participants will create and organize yourselves to implement an action plan for using acute pain management evidence in everyday practice on your unit, which can be accomplished within 3 months. Due to the duration of each session and to avoid interference with clinical responsibilities, you will have to schedule a day off for those days that the sessions are held. You will be asked to coordinate a mutual days off with fellow participants.
Six weeks prior to the intervention you will be asked to complete 6 measures that assess your demographic information, knowledge and attitudes regarding acute pain management, attitudes towards research, and your views on your leadership style and organizational context and culture of your unit. Filling out these measures should take you approximately 1 hour. At 3-weeks prior to the intervention and 3 and 6 months after the intervention you will be asked to complete the measure regarding your knowledge and attitudes regarding acute pain management. This measure should take you approximately 20 minutes to complete. The total time to complete all questionnaires over the 6-month duration of the study is 2 hours. One week following the 6-month follow-up of the intervention, you will be asked to engage in an individual interview with a Research Assistant regarding your views on the barriers to and usefulness of the intervention for translating acute pain management evidence into clinical practice, as well as your views on the communication skills and credibility of the facilitators. With your permission, this interview will be audiotaped. The interview will last approximately 30 minutes and will take place at a time and place convenient to you.

If you choose not to participate in this study, you will be invited to complete 2 measures: the demographics form and the attitudes towards research questionnaire. Completion of these measures will take you approximately 10 minutes.

New information from this study or other studies may affect whether you want to continue to take part in the study. If this happens, we will tell you about this new information. The research data will be destroyed after the study is complete as required by (hospital) policy.

**Potential Harms:**
We know of no harm that taking part in this study could cause you.

**Potential Discomforts or Inconvenience:**
Participation in this study may be inconvenient due to the time requirements of intervention participation (12 hours total over 4-8 weeks) and instrument completion (2 hours over the 6-month study duration), as well as involvement in an individual interview (30 minutes).

**Potential benefits:**
(a) **To individual subjects.** You will not benefit directly from participation in this study. However, you may benefit indirectly through increasing your knowledge of evidence-based acute pain management and establishing organizational supports that may enable you to build on the quality of acute pain management practices on your unit. Also, you will learn about the Appreciative Inquiry process, which you and your colleagues can apply to other topics of interest in the future. A lay summary of the results of this study will be made available to you (e.g., a study pamphlet in your work mailbox). You will also receive a certificate of participation in the study and be invited to participate in the dissemination of study results by contributing to the development and delivery of a presentation on the generated AI action plan to be given at a Nursing Lunch and Learn at (hospital).

(b) **To society:** The results of this study will be communicated to health professionals, policy makers, administrators and researchers. Hospitalized children experiencing...
acute pain may benefit from this study if the intervention successfully facilitates nurses’ use of acute pain management evidence in everyday practice.

**Confidentiality:**
We will respect your privacy. No information about who you are will be given to anyone or be published without your permission, unless required by law. All information collected during this study will be kept confidential by using only a code number on all written information. The data produced from this study will be stored in a secure, locked location according to the two-lock policy.

(Hospital) Clinical Research Monitors or employees of the Canadian Institutes of Health Research or Sigma Theta Tau International (the study funders) may see your research record to check on the study. By signing this consent form, you agree to let these people look at your records.

Only the members of the research team will have access to the data. Following completion of the research study the data will be kept as long as required then destroyed as required by (hospital) policy. Published results will not reveal your identity. During the group meeting we will remind everyone that the information shared is private and should not be repeated outside the group but we cannot be sure that information about you will be kept private. People in groups may share information with others outside the group.

**Reimbursement:**
We will reimburse you for all your reasonable out of pocket expenses for being in this study, e.g. parking and refreshments. If you stop taking part in the study, we will pay you for your expenses for taking part in the study up until that point. We will also provide you will some compensation in the amount of $400 for completing all phases of the study in recognition of your time and effort as you will be attending the AI sessions on a day-off and completing the questionnaires and interview on your own time.

**Participation:**
It is your choice to take part in this study. You can stop at any time. Your employment status or standing at (hospital) will not be affected in any way by whether or not you take part in this study. New information that we get while we are doing this study may affect your decision to take part in this study. If this happens, we will tell you about this new information. And we will ask you again if you still want to be in the study. We will give you a copy of this consent form for your records.

**Sponsorship:** The sponsor/funder of this research is the Canadian Institutes of Health Research and Sigma Theta Tau International.

**Conflict of Interest:**
I and the other research team members have no conflict of interest to declare.

**Consent:**
By signing this form, I agree that:
1) You have explained this study to me. You have answered all my questions.
2) You have explained the possible harms and benefits (if any) of this study.
3) I know what I could do instead of taking part in this study. I understand that I have the right not to take part in the study and the right to stop at any time. My decision about taking part in the study will not affect my employment standing or status at (hospital).
4) I am free now, and in the future, to ask any questions about the study.
5) I understand that no information about who I am will be given to anyone or be published without first asking my permission.

☐ I agree, or consent, to take part in this study.

☐ Although I choose not to participate in this study, I consent to filling out the demographics and attitudes towards research measures.

______________________________  ________________________________
Printed Name of Participant & Age  Participant’s Signature & Date

______________________________  ________________________________
Printed Name of Person who Explained Consent  Signature if Person who Explained Consent & Date

If you have any questions about this study, please call Tricia Kavanagh at (phone number).

If you have questions about your rights as a participant in a study, please call the Research Ethics Manager at (phone number).
Clinical and Education Nurse Leaders

**Appreciative Inquiry: An Interactive Organizational Intervention to Translate Acute Pain Management Evidence into Pediatric Nursing Practice**

**Principal Investigator:**
PhD Supervisor

**Co-Investigators:**
PhD Committee

**PhD Candidate:**
Tricia Kavanagh, RN, PhD(c)

**Purpose of the Research:**
The primary purpose of this study is to describe the implementation process of the AI intervention. The secondary purposes are to: (a) explore the beginning effects of the AI intervention on process, practice and patient outcomes, and (b) describe extraneous factors related to the concepts of Evidence, Context and Facilitation in the PARIHS framework and/or explore their influence on the process and practice outcomes of the AI intervention. This information may ultimately contribute to improving child and health care outcomes by advancing the use of acute pain management evidence in the clinical setting.

**Description of the Research:**
You will be involved in 4 3-hour Appreciative Inquiry sessions (total of 12 hours) over a 4-8 week period. Each session will be facilitated by a process expert familiar with the AI process (Tricia Kavanagh) and a local Advanced Practice Nurse familiar with acute pain management evidence. With your permission, each session will be audiotaped. To prepare for the intervention, you will be asked to read a 1 page explanation of the session activities in advance of each session.

In the first session you will engage a partner in a conversation about a time when you felt that you or a colleague were the most successful in managing a child’s acute pain based on evidence. The second session will involve talking with a partner about possibilities for practicing evidence-based acute pain management practices on the unit. In the third session, you will individually create a statement that realistically describes the possibilities for practicing evidence-based acute pain management on your unit. The group will then come together to create one vision statement. Finally, in the last session, you and the other participants will create and organize yourselves to implement an action plan for using acute pain management evidence in everyday practice on your unit, which can be accomplished within 3 months. Due to the duration of each session and to avoid interference with clinical responsibilities, you will have to schedule a day off for those days that the sessions are held. You will be asked to coordinate a mutual day off with fellow participants.
Six weeks prior to the intervention you will be asked to complete 5 measures that assess your demographic information, knowledge and attitudes regarding acute pain management, attitudes towards research and views on the organizational context and culture of your unit. Filling out these measures should take you approximately 1 hour. At 3-weeks prior to the intervention and 3 and 6 months after the intervention you will be asked to complete the measure regarding your knowledge and attitudes regarding acute pain management. This measure should take you approximately 20 minutes to complete. The total time to complete all questionnaires over the 6-month duration of the study is 2 hours. One week following the 6-month follow-up of the intervention, you will be asked to engage in an individual interview with a Research Assistant regarding your views on the barriers to and usefulness of the intervention for translating acute pain management evidence into clinical practice, as well as your views on the communication skills and credibility of the facilitators. With your permission, this interview will be audiotaped. The interview will last approximately 30 minutes and will take place at a time and place convenient to you.

If you choose not to participate in this study, you will be invited to complete 2 measures: the demographics form and the attitudes towards research questionnaire. Completion of these measures will take you approximately 10 minutes.

New information from this study or other studies may affect whether you want to continue to take part in the study. If this happens, we will tell you about this new information. The research data will be destroyed after the study is complete as required by (hospital) policy.

**Potential Harms:**
We know of no harm that taking part in this study could cause you.

**Potential Discomforts or Inconvenience:**
Participation in this study may be inconvenient due to the time requirements of intervention participation (12 hours total over 4-8 weeks) and instrument completion (2 hours over the 6-month study duration), as well as involvement in an individual interview (30 minutes).

**Potential benefits:**
(a) **To individual subjects.** You will not benefit directly from participation in this study. However, you may benefit indirectly through increasing your knowledge of evidence-based acute pain management and establishing organizational supports that may enable you to build on the quality of your acute pain management practices and those on your unit. Also, you will learn about the Appreciative Inquiry process, which you and your colleagues can apply to other topics of interest in the future. A lay summary of the results of this study will be made available to you (e.g., a study pamphlet in your work mailbox). You will also receive a certificate of participation in the study and be invited to participate in the dissemination of study results by contributing to the development and delivery of a presentation on the generated AI action plan to be given at a Nursing Lunch and Learn at (hospital).

(c) **To society:** The results of this study will be communicated to health professionals, policy makers, administrators and researchers. Hospitalized children experiencing
acute pain may benefit from this study if the intervention successfully facilitates nurses’ use of acute pain management evidence in everyday practice.

**Confidentiality:**
We will respect your privacy. No information about who you are will be given to anyone or be published without your permission, unless required by law. All information collected during this study will be kept confidential by using only a code number on all written information. The data produced from this study will be stored in a secure, locked location according to the two-lock policy.

(Hospital) Clinical Research Monitors or employees of the Canadian Institutes of Health Research or Sigma Theta Tau International (the study funders) may see your research record to check on the study. By signing this consent form, you agree to let these people look at your records.

Only the members of the research team will have access to the data. Following completion of the research study the data will be kept as long as required then destroyed as required by (hospital) policy. Published results will not reveal your identity. During the group meeting we will remind everyone that the information shared is private and should not be repeated outside the group but we cannot be sure that information about you will be kept private. People in groups may share information with others outside the group.

**Reimbursement:**
We will reimburse you for all your reasonable out of pocket expenses for being in this study, e.g. parking and refreshments. If you stop taking part in the study, we will pay you for your expenses for taking part in the study up until that point. We will also provide you will some compensation in the amount of $400 for completing all phases of the study in recognition of your time and effort as you will be attending the AI sessions on a day-off and completing the questionnaires and interview on your own time.

**Participation:**
It is your choice to take part in this study. You can stop at any time. Your employment status or standing at (hospital) will not be affected in any way by whether or not you take part in this study. New information that we get while we are doing this study may affect your decision to take part in this study. If this happens, we will tell you about this new information. And we will ask you again if you still want to be in the study. We will give you a copy of this consent form for your records.

**Sponsorship:** The sponsor/funder of this research is the Canadian Institutes of Health Research and Sigma Theta Tau International.

**Conflict of Interest:**
I and the other research team members have no conflict of interest to declare.

**Consent:**
By signing this form, I agree that:
1) You have explained this study to me. You have answered all my questions.
2) You have explained the possible harms and benefits (if any) of this study.
3) I know what I could do instead of taking part in this study. I understand that I have the right not to take part in the study and the right to stop at any time. My decision about taking part in the study will not affect my employment standing or status at (hospital).
4) I am free now, and in the future, to ask any questions about the study.
5) I understand that no information about who I am will be given to anyone or be published without first asking my permission.

☐ I agree, or consent, to take part in this study.

☐ Although I choose not to participate in this study, I consent to filling out the demographics and attitudes towards research measures.

__________________________    ________________________
Printed Name of Participant & Age        Participant’s Signature & Date

__________________________    ________________________
Printed Name of Person who Explained Consent    Signature if Person who Explained Consent & Date

If you have any questions about this study, please call Tricia Kavanagh at (phone number).

If you have questions about your rights as a participant in a study, please call the Research Ethics Manager at (phone number).
Staff Nurses

**Appreciative Inquiry: An Interactive Organizational Intervention to Translate Acute Pain Management Evidence into Pediatric Nursing Practice**

**Principal Investigator:**
PhD Supervisor

**Co-Investigators:**
PhD Committee

**PhD Candidate:**
Tricia Kavanagh, RN, PhD(c)

**Purpose of the Research:**
The Primary purpose of this study is to describe the implementation process of the AI intervention. The Secondary Purposes are to: (a) explore the beginning effects of the AI intervention on process, practice and patient outcomes, and (b) describe extraneous factors related to the concepts of Evidence, Context and Facilitation in the PARIHS framework and/or explore their influence on the process and practice outcomes of the AI intervention. This information may ultimately contribute to improving child and health care outcomes by advancing the use of acute pain management evidence in the clinical setting.

**Description of the Research:**
You will be involved in 4 3-hour Appreciative Inquiry sessions (total of 12 hours) over a 4-8 week period. Each session will be facilitated by a process expert familiar with the AI process (Tricia Kavanagh) and a local Advanced Practice Nurse familiar with acute pain management evidence. With your permission, each session will be audiotaped. To prepare for the intervention, you will be asked to read a 1 page explanation of the session activities in advance of each session.

In the first session you will engage a partner in a conversation about a time when you felt that you or a colleague were the most successful in managing a child’s acute pain based on evidence. The second session will involve talking with a partner about possibilities for practicing evidence-based acute pain management practices on the unit. In the third session, you will individually create a statement that realistically describes the possibilities for practicing evidence-based acute pain management on your unit. The group will then come together to create one vision statement. Finally, in the last session, you and the other participants will create and organize yourselves to implement an action plan for using acute pain management evidence in everyday practice on your unit, which can be accomplished within 3 months. Due to the duration of each session and to avoid interference with clinical responsibilities, you will have to schedule a day off for those days that the sessions are held. You will be asked to coordinate a mutual days off with fellow participants.

Six weeks prior to the intervention you will be asked to complete 6 measures that assess your demographic information, knowledge and attitudes regarding acute pain management, attitudes
towards research, and views on the organizational context, culture and leadership on your unit. Filling out these measures should take you approximately 1 hour. At 3-weeks prior to the intervention and 3 and 6 months after the intervention you will be asked to complete the measure regarding your knowledge and attitudes regarding acute pain management. This measure should take you approximately 20 minutes to complete. The total time to complete all questionnaires over the 6-month duration of the study is 2 hours. A Research Assistant will conduct a chart audit regarding the acute pain management practices of all the nurses on the unit at each of the 4 data collection periods. One week following the 6-month follow-up of the intervention, you will be asked to engage in an individual interview with a Research Assistant regarding your views on the barriers to and usefulness of the intervention for translating acute pain management evidence into clinical practice, as well as your views on the communication skills and credibility of the facilitators. With your permission, this interview will be audiotaped. The interview will last approximately 30 minutes and will take place at a time and place convenient to you.

If you choose not to participate in this study, you will be invited to complete 2 measures: the demographics form and the attitudes towards research questionnaire. Completion of these measures will take you approximately 10 minutes.

New information from this study or other studies may affect whether you want to continue to take part in the study. If this happens, we will tell you about this new information. The research data will be destroyed after the study is complete as required by (hospital) policy.

**Potential Harms:**
We know of no harm that taking part in this study could cause you.

**Potential Discomforts or Inconvenience:**
Participation in this study may be inconvenient due to the time requirements of intervention participation (12 hours total over 4-8 weeks) and instrument completion (2 hours over the 6-month study duration), as well as involvement in an individual interview (30 minutes).

**Potential benefits:**
(a) **To individual subjects.** You will not benefit directly from participation in this study. However, you may benefit indirectly through increasing your knowledge of evidence-based acute pain management and establishing organizational supports that may enable you to build on the quality of your acute pain management practices. Also, you will learn about the Appreciative Inquiry process, which you and your colleagues can apply to other topics of interest in the future. A lay summary of the results of this study will be made available to you (e.g., a study pamphlet in your work mailbox). You will also receive a certificate of participation in the study and be invited to participate in the dissemination of study results by contributing to the development and delivery of a presentation on the generated AI action plan to be given at a Nursing Lunch and Learn at (hospital).

(b) **To society:** The results of this study will be communicated to health professionals, policy makers, administrators and researchers. Hospitalized children experiencing
acute pain may benefit from this study if the intervention successfully facilitates nurses’ use of acute pain management evidence in everyday practice.

**Confidentiality:**
We will respect your privacy. No information about who you are will be given to anyone or be published without your permission, unless required by law. All information collected during this study will be kept confidential by using only a code number on all written information. The data produced from this study will be stored in a secure, locked location according to the two-lock policy.

(Hospital) Clinical Research Monitors or employees of the Canadian Institutes of Health Research or Sigma Theta Tau International (the study funders) may see your research record to check on the study. By signing this consent form, you agree to let these people look at your records.

Only the members of the research team will have access to the data. Following completion of the research study the data will be kept as long as required then destroyed as required by (hospital) policy. Published results will not reveal your identity. During the group meeting we will remind everyone that the information shared is private and should not be repeated outside the group but we cannot be sure that information about you will be kept private. People in groups may share information with others outside the group.

**Reimbursement:**
We will reimburse you for all your reasonable out of pocket expenses for being in this study, e.g. parking and refreshments. If you stop taking part in the study, we will pay you for your expenses for taking part in the study up until that point. We will also provide you will some compensation in the amount of $400 for completing all phases of the study in recognition of your time and effort as you will be attending the AI sessions on a day-off and completing the questionnaires and interview on your own time.

**Participation:**
It is your choice to take part in this study. You can stop at any time. Your employment status or standing at (hospital) will not be affected in any way by whether or not you take part in this study. New information that we get while we are doing this study may affect your decision to take part in this study. If this happens, we will tell you about this new information. And we will ask you again if you still want to be in the study. We will give you a copy of this consent form for your records.

**Sponsorship:** The sponsor/funder of this research is the Canadian Institutes of Health Research and Sigma Theta Tau International.

**Conflict of Interest:**
I and the other research team members have no conflict of interest to declare.

**Consent:**
By signing this form, I agree that:
1) You have explained this study to me. You have answered all my questions.
2) You have explained the possible harms and benefits (if any) of this study.
3) I know what I could do instead of taking part in this study. I understand that I have the right not to take part in the study and the right to stop at any time. My decision about taking part in the study will not affect my employment standing or status at (hospital).
4) I am free now, and in the future, to ask any questions about the study.
5) I understand that no information about who I am will be given to anyone or be published without first asking my permission.

☐ I agree, or consent, to take part in this study.

☐ Although I choose not to participate in this study, I consent to filling out the demographics and attitudes towards research measures.

Printed Name of Participant & Age

Participant’s Signature & Date

Printed Name of Person who Explained Consent

Signature if Person who Explained Consent & Date

If you have any questions about this study, please call Tricia Kavanagh at (phone number).

If you have questions about your rights as a participant in a study, please call the Research Ethics Manager at (phone number).
Audiotaping

**Appreciative Inquiry: An Interactive Organizational Intervention to Translate Acute Pain Management Evidence into Pediatric Nursing Practice**

**Investigators:**
Tricia Kavanagh, RN, PhD(c), PhD Supervisor, PhD Committee

**Confidentiality:**
“The tapes produced from this study will be stored in a secure, locked location. Only members of the research team (and maybe the (hospital) monitor, or employees of the company sponsoring the study or the regulator e.g., Health Canada) will have access to them. Following completion of the study the tapes will be kept as long as required in the (hospital) “Records, Retention and Destruction” policy. They will then be destroyed according to this same policy.”

**Consent**
“By signing this form,

1) I also agree to be taped during this study. These tapes will be used to: (a) determine the consistency of intervention implementation with the elements of the AI process, and (b) explore the relevance and usefulness of the AI intervention, factors that interfered with intervention implementation, and the perceived credibility and communication skills of the facilitators, according the views of the participants.

2) I understand that I have the right to refuse to take part in this study. I also have the right to withdraw from this part of the study at any time (e.g., before or even after the tapes are made). My decision will not affect my employment status or standing at (hospital).

3) I am free now, and in the future, to ask questions about the taping.

4) I understand that no information about me (including these tapes) will be given to anyone or be published without first asking my permission.

5) I have read and understood pages 1-2 of this consent form. I agree, or consent, to being taped as part of the study.”

Printed name of subject ___ Subject’s signature & date ___

Printed name of person who explained consent ___ Signature & date ___
In addition, I agree or consent for these tapes to be used for:
1. Other studies on the same topic
2. Teaching and demonstration at (hospital)
3. Teaching and demonstration at meetings outside (hospital)
4. Not to be used for anything else

In agreeing to the use of the tapes for other purposes, I have been offered a chance to hear the tapes. I also have the right to withdraw my permission for other uses of the tapes at any time.

__________________________________________  ______________________________________
Printed name of subject                        Subject’s signature &
                                        date

__________________________________________  ______________________________________
Printed name of person who explained consent   Signature & date
Appendix L

Conceptual Index

Acceptability of the AI Intervention: Statements on the participant's general feelings on the AI process and intervention sessions. Includes overarching statements of liking or not liking the AI intervention and its effects.

Views on the AI Process

Refreshing approach to change: Any references to the AI approach or intervention being different and preferable to what they are used to in terms of change initiatives. Includes any statements made that contrast AI to other approaches to change.

Positive approach: Statements around the AI process and its focus on acknowledging strengths (or 'what is working well') and successes, and its constructive perspective.

Democratic nature: Statements that contrast AI to more dictatorial approaches to change (i.e., what to do and how to fix things). Includes statements alluding to the collaborative nature of AI and that the process gave staff nurses an opportunity to be an active part of the change, rather than using a hierarchical change structure.

Expanding on existing practices: Any reference to how the AI process enabled the group to build on existing clinical practices (e.g., documentation) or relational practices (i.e., informal knowledge sharing) on their unit (i.e., things they're already doing). Includes statements around AI being a realistic or practical approach to change.

Views on the AI intervention sessions

Structure of the sessions: Views on concrete design elements of the intervention sessions.

Number: Statements about the acceptability of having four sessions.

Frequency: Statements around the acceptability of the spacing of sessions. Includes references to blending or combining sessions, as well as separating sessions.

Duration: Statements around the length of each AI session. Excludes statements around the length of the whole AI process (e.g., implementation of the action plan). Excludes statements around the full day of the intervention sessions.

Cumulative: Statements around each phase of the intervention being important to the process. Includes statements that all participants need
to be present at each stage in the process. Includes statements around the local leaders missing bits of the sessions and the impact.

**Incentives:** References to the impact of the monetary incentive on participation in the intervention.

**Positive examples:** Statements around the experience of sharing positive examples and the sufficiency of positive examples for evidence-based pain management during Discovery.

**Scheduling:** Statements around the acceptability of having the interventions on their days off, other possibilities and logistics around scheduling (i.e., advance scheduling).

**Topic selection:** Statements referring to the experience of choosing a specific topic during the Dream phase of the intervention.

**Nature of the group**

**Group mix:** Opinions on the composition of the participants as a group. Includes references to the facilitators as part of the group.

**Group size:** Opinions about the acceptability of the number of participants in the intervention group.

**Dynamic:** Any reference to the feeling among participants, quality of interactions, or the nature of the intervention group during the AI sessions. Includes reference to working together in a positive way during the sessions. Excludes references to the broader context or culture of the unit.

**Facilitator partnership:** Any statements around the participant's feelings on having two facilitators leading the sessions (e.g., perspectives, contextualizing).

**Recording results:** Statements regarding the usefulness or lack of around recording discussion results during the AI sessions.

**Discussion:** Any reference to discussion aspect, sharing ideas, group dialogue of the intervention. Includes reference to activities done to promote discussion (e.g., Think-Pair-Share).

**Effects of the AI intervention:** Any statements regarding the impact of the intervention sessions and/or action plan on the following factors. Includes effects on the participants and/or their colleagues on the unit.
Positive reception to change: Statements regarding the AI process influencing the interest in and willingness to change by the participants and on the unit.

Broadened horizons: Any reference to the AI intervention facilitating an increase in the range of things participants new, were aware of, and were able to do related to pain assessment and management.

Expanded knowledge base: Statements referring to the impact of the AI sessions or implementation of the action plan on knowledge around pain assessment and management (i.e., gaining knowledge or not gaining knowledge). Includes references to generating knowledge within the group (e.g., through sharing perspectives and ideas) around pain or their pain practices, as well as gaining knowledge through the facilitators.

Informal evaluation of pain practices: Statements regarding the use of AI for evaluating their knowledge, providing feedback, and collecting baseline information for practice appraisal.

Awareness of pain: Statements around the intervention increasing insight around or attention to pain and pain management. Includes statements about people talking about pain as a result of the intervention. Excludes statement relating to increased knowledge around pain from the intervention.

Pain practices: Any reference to the AI intervention impacting the pain assessment and documentation practices of the nurses on the unit. Includes statements around nurses’ pain assessment practices during the audits.

Team Spirit

Team building: Any reference to the group coming together over one common goal or recognizing each other's strengths.

Appreciative learning culture: Any statement about the AI intervention resulting in more positive interactions with colleagues or on the unit as a whole after the intervention. Any reference to elements implemented by the group that were above and beyond the items in the action plan (e.g., creating a binder with the policies, looking at other practices).

Fidelity of the AI Intervention: Any reference to factors that affected participants’ attendance in the intervention sessions or implementation of the action plan.

Barriers: Any reference to factors that adversely affected participation in the intervention sessions or implementation of the action plan on the unit.
**Change overload:** Any reference to an onslaught of hospital-led changes implemented on the unit concurrent with the action plan, which adversely impacted its implementation. Includes references to physical resources and infrastructure (e.g., IV pumps, computer system), as well as human resources (e.g., staff nurse orientees).

**Busyness:** Statements around the adverse impact of the demands of daily work on the implementation of the action plan. Includes references to lack of time due to clinical and/or administrative responsibilities.

**Logistics:** Any reference to organizational issues that adversely impacted the implementation of the action plan (e.g., nurse leader leaving suddenly nurse leader delaying implementation).

**Lack of organized follow-up:** Statements around wanting feedback on their practices during the process or a discussion around 'how things went' during the implementation process. Includes references to requiring leadership to initiate and organize this process.

**Facilitators:** Any references to factors that supported participation in the intervention sessions or implementation of the action plan on the unit.

**Concrete plan:** Statements around concrete and realistic goals, deadlines, or timelines helping the group implement the action plan.

**Culture:** Statements about the ‘feel’ of the unit and usual ways of working. Includes references to ways of practicing, ways of communicating, and perceptions of hierarchy. Excludes nurse leader decisions during the implementation of the action plan.

**Leadership:** Statements around the influence of the nurse leaders on the unit or leadership taken by other staff nurses, in terms of pain management or the implementation of the action plan on the unit (e.g., pushing forward with the plan in spite of delays from leaders).

**Evaluation:** Statements regarding the typical practice of the nurse leaders evaluating the staff nurses’ clinical practices (e.g., audits).

**Knowledge base:** Statements regarding the existing knowledge base on the unit around pain and pain management.

**Resources:** Any reference the availability of people and physical resources (e.g., pain tools, policies, procedures) existing on the unit.
**Practices:** Any reference to the existing practices on the unit in terms of pain assessment and management.

**Views on the Content and Process Facilitators**

**Credibility:** Any statements to the perception of the facilitators being experts. Includes statements regarding the CF as a pro, her experience, or her internal position in the hospital. Also includes any references to valuing her opinion because of any of these factors. Any statements referencing the credibility of the PF in terms of expertise in AI or as a moderator.

**Knowledge:** Any reference to the PF having theoretical or practical knowledge relevant to the AI process and CF to pain.

**Communication Skills**

**Breaking it down:** Statements around facilitator’s ability to simplify information and make it understandable relating to AI and pain.

**Coaching:** Statements around skills and attributes of the facilitators that enabled participants during the AI intervention sessions.

**Guiding, not telling:** Any reference to the facilitators helping participants through the intervention sessions and working with them, rather than telling them what to do and when to do it. Includes explaining and questioning to promote reflection and skills like listening, rephrasing, focusing, mediating. Excludes redirecting to the positive.

**Positive focus:** Any statement around the facilitator’s ability to focus on the positive, re-direct participant's to focus on the positive and see the positive in what others were saying.

**Demeanor:** Any reference to personality traits of the facilitators (e.g., soft-spoken, personable, enthusiastic) that had an impact on the participants. Excludes skills.
Appendix M

Questions Included in the PKNAS Pain Assessment Subscale

<table>
<thead>
<tr>
<th>Question</th>
<th>Type</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>True or false</td>
<td>Observable changes in vital signs must be relied upon to verify a child’s/adolescent’s statement that he has severe pain.</td>
</tr>
<tr>
<td>19</td>
<td>True or false</td>
<td>Children less than 8 years cannot reliably report pain intensity and therefore, the nurse should rely on the parents’ assessment of the child’s pain intensity.</td>
</tr>
<tr>
<td>35</td>
<td>Multiple choice</td>
<td>The most accurate judge of the intensity of the child’s/adolescent’s pain is: (a) the treating physician, (b) the child’s/adolescent’s primary nurse, (c) the child/adolescent, (d) the pharmacist, (e) the child’s/adolescent’s parent.</td>
</tr>
<tr>
<td>39A</td>
<td>Multiple choice</td>
<td>Andrew is 15 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort), he rates his pain as 8. On the patient’s record you must mark his pain on the scale below. Circle the number that represents your assessment of Andrew’s pain.</td>
</tr>
<tr>
<td>40A</td>
<td>Multiple choice</td>
<td>Robert is 15 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8. On the patient’s record you must mark his pain on the scale below. Circle the number that represents your assessment of Robert’s pain.</td>
</tr>
</tbody>
</table>
Appendix N

Formula Derivation for the Practice Indicators

As part of their action plan, participants developed an education module for evidence-based pain assessment and documentation based on the hospital Clinical Practice Guideline (CPG). The module was delivered to all nurses on the unit. For transparency and to control for variation in patient complexity, the audit data for the practice outcome was analyzed against the five specified guidelines as follows:

1) Start of Shift: 0 or 1 depending on whether patient was in unit at time of shift start.
2) With Vital Signs: 0-2 depending on how long the patient has been the unit for that shift (i.e., VS are taken every 4 hours at standard times during a 12 hour shift). The first interval is accounted for in the Start of Shift variable.
3) On admission: 0-1 depending on whether the patient was already in the unit at the start of the nurse’s shift. This could be discounted on account of overlap with a routine pain assessment (q4h with VS).
4) Before, During and After Invasive Procedure: the number of assessments required due to procedures. This number may be discounted on account of overlap with any of the above variables (e.g. if a procedure is conducted at approximately the time of VS).
5) One Hour after Pain Management Intervention: the number of assessments associated with pharmacological, physical or psychological pain interventions. Again, this variable may be discounted by overlapping VS, procedures, etc.

The analysis of the expected number of pain assessments is somewhat subjective because some requirements overlap; the above breakdown methodology is intended to remove redundant pain assessment checks by implying a consistent order of precedence.

The number derived from this formula represents the recommended number of assessments based on the number of actual interventions conducted, not the number of recommended interventions, as the focus of the AI intervention and practice outcome was pain assessment documentation, not the broader application of EBP pain practices.
Appendix O

Exploratory Analyses

Exploratory analyses for the influence of nurses’ attitudes towards research and clinical experience on the process and practice outcomes (Research Question 2a). Time 3 data were used. The table is organized according to the process and practice outcomes of the AI intervention.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Predictor</th>
<th>Statistical test</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKNAS total scores</td>
<td>Attitudes towards research</td>
<td>Pearson correlation coeff.</td>
<td>$r (10) = 0.68, p = 0.016$</td>
</tr>
<tr>
<td></td>
<td>Employment duration</td>
<td>Pearson correlation coeff.</td>
<td>$r (10) = 0.07, p = 0.835$</td>
</tr>
<tr>
<td></td>
<td>Nursing experience</td>
<td>ANOVA</td>
<td>$F (2, 9) = 2.75, p = 0.117, \eta^2 = 0.38$</td>
</tr>
<tr>
<td>PKNAS pain assessment subscale scores</td>
<td>Attitudes towards research</td>
<td>Independent t-test</td>
<td>$t (10) = -1.24, p = 0.245, \eta^2 = 0.07$</td>
</tr>
<tr>
<td></td>
<td>Employment duration</td>
<td>Independent t-test</td>
<td>$t (10) = -1.00, p = 0.339, \eta^2 = 0.04$</td>
</tr>
<tr>
<td></td>
<td>Nursing experience</td>
<td>Fisher’s exact test</td>
<td>$p = 0.727$</td>
</tr>
<tr>
<td>Practice indicator</td>
<td>Attitudes towards research</td>
<td>Pearson correlation coeff.</td>
<td>$r (7) = 0.13, p = 0.744$</td>
</tr>
<tr>
<td>‘Evidence-based pain assessment</td>
<td>Employment duration</td>
<td>Pearson correlation coeff.</td>
<td>$r (7) = 0.48, p = 0.194$</td>
</tr>
<tr>
<td>documentation’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice indicator</td>
<td>Attitudes towards research</td>
<td>Pearson correlation coefficient</td>
<td>r (7)</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------</td>
<td>---------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Documentation of pain intensity score and tool</td>
<td></td>
<td></td>
<td>-0.10</td>
</tr>
<tr>
<td>Documentation of pain intensity</td>
<td></td>
<td></td>
<td>0.25</td>
</tr>
<tr>
<td>Pain assessment documentation effort</td>
<td></td>
<td></td>
<td>0.48</td>
</tr>
</tbody>
</table>

Nursing experience ANOVA
F (7, 1) = 1.33, p = 0.286, \( \eta^2 = 0.16 \)

Employment duration Pearson correlation coefficient
F (7, 1) = 0.43, p = 0.533, \( \eta^2 = 0.06 \)

Employment duration Pearson correlation coefficient
F (7, 1) = 0.01, p = 0.914, \( \eta^2 = 0.00 \)

Employment duration Pearson correlation coefficient
F (7, 1) = 0.19, p = 0.675, \( \eta^2 = 0.03 \)

*\( \eta^2 = \) eta-square
Exploratory analyses for the influence of participants’ knowledge and attitudes regarding pain on the practice outcome (Research Question 2c). Time 3 data were used. The table is organized according to participants’ knowledge and attitudes regarding pain.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Outcome</th>
<th>Statistical test</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKNAS total score</td>
<td>Practice indicator ‘Evidence-based pain assessment documentation’</td>
<td>Pearson correlation coefficient</td>
<td>$r(7) = 0.14, p = 0.714$</td>
</tr>
<tr>
<td></td>
<td>Practice indicator ‘Documentation of pain intensity score and tool’</td>
<td></td>
<td>$r(7) = 0.04, p = 0.927$</td>
</tr>
<tr>
<td></td>
<td>Practice indicator ‘Documentation of pain intensity score’</td>
<td></td>
<td>$r(7) = 0.61, p = 0.082$</td>
</tr>
<tr>
<td></td>
<td>Practice indicator ‘Pain assessment documentation effort’</td>
<td></td>
<td>$r(7) = 0.77, p = 0.014$</td>
</tr>
<tr>
<td>PKNAS pain assessment subscale score</td>
<td>Practice Indicator ‘Evidence-based pain assessment documentation’</td>
<td>Independent t-test</td>
<td>$t(7) = -0.30, p = 0.733, \eta^2 = 0.00$</td>
</tr>
<tr>
<td></td>
<td>Practice indicator ‘Documentation of pain intensity score and tool’</td>
<td></td>
<td>$t(7) = -0.38, p = 0.713, \eta^2 = 0.07$</td>
</tr>
<tr>
<td></td>
<td>Practice indicator ‘Documentation of pain intensity score’</td>
<td></td>
<td>$t(7) = -1.85, p = 0.106, \eta^2 = 0.18$</td>
</tr>
<tr>
<td></td>
<td>Practice indicator 4 ‘Pain assessment documentation effort’</td>
<td></td>
<td>$t(7) = -2.46, p = 0.043, \eta^2 = 0.27$</td>
</tr>
</tbody>
</table>
## Appendix P

Process Facilitator Checklist: AI Process Components of the Intervention

<table>
<thead>
<tr>
<th>AI Phase</th>
<th>AI Intervention Component</th>
<th>Done</th>
<th>Not Done</th>
<th>Rationale (if not done)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Discovery</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Set the context for the AI intervention</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Introduce AI theory and practice</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Outline the roles of the facilitators and participants and the ground rules for participation</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Explain the concept of ‘high’ evidence</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Reframe evidence-based pain management as an Affirmative Topic</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Explain concept of Appreciative Interviews</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Review guidelines for conducting Appreciative Interviews</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Dyads engage in Appreciative Interviews</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Engage in group discussion around Appreciative Interviews</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dream</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Explain concept of Miracle Questions</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Dyads engage in discussion around Miracle Questions</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Engage in group discussion around Miracle Questions</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Select a specific topic area</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Choose the themes from <em>Discovery</em> and <em>Dream</em> that are the key ingredients for practicing and/or being enabled to practice evidence-based acute pain management</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Choose words and concepts from the themes that capture the meaning of being enabled</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
to practice evidence-based acute pain management

<table>
<thead>
<tr>
<th><strong>Design</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Explain concept of Provocative Proposition</td>
<td>√</td>
</tr>
<tr>
<td>2</td>
<td>Write individual provocative propositions for specific topic area</td>
<td>√</td>
</tr>
<tr>
<td>3</td>
<td>Engage in group discussion around the individual Provocative Propositions</td>
<td>√</td>
</tr>
<tr>
<td>4</td>
<td>Construct a collective Provocative Proposition</td>
<td>√</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Destiny</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brainstorm action items based on the Provocative Proposition</td>
<td>√</td>
</tr>
<tr>
<td>2</td>
<td>Select one action item to be implemented in a 3-month period</td>
<td>√</td>
</tr>
<tr>
<td>3</td>
<td>Self-organization of participants around the action item to construct a detailed action plan</td>
<td>√</td>
</tr>
<tr>
<td>4</td>
<td>Concluding remarks</td>
<td>√</td>
</tr>
</tbody>
</table>

**Note:** The components listed above will be considered in relation to the AI Intervention Manual, which outlines specific content for each step. If an element is missing from any of the overarching steps, it will be recorded in the far right column. The investigator will refer to the Facilitator Log to determine and record the rationale(s) for any missing component(s).
# Appendix Q

Content Facilitator Checklist: Pain Components of the AI Intervention

<table>
<thead>
<tr>
<th>AI Phase</th>
<th>Pain Intervention Component</th>
<th>Done</th>
<th>Not Done</th>
<th>Rationale (if not done)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Discovery</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apply the concept of ‘high’ evidence to pediatric acute pain management (research, clinical experience, patient experience, local data).</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clarify the <em>type</em> and <em>quality</em> of pediatric acute pain management evidence used by participants in the stories from their Appreciative Interviews. Guide participants to focus on the use of ‘high’ acute pain management evidence.</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dream</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ensure that participants are focused on examples of using ‘high’ acute pain management evidence in practice in the group discussion about the Miracle Questions.</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ensure the specific topic selected is one supported by ‘high’ evidence.</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ensure that participants are focused on examples of using ‘high’ acute pain management evidence in practice in the group discussion about key ingredients for practicing evidence-based pain management.</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ensure that participants are focused on examples of using ‘high’ acute pain management evidence in practice in the group discussion about the words and concepts that capture the meaning of being enabled to practice evidence-based pain management.</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Design</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Provide an explanation of the type and quality of evidence, as well as how it is used in clinical practice related to the topic area selected by the participants in *Dream.*

Ensure that the focus of the Provocative Propositions is on using ‘high’ acute pain management evidence in practice.

Ensure that the shared Provocative Proposition is: (a) focused on using ‘high’ pain management evidence in everyday practice, and (b) realistic in scope.

**Destiny**

Ensure that the action items are *realistic* and clinically *appropriate* ways to use ‘high’ acute pain management evidence in everyday practice.

Guide participants to select the *most realistic* action item that focuses on an important element of using ‘high’ pain management evidence in everyday practice.

Guide participants to determine *resources* and *supports* that will contribute to realizing their action plan.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The components listed above will be considered in relation to the AI Intervention Manual, which outlines specific content for each step. If an element is missing from any of the overarching steps, it will be recorded in the far right column. The investigator will refer to the Facilitator Log to determine and record the rationale(s) for any missing component(s).