HOW ORGANIZATIONAL EXPERIMENTS INFLUENCE ORGANIZATIONAL LEARNING

by

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

Organizational learning through experience has been found to be associated with enhanced firm performance. Organizational experiments are a method of experiential learning that enable organizations to learn from experience and gain context-specific knowledge of how and why to implement new knowledge. Pilot projects, a type of organizational experiment, involve making intentional, systematic efforts to gather and analyze feedback in order to accurately assess the action-outcome relationships of adopting new knowledge prior to embarking on full-scale implementation. Despite the popularity of pilot projects used to test products, programs, and services as well as reports on the outcomes of such experiments, there is a dearth of research focusing on how organizational learning occurs during organizational experiments, and on the processes and structural mechanisms of organizational experiments that contribute to organizational learning.

A qualitative, multiple-case study of eight pilot projects was carried out within nursing units across five acute health care organizations during Fall 2008. Interviews were conducted with 32 individuals, including pilot project leaders, nursing program managers and direct care nurses. An inductive approach to data analysis was applied and themes identified. Results were compared to 14 propositions that were developed based on the knowledge transfer, innovation diffusion, and organizational learning literature, and which were bracketed before data analysis to allow findings to emerge from the data.
The findings advance existing organizational learning, innovation diffusion, and knowledge transfer models by illuminating the complexity of organizational learning processes. Several processes and structural mechanisms of organizational experiments were found to facilitate single-loop organizational learning, leading to incremental changes to meet existing goals and objectives. Although double-loop organizational learning, which may result in fundamental changes in an organization’s assumptions, norms, policies, goals and objectives was not observed, the study revealed a number of processes and structural mechanisms that have the potential to encourage this type of learning.

Studies of organizational experiments are rare. Future directions for research and theory development are suggested to build on the findings of this study. Practical implications are offered to organizations in any industry interested in realizing the potential that organizational experiments have for double-loop learning and enhanced organizational performance.
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Thank you to the many acute care hospitals and research participants who shared their pilot project experiences. Pilot projects are prevalent in many industries and understanding how they may be a means for double-loop organizational learning is valuable.

As I reflect on how I became interested in completing a doctorate, a couple of key individuals came to mind who I would like to acknowledge and thank. My interest in applied health services research began when I worked with Dr. Gordon Doig at the London Health Sciences Centre as an MBA student. He provided me with the autonomy to design, execute and disseminate an original research study and was a mentor who instilled in me much confidence early in my career. He also introduced me to Dr. George Browman who was at the time the Chair of Clinical Epidemiology & Biostatistics at McMaster University and CEO of the Hamilton Regional Cancer Centre. Dr. Browman recognized my interest in health services research and inspired me to pursue a PhD when he invited me to apply to
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CHAPTER 1: INTRODUCTION

1.1 Organizational Learning–Performance Link

Health care organizations are increasingly under pressure and public scrutiny to improve the quality and safety of care that they provide (Rivard, Rosen & Carroll, 2006). Enhancing the ability of health care organizations to learn and apply new knowledge may lead to improved health care services, better patient/client outcomes, and fewer medical errors (Caroll & Edmonson, 2002; Nutley & Davies, 2001; Tucker & Edmondson, 2003).

‘Organizational learning’\(^1\) can be defined as the “acquisition of knowledge about action-outcome relationships and the effect of the environment on those relationships” (Duncan & Weiss, 1979). Fiol and Lyles (1985) define organizational learning as the development of knowledge about the “associations between actions and their effectiveness”. Organizational learning is suggested to have occurred when there is evidence that knowledge has been gained through experience and/or when changes in behavior are a result of experience (Argote, 1993).

Organizational learning is a social phenomenon, whereby members of an organization construct meaning through their interactions with each other, as well as with preexisting learning systems embedded into the history and norms of the work environment (Brown & Duguid, 1991; Fiol & Lyles, 1985; Nutley & Davies, 2001; Simon, 1991). Organizational learning is more than the sum of individual learning because it results in the development of a shared organizational understanding and interpretation of the organization’s environment, allowing it to better assess and decide upon strategic directions (Daft & Weick, 1984; Donaldson & Lorsch, 1983). Organizational learning is also evident by the codification of

\(^1\) A glossary of key terminology used throughout this study is presented in Appendix G.
new knowledge in policies, procedures, and information/data collection systems and norms, which continue to exist even when individuals depart from the organization (Argote, 1993; Crossan, Lane & White, 1999; Simon 1991).

Organizational learning can occur through variety of means, including: (a) congenital learning, where “organizations are driven to incorporate the practices and procedures defined by prevailing rationalized concepts of organizational work and institutionalized in society”; (b) vicarious learning, where organizations learn through imitation of other organizations; (c) grafting, where new members who possess the knowledge not previously available to the organization are added; and (d) searching or noticing, where information is acquired from scanning the external environment, including the literature, and monitoring firm performance (Huber, 1991).

Organizational learning is thought to be a function of *absorptive capacity*—a term used to describe an organization’s ability to recognize the value of new knowledge and information, assimilate it, and apply it to make high-quality decisions (Cohen & Levinthal, 1990). Recent research has focused on the role of absorptive capacity in innovation (Tsai, 2001); business performance (Lane, Salk, & Lyles, 2001; Tsai, 2001); intraorganizational transfer of knowledge (Gupta & Govindarajan, 2000; Szulanski, 1996); and interorganizational learning (Lane & Lubatkin, 1998; Lane et al., 2001; Lyles & Salk, 1996). There is a growing interest in how absorptive capacity can be enhanced to improve organizational learning, organizational performance, and, ultimately, competitive advantage (Huber, 1991). Hence, absorptive capacity is both a precondition to organizational learning and can be augmented by organizational learning.
Empirical research has consistently found that organizational learning through direct experience contributes positively to performance. Organizational learning curve studies conducted across a number of industry settings—including aircraft production (Wright, 1936), petroleum refining (Hirshmann, 1964), and pizza production (Darr, Argote, & Epple, 1995)—show that organizational learning through cumulative experience with a task enhances performance (Argote & Epple, 1990). Recent studies of organizational learning curves have observed this phenomenon for total quality management programs (Lapre, Mukherjee, & Van Wassenhove, 2000), as well as in health care for the adoption of minimally invasive cardiac surgery procedures (Pisano, Bohmer, & Edmonson, 2001). An extensive literature (Dutton & Thomas, 1984; Mody, 1989; Muth, 1986; Yelle, 1979) documents learning-through-experience’s (i.e., experiential learning’s) positive effect on performance (Huber, 1991).

Studies on experiential learning have identified that unit costs tend to decline at a uniform rate with experience, and that performance variations are in part a function of the differences in the rates at which organizations learn (Argote, 1999; Dutton & Thomas, 1984; Mody, 1989; Muth, 1986; Yelle, 1979). For example, Dutton and Thomas (1984) examined over 100 empirical studies of the relationship between costs and cumulative volume of production in manufacturing processes, and noted a considerable variation among firms’ ability to learn about the relationship between production volumes and costs, which would allow them to benefit from this knowledge. This variation in organizational learning has been observed not only in studies of different industries, products, and production processes, but also over time in organizations with the same products and processes (Adler & Clark, 1991; Argote, 1999). A key limitation of these studies is that they use a proxy (i.e., cost) for
determining whether organizational learning has occurred, rather than using direct measures of organizational learning—such as the degree of knowledge that has been gained from experience and/or when changes in behavior are a result of experience, Argote’s (1993) definition of organizational learning.

Despite the impressive amount of evidence linking organizational learning to improved firm performance, the literature contains few empirical studies on exactly how organizations learn during experiential learning (Huber, 1991). In other words, while learning curve studies associate experience (increasing production volume) with improved outcomes (declining cost), such studies provide little insight into the detailed processes through which organizational learning occurs. Hence, a lack of empirical research exists on the specific processes that organizational learning entails and the factors that may influence learning, either positively or negatively (Dutton & Thomas, 1984). This knowledge stands to benefit those organizations seeking to adopt strategies and methods for enhancing their ability to learn from experience.

1.2 Organizational Experiments as a Method for Experiential Learning

Organizational experiments are one form of experiential learning that involve making intentional and systematic efforts to gather and analyze feedback in order to understand the association between adopting new knowledge and the results that are achieved. Huber (1991) suggests that experiential learning is enhanced by the availability as well as the concerted collection and analysis of feedback in response to actions that are taken. Increasing the accuracy of observations about what happens when new knowledge is adopted is what facilitates organizational learning and leads to enhanced performance.
Organizational experiments are a method of “learning by doing” (Argote, 1999), a practice that is required when organizations do not have the underlying knowledge base needed to simulate the effects of the new knowledge/innovation in advance. Under these conditions, it is suggested that an organization can understand how specific variables interact to affect performance only through learning-by-doing. Furthermore, learning-by-doing is required when the implementation of new knowledge is context-dependent; that is, when its introduction is dependent on the specific people, structures, and technologies that are in place in a specific environment. It has been suggested that under these conditions, predicting the effects of new knowledge on the context in advance is difficult, and therefore learning-by-doing is required (Argote, 1999).

Organizational experiments provide organizations with the opportunity to learn in advance of full-scale implementation why the new knowledge should be adopted and how it would best be implemented (Moingeon & Edmondson, 1996). Learning why during an organizational experiment would require processes and structures that allow for the gathering of feedback to determine whether the full-scale implementation of the new knowledge would lead to a favorable outcome. For example, an organization could implement an automated information reporting system (e.g., an audit/compliance system) to assess whether the expected outcomes from implementing the new knowledge are achieved. Learning how during the organizational experiment would require engaging in processes to gain the necessary skills for applying the new knowledge. For instance, skills could be gained through participation in training sessions about the new knowledge, observing demonstrations of applications of the new knowledge, or through hands-on experience with applying the new knowledge. The processes of learning why and learning
how may occur simultaneously, and organizations benefit from engaging in both types of learning processes at once (Moingeon & Edmondson, 1996).

Organizational experiments may be valuable initiatives for enhancing organizational performance because they may facilitate adaptive, double-loop learning. According to the adaptive learning perspective, organizations are goal-oriented activity systems that learn from experience by repeating successful behaviors and discontinuing unsuccessful ones (Cyert & March, 1963). Within the adaptive learning perspective, organizational learning theorists distinguish between three types of learning: (a) incremental or single-loop organizational learning, (b) radical or double-loop organizational learning, and (c) triple-loop organizational learning (Miner & Mezias, 1996; Nutley & Davies, 2001).

In contrast to single-loop learning, where an organization is permitted to carry on with its present policies or achieve its current objectives despite being presented with new knowledge indicating that change is warranted, double-loop learning occurs when new information influences an organization to modify its underlying assumptions, norms, policies and goals, leading to more fundamental changes in the way business is conducted. Argyris and Schön (1978) argue that only double-loop learning has an adaptive learning potential, enabling an organization to perform closer to its aspiration levels and/or achieve its goals. Organizational experiments may potentially promote double-loop, adaptive learning because by definition, they are more likely to encourage experimentation and change over their duration providing organizations with the opportunity to determine whether and how they can realize the benefits of the new knowledge.
Organizational experiments may also contribute to another level of learning that transcends gaining content knowledge about why and how to implement new knowledge; *triple-loop organizational learning* (also known as *meta-learning* and *learning about learning*) refers to an organization’s ability to learn about how and when they learn, as well as how and when they do not learn (Nutley & Davies, 2001). For example, organizations may learn through organizational experiments that training sessions are more appropriate for learning explicit knowledge, whereas hands-on practice is required to gain tacit knowledge. Argyris and Schön (1978) suggest that rather than focusing on the content to be learned, reflecting on the learning activities and processes that inhibit or facilitate learning allow for the creation of new strategies for learning. Hence, learning *how to learn* may lead to improved organizational learning and firm performance.

While there is widespread acceptance of the concept of organizational learning and its impact on firm performance, a lack of consensus exists in the field regarding what constitutes organizational learning and when various levels of organizational learning are evident (Fiol & Lyles, 1985). The difficulty arises because organizational learning has been identified to result not only in overt changes in behavior at the individual, group, and organizational levels but also at the cognitive level, whereby new knowledge is gained but not easily visible or demonstrated in action. Hence organizational learning can occur due to: (a) changes in behavior, (b) changes in cognition, or (c) changes in both behavior and cognition (Fiol & Lyles, 1985).

Scholars debate whether changes in behavioral or cognitive components alone constitute organizational learning. For example, one would expect that organizational learning would be evident through behavior or action. However, scholars argue that
behavioral changes without cognitive advancement may not be indicative of organizational learning if the association between actions and outcomes has not been made. Small or gradual behavior changes may not lead to major cognitive development due to difficulty with relating actions to outcomes (Fiol & Lyles, 1985). Major organizational changes may not be caused by cognitive growth but rather by pressure on an organization’s management team to take action or create the illusion of learning so that it can appear to be in control (Salancik & Meindl, 1984; Starbuck, 1983). Furthermore, cognitive changes may not be evident, such as when a decision is made to not act based on what has been learned. Few empirical studies have been completed to enhance our understanding of the cognitive and behavioral components of organizational learning and how they are related.

The lack of consensus and clarity regarding the concept of organizational learning also extends into the levels or types of learning. Scholars contend that organizations can engage in different modes of learning, from more rudimentary to advanced; however existing literature provides little guidance on how these types of learning can be identified empirically (Huber, 1991). While single-, double-, and triple-loop learning are terms typically used in the organizational learning literature to describe consecutively higher levels of learning, researchers have few specific operational definitions to utilize for empirical studies. To promote greater clarity for the present study, specific definitions have been adopted (see Table 1).
Table 1

Organizational Learning Definitions Adopted for This Study

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<td>Organizational learning</td>
<td>“Evidence that knowledge has been gained through experience and/or when changes in behavior are a result of experience.” (Argote, 1993)</td>
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<td>Single-loop organizational learning</td>
<td>“When the error detected and corrected permits the organization to carry on its present policies or achieve its present objectives.” (Argyris &amp; Schon, 1978)</td>
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<tr>
<td>Double-loop organizational learning</td>
<td>“When error is detected and corrected in ways that involve the modification of an organization’s underlying norms, policies and objectives.” (Argyris &amp; Schon, 1978)</td>
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<tr>
<td>Triple-loop organizational learning</td>
<td>“An organization’s ability to learn about how and when they learn, as well as how and when they do not learn.” (Nutley &amp; Davies, 2001).</td>
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Despite the potential benefit that organizational experiments have for organizational learning, a dearth of literature exists on this method of experiential learning. The term “organizational experiment” can be found in the management literature published during the 1970s but is scarcely used today. For example, Huber (1991) identified some formal organizational experiments that were completed in the 1970s (e.g., Wildavsky 1972; Lawler, 1977; Staw, 1977) and other formal post hoc analyses of so-called natural experiments (e.g., Landau, 1973; Huber et al., 1979). These studies demonstrate that organizational learning is indeed facilitated through gathering information on the association between organizational actions and outcomes; however, recent literature is limited. The literature that is available

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2 Specific examples of single-, double-, and triple-loop learning corresponding to the subject of this study (i.e., organizational learning through pilot projects on clinical practice guideline implementation) are presented in Appendix B.
suggests that organizational experiments are effective means for testing the effect of products, services, and programs but does not describe how these organizational experiments are or should be carried out (e.g., Mitroff & Mohrman, 1987; Heugens & van Oosterhout, 2001; Senge, 1996).

Program evaluation literature comprises a field of study that is closely related to organizational experiments. The purpose of a program evaluation is similar to an organizational experiment: to assess whether certain outcomes will be achieved due to the implementation of new knowledge or an innovation. Program evaluation literature (e.g., Michnich, Shortell, & Richardson, 1981; Posavac & Carey, 1992) suggests two types of evaluation—formative and summative. Formative program evaluation is conducted over the course of a program to continuously assess, implement, and monitor the success of changes to the program. Summative program evaluation involves a determination after a period of time, whether the program should be continued in its existing form or modified, whether no action should be taken for the time being, or whether it should be discontinued altogether.

Organizational experiments could involve both formative evaluation activities throughout its duration and summative evaluation activities at its conclusion. Thus, program evaluations and organizational experiments may entail similar activities. Where program evaluations and organizational experiments differ is the degree to which the innovation is implemented and the timing of the activity. Organizational experiments typically entail a trial-run of an innovation on a limited basis prior to its full implementation. Hence, the innovation has either not been implemented in its entirety or applied to all of its intended

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3 The term “program” may include any organizational action such as media campaigns, service provision, educational services, public policies, and research projects (Centers for Disease Control and Prevention [CDC], 1999).
participants. A program evaluation, on the other hand, usually involves an assessment of an innovation (i.e., the program) after its complete implementation to all of its intended recipients.

Interest is growing in a specific aspect of program evaluation; that is, process evaluation—the assessment of the implementation process of a program and how this process is linked to outcomes (Stecker & Linnan, 2002). This type of evaluation helps to answer why and how program outcomes were (or were not) achieved (Murphy & Dowling, 2002). Process evaluation does not have to be completed at the end of program; it can be used as a formative tool, to improve and refine programs while they are being implemented by helping to explain and interpret program outcomes (Helitzer, Davis, & Gittelion, 1999; Israel, Cummings, & Dignan, 1995; McGraw et al., 1994). Consequently, organizational experiments may also involve process evaluation activities.

While the body of program evaluation literature is vast, it does not sufficiently address the question of how organizations learn through program evaluations for at least two reasons. First, the literature lacks theoretical foundation and is primarily prescriptive; it suggests approaches/steps and factors to consider when planning and conducting program evaluations. For example, program evaluation literature (e.g., Gredler, 1996; Olney, 2005; Posavac & Carey, 1992) typically describes: (a) how to plan a program evaluation (e.g., identify the stakeholders; examine the literature; select an appropriate evaluation methodology); (b) how to select criteria and standards for evaluating a program (e.g., the needs of the people to be served are met; the outcomes achieved match the goals of the program); (c) where to obtain data for an evaluation (e.g., archival records, program participants); and (d) other issues to consider when conducting evaluations (e.g., ethical
standards, managing potential negative side effects of evaluation). Literature is usually focused on describing how to conduct program evaluation rather than describing how program evaluation occurs in natural settings; the program evaluation processes in real-life contexts may differ from those that are prescribed.

The second reason that program evaluation literature contributes marginally to our understanding of organizational learning from organizational experiments is that program or process evaluations of various human service delivery programs (e.g., adolescent health education; evidence-based health care; breast and cervical cancer prevention) primarily report on whether specific program goals have been met (Helitzer, Yoon, Wallerstein, & Garcia-Velarde, 2000; Sheirer, Shediac, & Cassady, 1995; Warburton & Black, 2002). While the literature on these program evaluations may include general descriptions of the processes or methodologies used to conduct the evaluations, the studies do not describe, in any depth, the evaluation process itself nor the specific aspects of the evaluation process that were most instrumental for learning, though it is a greater understanding of such processes that will contribute to enhanced organizational learning, program delivery, and outcomes.

This study examined the processes by which new knowledge was adopted during organizational experiments. In addition, the study explored whether some aspects of organizational experiments are more instrumental than others for promoting double-loop, adaptive learning.

1.3 Pilot Projects—A Type of Organizational Experiment

An example of an organizational experiment is the pilot project, which can be defined as “an initial or small-scale effort designed to test an idea or working approach. Pilot projects are usually undertaken with the intention of replicating or widening the scale of
implementation at a later stage” (Bassler & Smit, 1997, p. 42). A pilot project facilitates *trialability* of an innovation—the level at which an innovation adopter can test and assess the innovation before its full adoption and implementation (Rogers, 1995). Pilot projects are used extensively in the field of information technology to test the impact of new products and applications, as well as to plan for their introduction before full-scale implementation (e.g., Bekic, Gojsic, & Pale, 2003; Brykcynski & Small, 2003; Giraudo & Tonella, 2003; Gunter, 2004; Spreng, 2002). In the field of health care, pilot projects are often conducted to test innovations such as new health care programs, medical therapies and interventions, as well as clinical practice guidelines (e.g., Barnason, Merboth, Pozehl, & Tietjen, 1998; Doze & Simpson, 1997; Ellerbeck et al., 1995; Fumagalli et al., 2006; Hernandez et al., 2006; Sato et al., 2005; Smith, Manfredi, Hagos, Drummond-Huth, & Moore, 2006; Stevens, Kinmonth, Peveler, & Thompson, 1997; Thienemann, Moore, & Tompkins, 2006). Conceptualized as a type of organizational experiment, a pilot project offers organizations the opportunity for experiential learning about the effects of adopting new knowledge in a specific context or setting.

Similar to the literature on program evaluation, the lay literature on pilot projects also primarily focuses on reporting the results or outcomes of specific initiatives and lacks information on the organizational learning processes that took place. Furthermore, the literature on pilot projects does not examine how learning can be enhanced or how poor learning or ineffective learning practices can be avoided. This finding also applies to the health care literature which contains countless studies reporting how new medical therapies/approaches and broader health programs were delivered and what outcomes were achieved (such as clinical efficacy, cost-effectiveness, and patient satisfaction) but is silent on the
process by which such innovations were trialed. While pilot projects are regularly completed to test new knowledge and innovations, how these organizational experiments affect organizational learning has not been examined to date.

Organizational experiments such as pilot projects are thought to provide an organization with opportunities to learn and, in particular, engage in double-loop learning which improves performance (Argyris & Schön, 1978). However, how an organizational experiment can affect this type of learning is not well understood. This study examined how pilot projects influence organizational learning; about whether and how organizations should adopt new knowledge. The results of this study are beneficial to organizations that are planning to conduct or are already engaging in pilot projects.

1.4 Clinical Practice Guideline Pilot Projects for Organizational Learning

Clinical practice guidelines (CPGs) are “systematically developed statements and recommendations to assist practitioner and patient decisions about appropriate health care for specific clinical conditions that incorporate the best available evidence” (Institute of Medicine, 2002). Practice guidelines are used for a number of reasons, such as facilitating the transfer of the best available research evidence into practice, guiding complex clinical and patient decision-making, and reducing variation in practice (Duff, Kitson, Seers, & Humphris, 1996; Grimshaw & Hutchinson, 1995). There is widespread interest among health care researchers and the physician community on whether and how evidence-based CPGs can be used to enhance health care. CPGs embed new knowledge about care delivery/practices in organizations. In some settings, CPGs have been shown to improve
physicians’ performance and to promote the delivery of high quality, evidence-based health care (Grimshaw & Russell, 1993).

The interest in CPGs during the past two decades has fueled an enormous investment in the development of CPGs and in efforts aimed at their implementation. As a result, a plethora of CPGs are available to health care practitioners through a number of sources (e.g., abstracting journals such as *Evidence Based Medicine*, *Evidence Based Nursing*, and *Registered Nurses Association of Ontario Nursing Best Practice Guidelines*; Agency for Health Care Policy and Research guidelines). A considerable stream of research has emerged to identify and test guideline implementation strategies targeted at physicians (e.g., direct mailing; publishing guidelines in newsletters and journals; electronic dissemination; educational or continuing medical education activities; outreach visits; audit and feedback programs; and handing out information about guidelines to patients and clients) (e.g., Bero et al., 1998; Burgers, Grol, Klazinga, Makela, & Zaat, 2003; Grimshaw, Beardall, Carter, Tetroe, & Davies, 2002; Lomas et al., 1989; Mugford, Banfied, & O’Hanlon, 1991; Oxman, Thomson, Davis, & Hayes, 1995; Stone, Schweikhart, Mantese, & Sonnad, 2005). Some researchers have found that a multifaceted approach of using more than one guideline implementation strategy is more likely to encourage the adoption of CPGs (Wensing & Grol, 1994). However, a recent systematic review of 235 guideline dissemination and implementation strategies has found that multifaceted interventions were no more effective than single interventions (Grimshaw et al., 2004). Thus, the evidence about how organizations can best implement CPGs is mixed.

Despite the vast and growing supply of various CPGs and several research studies that have been completed to identify and test various implementation strategies, it is now
widely acknowledged that these strategies have limited impact on usage of these guidelines by physicians (Bero et al., 1998; Freemantle et al., 1996; Grimshaw et al., 2004). In addition to concluding that the evidence is mixed regarding which strategies are likely to be efficient under different circumstances, Grimshaw et al. (2004) suggest that in the absence of hard evidence, considerable judgment is required about how best to dedicate organizational resources to strategies aimed at improving the uptake of guidelines.

In the field of nursing, there is a widespread interest in the use of CPGs as means to ensure higher quality care (Cheater & Closs, 1997). Research on the effectiveness of various CPG implementation strategies targeted at nurses is considerably less extensive. Nevertheless, a number of strategies that have been applied to physicians have also been tested and found to be effective at influencing nurses to adopt practice guidelines (e.g., educational outreach, reminders, and prompts, interactive educational meetings, and multiple interventions) (McArthur, 1999). A systematic review completed by Thomas, McColl, Cullum, Rousseau, and Soutter (1999) found that for nurses, educational interventions (e.g., patient-specific feedback and reminders) are more effective than passive dissemination strategies (e.g., mailing targeted groups, journal publications).

Research on CPG adoption by the nursing profession is a subset of a substantial body of work on nursing research utilization. Research utilization can be defined broadly as “a process directed towards the translation of specific research-based knowledge into practice through the systematic use of a series of activities” (Horsley, Crane, Crabtree, & Wood, 1983). Clinical practice guidelines, protocols, care plans, and new care techniques are forms of “instrumental” research utilization—the direct application of research findings (Estabrooks, 1997).
Several federally funded efforts in the United States, from the mid-1970s to mid-1980s, have been undertaken to increase the utilization of research by nurses by applying various models of research utilization on populations and measuring research uptake; for example, the Western Interstate Commission for Higher Education in Nursing (WICHEN) (Burns & Grove, 1987); the Conduct and Utilization of Research in Nursing (CURN) project (Funk, Torquist, & Champagne, 1989; Horsley et al., 1983); the Nursing Child Assessment Satellite Training (NCAST) project (Horsley, Stewart, & Crane, 1992); and the Orange County Research Utilization in Nursing (OCRUN) Project (Rutledge & Donaldson, 1995).

These efforts have led both to the refinement of research utilization models that were implemented during these initiatives, as well as to the development of other conceptual models, such as the Stetler (2001) model, which prescribes six stages of research utilization, and the Iowa Model of Research in Practice (Titler et al., 1994), in which research utilization is seen as an organizational process and planned change principles are used to integrate research and practice through a multidisciplinary team approach.

In a comparison of three models (i.e., CURN, the Stetler (2001) model, and the Titler et al. (1994) Iowa Model of Research in Practice) which are representative of the others, White, Leske, and Pearcy (1995) found that the research utilization processes identified by the three models are virtually the same, involving linear/sequential steps to evaluate the effectiveness of the innovation, adapting the innovation to the local environment, making decisions on whether to apply the innovation, and proceeding with implementation if warranted. In addition, these models identify the factors that must be in place for these steps to be successfully implemented, such as organizational commitment to the process, visible and enduring mechanisms to facilitate the process, and the requisite financial, human, and
temporal resources to follow through. Through a review of nine models of medical and nursing research utilization, Brown and Rodger (1999) found processes similar to those mentioned above and also suggested that there is a need for adequate resources and environments conducive to using new research evidence in daily clinical practice. A key limitation of these models is that they were developed as prescriptive rather than empirically based models, indicating the processes that research utilization should involve and the supports that are required. Furthermore, White, Leske, & Pearcy (1995) also conclude that insufficient data exist for evaluating the effectiveness of any one of these prescriptive models.

Several empirical studies have used a survey approach to identify nurses’ perceived barriers to research utilization; these have been conducted on a global scale, including the United States (Brett, 1987; Coyle & Sokop, 1990; Funk, Tornquist, & Champagne, 1991; Ketefian, 1975; Kirchoff, 1982); the United Kingdom (Hicks, 1995, 1996; Hunt, 1991; Rodgers, 1994); Canada (Butler, 1995; Wells & Baggs, 1994); Sweden (Berggren, 1996; Kajermo, Nordstrom, Krusebrant, & Bjorvell, 1998); and Australia (Restas & Nolan, 1999). These studies identify the most salient barriers to research utilization, which can be grouped into: (a) characteristics of the individual nurses (e.g., attitudes, educational level); (b) characteristics of the setting (e.g., authority to change patient care procedures, time to read research, support of physicians and other staff); and (c) the presentation of the research (e.g., statistical analyses are not understandable, relevant literature is not compiled in one place). A meta-analysis conducted in by Ashley (2005) found that the setting or organization was perceived to be the greatest barrier to research utilization and that individual characteristics (e.g., education, attitudes, etc.) had the least influence on research utilization.
Researchers today acknowledge that the process of research utilization is complex and determined by numerous intervening variables related to the research/innovation, organization, environment, and individual (Dobbins, Ciliska, Cockerill, Barnsley, & DiCenso, 2002). Recently, conceptual work on nursing research utilization, such as the Promoting Action on Research Implementation in Health Services (PARIHS) framework, suggests that research implementation is a function of the relationships among evidence, context, and facilitation, and that these elements have a dynamic, simultaneous relationship (Rycroft-Malone et al., 2004).

It has been acknowledged by medical and nursing researchers alike that CPG implementation is not a straightforward process of dissemination and action, but rather one that is fraught with complex challenges (Grimshaw et al., 2004; Rycroft-Malone et al., 2004). Researchers have found that putting health care research evidence into practice is complex, messy, and not amenable to prescriptive implementation strategies (Ferlie, 1999; Kitson, Harvey, & McCormack, 1998). There is increasing recognition that the effort required to transfer new knowledge (such as a CPG) into an organization is often laborious, time consuming, and difficult, even though current conceptualizations of knowledge transfer treat them as a costless and instantaneous activity (Szulanski, 2000).

While much literature on CPGs (such as those sources discussed above) suggests a number of factors and strategies that influence their adoption, as well as research utilization models that can be adopted or conceptual frameworks for thinking about the phenomenon, there still exists a need to conduct research studies to examine CPG implementation from the organizational learning lens. Furthermore, as previously discussed, little is known about how pilot projects can be used to learn why and how CPGs may be implemented.
The pilot project, as a limited, trial-run implementation initiative is thought to be an effective and efficient means for an organization to learn about the complexities and context-specific requirements associated with implementing CPGs in their settings, prior to embarking on wider-scale implementation. A pilot project on CPGs could provide invaluable organizational learning about the impact of a CPG on outcomes (e.g., quality of care, patient satisfaction) in a specific setting. A pilot project could also provide the organization with knowledge about what is required to implement the guideline in a local context (e.g., cost, human resources, policies). Pilot projects, as organizational experiments, allows an organization to learn about how it can realize the benefits of new knowledge and improve its performance through double-loop, adaptive organizational learning, as well as facilitate learning about how to learn (Nutley & Davies, 2001). However, it is likely that not all pilot projects will result in the same type or degree of organizational learning. How pilot projects are organized (i.e., structured) and carried out (i.e., their processes) may affect how an organization learns and, ultimately, the extent to which an organization is able to learn and benefit from this experience (i.e., double-loop vs. single-loop learning). Examining the aspects of the pilot project process that make pilot projects effective and efficient organizational learning opportunities is instructive to organizations that are currently involved in or are planning to conduct pilot projects on CPG implementation or other types of knowledge application.

This study explored how organizational experiments affect organizational learning. Organized experiments offer a means for organizational learning by providing opportunities for the organization to engage in learning-by-doing in order to determine the specific action–outcome relationship of adopting new knowledge in a particular context (Huber, 1991). The
opportunity to gather accurate information about these action–outcome relationships is the key benefit and outcome of organizational experiments. Organizational learning, particularly double-loop adaptive learning, could lead to enhanced performance.

The pilot project, as it has been applied to learning about a particular type of knowledge in the health care field—the CPG—was examined. To date, organizational learning research has focused primarily on outcomes, while this study offers insights into how organizational experiments influence organizational learning processes. This study explores the processes and structures of organizational experiments by examining whether and how these aspects contribute to or detract from organizational learning. This study responded to calls from learning theorists and researchers for formal, systematic field studies of how organizational experiments affect the organizational learning process (Huber, 1991). Furthermore, this study investigated how experiential organizational learning over the course of organizational experiments occurs in the health care industry—a setting in which several organizational experiments have been conducted on various programs and services, but one in which few research studies have been completed to understand the processes underlying such experiments and the manner in which they affect organizational learning.
CHAPTER 2: THEORETICAL FRAMEWORK AND RESEARCH QUESTIONS

2.1 Full Conceptual Model and Areas of Focus

While several aspects of organizational experiments could be examined (as illustrated in Figure 1), this research study focused on two areas of the conceptual model: the organizational learning processes and aspects of the organizational experiment that influence those processes (refer to shaded areas in Figure 1). As described in chapter 1, there is a dearth of research on the organizational learning processes of organizational experiments and the aspects of organizational experiments that affect (i.e., facilitate or impede) organizational learning which, to reiterate, is defined as knowledge gained about the action–outcome relationships of adopting the new knowledge. The following discussion is a review of literature from the fields of (a) organizational learning, (b) knowledge transfer, (c) innovation diffusion, and (d) nursing research utilization as it applies to each part of the conceptual model shown in Figure 1 (proceeding from left to right).
2.1.1 Antecedents to Organizational Learning

As illustrated in the left panel Figure 1, the literature corresponding to organizational learning, knowledge transfer, innovation diffusion, and nursing research utilization suggests that several factors comprise the antecedents or preexisting conditions that influence organizational learning. These factors can exist at many levels of analysis and also include knowledge or innovation factors discussed below.

2.1.1.1 External Environment Factors

The knowledge transfer, innovation diffusion, and nursing research utilization literature suggest that factors external to the organization, such as regulatory demands and peer pressure (Cockerill & Barnsley, 1997), culture and leadership (Greenhalgh, Glen, MacFarlane, Bate, & Kyriakidou, 2004; Kitson et al., 1998), and data capture systems that can impact how knowledge is valued by the organization such as those that measure the effectiveness and quality of care (Kitson et al., 1998; McCormack et al., 2002) all affect the adoption of knowledge, research, and innovations.

2.1.1.2 Organizational Factors

In innovation diffusion literature, characteristics of the organization, such as size, structure, functional differentiation (an internal division of labor), slack resources and specialization (the organization has a clear “niche” in which it offers expertise and specialist resources), complexity, and type as identified by industry, sector, structure, and strategy can all influence an organization’s ability to effectively acquire knowledge or adopt an innovation (Damanpour, 1991; DeCanio et al., 2000). In nursing research utilization literature, factors such as the degree of support from nursing administration and the levels of nursing staff and physicians, culture, leadership, data measurement systems, and time to use
and conduct research affect the use of research evidence (Closs & Cheater, 1994; Funk et al., 1989; McCormack et al., 2002; Nolan, Larson, McGuire, Hill, & Haller, 1994; Pettengill, Gillies, & Clark, 1994; Restas, 2000; Walczak, McGuire, Haisfield, & Beezley, 1994).

2.1.1.3 Individual Factors

Cognitive and social psychological traits (e.g., tolerance of ambiguity, intellectual ability, motivation, values), meaning of the innovation for the intended adopter, experiences, educational background, and degree of professionalism of organizational leaders are commonly considered to be important to the degree of innovation adoption (Greenhalgh et al., 2004).

2.1.1.4 Knowledge Attributes

Innovation diffusion literature is also replete with empirical studies that demonstrate how the specific attributes of the knowledge or innovation (including relative advantage, cost, compatibility, trialability, observability, and complexity) affect its adoption (Greenhalgh et al., 2004; Rogers, 1995; Tournatzky & Klein, 1982). Nursing research utilization literature has demonstrated that evidence plays a significant role in the uptake of research and can encompass knowledge that is broader than research (e.g., clinical experience, patient experience, and information from the local context such as audit information) (Rycroft-Malone et al., 2004). These researchers argue that successful implementation is more likely to occur when research and clinical/patient experience are high in quality (as defined by a number of explicit criteria). Furthermore, the accessibility of nursing research (i.e., how it is presented and communicated) also affects its level of utilization (Restas, 2000; Veeramah, 1995).
Extensive research has been undertaken on the antecedents to organizational learning and hence, this research study focuses on other areas that have been much less extensively studied—the processes through which organizational learning occurs and the aspects of organizational experiments that influence organizational learning processes.

2.1.2 Organizational Learning Processes

The next part of Figure 1, which is shaded and located to the right of the organizational learning antecedents, is a key area of focus for this study. As previously discussed, there have been few empirical studies of processes that underlie organizational learning generally, and in organizational experiment contexts specifically. A systematic review of 213 empirical and 282 non-empirical studies on the diffusion of health service innovations found that learning studies generally were impoverished by a lack of process information and that research is required on how these innovations are implemented and how these processes can be enhanced (Greenhalgh et al., 2004).

Furthermore, as noted earlier, while the nursing research utilization literature contains many studies of the barriers and facilitators perceived by nurses to affect the usage of research, little is known about research utilization processes and how they unfold over time. This study examines perceived organizational learning during organizational experiments as the key consequence of organizational experiments.

2.1.3 Influencers—Aspects of the Organizational Experiment Influencing Organizational Learning

This study proposes that certain aspects of the organizational experiment, both processes and structural mechanisms, affect organizational learning. Organizational experiment processes are defined as one or more activities that organizational experiment
participants engage in to learn about the new knowledge (e.g., training, mentoring, and observation). Structural mechanisms of the organizational experiment include human (e.g., pilot project leader, pilot project participants), financial (e.g., dedicated budget), and technological resources (e.g., computer hardware and software) that are assigned to the pilot project.

Conceptual work has been completed on how facilitation affects nursing research utilization. The concept of facilitation has been examined in detail, particularly with respect to how the roles of structural mechanisms (including project leads, facilitators, change agents, opinion leaders, champions, and boundary spanners) can be differentiated in terms of how they each affect research utilization (Kitson et al., 1998; Markham, 1998; Meyer & Goes, 1988; Thomson O’Brien et al., 2003). Harvey et al. (2002) and Thompson et al. (2006) suggest that the concept of facilitation is only partially understood because it is unclear whether the various roles are completely distinct and how they are carried out. Nevertheless, a facilitator, as a type of structural mechanism, could positively influence the degree of organizational learning by applying and sharing his or her knowledge and skills (e.g., research utilization) to help organizations achieve their goals (Harvey et al., 2002).

In the learning organization literature, Nutley and Davies (2001) propose that mastering a number of competencies (e.g., open systems thinking, team learning); cultural values (e.g., celebration of success, tolerance of mistakes, openness, trust); and structural mechanisms (e.g., team work structures, incentives and rewards for learning) facilitate organizational learning. However, organizational learning literature (e.g., Senge, 1996) is mostly prescriptive in nature, lacking comprehensive theoretical underpinning, and may not have been empirically tested.
Limited theoretical and empirical work that has been completed on how organizational experiments affect organizational learning. This study contributes to our understanding of how specific aspects of organizational experiments (processes and structural mechanisms) facilitate and constrain organizational learning.

2.1.4 Outcomes of the Organizational Experiment

The right side of Figure 1 illustrates the potential outcomes of learning. As previously discussed, a limitation of the research that has been completed to date is that production unit cost extensively used a proxy for measuring that organizational learning has occurred (Dutton & Thomas, 1984). In other studies, organizational learning has been measured as whether or not there has been adoption of new knowledge rather than as the extent of adoption; direct measures of organizational learning (such as the degree of knowledge that has been gained from experience and/or when changes in behavior are a result of experience) not typically been applied (Argote, 1993).

As shown in Figure 1, there may be two potential types of outcomes of the organizational learning processes: (a) organizational learning outcomes, such as single- and double-loop learning, that are directly affected by the organizational experiment; and (b) performance outcomes that are affected by the extent of organizational learning and the actions that are motivated by learning. Performance outcomes can be studied at the organizational (e.g., cost, quality), group (e.g., team effectiveness), and individual (e.g., patient functional status, employee satisfaction) levels.

While most studies focus on measuring the organizational learning as an outcome, this study examines an understudied area and describes the processes of organizational
learning and the processes and structural mechanisms of organizational experiments that are perceived to affect organizational learning.

2.2 Research Questions

The questions that were addressed during this study were:

- How do organizations learn during organizational experiments about why and how to adopt new knowledge?
- What processes and structural mechanisms of organizational experiments influence organizational learning?
- What processes and structural mechanisms of organizational experiments contribute to or detract from double-loop, adaptive organizational learning?

Drawing on the relevant literature, the following chapter presents the propositions that were examined during this study which centre on the organizational experiment process and the processes and structural mechanisms of organizational experiments that influence organizational learning.
CHAPTER 3: PROPOSITIONS

3.1 Organizational Learning Processes of Organizational Experiments

As previously discussed, studies on the organizational learning processes of organizational experiments (including pilot projects) were inexistent at the time the present research study began. However, an extensive literature exists in the fields of organizational learning, knowledge transfer, and innovation diffusion regarding the stages that occur during the adoption of new knowledge, and factors that may affect uptake. This literature can be drawn upon to anticipate what the organizational learning process during pilots might involve. Below, these literatures are reviewed and stages of the organizational experiment process through which organizational learning occurs are proposed.

3.1.1 Organizational Experiment Process as a Subset of Broader Processes

A framework for conceptualizing organizational experiment processes as a part of a broader range of processes of knowledge transfer, innovation diffusion, and organizational learning was developed. It is suggested that the organizational experiment comprises shorter, similar processes, involving the stages suggested in the knowledge transfer and innovation diffusion literature.

As indicated within the shaded box at the centre of Figure 2, the primary interest of this research study is to examine the process(es) by which learning occurs during organizational experiments. Conceptualizing organizational learning as involving processes is appropriate. While innovation diffusion and knowledge transfer research has traditionally considered adoption to be a single act, an increasing number of researchers now recognize that a process perspective is a more accurate reflection of the phenomenon. Researchers have begun to refer to the extent of knowledge adoption, which examines process on a
continuum - from no adoption to full adoption (Lemieux-Charles & Barnsley, 2004). A process view also encourages a detailed examination of how knowledge transfer occurs over time or stages, and also provides insight into how various factors influence knowledge transfer. This information can inform managerial interventions and help design organizational mechanisms that support knowledge transfer throughout the process (Szulanski, 2000).

Organizational experiment processes are likely a subset of a larger set of organizational processes/scenarios; that is, an organizational experiment is a small-scale, intentional experiment prior to potential full-scale adoption for the purposes of determining why and how the new knowledge/innovation can be implemented (see Figure 2).

Several possible pre-organizational experiment scenarios exist as illustrated in the left panel of Figure 2. For example, it is plausible that an organization would have had preexisting knowledge about the innovation before deciding to proceed with an organizational experiment. The organization may have decided not to act on the knowledge it has gained and not to engage in an organizational experiment. It should also be noted that organizations may choose to skip the organizational experiment process(es) altogether and
proceed with implementation. There are also several possible scenarios that may occur after
the organizational experiment process(es), as shown in the right panel of Figure 2. An
organization may decide to implement the innovation full-scale, as it is across the
organization or to partially implement it some parts of the organization. The organization
may also choose to alter or reinvent the innovation into a new form (Rogers, 1995). It may
also cease to take any further action after the organizational experiment for a number of
reasons (e.g., lack of resources, competing priorities).

3.1.2 Proposed Stages of the Organizational Experiment Process

Rogers (1995) suggests that the innovation diffusion process consists of five stages—
(a) knowledge, (b) persuasion, (c) decision, (d) implementation, and (e) confirmation—and
also discusses the challenges and elements that need to be managed at each stage. The first
stage, knowledge, begins with awareness of a new innovation and an understanding of how it
works (“how-to knowledge”). The next stage, persuasion, occurs when individuals are
persuaded to adopt an innovation by considering its attributes (e.g., relative advantage,
complexity, compatibility, cost). The decision stage involves activities that lead up to the
individual’s decision to adopt or reject the innovation. Confirmation is the last stage of the
process and involves seeking reinforcement for the decision that has been made, which can
be an ongoing activity.

Szulanski (2000) suggests that there are four distinct stages in knowledge transfer—
(a) initiation, (b) initial implementation effort, (c) ramp-up to satisfactory performance, and
(d) integration—and discusses elements that cause ‘stickiness’ or a lack of knowledge
transfer during each stage. The initiation stage includes all of the events that lead up to the
decision to transfer the new knowledge. The implementation stage leaves off from the
decision to proceed and involves the transfer of knowledge between the source and the recipient. Once the recipient begins using the new knowledge, then the organization has entered into the ramp-up stage in which the focus is on identifying and resolving unexpected problems that are obstacles to realizing performance expectations. The integration stage begins after satisfactory results are achieved with the transferred knowledge is when its use gradually becomes routinized over time.

The process frameworks suggested by Rogers (1995) and Szulanski (2000) were developed for permanent and full-scale implementation of innovations. However, these frameworks can be readily applied to the organizational experiment process because it is likely that similar stages are involved. A broad analysis of commonalities between Rogers’s (1995) knowledge-transfer and Szulanski’s (2000) innovation-diffusion process was completed to develop a proposed process framework for organizational experiments. Figure 3 contrasts the Rogers (1995) and Szulanski (2000) frameworks and illustrates the three proposed stages of organizational experiments.

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<td>Awareness of new knowledge</td>
<td>Formation of the transfer seed</td>
<td><strong>Initiation</strong></td>
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<tr>
<td>Persuaded to Adopt</td>
<td>Decision to transfer</td>
<td><strong>Implementation</strong></td>
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<td>Activities leading to decision</td>
<td>First Day of Use</td>
<td><strong>Results</strong></td>
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<td>Innovation instituted</td>
<td>Satisfactory Performance</td>
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<td>Reinforcement sought for decision</td>
<td>Routinization of New Knowledge</td>
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**Figure 2. Identifying Organizational Experiment Stages Through a Comparison of Rogers (1995) & Szulanski (2000) Process Frameworks**
First, the organizational experiment *initiation* stage is expected to include awareness of the new knowledge, attitude formation about the knowledge, expectations about its outcomes, and the decision to proceed with implementation. Second, the organizational experiment *implementation* stage involves piloting activities and efforts to gauge the realized results of the new knowledge. Third, the organizational experiment *results* stage involves knowledge gathering and decision-making activities leading to a final decision about what to do with the new knowledge (i.e., full implementation, partial implementation, or no action, as shown in the post-organizational experiment scenarios in Figure 2). Hence, the following was proposed:

Proposition 1: The organizational learning process of the organizational experiment is comprised of three stages: initiation, implementation, and results.

Additional propositions pertaining to the aspects organizational experiments that may influence the organizational learning process are presented below.

### 3.2 How Aspects of Organizational Experiments Influence Organizational Learning

Processes and structural mechanisms inherent to the organizational experiment may influence organizational learning. Processes were defined as activities that participants of the organizational experiment engage in to learn about the new knowledge. Examples include holding education and training activities to learn about the new knowledge or having status-update meetings to discuss the progress achieved towards implementation of the new knowledge. Structural mechanisms were defined as the human, financial, and technological resources that influence organizational learning. For example, a facilitator, a pre-determined
budget, and an electronic documentation system may be structural mechanisms that may improve organizational learning.

Propositions were developed based on the organizational learning, knowledge transfer, innovation diffusion, and nursing research utilization literature. Figure 4 summarizes the organizational experiment process as previously proposed, and the aspects that were proposed to influence organizational learning during each stage of the organizational experiment process. Feedback loops have been included to indicate that it is expected that some stages likely will be repeated (perhaps several times). For example, the results of the organizational experiment may be causally ambiguous and signal to participants that more learning during the initiation stage is required. Causal ambiguity refers to uncertainty regarding the action–outcome relationship of adopting the knowledge and ultimately, the outcomes that will be achieved upon its implementation (Szulanski, 2000). Berta and Baker (2004) suggest that if causal ambiguity is not reduced, disenchantment could result and new routines could be abandoned in favor of previous routines and behaviors. The results may also indicate that not enough knowledge has been gained about how to implement, therefore, requiring a return to the implementation stage.

### 3.2.1 Stage One: Organizational Experiment Initiation

The organizational learning and knowledge transfer literature sheds light on a number of elements that may affect the first stage of knowledge transfer: initiation. Included in these elements are characteristics of the knowledge and the absorptive capacity of the knowledge recipient. These elements comprise both the facilitators and barriers of knowledge transfer and thus may be influencers of the organizational learning process.
3.2.1.1 Assessment of Knowledge Attributes

A number of attributes of the knowledge that is being transferred have been found to be associated with the ease of its implementation. In the innovation diffusion literature, Rogers (1995) suggests a number of attributes that predict the rate of adoption of an innovation, including: (a) relative advantage, (b) compatibility, (c) complexity, (d) observability, and (e) trialability.

*Relative advantage* refers to the degree to which an innovation is perceived to be better than an existing practice, using measures such as economic gain, social prestige, and savings in time and effort. *Compatibility* pertains to the degree to which the innovation is
perceived to meet the needs of the adopter. A high degree of compatibility is believed to lead to the adoption of the innovation as it exists, while a low degree of compatibility may lead to modifications to the innovation in order to increase its compatibility or rejection altogether. *Complexity* is the degree to which an innovation is perceived as relatively difficult to understand and use. Through a meta-analysis of 75 publications about perceived attributes and rate of adoption, Tournatzky and Klein (1982) found that the attributes relative advantage, compatibility, and complexity were consistently closely related to the rate of adoption.

It was proposed that during the initial stages of the organizational experiment process, there may be processes that an organization may engage in that could affect the ability of the organization to assess how the new knowledge fares against these attributes; that is, the action–outcome relationships of implementing the new knowledge. For example, with respect to relative advantage, it was proposed that the ability of the organization to assess whether the new knowledge would result in greater (or poorer) outcomes (e.g., better patient care) that facilitates the organizational learning process. The same logic was applied for the attributes of compatibility and complexity. The organizational experiments may involve processes that allow the organization to determine whether the guideline is compatible (or not compatible) with its needs. An organizational experiment could also allow the organization to learn about the complexity of the new knowledge and assess how easy (or difficult) it is to use and understand. The ability to assess the attributes of the new knowledge facilitates organizational learning.4 Hence, the three propositions below were proposed.
examined during the study. Single- and double-loop learning are both included in the term “organizational learning” in these three propositions as well as the Propositions 8-14 as these types of learning are of interest in this study.

Proposition 2: Processes and structural mechanisms of the organizational experiment that allow for the assessment of the relative advantage of the new knowledge facilitate organizational learning.

Proposition 3: Processes and structural mechanisms of the organizational experiment that allow for the assessment the compatibility of the new knowledge facilitate organizational learning.

Proposition 4: Processes and structural mechanisms of the organizational experiment that allow for the assessment the complexity of the new knowledge facilitate organizational learning.

It was proposed that the organizational experiment may also facilitate the organizational learning process by addressing two other knowledge attributes, observability and trialability, as suggested by Rogers (1995). Observability relates to the degree to which the results of an innovation can be readily seen by others. An organizational experiment may facilitate the observability of an innovation depending on the processes or structural mechanisms that are used. For example, the use of a common reporting format (e.g., a
checklist) for gathering and sharing data on the impact/experience with an innovation with other individuals could lead to greater observability of the outcomes of the innovation than verbal accounts. *Trialability* refers to the degree to which an innovation may be experimented with on a limited basis. Overall, the purpose of an organizational experiment is to test an innovation prior to deciding whether or not to embark on its full-scale implementation. However, there may be some processes or structural mechanisms of an organizational experiment that allow for greater trialability of the innovation than others. Innovations that can be divided into parts for trial could be adopted at a greater rate than those that cannot. For example, a pilot project that asks its participants to implement a subset of a full innovation (e.g., part of a clinical practice guideline) may ease the effort required to learn about the innovation, which in turn may facilitate greater adoption of the entire content of the guideline in the end. Organizational experiments that introduce the innovation to an organization in a format that facilitates trialability (e.g., introducing a guideline in a short, easy to understand checklist format versus a long policy document) may also promote better adoption. Hence, two additional propositions regarding the observability and trialability of the innovation/new knowledge were proposed:

Proposition 5: Processes and structural mechanisms of the organizational experiment that allow for the observability of the impact of the new knowledge facilitate organizational learning.

Proposition 6: Processes and structural mechanisms of the organizational experiment that allow for the trialability of the new knowledge facilitate organizational learning.
3.2.1.2 Gaining Unit Level Absorptive Capacity

Structural mechanisms of the organizational experiment can affect the learning about new knowledge. One of these structural characteristics could be absorptive capacity. Organizational learning scholars suggest that an organization must first possess prior related knowledge in order to acquire and use new knowledge (Cohen & Levinthal, 1990). With foundations in the cognitive and behavioral sciences and research on memory development, this concept suggests that new knowledge is gained through associative learning. Szulanski (1996) found that the lack of absorptive capacity causes stickiness in the initiation process, a term that he uses to describe difficulties, problems, or barriers experienced during the knowledge transfer process.

Organizational experiments that involve individuals who have prior knowledge and/or experience with the application of new knowledge (i.e., absorptive capacity) were proposed to facilitate organizational learning. That is, involvement of individuals in the organizational experiment who have previous experience with implementing the new knowledge or similar will facilitate organizational learning.

Proposition 7: Involvement of individuals in the organizational experiment who have prior experience with implementing the new knowledge facilitates organizational learning.
3.2.2 Stage Two: Organizational Experiment Implementation

The knowledge transfer and organizational learning literature also indicates that there are a number of other processes and structural mechanisms that may influence the implementation of new knowledge.

3.2.2.1 Facilitator

A dedicated facilitator for the organizational experiment was proposed to be a structural mechanism that enables organizational learning. A facilitator is defined as someone who is appointed specifically to the role of facilitation as opposed to an opinion leader, who through his or her reputation and influence acts as a change agent. The role may be internal or external (or both) while the change is being implemented. The role of the facilitator is to help and enable rather than tell or persuade (Harvey et al., 2002).

Facilitation has been suggested to be effective in assisting with the implementation of clinical practice guidelines (Harvey et al., 2002; Rycroft-Malone et al., 2004). Facilitation is defined as “a technique by which one person makes things easier for others, helps others work towards achieving particular goals, encourage others, and promote action” (Kitson et al., 1998). Therefore, in the context of this study, a facilitator could work with the organizational experiment participants to implement the new knowledge. The facilitator’s role could vary from providing help and support in order to achieve specific goals to working with organizations to analyze, reflect, and change their own attitudes, behaviors, and ways of working (Harvey et al., 2002). Hence, it was proposed that a facilitator would assist with organizational learning about the action–outcome relationships of adopting new knowledge.
Proposition 8: The assignment of a dedicated facilitator to the organizational experiment is a structural mechanism that facilitates organizational learning.

3.2.2.2 Direct Usage and Conversion of Tacit and Explicit Knowledge

Nonaka (1994) suggests that effective knowledge creation requires the usage of two forms of knowledge—explicit and tacit. Explicit knowledge refers to knowledge that can be easily codified and transmitted in formal, systematic language and kept in historical records (e.g., libraries, archives, databases). Tacit knowledge, on the other hand, is deeply rooted in an individual’s values, beliefs, and commitment to and involvement in a specific context. Also referred to as “know-how” knowledge, tacit knowledge is typically difficult to codify and communicate to others (Nonaka, 1994). As Polanyi (1966) stated, “We can know more than we can tell” (p. 4).

Kitson et al. (1998) suggest that knowledge, which is referred to as evidence, is successfully implemented when three aspects are considered at once: research, clinical expertise, and patient choice. Research, which is intended to be based on rigorous systematic evaluation, would represent an explicit form of knowledge, while consensus among clinical expert and patient opinions would be considered to be tacit forms.

Nonaka (1994) suggests that knowledge creation requires not only building both tacit and explicit knowledge, but also achieving an understanding of the interplay between the two forms of knowledge, which he refers to as reflection in action. The process of reflection involves the constant conversion of explicit into tacit knowledge and vice versa. Being a reflective process, it is posited that knowledge conversion may involve or lead to double-loop adaptive organizational learning. Nonaka and Takeuchi (1995) suggest four interactive
models of knowledge conversion: socialization (tacit to tacit), externalization (tacit to explicit), combination (explicit to explicit), and internalization (explicit to tacit).

It was proposed that organization learning is facilitated when processes or structural mechanisms of the organizational experiment are in place to gather and utilize the tacit and explicit forms of knowledge through its direct usage or via the conversion of it from one form to another. For example, the organizational experiment might involve the utilization of documents or tools that assist with implementation of the new knowledge (e.g., policies and checklists), harnessing explicit knowledge. Discussions with project participants to reflect on their experiences with implementing the new knowledge, for example, would capture tacit knowledge and may assist with converting explicit to tacit knowledge. Argote (1999) suggests rotating personnel to affect the transfer of tacit and explicit knowledge and to enhance their understanding of the knowledge needs of their organizations and where knowledge resides. Argote (1999) also suggests that standardizing and documenting transfer experiences would convert tacit into explicit knowledge. Hence, three propositions were offered on how organizational experiments may facilitate organizational learning about tacit knowledge, explicit knowledge, and the conversion between tacit and explicit forms of knowledge.

Proposition 9: Processes and structural mechanisms of the organizational experiment that capture and utilize explicit knowledge facilitate organizational learning.

Proposition 10: Processes and structural mechanisms of the organizational experiment that capture and utilize tacit knowledge facilitate organizational learning.
Proposition 11: Processes and structural mechanisms of the organizational experiment that convert knowledge from one form to another facilitate organizational learning.

3.2.2.3 Skills and Practice with the New Knowledge

Cohen and Levinthal (1990) suggest that intensity and repeated exposure to prior knowledge is critical for developing effective absorptive capacity, enhancing organizational learning, and improving firm performance. Argote (1999) suggests that providing staff with opportunities to enhance their knowledge transfer experiences through participation in meetings, conferences, and training sessions develops absorptive capacity. Rulke, Zaheer, and Anderson (2000) found that relational channels involving personal contact with internal and external sources of knowledge were salient for an organization to understand its capabilities. Referred to as “self-knowledge,” this knowledge was found to be essential for learning about best practices and implementing them internally. Hence, it was proposed that processes or structural mechanisms that allow organizations to gain skills and practice with implementing the new knowledge facilitate organizational learning.

Proposition 12: Processes and structural mechanisms of the organizational experiment that allow for the gain of skills and practice with implementing the new knowledge facilitate organizational learning.

3.2.2.4 Identifying and Resolving Problems

Szulanski (2000) suggests that once an organization begins using new knowledge, the main requirement is to identify and resolve unexpected problems that may prevent it from meeting or exceeding performance expectations of the new knowledge. Furthermore,
Szulanski (2000) suggests that there is a brief window of opportunity to address unexpected problems before new knowledge is used ineffectively or abandoned. Therefore, it was proposed that processes and structural mechanisms relating to problem identification and resolution would facilitate organizational learning.

Proposition 13: Processes and structural mechanisms of the organizational experiment that identify and resolve problems regarding the new knowledge, facilitate organizational learning.

3.2.3 Stage Three: Organizational Experiment Results

3.2.3.1 Building Retentive Capacity

The organizational experiment results stage involves making a decision on whether or not to proceed with further implementation of the new knowledge. From an organizational learning perspective, it was proposed that this stage involves the review of all the knowledge that has been gained by the organization, including why and how the new knowledge should be adopted. This last stage of organizational experiment process is critical for building “retentive capacity,” an organization’s ability to institutionalize and sustain usage of the new knowledge (Argote & Ingram, 2000; Szulanski, 1996). It was proposed that summative evaluation processes and structural mechanisms, such as an organizational experiment debriefing meeting or the conduct of a formal post-pilot evaluation, would facilitate organizational learning. The final proposition for this study was as follows:
Proposition 14: Processes and structural mechanisms that allow for summative evaluation of the organizational experiment facilitate organizational learning.
CHAPTER 4: METHODOLOGY

4.1 Case Study Design

A qualitative, retrospective, multiple case study design was used for this study. Qualitative methods allowed for an exploratory, in-depth, inductive study of the complex and dynamic organizational learning processes of organizational experiments for which there is currently a dearth of knowledge (Cockerill & Barnsley, 1997; Dobbins et al., 2002). Qualitative research methods were also applied since the purpose of this study was not to measure whether organizational learning during organizational experiments leads to CPG guideline implementation but rather to describe how organizational learning occurs during organizational experiments and the processes and structural mechanisms that facilitate or constrain gaining knowledge about the action–outcome relationship of implementing the innovation. Quantitative methodology is more appropriate for determining the strength of the association between specific organizational experiment aspects and organizational learning.

A case study approach allowed for the detailed examination of organizational learning processes within natural settings. According to Yin (2003) and Stake (1995), the case study approach facilitates study of complex phenomena and the contextual environment in which it is situated. As Yin states: “a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (p. 13).

Multiple cases of organizational experiments allowed for the comparison of themes across cases in addition to the identification of within-case themes. Multiple cases also provided support for the empirical validity of the findings (Yin, 2003).
4.2 Case Selection Procedures

The procedures for case selection are described below. Also provided is information on the cases that were ultimately included in this study and a brief description of the innovation that was piloted by the cases.

4.2.1 Definitions

The CPG pilot project (the organizational experiment) was defined as the unit of analysis and the case for this study. The level of analysis was the nursing unit in which the CPG was piloted. The case study site was the organization to which the nursing unit belongs.

4.2.2 Number of Cases

Literal and theoretical replication logic was applied to determine the number of cases for this study (Eisenhardt 2002; Huberman & Miles 1994; Yin, 2003). Eight cases were selected for this study [2 conditions (propositions 7 and 8) x 2 extremes x 2 cases per extreme = 8], based on selecting the minimum number of cases (two) needed for comparison of cases that would predict similar results (literal replication) and comparisons across potential positive and negative conditions (theoretical replication) [Yin, 2003]. An additional two cases were identified to test and refine the semi-structured interview guide that was developed.

4.2.3 Case Recruitment Process

In 2002, the RNAO initiated a Nursing Best Practice Guideline Project and issued a Request for Proposals to which health care organizations interested in piloting nursing best practice guidelines responded. Numerous organizations from a range of health sectors (e.g., acute, long-term care, rehabilitation, complex continuing care, etc.) in Ontario participated in
this project. Organizations that were selected to participate in the RNAO project committed to piloting a guideline for a span of at least two years and were required to dedicate financial and human resources.

The inclusion criteria for cases in this study were as follows: (a) the cases piloted the same RNAO nursing practice guideline; (b) the pilot was concluded during the last two years (October 2006 – October 2008) prior to data collection; (c) the pilot took place at an acute care organization; and (d) the health care organization was located in an urban centre. Selecting cases from a similar health care setting, geographical location (i.e., urban setting), and piloting the same CPG contributed to a greater focus on organizational learning processes by controlling for extraneous variation across the cases due to environmental or organizational factors and knowledge attributes. Selecting cases that concluded in the last two years assisted with reducing recall bias.

Rather than requesting RNAO to contact Nursing Best Practice Guideline Project participants to determine whether they might be interested in participating in this study, the “Guide to Canadian Healthcare Facilities, Volume 13.1” published by the Canadian Healthcare Association in 2006 was used to identify potential cases for the study. This guide was used to randomly choose acute health care organizations located in major Ontario city centres to contact.

The Chief Nursing Executive/Chief Nursing Officer (CNE/CNO) at each organization was contacted through email and telephone to determine whether the organization had participated in the RNAO Best Practices Pilot Project and whether there was interest in participating in the study. If these conditions were met, the CNE/CNO was asked for a
referral to the individual who was most responsible for managing and operating the pilot, referred to as the “pilot project leader” in this study.

The pilot project leader was contacted via telephone and a screening tool was applied to identify the guideline(s) they had piloted and whether they met the other inclusion criteria. This process was continued with the list until 10 cases that piloted the same nursing practice guideline were identified. Ethics submissions were made to the University of Toronto Research Ethics Review Board and where required, an additional approval was obtained from the Research Ethics Board of each participating health care facility.

Eight cases were randomly chosen for inclusion in the study using a random number table obtained through the Internet. The other two cases were used to test the semi-structured interview guide. The interview guide was emailed to the pilot project leaders of these two cases and they were asked to provide their own feedback, as well as obtain input from direct care nurses and their program manager, if this was another individual. A telephone call with each pilot project leader was subsequently held to receive and discuss this feedback. The pilot project leaders of the other eight cases were contacted again and asked to provide the names and contact information for at least one and preferably, three direct care nurses who were most closely involved with piloting the guideline, as well as the name of the nursing unit’s program manager/administrator. In some cases, the pilot project leader was in this role.

Each of the pilot project leaders and participants at their organizations were emailed information about the study and contacted by telephone to formally enroll them in the study. Interview times were arranged with the assistance of the pilot project leader.
4.3 Case Characteristics

The eight cases (pilot projects) that were selected using the procedures described above were situated within eight nursing units and located within five separate urban centre acute care facilities in Ontario. Each of these nursing units piloted the RNAO “Pain Assessment and Management Best Practice Guideline (Revised 2007)” sometime between October 2006 and October 2008. The pilot projects that were included in this study took place at a variety nursing units within both large and smaller community acute care hospitals. Characteristics of the organizations from which the nursing units were situated, as well as features of each nursing unit are shown in Table 2.

Table 2

<table>
<thead>
<tr>
<th>Case</th>
<th>Nursing unit type</th>
<th>No. beds in nursing unit</th>
<th>Organization type</th>
<th>No. beds in organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inpatient Surgery</td>
<td>28</td>
<td>Acute care teaching hospital</td>
<td>486</td>
</tr>
<tr>
<td>2</td>
<td>Palliative Care/Oncology</td>
<td>22</td>
<td>Multi-site hospital with acute care, mental health and long-term care facilities</td>
<td>939</td>
</tr>
<tr>
<td>3</td>
<td>Inpatient Surgery</td>
<td>65</td>
<td>Community hospital</td>
<td>450</td>
</tr>
<tr>
<td>4</td>
<td>Intensive Care Unit</td>
<td>14</td>
<td>Community hospital</td>
<td>450</td>
</tr>
<tr>
<td>5</td>
<td>General Internal Medicine</td>
<td>54</td>
<td>Acute care teaching hospital</td>
<td>846</td>
</tr>
<tr>
<td>6</td>
<td>General Internal Medicine</td>
<td>60</td>
<td>Acute care teaching hospital</td>
<td>846</td>
</tr>
<tr>
<td>7</td>
<td>Complex Continuing Care</td>
<td>42</td>
<td>Community hospital</td>
<td>155</td>
</tr>
<tr>
<td>8</td>
<td>Oncology</td>
<td>11</td>
<td>Community hospital</td>
<td>155</td>
</tr>
</tbody>
</table>
4.4 The Innovation

The “Pain Assessment and Management Best Practice Guideline (Revised 2007)” was the “innovation” that was being implemented during the pilot projects. The primary focus of this study was not to examine the content or nature of this guideline but rather how this innovation was implemented during pilot projects and the influence of these processes on organizational learning. However, the characteristics of this innovation may have contributed to the organizational learning processes that were observed and hence general information about the guideline is provided below for context.

The nursing practice guideline on pain was developed by RNAO with the assistance of a panel of nurses from health care organizations across Ontario. A team of academic researchers is also acknowledged in the document as contributing to the evaluation of the guideline. The guideline is 144 pages in length including appendices. It contains 79 recommendations regarding pain assessment and management practices including: a brief one-page overview of how to use the document, practice recommendations (#1-66), education recommendations (#67-70), and organization and policy recommendations (#71-79). The body of the guideline concludes with five pages of information/suggestions for evaluation and monitoring guideline implementation.

The appendices of the guideline include a glossary of key terms, various sample pain assessment and management tools, a description of the toolkit, and a chart summarizing the practice recommendations. In addition, included at the end of the guideline was a 26-page supplement published in March 2007. This document lists 75 recommendations. It states that several recommendations were combined and a number were reworded for clarity. For each recommendation, it is indicated whether there has been new evidence that supports each
original guideline recommendation (indicated as unchanged) or whether a revision has been made.

4.5 Data Collection

Data for this study were collected through face-to-face interviews with individuals at each case study site. The data collection process is described below.

4.5.1 Interview Guide

Based on a review of the literature, a semi-structured guide was developed to guide the interview process (Appendix A). Generally, the individuals interviewed were asked to recall in their own words, their overall experience with piloting the guideline. Interviewees were also asked to speak about whether there were any stages of the pilot project. Interviewees were asked about what aspects of the pilot project (e.g., evaluation tools, meetings, facilitators, etc.) they felt were important for facilitating their learning about the guideline. They were asked how these aspects enabled them to learn and why these aspects were important for learning about guideline implementation. They were also asked about the relative importance of each of these aspects and the rationale for their responses. Research participants were also asked about pilot project aspects that they perceived were ineffective and the reasons why. The interview concluded with asking participants what, if any, changes the pilot project participants made to their own practice, the guideline, and their nursing units as a result of the pilot. They were also asked what happened after the pilot project had concluded.

The interview guide was pre-tested with pilot project leaders at two organizations to confirm the appropriateness of the language and relevance of the questions. The same interview guide was used for all of the research participants with the exception one question
that was meant for only the Pilot Project Leader and Nursing Program Manager roles which asked about the financial impact of the pilot.

4.5.2 Interviews

Data were gathered through face-to-face interviews with individuals who had participated in the piloting of the organizational experiments. Documents supporting what was discussed during the interviews were also requested and gathered from research participants. Data were collected between November 2008 and January 2009. With the exception of two cases where interviews were conducted over the course of two days, spread apart by two and three weeks, respectively, the interviews for the remaining cases were all conducted within the same day.

Thirty-two individuals participated in this study, including a total of six pilot project leaders, six nurse program managers, and twenty direct care nurses. The number of individuals in each of these roles was distributed fairly evenly across the eight nursing units. The rationale for interviewing individuals in each of these roles is described below.

Interviews were carried out with individuals in the following roles at each case study site:

- Pilot Project Leaders: One interview with the leader of the pilot project. This individual was interviewed to obtain an overall account of the organizational experiment process and what from the pilot contributed to organizational learning.
- Nursing Program Managers: One interview with the Nursing Program Manager if he/she was someone other than the pilot project leader. This individual was interviewed to explore any financial or other management related aspects that may have affected organizational learning during the pilot.
- Direct Care Nurses: Full-time nurses from the unit who were directly involved with the pilot. The Pilot Project leader was asked to identify at least one and up to three nurses to participate in the study. As nurses were to be the key adopters of the new knowledge, they were interviewed to gather a first-hand account of their experience with the organizational experiment process and aspects influencing their learning.

Prior to each interview, the research participant was provided with a letter about the study and two copies of the consent form to review and sign. One copy of the consent form was returned to the research participants and the other was kept and filed in a secure location. Each individual was also given a token of appreciation (i.e., a $5.00 gift certificate for coffee purchases) before the interview for participating in the study and were asked to leave their contact information if they wished to receive a copy of a publication resulting from this study.

Upon completing interviews with half of the case study sites, questions were added to the semi-structured interview guide to further elicit information about any organizational learning which had occurred. Specifically, a number of questions were added to identify whether any changes had occurred during the pilot. These questions are each indicated with an asterisk (*) in the semi-structured interview guide in Appendix A. The interviews ranged from 20 to 90 minutes and were audio-taped with consent. The audiotapes were transcribed verbatim by a professional transcriber.
4.6 Data Management, Analysis, and Interpretation

The procedures that were applied during data analysis and interpretation included the following:

- **Bracketing:** The propositions previously proposed and other personal perspectives regarding the key phenomenon (organizational learning processes/aspects of organizational experiments) were set aside to facilitate objective data analysis and interpretation.

- **Data Management:** The transcripts were imported into NVivo8 to facilitate the organization, cleansing, coding and retrieval of data.

- **Coding:** The transcripts were reviewed and codes developed to describe the phenomenon. Categories and subcategories were developed and refined. Documents that were obtained were also reviewed as coding was completed to confirm interview results.

- **Within-Case Analysis:** Using the categories and subcategories that were developed, individual case descriptions were developed. Themes within each case were identified.

- **Cross-Case Analysis:** Matrices were developed to compare and contrast data across cases using the categories and subcategories. Themes across the cases were compared and common themes were identified. Literature was drawn upon to assist with the interpretation of cross-case findings.

- **Propositions:** Findings were reviewed against the propositions to determine whether they were supported or refuted. Themes were also validated during this process.
Practical Implications and Future Research Directions: Further analysis interpretation of the themes was completed to identify and propose implications for theory development, empirical research and practice.

The data analysis and interpretation process was recursive and iterative. For example, codes were refined several times as new transcripts were reviewed. Categories and subcategories were also revised continuously as new findings emerged. Themes that emerged from the within-case analysis were used to inform the cross-case analysis. Themes that arose from the cross-case analysis were brought back to individual case data for more in-depth analysis. Themes identification occurred during within and cross-case analysis, as well as during the comparison of the findings to the propositions. A detailed discussion of data management, analysis and interpretation procedures is presented below.

4.6.1 Bracketing

While the literature and theories in which this study was situated (organizational learning, knowledge transfer, research utilization, and innovation diffusion) are relatively well-developed and hence allowed for the generation of propositions, these and other personal perspectives/bias about the research topic were bracketed before data analysis to allow for findings to emerge from the data. A journal was kept and used to document personal opinions before and during the data collection process. Bracketing facilitated objective analysis and interpretation of the data. Prejudgments based on personal views and past experience with organizational experiments were identified and therefore delineated from the experiences or perspectives of the research participants (Jackson, 2003; Stewart and
Mickunas, 1990). Furthermore, codes, categories and themes were not established prior to data collection and analyses activities and hence data analysis was inductive.

4.6.2 Data Management

The interview transcripts were imported into NVivo8. Each transcript was read and spelling errors were corrected as they were found. Where data were missing in the transcripts, the audiotape for the interview was listened to in an attempt to replace the missing data. Additional data were entered into NVivo8 to identify a set of transcripts as belonging to a single nursing unit and organization. Information on the role of the research participant was also assigned to transcripts along with identification of the patient population cared for by the nursing unit and the size of the nursing unit. This additional data facilitated within case and cross-cases analyses.

4.6.3 Coding

An inductive approach to data analysis was applied to allow findings to emerge from the data. Each transcript was read several times and coded for key actions and events within the data that were relevant to the research questions. Line-by-line, open coding was completed to name the key concepts in the data (Corbin & Strauss, 1990; Glaser, 1978). The questions what, when, how and why were continuously asked while reviewing the data (Yin, 1995; Stake, 1995).

In addition to coding the literally recorded data, open coding was completed for concepts that were implicit in the data. For example, while analyzing the transcripts, instances of concepts including types of organizational learning (i.e. single-loop, double-loop and triple-loop), as well as the types of knowledge that were being used (e.g., tacit vs.
explicit knowledge) were coded. Observations about the nature of the organizational learning processes (e.g., cyclical, ongoing, fluid) were also coded.

During the coding process, it was found that developing specific examples (Appendix B) for single, double and triple-loop learning as they relate to the pilot implementation of CPGs was needed to further operationalize the definitions that were adopted from the literature for this study (Table 1). These examples were used to assist with the identification of organizational learning as a whole and distinguish between single, double and triple-loop learning.

Interview data were compared with the codes that were already developed. This process resulted in the validation of existing codes, as well as the development of new ones. Saturation of codes was reached after coding approximately half of the interview transcripts.

After coding of each transcript was completed, the codes that were developed were reviewed to determine their relationships. Codes that were similar in describing a certain aspect of the phenomenon (e.g., implementation process, education activities, knowledge conversion) were grouped together under major categories using the NVivo8. As a final step in open coding, major categories were developed and codes related to each of these became subcategories.

Axial coding, an inductive data analysis procedure that is used to elaborate on the relationship between the categories and its subcategories was applied (Strauss and Corbin 1998). The subcategories belonging to each category were each mapped to the following aspects: 1) context in which the organizational experiment (pilot) project was situated, 2) causal/intervening conditions; 3) activities/actions that were carried out during the organizational experiment, and 4) consequences that were created as a result of the
organizational experiment. This procedure prepared the data for within and cross-cases analysis.

4.6.4 Within-Case Analysis

Within-case analysis was used to identify overarching themes for each case, as well as to examine specific features of each case (Creswell, 1998; Eisenhardt, 1989; Stake, 1995). A description of each case including information on the context of the case, activities/actions, and outcomes was developed. All of the data for each case were reviewed and themes for each case were identified. Individual case descriptions are included in Appendix C.

4.6.5 Cross-Case Analysis

Following the analysis of each case, a cross-case comparison was completed to identify similarities and differences across the cases (Appendices 4 and 5). Matrices contrasting the cases according to their context, key activities/actions, and outcomes, as well as any other characteristics were developed to assist with data analysis and interpretation across categories and subcategories (Yin, 2003).

As individual and organizational factors have been found to affect knowledge transfer/innovation diffusion as described in Chapter 2.1.1, data across transcripts were also compared across similar organization roles (i.e., pilot project leaders, program managers, nurses) and years of nursing experience. Cases were compared across size of nursing units (i.e., two groups compared: a) 11, 14, 22, 28 beds and 2) 65, 54, 60 beds) and size of organizations (i.e., three groups compared: 1) 155, 155 beds; 2) 450, 450, 486 beds; and 3) 846, 846, 939 beds). This analysis assisted with the confirming the major themes that were previously identified across the cases and identifying whether there were any variations in
themes between the various cohorts. No major differences between any of the cohorts were found.

4.6.6 Propositions

The findings from the within and cross-case analyses were compared to the 14 propositions and assessments were made to determine whether the findings supported or refuted the propositions (Yin, 2003). New findings that were not related to any of the propositions were also reported. Several sources of literature were referred to in order to assist with interpreting the findings. Themes were also validated/identified during this process and together with the themes from the within and cross-case analysis, a final set of themes were constructed to articulate the major findings of this study.

4.6.7 Practical Implications and Future Research Directions

A review of all of the study findings was completed to develop implications for practice and areas for future empirical research and theory development.

4.7 Research Rigor

The criteria: credibility, transferability, dependability, and confirmability were used to ensure the rigor of this research study (Lincoln & Guba, 1985).

- Credibility: To meet the credibility criterion, within and across case interview data and themes were triangulated to corroborate the accuracy of the findings (Miles & Huberman, 1994).

- Dependability: To meet the criterion dependability, a University of Toronto, Faculty of Medicine, Department of Health Policy, Management and Evaluation faculty member was asked to code and analyze four randomly selected transcripts from the
full set. A codebook which included a list of codes, a description of each code and data examples was provided to the faculty member to use for coding. The codes identified by the faculty member were compared with those identified by the researcher and any discrepancies or new findings were identified and resolved upon.

- **Transferability**: To facilitate an assessment of transferability of the findings to other settings, case-specific demographic data for the research participants was gathered (i.e., role of the interviewee, length of tenure at the organization, and total years of nursing experience). Information about the nursing units (i.e., patient population, number of beds, staffing) and organization (e.g. size, location, etc.), as well as any other unique features that may have had an impact on the organizational experiment and organizational learning were gathered. For example, a unique feature of two cases was that they were situated within organizations that had dedicated teams for pain management. In addition, characteristics of the innovation were presented in Chapter 4.4.

- **Confirmability**: To meet this criterion, entries were made in a journal before the research study began and after each interview. Observations were made about the research results as well as other personal biases and perspectives about the study, propositions, and data collected. These notes were reviewed to assist with bracketing during data analysis (Jackson, 2003).

### 4.8 Statement of Positionality

The primary researcher’s orientation to this study is shaped by her educational background and employment experience. She completed a Bachelor of Science in the Biological Sciences, Master of Business Administration (MBA) in Health Services
Management at McMaster University and subsequently worked for several years in the health care sector as a management consultant prior to being enrolled in the Faculty of Medicine, Department of Health Policy, Management and Evaluation doctoral research program at the University of Toronto.

It was during her undergraduate science degree that she learned the value of rigorous scientific research from an independent research course that involved designing and completing a laboratory study. During the MBA program, she honed her critical thinking skills guided by rational, linear methodologies for addressing business needs and issues. For example, in a marketing course, the primary researcher learned that a marketing plan should include the 4Ps: product, price, place and promotion. As the MBA program was a cooperative program, where students were employed in organizations between school terms to gain practical experience, she also had the opportunity to work with a health services researchers at an academic teaching hospital who were interested studying the adoption of evidence-based clinical practice guidelines targeted at physicians—and this was where her interest in clinical practice guidelines began.

During 10 years subsequent to completing an MBA and commencing the doctoral research program at the University of Toronto, the primary researcher worked as a management consultant across the health care sector with government, non-profit agencies, hospitals, health care associations, and partnerships/collaborations of these organizations. She supported these organizations with planning, managing and evaluating organization strategies, programs and projects, all with the intent of improving health care services, programs, organizations and patient/client outcomes. The first organization she joined was a small health and social services consultancy which did not believe in applying standardized
approaches to health care issues and hence did not typically develop and use predetermined project methodologies. It was here that the primary researcher learned how to design custom methodologies and solutions tailored to the specific needs of the organization. Specifically, she learned that although on the surface, standard management consulting methodologies could be applied, a ‘one size fits all’ approach to addressing health care issues would not be successful because the individuals and environment within which the problem was situated differed from across settings. This realization was continuously reinforced during her leadership and participation in projects over the decade. Standard, prescriptive methodologies and frameworks that were meant to be applicable to any situation fell short of being useful for addressing the complexities of the situation at hand.

Noticing that individual, organizational and broader environmental differences needed to be considered in designing effective approaches/solutions, the primary researcher became interested in understanding how to support organizations with learning about what was needed in their particular environment to be successful. Having planned and managed several pilot projects during her career, it seemed to her that pilot projects would be an ideal means for learning from experience because they could provide less risky and/or costly opportunities to experiment and learn what was required in that particular context in order to achieve the desired outcomes. She was interested in exploring what made pilot projects effective and in turn, how health care organizations and their patients/clients could adopt these approaches to reap positive outcomes. It was with this research interest that the primary researcher entered the doctoral program at the University of Toronto.

The primary researcher’s doctoral thesis committee shaped her orientation as a researcher in several meaningful ways. Dr. Whitney Berta, the primary researcher’s thesis
supervisor, challenged her to situate her lay interest in pilot projects within organization management theory and offered her expertise with organizational learning and knowledge transfer literatures. It was in reading this literature that the primary researcher came across the term ‘organizational experiments’, of which pilot projects could be considered one type. Dr. Berta also offered her first-hand experience with knowledge transfer research including research on factors affecting clinical best practice guideline adoption. Dr. Jan Barnsley contributed to the primary researcher’s study through her knowledge of innovation diffusion and quality improvement theories and empirical research. Dr. Susan Rappolt contributed to the study her knowledge of nursing utilization and clinical practice guidelines implementation studies, as well qualitative research methodologies.

During the study, the primary researcher became particularly sensitive to how her education, occupation and experience with organization management literature could affect data gathering and interpretation. Specifically, while the literature allowed for the development of propositions, she bracketed these by continuously questioning herself whether she was observing findings that she desired to see but may not have been contained within the data. For example, having been a project manager for several years, it was the primary researcher’s natural inclination to expect that projects, including pilots, would have well developed plans, be completed in an organized manner and be evaluated rigorously. In general, she felt that pilot projects were exciting opportunities to learn and that participants would share this sentiment. By being sensitive to her research orientation before embarking on data collection and reflexive during the data analysis process, she was able to minimize bias and allow for findings to emerge from the data itself.
In summary, the primary researcher’s professional experience, personal values and beliefs, as well as knowledge of organization management theories comprise the research orientation for this study. Reflexivity in how this orientation affected all aspects of this study from research question development to proposition design, data gathering, analysis and presentation of findings contributed to this rich descriptive study of how organizations learn during organizational experiments.
CHAPTER 5: RESULTS

In this chapter, findings are provided in relation to each of the study propositions presented in Chapter 3. Individual case/pilot project descriptions are presented in Appendix C. Cross-case analysis matrices are included in Appendices D (stages and processes) and E (structural mechanisms).

5.1 Stages of the Organizational Experiment Process

The findings from this study support Proposition 1 that the organizational learning process of organizational experiment consists of three major stages: (a) initiation, (b) implementation, and (c) results. The activities that occur during each of these stages are discussed in detail below.

5.1.1 Initiation Stage

Drawing on the knowledge transfer theories developed by Rogers (1995) and Szulanski (1999), the organizational experiment initiation stage for this study was proposed in Chapter 3.1.2 as the period of time before the new knowledge was put into practice. Specifically, this stage was proposed to include: (a) awareness of the new knowledge, (b) attitude formation about the knowledge, (c) expectation generation about the outcomes of the knowledge, and (d) decision-making regarding whether or not to proceed with full-scale implementation. The initiation stage for most of the pilot projects consisted of the organization becoming aware of the new knowledge, review and decision to pilot the new knowledge, and selection of specific aspects of the knowledge to pilot. Across the pilot

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5 For a complete list of study propositions, refer to Appendix F.
6 The implications of selecting specific aspects or a subset of the new knowledge to pilot on organizational learning are discussed in Chapter 6.6—Knowledge Unbundling and Selection.
projects, implementation activities appeared to occur in a fairly consistent and sequential manner.

5.1.1.1 Adoption Decision

With respect to initial awareness and attitude formation about the new knowledge, most of the pilot project leaders were aware of the RNAO Pain Management guideline prior to the organizational experiment taking place. At the time of this study, some organizations were designated or applying to be RNAO “Spotlight Organizations” which meant that they had committed to piloting several guidelines in their organizations. Hence in many instances the nurse executive, with endorsement from other senior management, had decided that her organization would pilot this particular guideline prior to the organizational experiment commencing. As a pilot project leader said about her organization’s receptivity to the guideline:

We just felt that it was a good guideline. It was well researched, we had the evidence there. It was probably one of the first guidelines that we as nurses embraced and took it as being a solid document. (C7, PPL)

A nursing program manager spoke about the credibility and validity of the guideline typical of the sentiment of many other research participants:

Knowing that RNAO had set standards in order for this to be published, looking at who wrote it, what credentials they had, and looking at the very back for all the other lit searches that had been done, there was certainly confidence…that it was current and that it was the best available tool that I could use for my patients. (C5, NPM).

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7 Pilot project case numbers and the role of the research participant are indicated at the end of quotations (PPL = pilot project leader; NPM = nursing program manager; N = nurse).
The guideline was felt by organizations to be legitimate and was something that should be implemented in order to improve patient care before it was reviewed in any detail. Hence, pilots had a greater emphasis on addressing the question how-to to transfer/adopt the guideline rather than why the guideline should be implemented.

5.1.1.2 Guideline Review and Recommendations Selection

Awareness of the new knowledge was enhanced when most of the pilot project participated in a half-day workshop held by the RNAO which provided general suggestions on how to pilot the nursing guidelines. Following the attendance of this event, pilot project leaders typically formed a committee consisting of nurses representing different departments from their organizations to review the guideline in greater detail. Committee members were asked to review the recommendations and select the ones that they thought should be implemented.

Pilot project leaders said that the criteria that they and/or their committees used to select the recommendations that they would pilot from the entire set of 75 contained in the guideline included: whether there was a need for improvement in that particular clinical aspect of pain management, ease of usage/application, feasibility of implementation, and potential impact. For example, for several pilot projects, participants felt that the guideline would improve the consistency of how pain assessments were completed among different program areas, as illustrated by the following quotation from a pilot project leader:

15 members were able to contribute to what our current practice was in different settings, and for example, within the guidelines, of course we talk about using a standardized tool and informally surveyed staff and from program to program were using all kinds of different scales. So we recognized that we have to use the same scale throughout the building, because our patients could potentially be confused. (C7, PPL)
In one of the two pilot projects that prematurely ended, a pilot project leader conveyed that she wished that she had taken more initiative to form a team to examine the guideline and select a pain tool. This she felt, would have led to the tool being better embraced by the organization as a corporate priority thus encouraging its greater adoption during the pilot:

I certainly would have been more pushy to put a team together. That was a mistake we made, because it was too much for [name] and I to do alone…to get different opinions. There was lots of other things going on with regard to pain management in [organization name] that we didn’t know about, and didn’t seem to be communicated and that was a big concern—not a concern, but an obstacle because we would find out after the fact that there’s a pain tool over here, this person was using a pain tool, but it was never shared…the team should have come from different disciplines as well as different departments. (C2, PPL)

5.1.1.3 Product Development/Selection

After awareness and attitude formation, with the exception of one organizational experiment in which six recommendations from the entire set were selected for implementation, the primary focus of the other organizational experiments was to develop and pilot a consistent pain intensity assessment scale and a documentation process as per two specific guideline recommendations: (a) Recommendation 3: “A systematic, validated pain assessment tool is selected to assess the parameters of pain,” and (b) Recommendation 4: “A standardized tool with established validity is used to assess the intensity of pain” (RNAO, 2007).

In several of the organizational experiments, condensed versions of the scale (e.g., pocket cards, face sheets) that could be easily carried by the nurses from patient to patient were developed or selected from existing tools. In most of the organizational experiments, pilot project leaders incorporated areas for nurses to note pain scores on their
patients’ paper charts, while in two organizational experiments, this information was documented in electronic medical records.

5.1.1.4 Expectation Generation

While organizations piloted the guideline in order to improve nursing clinical practice, specific expectations were not observed to have been set by pilot project leaders or nursing program managers regarding the outcomes that were expected from implementing the new knowledge.

5.1.1.5 Full-Scale Implementation Decision

As discussed above, the decision to implement the guideline was made before the guideline was reviewed in detail by committees and therefore did not occur at the end of the initiation stage. Hence, the activities during the initiation stage included selecting a portion of the recommendations to pilot, planning, and developing materials to prepare for implementation.

5.1.2 Implementation Stage

The implementation stage of the organizational experiment was proposed in Chapter 3.1.2 to involve knowledge transfer and formative evaluation activities. In contrast to initiation stage, in which the organizational learning process consisted of a sequential set of activities and hence was a relatively linear and recursive process, the implementation stage for the pilot projects was observed to be significantly more complex and dynamic. The organizational learning process during this stage consisted of multiple simultaneous processes. Each of these processes had different starting points, involved different individuals within the organization and achieved different results.
5.1.2.1 Implementation Planning and Preparation

While pilot project leaders stated that they did some initial planning at the beginning of the implementation stage, most of the activity at the outset of the implementation stage involved developing communication vehicles (e.g., newsletters, email notices, website postings) and planning educational activities (e.g., in-services) to introduce the guideline to staff. In each of two pilot projects, senior nurses were trained to document the pain scores in the organization’s electronic medical record in order to prepare these nurses to train other unit nurses.

Specific pilot project plans such as those consisting of activities attached to timelines and expected results, were not formally documented or communicated in any of the pilot projects. One pilot project leader described the typical lack of planning that took place across the organizations examined in this study:

Something else that we didn’t do with regards to the whole process was, we didn’t really develop a timeline. A specific timeline, “ok, this month we’re going to have this done, this month we’re going to have that done.” We kinda did it, but we didn’t do it as formal as we should have. (C2, PPL)

Nurses recognized that planning prior to the introduction of the guideline may have led to more effective introduction and greater adoption. As one nurse said:

It needs to be an education roll out. You can’t just expect to say, “ok, we’re doing this” one day and then implement it. You need a timeframe, when it’s going to come out. (C6, N2)

5.1.2.2 Knowledge Transfer Interventions

The guideline was introduced to unit nurses during the pilot projects using a variety of approaches which included: paper copy, CD-ROM educational sessions, email, posters,
reminder notices, and staff meetings. Some nurses preferred to have paper versions of the
guideline whereas other nurses preferred more interactive forms of knowledge transfer.
Overall, nurses felt that a range of educational approaches was required to meet the different
learning needs within their units as exemplified by the following two quotations; first:

Everybody has a different need—the poster works for some people, a PowerPoint
presentation works for some people, some people like a video. (C6, N4)

And second:

I think as an adult learner, you learn from different things. In my view, if I had to pick
and choose from the list of what I gave you for what vehicles were effective for
learning, I may be more inclined to two or three of them, whereas someone else may
choose the other two. (C1, N3)

Most of the pilot projects relied heavily on providing small group in-services and
informal one-on-one discussions to nurses who were available during various shifts. In most
pilot projects, education was provided to nurses when convenient - throughout the day and
for brief periods of time, when unit nurses could step away from direct patient care. This
approach was felt by pilot project leaders to be the most feasible given the large size of the
nursing units, different nurses working each shift, and the little time away from patients the
nurses had available. However, this approach to providing the education appeared to be ‘hit
or miss’. As one nurse stated:

They have briefly talked to us, and I don’t want to say hit and miss, but it is in the
sense that if you’re working the day, you get to meet with them, but if you aren’t then
you have to wait. (C5, N2)

The same nurse suggested that there was a need to ensure that education was received by
all staff:
I think taking a list of all the staff members, and really making sure that everybody is meeting with them, and everybody does get a chance to go do an in-service with them. Because I know that they did schedule these in-services, but if you’re not working on that day, chances are you won’t get that in-service. And they do hold probably two or three of the same in-service, but I think they need to look at when everybody’s working and have a list and check off when somebody does do the in-service, and track down who hasn’t had it, so they do get a chance to get it. (C5, N2)

Multiple streams of communication and educational activities occurred over several months. Pilot project leaders and nurses could not definitively say which communication mechanisms and activities were used when, with whom, and to what extent. Some of the intended knowledge recipients recalled attending education sessions, whereas others plainly stated that they did not have the time to attend. Some remembered seeing information about the new knowledge in an email or poster, whereas others did not. Several pilot project leaders and nurses recalled having informal meetings and conversations about the new knowledge in hallways and backrooms. Some knowledge recipients stated that they were using the new knowledge (i.e., pain assessment tool) and documenting the results (i.e., pain scores), whereas others said that documentation was inconsistent across their units because the information was sometimes missing (i.e., in the patient’s file) because the expectations for documentation were not articulated or enforced. Hence, expectations regarding the results/outcomes of the pilots were not formally defined. Specific goals for pilots were not established regarding the number of individuals to reach with the new knowledge and the intended impact of the new knowledge.

With respect to structural mechanisms, a key barrier to attending educational sessions was time that nurses had away from their patients. As one nurse said about attending in-services:
I was never at any of them, but I know her [the pilot project leader’s] feedback was nobody showed up. The resources aren’t there to cover the staff to go. I’m not saying nobody showed up, but most of the people, one in particular, was the student nurses, and maybe one educator came one time. (C2, N3)

Upon reflecting on the experience, one pilot project leader said the following about human and financial resources required for the pilot project:

I would want more resources, both money for roll out and money for nurses to come and attend the committee and more time to attend education, that’s the big thing…some sort of incentive for them to come. (C3, PPL)

5.1.2.3 Data Collection and Review

Regarding data collection and review, these activities took place on an informal basis but were intertwined with the knowledge transfer intervention activities described above. Several micro-cycles of knowledge transfer, individual and group education, and informal evaluation occurred during the implementation stage and for the remainder of the organizational experiment (i.e. the results stage). The majority of evaluation type activities however, consisted of informal conversations with knowledge recipients to determine whether they were using the innovation and had any questions. The main process that unit nurses used to assess the impact of applying the guideline to their patients during the implementation stage usually included a number of steps, although not every nurse who was interviewed completed every step. In general, unit nurses made their initial assessments by using the pain assessment scales with their patients, documenting the pain scores in the patient’s chart, making a decision regarding whether additional medication or another medication was required, and making a medication request and administering that medication where necessary. Typically, unit nurses were asked to review their patients’ pain scores after a period of time to determine if the pain was well managed or whether medications needed to
Adoption of a tool to assess the degree of pain patients’ experienced appeared to be fairly consistent among the direct care nurses within and across pilots. However, there was inconsistency in the documentation of pain scores. Some nurses stated that they always documented scores, whereas others said that they sometimes documented them.

We’re inconsistent with writing down the pain score—especially if the patient doesn’t complain of anything, maybe it’s the busy-ness of the floor, but as I said, ideally, everybody has to mark down something in every shift. Because as I see it, when you look through – not a whole lot of nurses are writing down the pain score. (C5, N1)

Some of the nurses who documented the pain scores for their patients stated that this was important for determining outcomes—whether the patient’s pain was improving and whether the medication was effective.

When asked to recall whether they felt that the pain tool and documentation process was effective after initial usage, several unit nurses and nursing program managers said that they thought the tool was effective because it was clear, easy to use, and helped to standardize the method by which pain was assessed across the unit and also from shift to shift. As one nurse said:

There was a feeling of success or failure within a four hour period. We could then target our actions accordingly and get the guarantee of more of a better outcome for the patient and feel more successful at the end of the day. (C5, NPM)

However, nurses stated that they could not evaluate the effectiveness of the tool because they were unaware of how many nurses on their units were using the scale and were consistently documenting the pain scores. Most of the unit nurses who were interviewed said that they did not receive any information during the implementation stage from the pilot project leader or their organization about the effect of the tools including: which nurses were
using the tool, which nurses were documenting pain scores, as well as the impact of these tools were having on patient care. Hence, pilot project leaders and nurses could not definitively state when these follow-up activities occurred, such as immediately after educational sessions or at other times. Pilot project leaders did not keep track of the extent of these follow-up activities with respect to how many knowledge recipients they interacted with and how frequently. As one nurse said when asked what would be helpful to do after the introduction of the guideline:

Follow-up once you do the presentations. To say, is this working or is this not working? What can we do better? Do we need to do it again? (C3, N3)

When a nursing program manager was asked whether there were any assessment activities partway through the pilot, she said there were not however, she did perceive that there were some improvements based on her own experience and as indicated in patient satisfaction survey results that were reported later on (i.e., NRC Picker data):

Nothing formal, and I would think, if I were saying for the future, that was something that should have been done…surveying staff half way through, just to say, ‘how’s it going?’ So it was very informal. ‘How’s it going? How do you think we’re progressing? Do you see that this has made a difference?’ Because from my perspective I see that. Less patient complaints, less family complaints about pain, and my general opinion is that it was better. When we did the Picker data again, we did show an improvement. But the formal, sit down and asking specific questions, I don’t think that occurred to be honest. (C5, NPM)

As previously discussed, specific expectations and formal plans were for the most part not observed to have been developed during the initiation stage. However, during the implementation stage, pilot project leaders across most of the pilot projects said that they evaluated the impact of the guideline. These leaders stated that they completed chart audits partway through the implementation stage to assess for compliance in the documentation of pain scores. In two pilot projects, patient satisfaction survey results were reviewed during
the implementation stage. However, these evaluation processes were also reported to be informal. As a pilot project leader from one of the cases said:

I looked in some of the charts, just a verbal conversation with the staff, nothing formal. (C2, PPL)

Most of the project leaders said that throughout the implementation stage and beyond, they continuously followed up with nurses in person to determine if they were continuing to use the pain assessment tools, document pain scores, and to address questions or issues. For example, as one pilot project leader said about implementation:

It’s an ongoing process, it’s never stagnate. A fluid way of doing the implementation. Striving to help increase our patient satisfaction scores. (C1, PPL)

These informal follow-up processes between pilot project leaders and unit nurses continued for the remaining duration of the pilots.

5.1.3 Results Stage

The Results stage of the organizational experiment was proposed in Chapter 3.1.2 to involve information gathering and decision-making activities culminating with a decision regarding what to do with the new knowledge in the future such as: whether to continue to use the new knowledge, abandon the knowledge, spread the knowledge to other parts of the organization, or to take no further action.

A results stage, during which the progress and outcomes of the pilots were aggregated and reviewed, was not observed for most of the pilots. Out of the eight pilot projects, two completed summative evaluation activities (i.e., chart audits and review of patient survey results) to determine the impact of guideline/tool. However, beyond a quick review of the results of these tools, evidence of additional efforts, such as meetings or discussions, to
reconcile pilot project actions with outcomes were not reported. For the remaining pilot projects, formal aggregation of results was not found to occur.

Direct care nurses expressed disappointment with a lack of feedback during the implementation stage so that they could understand where the unit stood with respect to extent and rate of adoption. For instance, as one nurse said:

I think then we could show before and after, we could show target measures and percentage responses and consistent answers to the same questions. I think we would have much better data to support change for one guideline, to say ‘ok to best practice guidelines and to a champion—go for another one. Because you see the difference. I think they’re convinced but they need some of that data to see that they are making a difference out there. (C5, N2)

Pilot leaders who stated that they did not complete evaluation activities at the end of their projects also conveyed regret, particularly about not knowing the impact of implementing the new knowledge on patients. As one pilot leader said about not evaluating the impact of the pain assessment tool their nursing unit implemented:

Probably, I probably should have…was it specifically related to the tool? Or was it just the ongoing process of someone being admitted with pain out of control or pain problems? How was this being identified and were pain medications tweaked and changed…as you would hope for any patient that would come in and be in pain. So was it totally because of the tool? I would think more so but I couldn’t say for sure it was. (C2, PPL)

Hence, processes and the resultant information that would have allowed for the evaluation of the impact of the pilot were typically unavailable. In most of the pilot projects, it was difficult to assess the action-outcome relationship from adopting the new knowledge beyond personal experience.

As discussed above for the implementation stage, although the organizations were piloting the guideline to learn about its intended effects, most of the pilot projects remained
in a constant state of implementation and informal evaluation. Thus a definitive end to the pilots was not found to exist and the implementation stage blurred with the results stage, as a pilot project leader indicated:

Once it’s piloted, we just keep doing it until we get the feedback on whether it will work (C5, PPL)

For most of the pilots, project leaders continued to implement, informally evaluate and return to the guideline to select additional recommendations to adopt.

**5.2 Assessment of Knowledge Attributes**

This study investigated whether there were aspects of the organizational experiments that influence organizational learning. These aspects were proposed in Chapter 3.2 to include both processes that participants engage in to learn about the new knowledge and structural mechanisms (human, financial and technological resources). Some evidence was found for aspects that impact learning about Rogers (1995) knowledge attributes: relative advantage, compatibility, complexity, and trialability, and observability. These aspects were found to primarily contribute to single-loop organizational learning.

**5.2.1 Relative Advantage**

Processes and structural mechanisms were found to be in place during the pilots to assess the relative advantage/improvement that adoption of the guideline would yield over current practice, supporting Proposition 2 that these aspects of the organizational experiment facilitate organizational learning. As described in Chapter 5.1, the perceived assessment of the relative advantage of the guideline took place during both the initiation and implementation stages (although at the individual level) of the organizational experiment.
A key structural mechanism that facilitated an assessment of relative advantage for most of the pilot projects was the usage of a committee consisting of nurses representing different program areas in the hospital. Although, the overall decision had been made to pilot the guideline, committee meetings were held to review its content in detail and select a few of the recommendations to trial. For instance, as one pilot project leader stated:

I thought things that we weren’t doing now or things that we could improve on. (C3, PPL)

During these committee meetings, participants compared their own assessments of the guideline with those that others had made and then as a group, arrived at a consensus on which recommendations would be the most important to pilot in order to improve pain management and assessment within the organization. As one pilot project leader said about the process that was used to select recommendations to pilot:

Each group went through the book and looked at the recommendations and checked off the ones they felt were relevant for their area. Because they are set up different at those campuses. So that was the other thing, to make it so you could tailor it more to what they needed. And we weren’t saying, implement the entire best practice guideline. (C6, PPL)

Surveys were also used during the initiation stage of pilot projects to determine the relative advantage of the guideline. In one pilot project, the baseline knowledge that unit nurses had about pain assessment and management was assessed, and it was found that much needed improvement in that area of nursing practice was required.

When we first started to develop the tool, we did a questionnaire for the staff to determine what their knowledge base was and both <name> and I were quite surprised of the lack of knowledge considering this is a palliative care unit…so we knew then that there was a learning need…we did this to give us an understanding of where the knowledge was or was lacking and if, to help us mostly to see how much we needed to do; how specific we needed to be when we developed the tool. (C2, PPL)
During the implementation stage, a number of processes and structural mechanisms supported unit nurses with learning about the relative advantage of the guideline. In-services were most commonly referenced by nurses as being helpful for general knowledge about the importance of the guideline and how the pain assessment tool should be used. Using the tool in practice with patients, however, provided nurses with the most direct opportunity to assess relative advantage. Many nurses stated that personal experience with trying out the guideline/tool on patients and observing improved results from the better management of their patients' pain helped them learn about the value of the guideline/tool:

You could see if what you were doing was working because you could say ‘this is the problem’ and then the next day you could say, ‘is he having the same problem?’.

(C2, N1)

Participation in committees, surveys, accreditation recommendations, in-services contributed to single-loop organizational learning. While knowledge was gained from reviewing the guideline against existing practice, major changes to their pain assessment and management practices were not reported. Direct experience with applying the guideline/tool on patients seemed to have the potential to be more closely associated with double-loop organizational learning, as illustrated by the quotation above.

5.2.2 Compatibility

Support was found for Proposition 3 that processes and structural mechanisms of the organizational experiment allow for the assessment of the compatibility of the new knowledge facilitate organizational learning. Assessment of the compatibility of the guideline was also found to take place during both the initiation and implementation stages of the organizational experiments. Pilot project leaders and guideline review committees also
examined compatibility of the knowledge along a number of dimensions, including:
alignment with corporate priorities (i.e., effective pain management has been identified as an
important goal of the organization), external/formal recommendations (e.g., accreditation,
patient satisfaction survey results) and whether there were specific recommendations of the
guideline that were in line with the goals of nursing professional practice.

During most pilot projects, the decision to pilot one or more guidelines was typically
communicated widely at staff meetings, using internal newsletters and via Intranets. In some
pilot projects, the guidelines were also previously circulated in hard copy and/or posted
electronically. Thus, piloting the RNAO nursing practice guidelines was a corporate priority
for many of the organizations. As one nurse program manager said about the priority of
adopting a common pain assessment approach:

A lot of it is looking at organizational fit and some of the recommendations that are
truly being addressed or assessed within program groupings, or also looking at areas
where we know that we need to work at, and one of those pieces was a universal
documentation tool where pain assessment scores could actually be written down, and
the group had looked at many options of doing that, either having a separate sheet, or
looking at some kind of a process of documentation. (C1, PPL)

For two specific pilots, trialing the guideline was particularly important as improving
pain management was the result of a formal process such as Accreditation Canada
recommendation and/or because patient satisfaction survey results had declined. As one pilot
project leader said:

One of our accreditation recommendations when we were accredited was: “what’s
your formalized procedure and plan for pain assessment and management?” But it
was recognized as a gap in accreditation…we knew overall as an organization that we
needed to look at it. (C2, NPM)
With respect to alignment with organization-wide goals for nursing professional practice, a pilot project leader said:

I just know that I browsed through them, and anything that jumped off the page that had to do with Acute Pain Service, probably in my particular case got my attention. One that is organization-wide is that we were really wanting to get Demerol out of the institution…so that is one of our main goals. So that one didn’t so much have to do with the pain service as it was a institutional-wide thing. (C3, PPL)

As a result of the identification of specific recommendations from the entire guideline to pilot, pain assessment tools and formats were usually developed to document patients’ pain scores. Hence the result of the initial assessment of the compatibility of the guideline during the initiation stage led to developing new versions of the new knowledge in order to further increase its compatibility.

Determination of the compatibility of the new knowledge also took place during the implementation stage when unit nurses were able to try out the new pain tools. Feedback was obtained by pilot project leaders from nurses to see whether the nurses would be willing to use the tool. Many unit nurses who were interviewed during this study stated that they liked the tool because it provided them with a method for consistently assessing the pain patients experienced.

The structural mechanisms and processes that assessed for compatibility appeared to contribute to single-loop organizational learning. Nurses learned how the guideline/tool could assist them with patient care but the organization did not appear to have engaged in double-loop learning through questioning their own assumptions or making any major changes to existing pain assessment and management approaches as a result of the learning.
5.2.3 Complexity

The findings support Proposition 4 that processes and structural mechanisms of the organizational experiment that allow for the assessment of the complexity of the new knowledge facilitate organizational learning. Assessment of the complexity of the guideline also took place during the initiation stage and implementation stages. The initial assessment of the complexity of the guideline was also made by the pilot project leader usually with a committee. Members of this committee selected aspects of the guideline that they felt would promote consistency in pain assessment, be easy to introduce to nurses, easy to understand, and would likely be sustained in usage. As one pilot project leader said:

When we created the pain assessment tool for the unit, we knew that the goal was to create a standardized way, a language for the team to assess pain. So we picked a model that we felt was most easiest to do. (C1, PPL)

Nurses assessed the complexity of the content of new knowledge during their usage of the new knowledge in practice. The complexity of the form in which the guideline was introduced to nurses was also important for organizational learning. Many direct care nurses stated that they liked forms of the guideline that were less complex (e.g., pocket cards) because they were concise and easy to remember, as well as easy to use in practice. This format was favored over paper-based or online versions of the guideline. As one nurse said:

She asked for our feedback, and I know what I told her, I told her that my biggest issue was that if we’re going to have a tool like this we need something that I could look at, at the bedside at a glance and see if all the issues were being addressed. If I was seeing any improvement…because the tool itself is useful. (C2, N1)

The organizational experiment provided research participants with knowledge about how easy the guideline/tool would be to use with their patients. Single-loop organizational
learning occurred as no major changes were made to the way in which nurses viewed the guideline or how the guideline was used.

5.2.4 Observability

The findings support Proposition 5 that processes and structural mechanisms of the organizational experiment that allow for the observation of the impact of the new knowledge facilitate organizational learning. Observability of the impact of the new knowledge took place during the implementation and results stages of the organizational experiments. Pilot project leaders cited chart reviews, tracking sheets, end of year reviews, and patient satisfaction surveys as being the most useful evaluation mechanisms for determining compliance with the guideline and also for assessing the impact that the application of the guideline had on patients.

For unit nurses, these evaluation mechanisms also contributed to their own learning because they constituted formal records of results which allowed them to review the impact of their pain management interventions, question their approaches and assumptions, as well as to reinforce or modify their pain management approaches accordingly. Nurses who did not have access to these assessment tools and outcomes data expressed frustration and dissatisfaction with not knowing where they and their unit currently stood with respect to guideline/tool usage. For example, one nurse suggested that the following would be helpful for enhancing her learning:

Follow-up once you do the presentations. To say, ‘is this working or is this not working? What can we do better? Do we need to do it again? Just to remind you – now that you’re familiar with it to start with, ‘what would you do’? Are you using this? Was it beneficial? What can we do to help make it more effective? Is it effective? (C6, N1)
Again, nurses stated that they did not know whether their efforts from participating in the pilot resulted in sustained usage of the new knowledge or had resulted in any significant impact to patient care.

While these tools had the potential to facilitate double-loop organizational learning because they provided feedback to pilot project leaders about the status/outcomes of implementation as well as the impact of the new knowledge, as discussed in Chapter 5.1, the information from these formal evaluation mechanisms were used informally and solely by pilot project leaders to complete rapid and informal assessments. These results did not appear to be aggregated, reviewed or reflected upon extensively by the pilot project leaders alone or in conjunction with other pilot participants, at the organizational level, to determine whether goals, objectives, assumptions or beliefs needed to be modified in order to ensure greater implementation success or impact. Hence, using these tools and the gathering information to observe the impact of the new knowledge, facilitated primarily single-loop organizational learning.

5.2.5 Trialability

Evidence was found to support Proposition 6 which suggested that processes and structural mechanisms of the organizational experiment that allow for the trialability facilitate organizational learning. Again, during most of the pilot projects, a committee was used during the initiation stage to assess the trialability of the recommendations contained in the guideline. When asked whether the organization considered the feasibility of implementing the guideline, a pilot project leader said:

I guess we did that informally. Looking at it, ‘we can’t possible influence that. We’re not at that level.” We made some recommendations and shot them forward to senior management—“here’s our recommendations based on this” We tried to influence practice that we felt we could. (C7, PPL)
Following this, again for virtually all of the pilots, a tool for nurses to refer to or use to assess pain in patients was developed. This tool was felt to be easy to implement. In one pilot project, a one-page summary that included the tool and expectations regarding pain score documentation was developed. As one nurse program manager said:

In my experience at the bedside, I use what I can grab quickly, and if it’s put in a prominent place close to me, I’m more likely to refer to it. So that if I’m struggling with pain control for an individual I may not always remember I need to chart that number down there. But if somebody puts the pain number in front of my face, I’m likely to follow that. And I find the guidelines are very, very comprehensive for the average nurse at the bedside, we just don’t have the time to do that. (C5, NPM)

All of the nursing units felt that selecting a simple tool was necessary as piloting all of the recommendations in the guideline was perceived as being too much introduce during the pilot and may lead to less adoption. Hence the process of selecting, modifying and developing pain tools may have enhanced trialability of the guideline by making the guideline more palatable for adoption during the implementation stage, perhaps making it less likely to be abandoned.

Enhancing the trialability of the guideline appeared to contribute mainly to single-loop organizational learning. During the pilots, participants learned about and adopted the pain assessment tools with ease.

5.3 Unit Level Absorptive Capacity

Prior experience with the new knowledge was found to have a positive influence on organizational learning during the implementation stage. This finding supports Proposition 7, that involvement of individuals with prior experience with implementing new knowledge facilitates organizational learning. Unit nurses stated that they felt that pilot project leaders with previous knowledge with pain management, as well as experience with implementing
the pain assessment and management guideline or other guidelines were perceived to be more effective than those who did not have this experience.

For the pilot projects which involved nurses with prior knowledge, unit nurses valued the knowledge base that these individuals had about pain management. Nurses felt that they individuals also knew how best to educate, communicate and relate to nursing staff. These experienced individuals served as ongoing resources that nurses approached with questions about the new knowledge or supported nurses with using the guideline. Nursing units with pilot project leaders who were previously involved with RNAO (e.g., member of the guideline development panel) were also perceived to be more effective teachers.

Pilot project leaders and facilitators with prior experience were found to have the ability to apply their experience to drive a greater degree of change within their organizations. In two pilot projects, the availability of experienced facilitators was perceived to lead to fundamental change during the implementation stage. For example, in one pilot, the pilot project leader was in a position of authority to facilitate the drafting and approval of pain management policies by the senior management of the organization.

In two other pilots projects, several nurses with many years of experience who were referred to as ‘late career nurses’ were assigned the role of ‘champions’ for the new guideline in the organization. These nurses received significant training about the guideline and how to apply it, and were introduced as experts to other nursing staff. These individuals were also responsible for teaching the guideline to other unit nurses and encouraging its ongoing usage.

In one pilot, the pilot project leaders, who were jointly responsible for leading the initiative, shared the challenges they experienced due to their lack of experience with piloting nursing practice guidelines:
“Champions” were felt to be valuable for obtaining buy-in throughout the nursing unit, ensuring long-term usage of the new guideline. The pilot project leaders of the two pilots stated that they believed that the knowledge would not have been implemented successfully without obtaining buy-in through the purposeful identification and usage of ‘champions’. Several research participants from these pilot projects also indicated that this approach was the most important feature of their pilot projects that assisted with convincing other nurses to adopt the guideline in their nursing units. As one nursing program manager said about the role and impact of champions during their pilot:

I think you need a champion in the hospital who is really passionate about what you’re doing. You need a manager that’s supportive of the project. Certainly this all falls with having that champion. Then having the staff buy-in. And so by having that champion, that’s a trusted and valued member of the team that will, I think, ensure better buy-in. And because we’re health care workers, we got into the field to make a difference, and so I think that if it’s a project that you feel can really make a difference you’re going to find that health care workers will embrace that”…and it’s the staff that feels it can really make a difference. So often front line staff workers are asked to fill out surveys and do things to participate in projects that they’re not sure of the value of for the patient. So, I think if we can prove that it’s going to make a difference. (C3, NPM)

Evidence for double-loop learning at the organization level due to the presence of champions was not found. However, it was found that these individuals played a significant role in transferring knowledge at the individual level, and in particular, tacit knowledge.

The nurses can just call them, can just page them, and they will come and review a chart, look at the individual patient, make suggestions, so it’s instant gratification for the nurses to provide the care that they want to give…I think they trust them because they’re used to working together…so it’s just the familiarity with her, and she’s a
valued team member prior to being on the pain service. So they trust that…and a very effective educator. (C3, NPM)

In addition, the credibility of the champions, due to their several years of nursing experience, as well as expert knowledge about the guideline allowed them to challenge existing pain assessment and management practices of individuals, facilitating a deeper level of learning and change in practice in some pilot projects. As one nurse put it:

They’re visible and I still believe that’s how front line nurses learn the best. By seeing, by being able to ask questions right away, when questions arise. And when they can see changes with their patients. (C8, N3)

When asked how, specifically, the champions supported nurses with the implementation of the guideline, the same nurse said:

Because almost every shift, you have one of them there. So if you have any questions, if you didn’t understand anything, they were right there and they could explain it to you. A couple of times we asked ‘why do we have to do this’? Like the going back, why do we have to go back and say this worked or didn’t work? Obviously if it didn’t work, we would have given them something else. But she said make sure that we can say, yes, that medication worked, or that kind of thing. (C8, N3)

In one pilot, where the adoption of the guideline was not sustained, developing absorptive capacity was cited by one pilot project leader as being a potential strategy:

Getting more staff involved. Getting them participating and maybe even super users of the best practice guideline; investing the time into a handful of nurses and making them the advocates, have them teach a peer. (C6, PPL)

When asked what would have been helpful for learning during the pilot, the same pilot project leader concluded:

I think someone that’s been through it, or done it in the past or has done something similar to this. If we could have had more involvement with them, that could have helped. (C2, PPL)
5.4 Dedicated Facilitator

Support was found for Proposition 8 which suggested that the assignment of a dedicated facilitator to the organizational experiment facilitates organizational learning. Participants of almost every nursing unit pointed to one or more dedicated facilitators who were key drivers of the pilot. Pilot project leaders for most of the pilots played a dedicated facilitation role in spearheading the initiative, implementing the new knowledge and assessing its impact. When a pilot project leader was asked about the role she played, she said:

I know that in reflecting back on the entire process, certainly it helped to have that driver to help support the initiative and to allow the clinicians to do the work that they do best. My role was to help facilitate behind the scene work in organizing and coordinating meetings and looking at record keeping and those types of things. But certainly yes, it does help to have someone taking a lead. (C2, PPL)

In one pilot, several nurses who belonged to a ‘Corporate Pain Management Group’ also served as facilitators, providing support for the implementation of the new knowledge, although they were not dedicated to the pilot full-time:

We have in our organization a very strong infrastructure so we had a corporate pain group which was comprised of multi-disciplinary with physicians group, corporate representation as well as advanced practitioners group. And from that larger corporate pain group came the sub-committee comprised of advanced practice nurses who in their portfolio have acute or chronic pain in their job descriptions. So there were about 6 nurses and corporate educator and myself as facilitators of the entire project. (C1, PPL)

This group played an important role in providing specific expertise regarding pain assessment and management within the organization. It was also a structure that provided support to nurses during the pilot on how to use the new knowledge. Finally, the group identified and addressed organization-level issues which could influence the successful
implementation of the pilot, as well as the future adoption of the new knowledge by other health professions and departments. As one nurse who belonged to this corporate group said:

I think a key factor is the experts in pain management. So the advance practice nurse roles in pain management, like the nurse practitioners in pain service are instrumental. They are your one resource that is not everywhere, and it’s the one resource that is focused on pain control. The structure that we have in place, the corporate pain committee, which is an inter-professional and addresses the large organizational issues related to pain management is also a committee where you can then influence the different profession. (C1, N1)

In two of the pilots, as described above, ‘late career nurses’ also played the role of dedicated facilitator. These individuals played a key role in supporting nurses with the implementation of the new knowledge – more specifically, the electronic documentation of pain scores. As the pilot project leader said:

There was a lot of support on the units…it was a lot of continuing education. It was nurses saying: ‘I used the screen and I want to chart this, and I wasn’t sure where to put it. ‘ok let’s look at the screen together.’ So it was a lot of that reinforcement. (C7, PPL)

These ‘late career nurses’ worked closely with nurses in their place of practice, promoting adoption of the guideline through the sharing of tacit knowledge. As one nurse said:

I remember, I think two people came up to teach us. They would go through a binder, sort of like a slide show, but on paper, And they tried to get everybody while they were working. Instead of having an in-service in a different room, they came up to the floor and went through the pain assessment screen, in the binder, taught us that way…it forces you to learn it. There’s always something else to do. If they just leave it there and then you get it to, if you get to it. At least they said, ‘ok it’s time’ you have to do it. (C7, N3)
Characteristics of the facilitators who were perceived across the pilot projects to be valuable for facilitating learning included: respected by staff for their knowledge and expertise and ability to educate/teach. As one nurse said about their pilot project leader:

[Name] is very approachable and very receptive to our comments and experience. She’s got a lot of experience and knowledge and learning and I consider her a very good teacher. (C2, N2)

Akin to the characteristics of ‘champions’ as described above, effective pilot project leaders/facilitators were also described as being action-oriented, easy to approach or relate to, and having first-hand experience. For instance, a nurse stated:

She’s very dynamic, energetic, she’s a doer. You know that if you go to her with a problem she is going to listen and act on it. Just her personality I guess. And she’s so well qualified and educated, personable, very approachable. That’s the kind of thing. Open to suggestions. I know her from years ago and she knows what it’s like at the bedside; that I find is very valuable. (C4, N2)

Having facilitators who were peers on the unit was found to be important for developing trust with knowledge adopters. As one nursing program manager put it:

I think they trust them because they’re used to working, especially with the one – she was a nurse that we trained for the pain service…so it’s just the familiarity with her, and she’s a valued team member prior to being on the pain service. So they trust that. (C3, NPM)

Facilitators with these characteristics appeared to have the potential to promote double-loop organizational learning in nursing units. These individuals were not only resources to whom nurses could approach about the guideline. They were also able to relate to nurses individually to understand the particular situation at hand, question assumptions underlying nurses’ pain management approaches, facilitate joint problem-solving, and
provide options about pain management interventions. As a nurse program manager said about one facilitator:

[Name] was more of a relational person. So it was about, ‘how does this translate to your practice? Tell me about some of the bumps that are making it hard for you. Let’s strategize together because I see that you’ve charted it here. I see that your pain score is here. I see that pain as an area but what’s preventing you from putting it all together?...I see these steps towards progress, we’d really like to get it to a 10, this is what I can help you with. (C5, NPM)

As previously discussed, pilot project leaders from two separate pilots felt that they were poor facilitators due to their lack of experience. Unit nurses validated this; it was felt that these facilitators had compromised the potential success of their pilots. In these pilots, the pilot projects were abandoned after pain assessment tools were briefly introduced to unit nurses and some initial feedback about them gathered. As a nurse from one of the pilots said when asked whether it would be useful to have a designated individual who nurses could approach with questions:

Somebody that’s designated. Somebody who is trained from this unit. You probably need more than one…she could reiterate the highlights, find out what is working, what is not working, provide feedback during the presentations…and also someone who would encourage and promote the whole process…just by talking to people, touching base, saying ‘how’s it going?’ Could you do this better? Is that working? (C6, N1)

Although not explicitly stated by most pilot project leaders or facilitators, it was also observed that facilitators required a significant amount of time from their existing positions for pilot project planning, implementation and evaluation. Similarly, as one pilot project leader stated about having dedicated time to focus on the pilot:

Because I don’t know who else would do it, because the front line staff, the ones you need the most, are so busy, and that’s not to say that I’m not busy, I am too, but you need somebody to orchestrate it. (C3, PPL)
5.5 Direct Usage and Conversion of Tacit and Explicit Knowledge

The findings of this study show that processes and structural mechanisms that involved the utilization of explicit and tacit knowledge as well as the conversion of knowledge from one form to another facilitate organizational learning, supporting Propositions 9-11.

Research participants stated that both tacit and explicit forms of the guideline were important for their learning. Explicit knowledge that was made available by the pilot project leaders such as paper versions of the guideline, manuals, posters, reminder notices, and information about the guideline on the Intranet were useful sources for reference, particularly when nurses had the time to review this material during their breaks. Explicit sources of knowledge were generally perceived to be limited in value without tacit knowledge.

Having someone who can explain things to you and put it into a more presentable form, because again, the guideline is wonderful, but its volume and I don’t see how nurses will sit and read through it. Plus it has a lot of information that doesn’t apply specifically to your area, it’s more general. Resources like someone who knows the hospital, knows the clientele, who could come to us and give us a little more. (C1, N1)

Tacit knowledge was provided by experienced nurses, the pilot project leader, champions or facilitators as discussed previously. As a structural mechanism, these individuals drew on their experience and converted the explicit knowledge to tacit forms which could be more easily adopted by other nurses. Explicit to tacit knowledge conversion took place during in-services, particularly when they included a discussion of patient specific cases. For example, as one nurse said she preferred to not only receive the new knowledge in explicit forms (e.g., paper, presentations) but have the opportunity discuss specific patient cases to apply the new knowledge:
It’s applied, and it applies to everyone in the room because they’ve all seen the patient. It’s not hypothetical case scenario. It’s an actual case. (C1, N3)

Another nurse said that they learned from the experiences of senior nurses during these case discussions:

I like the discussion, you can just headline points and then get nurses to communicate events that have happened to them related to pain. It’s always good to hear from the experienced nurses…what worked and didn’t work is one way. And it seems like everyone has different things to offer. (C5, N3)

Tacit knowledge was also transferred to nurses through informal conversations with nurses while they were working on their units. During these conversations, the facilitators would gently probe for usage of the guideline and whether the intended outcomes were being met. The facilitators helped unit nurses reflect on their pain management experiences and practices. Then facilitators provided unit nurses with advice and/or suggested other questions to consider. As a nursing program manager said about a pilot project in which ‘late career nurses’ served as the facilitators:

There’s nothing like experience…the one-on one personal approach is really helpful…I think that they can ensure that they are understanding. You can tailor your approach. You can tailor your learning. Not everyone learns the same, especially the adult learners, they learn a lot differently. To sit and watch a lunch and learn, a Power Point presentation, people may be shy to ask questions, or it may not occur to them at the time. Or that type of presentation just doesn’t do it for them…then follow-up when I’m available. They can ask questions and you can try to get a sense of what the question really is. Sometimes they are vague or they lead to other questions. So I think the personal interaction is quite effective. (C7, NPM)

Sharing tacit knowledge and the conversion of explicit to tacit knowledge was observed to have the potential to encourage double-loop organizational learning. A deeper level of learning occurred when facilitators encouraged nurses to reflect on their personal experience with the guideline and specific decisions that they had made.
5.6 Skills and Practice

The results show that processes and structural mechanisms of the organizational experiment that allow an organization to gain skills and practice with implementing the new knowledge facilitate single-loop organizational learning, providing support for Proposition 12. As briefly discussed above, case study discussions as part of the in-services, particularly where pain management approaches to existing patients on the unit were discussed within a group of nurses, were felt to be very useful for practicing the application of the new knowledge.

As one nurse said, discussing specific patient cases allowed her apply the new knowledge in practice versus in a theoretical fashion:

It hits close to home, you took care of him you have an interest in that patient, it’s not just Mr. Smith on a piece of paper, you connect to the family, you took care of him 24 hours a day. (C6, N2)

A pilot project leader thought that the interactive nature of case studies fostered group learning:

They’re interactive usually, they get to speak up about what their concerns are as a team approach. They look back at it: what did we do well? What did we not do well? What can we learn? And now what can we do from here? (C6, PPL)

Case discussions during in-services were felt to promote critical thinking and changes to nursing practice:

I don’t think we pay enough attention to what influence that actually has versus reading something. I think there can be a group discussion—people can help each other learn. And as someone is taking them through the critical thinking process, which you may not get from a tool kit, I think the cognitive aspect of learning through each other versus just a straight read, is much more influential in advancing their practice. (C1, NPM)
In two organizations, ‘nursing skills fairs’ were held during which nurses were able to see and use new pain dispensing equipment first-hand. Attendance at these events were mandatory and thus nurses were provided time off with pay. Nurses stated that this approach was very effective for learning. As a nurse from one pilot said:

You definitely need to set it up like that, it needs to be a hands-on type of session where we can go over the pumps and see how everything works, from the tubing of the pumps as well as the assessment of the patients and side effects of certain medications you need to be aware of.”...it’s a lot more effective than just the lecture style training, where somebody tells you what to look for… I think it’s more helpful to go through the scenario. Problem-based learning would be more helpful. (C4, N3)

Nurses also stated that trying out the guideline/tool at the bedside was valuable for learning about how to use it in practice and seeing its potential outcome, particularly if someone could provide them with supporting education at the same time. As one nurse said:

I think seeing how it works and how to do it is beneficial for the staff members, but we just usually talk about it, we don’t usually do it… if you’re at the bedside and you are trying to assess pain and get it done right then, it’s very difficult to find someone that can educate you and at the same time..but if they happen to be there, that’s good. (C5, N2)

Recording pain scores in patients’ charts (paper or electronic) also helped nurses to practice monitoring their patients’ response to pain medications and make adjustments. Previously, there had been inconsistent assessment and documentation of this information.

As one nurse said:

In the beginning, it was a bit of a hurdle. It was only an additional thing I had to make sure that I was doing. Initially, I thought, ‘I don’t need to make a set statement about this in my documentation. If I put a number on a flow sheet, and then I chart that I gave him medication, that’s good enough, that covers it.’ But I noted that I do need to target response time, so initially I might put pain was a 7 and I gave medication, but I didn’t necessarily go back and put, ‘the next time I checked, within a half an hour, pain was a 3’. I found that my follow-up was much better, and that I was targeting for a much more consistent response. (C5, N1)
5.7 Identifying and Resolving Problems

Research participants from most of the pilot projects stated that generally, they did not have any issues implementing the new knowledge but if they did, they would have approached the pilot project leader(s) or facilitator(s) during the pilot. The pilot project leaders of most pilots also stated that they did not have any major issues during the pilots. They indicated that their knowledge implementation processes were iterative and that they were constantly monitoring nurses to identify and address any questions or issues. It could not be ascertained from the data whether problem identification and resolution processes and structural mechanisms assisted with single or double-loop organizational learning. Hence the findings did not support nor refute Proposition 13 which suggested that processes and structural mechanisms of the organizational experiment that identify and resolve problems with the new knowledge facilitate organizational learning.

5.8 Building Retentive Capacity

Proposition 14, which suggested that processes and structural mechanisms that allow for summative evaluation of the organizational experiment facilitate organizational learning, was supported. However surprisingly, only two nursing units completed formal evaluations using tools at the end of their organizational experiments (e.g., patient satisfaction surveys, chart audits) whereas the rest completed informal evaluations as discussed in Chapter 5.1.2. Furthermore, as discussed previously, the data gathered with these tools were not reported to be aggregated or compared to goals/expectations but rather used in a relatively casual way, as indicated by the statement of one pilot project leader regarding using the results of a pain satisfaction survey:

I just compare the current results with the previous results, see what initiatives we’ve done, and if we need to do something else. (C1, PPL)
Generally, the pilot project leaders stated that this information was used to inform continuous improvement approaches. When one pilot project leader was asked what they would do next following the pilot, she said that they would:

…tweak as you go or add additional. (C1, PPL)

Research participants from the pilot projects that said that they did not complete evaluation activities at the end of their pilots indicated that this information would have been valuable for measuring the progress that the unit made regarding nurse compliance with using the tool, as well as with respect to determining patient impact/outcomes. As one pilot project leader suggested:

You need to, when you say evaluation, you need feedback. Both positive and negative from the staff that are actually doing it. And how to get that, I’m not really sure; other than we did that little post questionnaire, but I think you need to actually talk to the people that are using it, and perhaps the patients themselves. Did they feel that their questions were answered? Did they feel that by doing this, was their symptoms better controlled? (C2, PPL)

Summative evaluation was felt to be important for assessing whether goals and objectives of the pilot project were met or whether plans and activities would need to be adjusted. Research participants said that the lack of summative evaluation information made it difficult to plan next steps. For instance, as one nurse said:

It would just be nice to know how many of us are really doing our assessments with pain and are we staying on top of it? Cause really we don’t want patients to sit there in pain. We need to know that’s one aspect of our head to toe assessment that we are covering and we’re not forgetting to cover so that we can follow-up. (C5, N3)

It was recognized that evaluating pilot results effectively required skills and abilities.
As one program manager said:

I never saw documented evidence of what came out of the initial pilot. Everything was really anecdotal, from two staff members….I don’t think that either of them had the skill or ability to really to an evaluation at the end of their plan and even though the template was there within the guideline, I don’t think they had to level of experience and ability to develop the evaluation. (C2, NPM)

Except for two pilot projects, the results stage, which was expected to involve summative evaluation activities, was not observed. Most of the pilot projects remained in a constant state of implementation – educating participants about the new knowledge and continuously following-up to determine knowledge uptake. The lack of summative evaluation activity made it difficult for cases to ascertain their progress with respect to adopting the new knowledge and the impact that it made. Hence, the lack of activities and structural mechanisms in place for summative evaluation appeared to detract from organizational learning, particularly double-loop organizational learning.
CHAPTER 6: DISCUSSION

In this chapter, the major themes that resulted from the cross-case analysis are presented. Again, cross-case analysis matrices from which these themes were derived are included in Appendices D and E.

6.1 The Complexity of the Organizational Learning Process

In accordance with the knowledge transfer and innovation diffusion frameworks suggested by Rogers (1995), Szulanski (2000, 2003), and Berta et al. (2010), this study found that the organizational experiment process included at least three stages: (a) initiation, (b) implementation, and (c) results. Each stage comprised several organizational learning activities. The activities occurring during the initiation stage were relatively consistent and sequential with organizations becoming aware of the new knowledge, review and decision to pilot the new knowledge, and selection of a subset of the knowledge to pilot. Rogers’s (1995) knowledge attributes including: relative advantage, compatibility, complexity, observability, and trialability were assessed by committees and on an individual basis during the application of the new knowledge. Single-loop learning was predominant during this stage since although organizations had gained new knowledge, information on the action-outcome relationship gained through experience with the new knowledge was not yet available for the organizations to reflect upon and engage in double-loop learning.

In contrast to the initiation stage, the implementation and results stages were observed to be blended and more complex and dynamic than what has been traditionally described in the knowledge transfer and innovation diffusion literature. The organizational learning process during the implementation stage consisted of multiple activities/processes occurring simultaneously. Each of these activities/processes had different starting points, involved
different individuals within the organization and achieved different results. Specific goals or expectations for the organizational experiments regarding the number of individuals to reach with the new knowledge or the intended impact or outcome of the new knowledge were reported to have been set. Organizations typically did not keep track of which communication mechanisms and activities were used when, with whom, and to what extent, making it difficult for organizations to take stock of what was achieved during the organizational experiments. Nevertheless, potential for double-loop learning was observed during this stage with organizational experiment leaders and facilitators transferring tacit knowledge and several informal following-up discussions with knowledge recipients to support knowledge application.

Most of the organizational experiments were not punctuated with a definitive results stage as suggested in the knowledge transfer literature. Instead, the organizational experiments involved ongoing cycles of implementation and formative evaluation activities. Although single-loop learning occurred allowing organizations to achieve greater awareness about the new knowledge through well-intended activities, a lack of planning, formal evaluation, and concerted reflection about the action-outcome relationships of the new knowledge prevented the organizations from reducing causal ambiguity associated with introducing new knowledge and thus, engaging in a deeper, double-loop organizational learning. Had organizations made systematic and concerted efforts to use structural mechanisms and processes to engage in learning, they might have learned more from their experiences.

The findings of this study confirm scholars’ recent findings that innovation diffusion, knowledge transfer and organizational learning processes, particularly during the
implementation stage, do not unfold in a simple linear sequence of activities (Schroeder, Van de Ven, Scudder, & Polley, 1989; Tornatsky & Fleisher, 1990). The knowledge adoption process examined was also found to be complex, messy, and not a straightforward and instantaneous activity (Ferlie 1999; Kitson, Harvey & McCormack, 1998; Szulanski, 2000). This study furthers our understanding of organizational learning during organizational experiments by shedding light on the complexity of the implementation process and what aspects are required to achieve double-loop organizational learning during the implementation and results stages.

6.2 Explicit and Tacit Knowledge Transfer

The findings of this study show that both explicit and tacit forms of knowledge are valuable for organizational learning during organizational experiments. The introduction of various forms of the explicit knowledge (e.g., paper/online versions) were valuable for meeting different learning styles and preferences across the organization. Furthermore, these codified sources of knowledge also enabled organizations to transfer the new knowledge to several individuals at the same time. Explicit knowledge increased the overall awareness of the innovation, promoting single-loop but fell short of fostering double-loop organizational learning because processes that promoted reflection on the experience with the new knowledge and its impact were lacking.

Transferring tacit knowledge was found to have greater potential for encouraging double-loop organizational learning. Approaches that aimed to transfer tacit knowledge were found to be particularly useful for imparting knowledge that is valuable but not easily codified, communicated and transferred. The process of tacit knowledge transfer was less about instructing the knowledge recipients on what to do. Instead, knowledge recipients
learned how to apply the new knowledge to real life scenarios by drawing on the experience of others. Personal contact between facilitators and knowledge recipients promoted the sharing and challenging common beliefs, assumptions and practices. Hence, “mental models” and “know-how” knowledge were being transferred in the process (Nonaka & Konno, 1998). The results of this study support the literature on clinical practice guideline implementation strategies which have found that multiple education strategies are more likely to lead to guideline adoption (Wensing & Grol, 1994) and adds an experiential component to research that has found that multi-pronged strategies have no benefit over single interventions (Grimshaw, Beardall, Carter, Tetroe, & Davies, 2004). The findings also support the notion that knowledge creation is a function of building both tacit and explicit knowledge (Nonaka, 1994).

6.3 Knowledge Conversion

The conversion of knowledge back and forth between explicit and tacit knowledge, referred to as “reflection in action” was found during the study (Nonaka, 1994). Internalization (explicit to tacit) and socialization (tacit to tacit) processes had the most potential for double-loop organizational learning because they provided organizations with the opportunity to not only harness and share tacit knowledge amongst their members but also to reflect upon, challenge and modify prevailing existing beliefs, attitudes and practices. The findings indicate that internalization and socialization occurs extensively during organizational experiments and that these types of knowledge conversion are more likely to lead to double-loop organizational learning. Externalization and combination models of knowledge creation were not found in this study although it could be inferred from the
findings that externalization may also have contributed to double-loop organizational learning.

6.3.1 Explicit to Tacit Knowledge (Internalization)

Formal group educational sessions involving the discussion of case studies were felt to be effective by knowledge recipients because they could practice applying the new knowledge to real life scenarios, ask questions and receive guidance while doing so. Supporting this approach is a systematic review of medical education interventions which has found that passive and didactic sessions are unlikely to change professional practice, whereas interactive workshops can result in moderate changes (Thomas O’Brien et al., 2004a). During these sessions, ‘internalization’ or explicit to tacit knowledge conversion, occurred whereby the tool was discussed how the new knowledge could be applied. Double-loop organizational learning was more likely to occur because existing knowledge, assumptions and beliefs were actively challenged during the case study discussions.

6.3.2 Tacit to Tacit Knowledge (Socialization)

One-on-one conversations with between organizational experiment leaders/facilitators and knowledge recipients appeared to be valuable for socialization. Socialization occurred through a ‘just in-time’ approach of transferring knowledge, asking questions, obtaining feedback and applying the new knowledge. As a result the knowledge that was transferred was specific, relevant and meaningful to knowledge recipients. This finding is consistent with the literature which suggests that socialization occurs through joint activities such as an individuals’ spending time or learning together, in order to produce some form of shared mental model, metaphor, analogy or culture that can then serve as a framework for moving forward. Successful socialization requires that individuals empathize with one another
enough to incorporate others’ feelings and beliefs, so that a larger sense of situation and possibility can emerge (Nonaka & Konno, 1998). Because socialization involves acceptance of the beliefs, feelings and emotions of others, it is very difficult to achieve without some form of shared face to face experience. Face to face transfer is thought to be particularly important during early stages in the transfer process when difficulties that are related to knowledge tacitness – causal ambiguity and unproven knowledge – can create difficulties, contributing to stickiness in the process (Berta & Baker, 2004; Szulanski, 1996).

6.3.3 Tacit to Explicit Knowledge Conversion (Externalization)

Externalization was not observed during this study. However, it can be inferred that the lack of summative evaluation activities in most of the organizations examined in this study contributed to the lack of externalization. Individuals with the tacit knowledge, including organizational experiment leaders, dedicated facilitators, and the knowledge recipients themselves who gained tacit knowledge through personal experience, stated that they did not reconvene at the conclusion of the organizational experiments to share, standardize and document the new knowledge, thereby making it explicit. While harnessing tacit knowledge and transferring it to explicit forms may be challenging given the nature of this type of knowledge, the organizations in this study may have benefited from this activity. Externalization could have assisted the organizations with institutionalizing and sustaining the knowledge gained and in doing so, build organizational memory which is suggested to be key for promoting organizational learning and enhancing performance (Nonaka & Takeuchi, 1995).
6.3.4 Explicit and Explicit Knowledge (Combination)

Activities that involved bringing together different forms of explicit knowledge to produce more complex sets of explicit knowledge were also not observed during this study. Combination knowledge conversion involves social processes to combine different bodies of explicit knowledge held by individuals. The reconfiguring of existing information through the sorting, adding, re-categorizing and re-contextualizing of explicit knowledge can lead to new knowledge (Nonaka & Konno, 1998). However, similar to externalization, it could be inferred that combining various sources of explicit knowledge related to the organizational experiments could potentially contribute to double-loop organizational learning. For example, key explicit forms of knowledge produced and used during the organizational experiment could have been brought together, including: plans for the organizational experiment, information provided during education sessions, communications vehicles (e.g., posters, reminder notices, websites), the new knowledge in various formats (i.e., pain management tool, documentation sheets), information from evaluation activities (e.g., chart audits, surveys). Bringing together these sources of knowledge and evaluating their effectiveness, could have led to a discussion of whether more effective forms of explicit knowledge could be produced. This process could have provided justification – the basis for agreement, allowing the organization to take concrete steps forward (Nonaka & Konno, 1998).

In addition, a discussion among participants at the conclusion of the organizational experiments in this study could have for example, contributed to the creation of a summary document containing items such as expectations regarding pain management and assessment (perhaps in the form of a policy/procedure), an overview of the tool to be used in the process,
answers to key questions that may arise, who to contact for more information and where to find more information. Such a document would be beneficial to future knowledge recipients. This information is more appropriate than the original form of the new knowledge because it is context specific, based on experiential knowledge gained during the organizational experiment.

6.4 Structural Mechanisms

Organizational learning was assisted in many organizational experiments by structural mechanisms in the forms of: human resources, technology, and financial resources/time which were necessary contextual features supporting organizational learning during organizational experiments. These mechanisms served as prerequisites for introducing, applying/testing, and evaluating the knowledge. The absence or inadequate presence of these structural mechanisms was also found to constrain organizational learning during the organizational experiments.

- **Human resources** included organizational experiment leaders, facilitators, and committees of individuals brought together from across the organization to select aspects of the guideline to implement.
  
  - Consistent with the literature on research utilization, effective organizational experiment leaders had advance knowledge of how to implement guidelines, the status/credibility to implement the innovation, management/coordination skills, were positive and enthusiastic, and possessed good communication skills (Rycroft-Malone et al., 2004). The characteristics that made the leaders effective during this study also conform to those found for transformational leaders. These leaders have been described as those who inspire staff towards a common vision
and are able to challenge, stimulate, and enable organization members by developing trust and communicating effectively (McCormack et al., 2001).

- Facilitators were found to play a prominent role in potentially encouraging double-loop organizational learning by assisting knowledge recipients with questioning the assumptions underlying their practices. This finding is supported by the literature in the fields of counseling and humanistic psychology which suggest that the focus of facilitation is to promote experiential learning through critical reflection, dealing with psychological defensiveness and challenging cultural norms. The results also support the literature on health care profession reflective practice and clinical supervision literature which has found that the goal of facilitation is to challenge existing practice and support the development of new ways of working (Harvey et al., 2002). Overall, this study supports the suggestion that facilitation is one of three key elements (the others being evidence and context) in promoting the evidence-based practice (Harvey et al., 2002; Rycroft-Malone et al., 2004). The findings also agrees with calls for more conceptual clarity for the roles of project lead, champion, and facilitator as these terms were used interchangeably by those who participated in this study (Harvey et al., 2002; Rycroft-Malone et al., 2004).

- Committees consisting of representatives from across the organization were another key structural mechanism that promoted organizational learning during the organizational experiments. This supports knowledge transfer literature which indicates that organizations need to include a range and diversity of stakeholders in order for the adoption of new knowledge to be successful; professional and
social networks may play a role in the acceptance of pieces of evidence or new ways of working and in determining the characteristics of practice contexts (Dopson, FitzGerald, Ferlie, Gabby, & Locock, 2002)

- *Time* to introduce and learn the new knowledge was found to be another structural mechanism necessary for organizational learning. Organizations required dedicated human and financial resources. This finding is consistent with nursing research utilization literature which has found that time to use and conduct research affects knowledge transfer (e.g., Closs & Cheater, 1994; Funk, Tornquist, & Champagne, 1989; Nolan, Larson, & McGuire, 1994). Slack resources (financial and/or human resources) that an organization has beyond what is minimally required to maintain operations has also been found to be required in order to adopt and institute innovations (Rosner, 1968; Miller & Friesen, 1982).

- *Technology* facilitated the capture and transfer of the knowledge, thereby promoting reflective practice and organizational learning. Information and communication technologies have been suggested to be effective for knowledge codification which in turn may assist with the retention and transfer of knowledge at the individual and group levels (Steinmueller, 2000). For individuals, recording information that can be retrieved at a later point in time assists with knowledge recall. For groups, knowledge that has been stored for collective access in the future also assists with remembering solutions or ideas that have been previously developed or documented (Steinmueller, 2000). Hence, knowledge codification allows for greater access to organizational memory and organizational learning is enhanced (Robey, Boudreau, & Rose, 2000).
The study supports several medical and nursing research utilization models which emphasize the need for adequate resources and environments conducive to using new evidence in daily clinical practice (Brown & Rodger, 1999). The findings also underscore the importance of context in knowledge transfer (Harvey et al., 2000; Kitson, Harvey & McCormack, 1998; Rycroft-Malone et al., 2004). Indeed this study has found that learning is inextricably linked to both social (i.e., human resources) and physical conditions (e.g., financial resources, technology) in which it takes place and knowledge cannot be isolated from context (Brown & Duguid, 1991). Furthermore, this study confirms that the interaction of individuals with contextual factors should also be considered for effective knowledge implementation (McCormack et al., 2002; Stetler, 1998).

6.5 Evaluation Mechanisms and Processes

Evaluation mechanisms were used during the organizational experiments to gather, review and report on the progress of the pilot projects. Evaluation increases the observability of the innovation because it makes the benefits of the innovation more visible to intended adopters thereby by promoting greater adoption (Rogers, 1995). Research has found that an innovation is more likely to be assimilated and sustained if there is capacity to evaluate the innovation (Gustafson, Sainfort, Eichler, Adams, Bisognan, 2003; Rogers, 2005). Capacity includes having efficient data collection, review systems that provide accurate and timely information about the impact of the knowledge implementation, as well as the skills to analyze the data (Green, 2001; Grimshaw et al., 2004; Gustafson, Sainfort, Eichler, Adams, Bisognan, 2003). In this study, both tool-based and human-based evaluation mechanisms were used to collect feedback on the impact of the innovation, at least on a cursory level, and review it.
• Tool-based evaluation mechanisms (e.g., surveys and audits) were relatively objective, easily implementable and replicable means for gathering this information however, the information that they provide was limited. These mechanisms facilitated single-loop organizational learning because they were used primarily to assess compliance with recommended practice, also referred to as “error detection and correction” in the organizational learning literature (Argyris and Schön, 1995). Double-loop learning could have occurred had concerted efforts been made to: review the results of these data against established goals and objectives, identify the root causes for why these were not (or were) reached, and take action to address those underlying causes during the next portion of the organizational experiment or before rolling out the new knowledge to other parts of the organization. Review and analyses of these results with other organizational experiment participants would have also likely contributed to a greater understanding of the causes and effects of the new knowledge and hence deeper organizational learning. Tacit knowledge could have been shared and the conversion of tacit to explicit knowledge may have been encouraged.

• Informal, human-based evaluation mechanisms were comprised of facilitators who worked with knowledge recipients, on an informal and individual basis, to address specific needs. These individuals’ interactions with knowledge recipients allowed for more in-depth assessments regarding the specific actions carried out by individuals, the outcomes that they expected, and the logic/assumptions they held about the action-outcome relationships. Because facilitators were viewed as being credible and trustworthy by knowledge recipients, they were able to probe at deeper levels,
uncovering and challenging long-standing assumptions, attitudes, and behaviors. Hence, they had potential for facilitating double-loop organizational learning. Facilitators were instrumental not only for transferring new knowledge during the implementation stage, but also reinforcing uptake – potentially contributing to its sustained adoption.

With the exception of in two organizational, experiments, the results stage, which was expected to involve summative evaluation activities, was not observed. Again, most of the organizational experiments remained in a constant state of implementation – educating organizational experiment participants about the new knowledge and continuously following-up to determine knowledge uptake. The lack of formal summative evaluation activity made it difficult to ascertain progress during the organizational experiment with respect to the adoption of the new knowledge and its outcomes. Hence, little organizational learning occurred during this stage. These findings are consistent with what has been reported in the literature. Cheater and Closs (1997) found that research into the best means of implementing nursing clinical practice guidelines is often not within an evaluative framework. In a systematic review of knowledge transfer literature on health care policy, Mitton, Adair, McKenzie, Patten & Perry (2007) found only a handful of implementation studies that had intended to formally evaluate their knowledge transfer and exchange strategies in advance, and an even smaller set had clearly defined outcomes measures.

### 6.6 Knowledge Unbundling and Selection

An unexpected finding of this study was that every organization that participated in this study selected a very small subset of the new knowledge for pilot implementation. As described in Chapter 4, the innovation that was being implemented through the
organizational experiments included 75 recommendations in the revised version. As discussed in Chapter 5, during the initiation stage, organizations selected a small proportion of these recommendations to implement. The one exception was an organizational experiment during which six recommendations were selected for piloting. The remaining seven organizational experiments chose to pilot a pain assessment and management tool. Two recommendations from the entire set contained in the guideline, directly refer to a pain assessment tool: (a) Recommendation 3: “A systematic, validated pain assessment tool is selected to assess the parameters of pain, which include….‖ and (b) Recommendation 4: “A standardized tool with established validity is used to assess the intensity of pain…”. The other recommendations included in the guideline pertain to practices and procedures regarding pain assessment and management and organization level recommendations. The practice and procedures recommendations are grouped into the following categories: Comprehensive Pain Assessment, Reassessment and Ongoing Assessment of Pain, Communication of Pain Assessment Findings, Establishing a Plan for Pain Management, and Selecting Appropriate Analgesics. The organization level recommendations are divided into two categories: “Education” and “Organization & Policy” and are general recommendations that are included in all of RNAO’s Best Practice Guidelines.

In retrospect, the unbundling and selection of a subset of the knowledge to implement was unsurprising given the breadth of the new knowledge. This activity is related to Rogers (1995) concept of trialability—the degree to which an innovation may be experimented with on a limited basis. Rogers (1995) suggests that new ideas or techniques that can be tried on a limited basis reduce uncertainty for potential adopters. The ability to select and trial only some aspects of the new knowledge may have increased the trialability of the new
knowledge. Furthermore, selecting a subset of the innovation to pilot also reduced the complexity of the new knowledge, which has also been found to facilitate adoption (Rogers, 1995). These findings are consistent with research which has shown that organizations are not passive acceptors but rather active modifiers of innovations (Rogers, 2003) and that innovation is a process whereby the organization continuously and actively interacts with its environment to identify new problems and creates new knowledge to address those issues (Nonaka, 1994).

While this study found that unbundling the new knowledge and selection of certain aspects to implement may have facilitated knowledge transfer, the selection of very limited aspects of the knowledge to implement may have implications for organizations wishing to gain the full intended benefits of the innovation. Although not within the scope of this study to examine the specific attributes of the innovation that were piloted, one could contend that irrespective of the number of individuals who adopted the innovation during the organizational experiments in this study, it is unknown whether the small portion (two out of 75 recommendations) that were implemented without measurement or evaluation of the organizations status against the other 73 recommendations, constitutes implementation of the guideline. One could question whether piloting this guideline may be affected by a desire to garner legitimacy in the health care sector at a time when clinical practice guidelines are touted as one of the most effective means for improving quality of care.

6.7 Implications for Practice

The following is a discussion of the practical implications of the research findings, both for organizations and practice guideline developers. The strategies proposed may be
useful for achieving both single and double-loop organizational learning during organizational experiments.

6.7.1 Implications for Organizations

6.7.1.1 Adopt a Range of Knowledge Transfer Approaches

The study indicates that a range of educational approaches may be required to meet the different learning needs and styles of knowledge recipients. These approaches may include making the new knowledge available in paper and electronic-based formats that can be easily referenced at any time, as well as applying more active strategies including group discussions which encourage application of the new knowledge to specific scenarios. Rogers (1995) suggests that planned innovation dissemination programs will be more effective if both a full account of the needs and perspectives of knowledge adopters are identified and strategies are tailored to different subgroups. Successful communications campaign strategies consist of: (a) researching the intended recipients’ and the messages in order to plan more effectively; (b) setting reasonable goals; (c) segmenting the heterogeneous mass audience into homogenous audience segments; and (d) designing the campaign’s mass media messages to trigger interpersonal networks.

6.7.1.2 Share Tacit Knowledge with Dedicated Human Resources

While explicit knowledge contributes to single-loop organizational learning, this study found that it may be, by itself, insufficient for promoting double-loop adaptive learning. Tacit knowledge and the conversion of explicit to tacit knowledge were processes found to have more potential for double-loop organizational learning. Organizations might consider investing in putting into place dedicated, skilled and experienced facilitators to assist with their organizational experiments. The findings indicate that these facilitators
would ideally possess previous knowledge and experience with the implementation of new knowledge and/or are provided with additional education/training in preparation for introducing the knowledge to others in the organization. Organizations would also likely benefit from facilitators with previous experience with organizational experiments or major change initiatives, including planning, implementation and evaluation. Relational skills of the facilitators seem to be equally important for facilitating change during organizational experiments.

6.7.1.3 Dedicate Time to Organizational Learning

Knowledge transfer recipients in this study benefited from having dedicated time away from their existing responsibilities to participate in the organizational experiment in order to maximize opportunities for organizational learning. Researchers have found that with dedicated and ongoing funding for its implementation, the innovation is more likely to be implemented and routinized (Green 1998; Gustafson, Sainfort, Eichler, Adams, Bisognan, 2003). Furthermore, if the innovation starts out with a budget and the allocation of resources is both adequate and continuing, it is more likely to be assimilated (Gustafson, Sainfort, Eichler, Adams, Bisognan, 2003; Rogers, 1995).

6.7.1.4 Develop and Use Evaluation Mechanisms

Informal mechanisms, such as facilitators who transferred their tacit knowledge to knowledge recipients through informal conversations, enhanced single-loop learning. Double-loop organizational learning was not observed to have occurred perhaps because the information gathered and strategies suggested to individuals about the utilization/application of the new knowledge through informal means were typically not aggregated, analyzed and acted upon to improve the success of the organizational experiments or the successful roll out.
of the innovation to other parts of the organization. Consequently, the knowledge and experience gained remained with the facilitators as there was a lack of process or forum for sharing this information, which may have benefited the entire organization.

Organizations might also consider developing mechanisms and processes to evaluate their progress both during the organizational experiment and at its conclusion. Mechanisms include instruments such as documentation forms, surveys and audits, to gather data on a consistent and regular basis. Evaluation criteria, which are tied to the goals and expectations of the innovation should likely be stated at the outset of the pilot. In addition, a deadline for the decision regarding spread of the innovation would be ideal. Rapid and cursory review of the data provided by these instruments may not be sufficient as this activity results in single-loop learning where learning stays in error detection and correction mode. Organizations should consider establishing systematic processes for gathering and interpreting the data. These processes would allow organizations to reflect upon the actions that were taken and outcomes. Taking the time to question and understand the underlying assumptions between actions and outcomes could promote more double-loop learning and perhaps triple-loop learning, allowing the organization to create new strategies for learning.

Formative evaluations conducted partway through or at various intervals during the organizational experiments would provide organizations with the opportunity to assess the success of the implementation activities, as well as interim progress in terms of the achievement of outcomes. Adjustments could then be made to knowledge implementation strategies on an interim basis, based on the action-outcome relationships observed thus far.

Summative evaluations seem to be particularly important for aggregating individual level learning that has taken place over the course of the organizational experiment and
embedding this knowledge into the organization’s policies, procedures and systems to build organization memory. The key however, is for organizations to use this information to reflect upon long-standing assumptions and make adaptive changes to their assumptions and norms.

6.7.1.5 Establish Goals and Expectations

Effective evaluation of the action-outcome relationship of applying new knowledge during organizational experiments would be facilitated by organizations developing and documenting explicit goals and expectations for the transfer of the new knowledge including the quantity and quality of expected to be gained, by whom and by when. Without these goals and expectations, it may be difficult to assess both the progress of the organizational experiment from an activity standpoint, as well as what the organization has learned.

A lack of goals and expectations for organizational experiments would likely make it challenging for knowledge adopters to know what is expected of them to learn and do with the new knowledge, as well as how their actions contribute to broader organizational learning. Goals and expectations for the organizational experiment would probably allow organizations to more effectively plan and tailor knowledge transfer strategies, thereby encouraging deeper organizational learning.

6.7.2 Implications for Clinical Practice Guideline Developers

6.7.2.1 Manage Knowledge Unbundling and Selection

In this study, the new knowledge was unbundled and only a small portion of the innovation selected for pilot implementation. While it could be argued that the selection of a limited number of aspects of an innovation could increase the chances of successful adoption, not identifying the core and peripheral elements of the innovation could compromise the
ability to achieve the full intended impact of the new knowledge. Denis, Hebert, Langley, Lozeau & Trottier (2002) define the ‘hard core’ component of an innovation as the aspect which is relatively fixed and the ‘soft periphery’ relates to the various ways in which it may be implemented. The risk of not knowing which elements are core and peripheral is that organizations may not achieve the full benefits by implementing only the peripheral elements of the innovation or a subset of the core components.

Guideline developers could support organizations in their pilot implementation efforts by clearly identifying which aspects of the innovation are core, and which are peripheral, to achieving the intended outcomes such that the full benefits of the innovation may be realized. Peripheral elements can be presented as options that organizations should draw on and adapt to their specific settings, whereas core components should be piloted together and without significant alteration.

6.8 Study Limitations

Data collected for this study were largely based on the perceptions of research participants about organizational experiments and the learning that took place during these pilots. Research participants were asked to provide a retrospective account of their experience with organizational experiments that took place within the last two years. Most participants could recall the events of their organizational experiments. However, several individuals had difficulty with recalling the length of the pilot project, as well as the timing and duration of specific activities and processes. In addition, it was challenging for participants to recall any specific changes in their own attitudes and beliefs or with unit policies and practices, which has also been suggested to be evidence of double-loop organizational learning. A prospective study following organizations through organizational
experiments real-time would reduce recall bias and hence be beneficial for identifying an
even more realistic account of the organizational experiment process and aspects influencing
organizational learning.

A semi-structured interview guide was developed based on the literature and used to
gather data during this study. Although research participants were asked to recount their
experiences with the pilot projects in their own way, it is possible that by asking questions to
assess what and how they learned influenced their frames of reference and thus what they
reported. Using an open-ended approach to data gathering could have led to additional
insights about organizational learning that were not directly related to perceived learning by
the research participants.

Cases that were included in this study consisted of organizational experiments that
were concluded during the two years prior to data collection. It is plausible that double and
triple-loop organizational learning could have occurred post data collection. For example, an
organization that embarked on another organizational experiment following the pilot
examined in this study could have engaged in double and triple-loop learning when reflecting
on its prior experience. Lengthier, prospective studies would contribute to a greater
understanding of how time and reflection contributes to double and triple-loop organizational
learning.

At the time of this study, several organizations were applying to become recognized
as proficient knowledge adopters by RNAO (i.e. as Spotlight Organizations). There also
continues to be prestige and legitimacy in the health care sector associated with adoption of
as many clinical practice guidelines as possible. Hence, research participants could have
been inclined to represent themselves and their organizational experiments favorably during
the interviews which could have led to self-report bias. Again, a prospective study applying
a participant observation methodology would assist with reducing this bias.

Despite the limitations of this study, an initial step forward has been made in
understanding how organizational learning occurs during organizational experiments.
Processes and aspects of organizational experiments, including processes and structural
mechanisms that appear to affect organizational learning have been identified. Particularly
salient are the aspects that have the potential to encourage double-loop, adaptive learning
which is thought to lead to enhanced organizational performance.

6.9 Future Directions for Theory Development and Research

A first step has been made through this study by examining how organizational
learning occurs during organizational experiments. This study was exploratory and
descriptive in design. Aspects, both processes and structural mechanisms of organizational
experiments that were found to affect organizational learning have been described. Strategies
that organizations can adopt to enhance organizational learning have been suggested.
Several areas require additional empirical research and theory development in order to
achieve a fuller understanding about how organizational learning can be optimized during
organizational experiments.

6.9.1 Strength and Association of Organizational Experiment Aspects

This study described aspects of organizational experiments that affect organizational
learning and in particular those that have potential for encouraging double-loop learning.
Additional empirical research is required to further our understanding of the importance of
each of these aspects in influencing double-loop learning, individually and in combination.
This includes research to assess the relative strength of the processes and structural
mechanisms in promoting or detracting from double-loop organizational learning. Also required are studies to determine whether each of these aspects act as antecedents, mediators or modifiers and how these elements interact with each other during the organizational learning process to produce outcomes. Research that examines a critical mass of organizational experiment aspects is required to reach double-loop organizational learning would be valuable for determining whether there are prerequisites. Quantitative field experiments are ideal for addressing these areas of inquiry, the results of which would contribute to the development of a robust theoretical models that predict and explain how various aspects of organizational experiments influence organizational learning.

6.9.2 Conceptual Clarity of Organizational Learning

Although the purpose of this study was to examine the process of organizational learning rather than to measure organizational learning as an outcome, it was found that greater conceptual clarity was still required in order for a closer examination of this phenomenon. Argote’s (1993) definition of organizational learning: “evidence that knowledge has been gained through experience and/or when changes in behavior are a result of experience” was adopted for this study. Organizational learning has been defined as including: changes in values and assumptions (Argyris & Schön, 1978), skills (Fiol & Lyles, 1985), systems and structures (Levitt and March, 1988), core competencies (Prahalad & Hamel, 1990), organizational innovativeness and competitiveness (Nason, 1994), corporate success and employee satisfaction (Bontis & Fitz-enz, 2002). Hence, the concept of organizational learning is broad, encompassing changes in knowledge, action and outcomes. The challenge with applying this broad definition to the present study is that without clear operational definitions, virtually any activity and outcome, irrespective of whether the
organization has adopted the innovation, can be considered to be organizational learning. Perhaps providing conceptual clarity for when an organization has not learned would be useful for furthering our understanding of when organization has learned.

6.9.3 Delineating Between Single- and Double-Loop Organizational Learning

A need exists for greater delineation between the concepts of single and double-loop organizational learning. Instances of organizational learning identified in this study were based on Argyris & Schöen’s (1978) definitions. Single-loop learning is where an organization has gained and incremental changes are made but new knowledge but carries on with its previous policies, procedures and objectives. Double-loop learning was considered to have occurred where information influences an organization to modify its underlying assumptions, norms, policies and goals, leading to more fundamental changes in the way business is conducted. Greater specificity in these definitions is required regarding the extent to which changes are required to demonstrate that an organization has moved beyond single to double-loop organizational learning. Given the challenges with utilizing these broad definitions, a specific set of operational definitions were developed specifically for the purpose of this study (Appendix B). Research is needed to clarify the concept of organizational learning and provide guidance on how the concept should be used in empirical research, either as an activity/process or distal/proximal outcome depending on the purpose of the study. Specific operational measures that are relevant, reliable and valid are required for single and double-loop learning to support organizational learning scholars with accurate and consistent assessment of organizational learning as an outcome.
6.9.4 Situating Triple-Loop Organizational Learning

This study focused primarily on examining whether and how single-and double-loop learning occurred and what was required to shift from single to double-loop organizational learning. Third generation learning or triple-loop learning, a process whereby an organization is “learning how to learn” (Nutley & Davies, 2001) is suggested to be a third generation process that can occur once an organization has completed single and double-loop learning. While evidence of triple-loop following double-loop organizational learning was not found during this study, most of the participants offered suggestions about how learning could have been enhanced during their organizational experiments. Furthermore, in the case of two organizations that reported that their organizational experiments were failures, participants appeared to engage in deeper reflection on the limitations of their pilots, what could have been done to prevent failure and what they learned about what was needed for success. This is an example of “learning from failure” as described by Tucker & Edmondson (2003). Additional empirical work is required to understand whether triple-loop learning can occur after single-loop learning and without double-loop learning.

6.9.5 Facilitation Skills

Facilitators have been identified in this study as type of structural mechanism that encourages double-loop organizational learning. Theoretical work has been completed on the concept of facilitation, including: the purpose of facilitation, the role of a facilitator, and the general skills and qualities associated with effective facilitators (Harvey et al., 2002). However, little evidence exists regarding the specific skills needed by a facilitator to carry out this role effectively and also how these skills can be developed or honed (Harvey et al., 2002). This knowledge is required to support organizations with either attracting individuals
with these skills to participate in organizational experiments and/or developing these skill sets in existing members of the organization such that they can be effective facilitators during organizational experiments. In addition this study found that facilitators were particular effective in encouraging organizational learning during the implementation stage of the organizational experiment. Additional research is needed to further our understanding about whether facilitators could also play a role in enhancing organizational learning during the initiation and results stages of organizational experiments and what that might entail. More research is also required to understand the extent of the investment that should be made in facilitators and the potential impact that they can make with respect to organizational learning and the intended outcomes. Loftus-Hills & Harvey (2000) found that presence of a facilitator who provides face-to-face communication and uses a range of enabling techniques (e.g., audit and feedback, education, support, advice and team building) had some impact on changing clinical and organizational practice, although the effect size was variable and associated with differing costs.

6.9.6 Knowledge Conversion Processes

Internalization (explicit to tacit) and socialization (tacit to tacit) were key knowledge conversion processes that were found to have the potential to contribute to double-loop organizational learning during organizational experiments. This study noted the advantages of having in place dedicated, skilled and experienced facilitators during organizational experiments. However, the scope of this study did not allow for a detailed examination of how these types of knowledge conversion occurred. For example, the interactions between facilitators and knowledge recipients during which tacit knowledge was transferred were not examined. Furthermore, while externalization (tacit to explicit) and combination (explicit to
explicit) knowledge conversions were not observed during this current study, it should not be inferred that these activities do not occur at all during organizational experiments. Additional research should be completed to examine whether and if so, how these knowledge conversion processes are related to organizational learning.

6.9.7 Interaction of Individual-, Group-, and Organization-Level Learning

The debate about whether learning exists beyond the individuals in which the knowledge is held is long-standing in the organizational learning field. Some scholars argue that organizational learning is reification of learning which is actually embodied within individuals. However, researchers have found that that learning can exist at the organizational level. Evidence for organizational learning which includes new knowledge stored and retained in an organization’s policies or information systems, have been argued to contribute to an organization’s memory, absorptive capacity and hence an organization’s ability to learn. Nevertheless, how individual learning contributes to organizational learning and vice versa remains elusive. How group level organizational learning relates to individual and organizational level learning also requires further examination. Little is known about how organizational learning translates into organizational memory. Also poorly understood is the assimilation process, the stage in which individual and group learning is embedded into the non-human aspects of the organization, including systems, structures, procedures and strategy (Nevis, DiBella, & Gould, 1995).

6.9.8 Implications for Learning in Environments with Less Mimetic Pressure

The pilot projects that were examined in this study are taking place at a time during which adoption of clinical practice guidelines (and in particular the RNAO best practice guidelines) are being assumed by many health care organizations as the premier solution for
improved clinical practice and patient outcomes. As such, mimetic pressure and a desire to garner legitimacy could have played a role in the organizational experiment processes observed in this study. More specifically, this pressure could have contributed to organizations implementing the guideline quickly with little incentive or requirement to put into place rigorous processes to examine action-outcome relationships of the new knowledge. Studying organizational experiments that are not subject to the same pressure would be instrumental for achieving a fuller understanding of how learning occurs and may be enhanced.

6.9.9 Utility of Organizational Experiments Using Less Complex Innovations

The innovation that was examined in this study was complex including multiple aspects that could be implemented individually or in combination. Organizational experiments involving innovations that are less complex in content/length and cannot be unbundled need to be researched to better understand the relationship between specific organizational experiment processes, structural mechanisms and organizational learning. For example, organizational learning about new products and services that cannot be altered and are easy to use, as-is, may not require facilitation to transfer tacit knowledge or much skill and practice on the part of the knowledge recipient.

6.9.10 Organizational Experiments in Other Settings

Finally, additional studies examining organizational experiments in other health care settings (e.g., long-term care, complex continuing care, rehabilitation, mental health, community/public health) and other product and service delivery industries (e.g., manufacturing, telecommunications, financial services) are required to confirm and extend our understanding organizational experiments and organizational learning.
CHAPTER 7: CONCLUSION

Organizational experiments are a means of learning how best to implement an innovation such that the full benefits may be realized before spreading it to other parts of the organization. They provide organizations with context-specific knowledge through direct experience with the new knowledge. Organizational experiments can afford organizations with implementation know-how but can also foster double-loop adaptive learning leading to more innovation.

Figure 5 summarizes the two key areas of the organizational experiment explored in this study: (a) stages that organizational experiments involve and (b) aspects of organizational experiments that influence organizational learning. Aspects (i.e., processes and structural mechanisms) that were found have a potential influence double-loop organizational learning are marked with two asterisks (**). The remaining aspects were found to contribute primarily to single-loop organizational learning.

7.1 Initiation Stage—Processes and Structural Mechanisms

This study found that organizational learning occurs over the course of three main stages of organizational experiments. Activities and processes during the initiation stage included: awareness of the new knowledge, assessment of its various attributes of the innovation to determine its relevance and applicability to the local context, and expectations generation about the outcomes. An unexpected finding of this study was the unbundling and selection of a small number of components of the new knowledge to implement prior to its pilot implementation and how this process may have limited the extent of organizational learning and the intended effects of the innovation.
The main structural mechanism that was used during the initiation stage was the organizational experiment leader and an innovation review committee comprising representatives from across the organization convened by the leader to review the entire innovation and select parts for pilot implementation. Single-loop organizational learning occurred during these committee meetings as the knowledge about the innovation was enhanced.

### 7.2 Implementation Stage—Processes and Structural Mechanisms

Organizational experiment implementation stage activities were found to involve planning, knowledge transfer approaches development, knowledge transfer interventions and data collection and review activities. Planning for the organizational experiments were reported to have been completed however, specific goals and expectations for the process and

<table>
<thead>
<tr>
<th>Stages</th>
<th>I. Initiation</th>
<th>II. Implementation</th>
<th>III. Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processes</td>
<td>Innovation assessment</td>
<td>Implementation Planning</td>
<td>Ongoing data collection &amp; review</td>
</tr>
<tr>
<td></td>
<td>Knowledge unbundling &amp; selection</td>
<td>Development knowledge transfer approaches</td>
<td>Knowledge transfer interventions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Final data collection &amp; review</td>
</tr>
<tr>
<td>Activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assessment of Innovation's:</td>
<td>Informal data collection and review</td>
<td>Summative evaluation</td>
</tr>
<tr>
<td></td>
<td>• Relative advantage</td>
<td>• Transfer and creation of knowledge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Compatibility</td>
<td>• Transfer of explicit and tacit knowledge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Complexity</td>
<td>• <strong>Knowledge creation</strong> (explicit to tacit; tacit to tacit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Observability</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Trialability</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Review of innovation and selection of subset to pilot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structural Mechanisms</td>
<td>Innovation review committee</td>
<td><strong>Organized experiment leaders</strong></td>
<td>Formal evaluation mechanisms</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Organized experiment facilitators</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Formal evaluation mechanisms</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Informal evaluation mechanisms</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Financial resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Time</td>
<td></td>
</tr>
</tbody>
</table>

Note: ** indicates potential to influence double-loop organizational learning
outcomes of the organizational experiment were not observed to have been set. Several approaches to transferring the knowledge were developed to transfer both explicit and tacit knowledge. The conversion of explicit to tacit knowledge (internalization) and tacit to tacit knowledge (socialization) were also observed as key processes to have taken place.

The implementation stage was observed to be more complex and dynamic than those described by many traditional knowledge transfer, innovation diffusion and organizational learning process models which typically depict linear and sequential processes. Multiple knowledge transfer activities were found to occur simultaneously during this stage. Several feedback and feed-forward loops were in place between planning, development of knowledge transfer approaches, intervention implementation and data collection and review activities. Although complex in nature, these loops are where the potential for double-loop organizational learning lie because organizations are afforded with opportunities to reflect upon action-outcome relationships and question underlying assumptions and goals which may lead to more effective knowledge uptake.

Several structural mechanisms were found to influence organizational learning including during the implementation stage: organizational experiment leaders, organizational experiment facilitators, formal and informal evaluation mechanisms, financial resources to allow organization members time to participate in organizational experiment activities. Extensive personal contact by organizational experiment leaders and facilitators with prior experience and credibility played a key role in encouraging a deeper level of learning by individual members of the organization during case study discussions and one-on-one conversations. Direct experience with applying the innovation provided individuals with the opportunity to ascertain and reflect on its impact. This experience appeared to allow
individuals to contextualize the new knowledge and in doing so, internalize it and potentially engage in double-loop organizational learning.

Formal evaluation mechanisms such as surveys and chart audits facilitated single-loop organizational learning by providing information mostly on compliance with the new knowledge. Informal evaluation mechanisms, which were comprised of facilitators dialoguing with knowledge recipients to determine the extent to which they adopted the new knowledge, had more potential for promoting double-loop learning at least at the individual level. Thus, double-loop learning seemed to be more likely to occur in organizational experiments where mechanisms and activities encouraged reflection in action.

7.3 Results Stage—Processes and Structural Mechanisms

A results stage, which may have included summative evaluation activities and a final decision regarding whether to roll-out the new knowledge, was found to occur to a very limited extent or not at all during the organizational experiments examined. Most of the organizations in this study were found to continue with implementation and formative evaluation activities with no definitive end to the organizational experiment. Although single-loop learning occurred with the exposure to new knowledge and the intent to transfer and adopt it, limited planning and summative evaluation prevented the organizations from engaging in double-loop learning during the results stage.

Single-loop organizational learning can be encouraged by systematically planning, implementing and evaluating organizational experiments. But more importantly, dedicating facilitators to apply a ‘just-in-time’ approach to transferring tacit knowledge, supporting deep reflection, and encouraging immediate application can potentially influence double-loop organizational learning and improved organizational performance.
References


Backer,


Heugens, P., & van Oosterhout, J. (2001). To boldly go where no man has gone before: Integrating cognitive and physical features in scenario studies. *Futures, 33*(10), 861-872. doi:10.1016/S0016-3287(01)00023-4


Murphy, S. E., & Dowling, J. (2002). The rush to measure outcomes: Process evaluation and return on investment; how process evaluation has been used to enhance ROI in a statewide parenting project for youth at risk for tobacco, alcohol, and drug use. The Public Manager, 31(2), 39.


## Appendix A
### Semi-Structured Interview Guide

<table>
<thead>
<tr>
<th>Question</th>
<th>Addresses Proposition(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is your role with respect to the pilot project?</td>
<td>2-14</td>
</tr>
<tr>
<td>2. When did the pilot begin? Where are you currently at with respect to guideline implementation?</td>
<td>1</td>
</tr>
<tr>
<td>3. Please tell me about your experience with piloting the guideline.</td>
<td>All</td>
</tr>
<tr>
<td>4. Can you tell me about your pilot project, what it involved and what happened over time (e.g., activities, processes, stages, timing, etc.)?</td>
<td>All</td>
</tr>
<tr>
<td>- <em>For each aspect of the pilot project, did you gain any new knowledge? Based on this new knowledge, what were your thoughts about what to do next?</em></td>
<td></td>
</tr>
<tr>
<td>- <em>Did you carry out these thoughts with action? Why? Or did you choose to continue on as planned? Why?</em></td>
<td></td>
</tr>
<tr>
<td>5. a. <em>What impact did the pilot have on you? On your thoughts? On your assumptions? On your actions? On the thoughts and actions of the others involved in the pilot or on your nursing unit?</em></td>
<td>1-6</td>
</tr>
<tr>
<td>b. What did you learn during your guideline pilot? (Note 1: ask about learning during initiation, implementation and results stages if not brought up by informant and also how learning at one stage led to or was linked to learning at later stages) (Note 2: ask the program manager/administrator whether they learned about the financial impact of implementing the guideline in their organization).</td>
<td></td>
</tr>
<tr>
<td>6. a. <em>Were any changes made during the course of the pilot project (e.g., to the CPG, piloting process, learning mechanisms, nursing unit, etc.)? What changes were made (i.e., probe for whether changes made to procedures, policies, objectives, goals, assumptions)? Why were these changes made?</em></td>
<td>All</td>
</tr>
<tr>
<td>b. <em>If NO changes were made, were any NEEDED but NOT made? Why were changes NOT made?</em></td>
<td></td>
</tr>
<tr>
<td>c. <em>Did you agree to or go along with these changes (Note: assessing for Double-loop learning) or did you continue on with what you were doing? (Note: assessing for Single-loop learning)</em></td>
<td></td>
</tr>
<tr>
<td>8. What aspects of the pilot do you feel helped you learn about and apply the CPG? (Note: probe for the following if not brought up by informant. Also probe for timing of manifestation during the piloting process).</td>
<td>2-14</td>
</tr>
<tr>
<td>a. Were any assessments made of the potential impact of the new...</td>
<td></td>
</tr>
</tbody>
</table>
guideline as compared to existing practice at the onset of the pilot project process (Note: probe for relative advantage, compatibility, complexity, observability, trialability if not mentioned by informant)? What activities were involved in assessing the impact of the guideline? Were these assessments helpful (Note: probe for observability and trialability)? Why or why not?

b. Did any project participants have previous experience with implementing guidelines? What were their roles? When were they involved in the pilot? Was the work of this/these individual(s) helpful for learning about guideline implementation? Why or why not?

c. Was there a designated facilitator for the pilot? What was his/her role? Was the facilitator helpful in facilitating learning about the guideline? Why/why not?

d. Were any materials or tools provided to you to assist with learning about the practice guideline? Were these helpful for learning? Why or why not?

e. Did you receive any training or were you provided with any opportunities to practice with using the guideline during the pilot project? Were these helpful for learning about guideline implementation? Why or why not?

f. Were you involved with any meetings or discussions about the practice guideline? What was the purpose of these meetings? Were these sessions helpful for learning about guideline implementation? Why or why not?

g. Were any mechanisms in place to help resolve problems or issues with guideline implementation? *What types of problems were identified? What was done, if anything about these problems? If yes, did your thoughts, assumptions, or actions change as a result of addressing these issues? Why or why not? Did these mechanisms help you learn? Why or why not?*

h. Was the outcome of the guideline evaluated at the end of the pilot project process? *How were the outcomes evaluated? Have you seen this information? What did you think of this information? Did you do think differently or do anything differently as a result of this information? Were these activities useful for learning about the guideline? Why or why not?*

i. *Are there any other activities, processes, structures, etc. that impacted your knowledge about the CPG or the way in which you implemented the guideline? How did these mechanisms...*
<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Which aspects of the pilot were the MOST VALUABLE to you from a learning perspective? On a scale of 1 to 10, how would you rate each of the aspects in terms of how much they contributed to your learning? Please explain your ratings (i.e., why you rated the aspects this way).</td>
<td>All</td>
</tr>
<tr>
<td>10. What aspects of the pilot were NOT beneficial to learning about guideline implementation.</td>
<td>All</td>
</tr>
<tr>
<td>11. How could you have learned more from the pilot project? What could have been done to improve your learning about guideline implementation (e.g., activities, tools, processes, structures, etc.)? Why?</td>
<td>All</td>
</tr>
<tr>
<td>12. Overall, how would you summarize what you learned from the pilot and what aspects were most beneficial for learning?</td>
<td>All</td>
</tr>
<tr>
<td>13. What advice would you provide to other organizations so that they can learn the most from piloting a nursing best practice guideline?</td>
<td>All</td>
</tr>
<tr>
<td>14. *What did you learn about how yourself in terms of how you like to learn about new knowledge such as the clinical practice guideline? What about others? What did you learn about how they preferred to learn about the guideline? (Note: Probing for Triple loop learning)</td>
<td>All</td>
</tr>
<tr>
<td>15. Did you proceed with guideline implementation after the pilot? Why or why not?</td>
<td>For Context Only</td>
</tr>
</tbody>
</table>
Appendix B
Organizational Learning Examples

Examples of single, double, and triple-loop organizational learning pertaining to the pilot implementation of clinical practice guidelines in acute care nursing units.

<table>
<thead>
<tr>
<th>Single-Loop Learning</th>
<th>Double-Loop Learning</th>
<th>Triple-Loop Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>The nursing unit without question accepts the benefits of the CPG.</td>
<td>The nursing unit reviews the CPG in detail and questions the benefits and drawbacks of the CPG at length.</td>
<td>The nursing unit identifies members’ preferences for learning about the CPG.</td>
</tr>
<tr>
<td>The CPG is adopted by the nursing unit either without or with minor changes to it.</td>
<td>The CPG is dramatically revised to take into consideration the specific nursing unit environment.</td>
<td>The nursing unit identifies activities that prevent learning about the CPG.</td>
</tr>
<tr>
<td>When problems arise, the nursing unit makes quick fixes to its existing practices in an attempt to align with the CPG.</td>
<td>Based on CPG implementation experience, nursing unit values and norms are discussed, challenged and altered.</td>
<td>The nursing unit revises existing processes for learning about the CPG based on an understanding of what is effective for fostering learning.</td>
</tr>
<tr>
<td>Nursing unit values and norms are not discussed and challenged.</td>
<td>Nursing unit policies are developed or revised to ensure alignment with the CPG.</td>
<td>The nursing unit establishes new processes for learning about the CPG based on an understanding of what is effective for fostering learning.</td>
</tr>
<tr>
<td>The policies, and goals/objectives of CPG implementation (e.g., the entire nursing unit will practice according to the CPG) remain the same by the end of the pilot project.</td>
<td>Problems that arise are discussed to identify their root causes and solutions are developed and tested for effectiveness.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The goals/objectives of CPG implementation are revised to take into consideration new information (e.g., it is not feasible to practice according to the CPG in every instance due to certain circumstances)</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix C
### Individual Case Descriptions

**PILOT PROJECT 1**

### A. Characteristics of Organization

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization type</td>
<td>Acute care teaching hospital</td>
</tr>
<tr>
<td>Size</td>
<td>406 beds</td>
</tr>
</tbody>
</table>
| Other Features                 | - RNAO “Spotlight Organization”; implementation of several other guidelines  
                                  - UHN Corporate Pain Team consisting of 85 nurses across the organization (2007); provided 3-4 day education session |

### B. Characteristics of Nursing Unit

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Unit</td>
<td>Inpatient Surgery</td>
</tr>
<tr>
<td>Beds</td>
<td>28</td>
</tr>
<tr>
<td>Other Features</td>
<td>4 Pain Resource Nurses for the unit</td>
</tr>
</tbody>
</table>

### C. Characteristics of Organizational Experiment/Pilot

#### Aspects Influencing Organizational Learning (Processes/Activities & Structural Mechanisms)

<table>
<thead>
<tr>
<th>General Description of Process</th>
<th>Details</th>
</tr>
</thead>
</table>
|                                | 2 years  
                                | Ongoing, continuous, fluid  
                                | Implementation and results stages overlapping and circular |

### Initiation Stage

<table>
<thead>
<tr>
<th>Activities:</th>
<th>Details</th>
</tr>
</thead>
</table>
|                                  | Committee assessed relative advantage, relevancy and compatibility of guideline; selection of pain assessment tool as most feasible, least complex model to implement  
|                                  | Implemented subset of guideline |

#### Structural Mechanisms:

- Human Resources: Pilot project manager, Corporate Pain Management Team
- Financial Resources: Project manager, nursing education funds

### Implementation Stage

<table>
<thead>
<tr>
<th>Education Activities</th>
<th>Details</th>
</tr>
</thead>
</table>
|                                  | RNAO Workshop  
                                  | Newsletter  
                                  | In-Services/lunch and learns  
                                  | Pamphlets  
                                  | In-person follow-up  
                                  | Laminated pocket cards (tool)  
                                  | eLearning Module |

#### Formative Evaluation Activities/Mechanisms:

- Chart Audits (every 6 months)
<table>
<thead>
<tr>
<th>Results Stage</th>
<th>Ongoing monitoring &amp; implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation Activities/Mechanisms:</td>
<td></td>
</tr>
<tr>
<td>▪ Patient satisfaction survey</td>
<td></td>
</tr>
<tr>
<td>▪ Chart audits (every 6 months)</td>
<td></td>
</tr>
<tr>
<td>▪ Corporate balanced scorecard</td>
<td></td>
</tr>
<tr>
<td>▪ Report prepared for RNAO</td>
<td></td>
</tr>
</tbody>
</table>

**Structural Mechanisms Influencing Organizational Learning**

<table>
<thead>
<tr>
<th>Human Resources</th>
<th>Pilot project manager, Corporate Pain Management Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Resources</td>
<td>Nursing education funds</td>
</tr>
</tbody>
</table>
## PILOT PROJECT 2

### A. Characteristics of Organization

<table>
<thead>
<tr>
<th>Organization type</th>
<th>Multi-site hospital with acute care, mental health and long-term care facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>939 beds</td>
</tr>
</tbody>
</table>

### B. Characteristics of Nursing Unit

<table>
<thead>
<tr>
<th>Type of Unit</th>
<th>Palliative Care/ Oncology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beds</td>
<td>22</td>
</tr>
</tbody>
</table>

### C. Characteristics of Organizational Experiment/Pilot

#### Aspects Influencing Organizational Learning (Processes/Activities & Structural Mechanisms)

<table>
<thead>
<tr>
<th>General Description</th>
<th>Length: 3 months</th>
</tr>
</thead>
</table>

**Initiation Stage**

- **Assessment Activities**
  - Pilot leaders assessed guideline based on their own experience of what they would do themselves
  - Development of pain assessment tool

- **Evaluation Activity/Mechanisms**
  - Questionnaire to determine baseline knowledge of staff

**Implementation Stage**

- **Education Activities:**
  - RNAO workshop
  - In-services
  - Flyers/pamphlets
  - Staff meetings
  - Teaching manual

- **Formative Evaluation Activities/Mechanisms:**
  - Questionnaire re: satisfaction with tool
  - Chart audits
  - Verbal conversations

**Results Stage**

- No activities or mechanisms found

#### Structural Mechanisms Influencing Organizational Learning

<table>
<thead>
<tr>
<th>Human Resources</th>
<th>Lack of experience of pilot leader with implementing guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lack of project management and evaluation skill and ability</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Financial Resources/ Time</th>
<th>Lack of dedicated time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lack of time for nurses to attend education</td>
</tr>
</tbody>
</table>

#### Other Aspects Influencing Organizational Learning

<table>
<thead>
<tr>
<th>Corporate Direction</th>
<th>Lack of direction/expectations for pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Competing/duplicative organizational priorities resulting in lack of agreement/buy-in from staff, senior management</td>
</tr>
</tbody>
</table>
## PILOT PROJECT 3

### A. Characteristics of Organization

<table>
<thead>
<tr>
<th>Organization type</th>
<th>Community Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>450 beds</td>
</tr>
</tbody>
</table>

### B. Characteristics of Nursing Unit

<table>
<thead>
<tr>
<th>Type of Unit</th>
<th>Inpatient Surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beds</td>
<td>65 beds</td>
</tr>
</tbody>
</table>

### C. Characteristics of Organizational Experiment/Pilot

#### Aspects Influencing Organizational Learning (Processes/Activities & Structural Mechanisms)

| General Description | Length: 6 months  
|---------------------|-------------------|
|                     | Ongoing, continuous improvement process, ongoing: “tweak things as you go or add additional”  
|                     | Corporate pain service consisting of 2 RN’s |
| Initiation Stage    | Purpose of pilot is formalization of what already doing  
|                     | Committee of 6 nurses across the organization reviewed guideline and chose 6 recommendations to implement |
| Implementation Stage| Education Activities:  
|                     | RNAO Workshop  
|                     | Orientation package  
|                     | Newsletter  
|                     | Informal in-services |
|                     | Formative Evaluation Activities/Mechanisms:  
|                     | Patient satisfaction survey  
|                     | Informal, verbal feedback  
|                     | Patient rounds  
|                     | Incorporated material into orientation package |
| Results Stage       | No activities or mechanisms found  
|                     | Recognition of need for goals, objectives and timelines (implementation plan)  
|                     | Recognition of need for experienced pilot leader, champions, team approach  
|                     | Recognition of need to track and trend outcomes |

#### Structural Mechanisms Influencing Organizational Learning

<table>
<thead>
<tr>
<th>Human Resources</th>
<th>Education, experience and other characteristics of pilot project leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Resources</td>
<td>Time required to attend education - short staffed</td>
</tr>
<tr>
<td>Other Hospitals</td>
<td>Called other hospitals to learn about protocol</td>
</tr>
<tr>
<td>Other Aspects Influence Organizational Learning</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Corporate Support</strong></td>
<td></td>
</tr>
<tr>
<td>• Cross-organization representation on committee supported buy-in</td>
<td></td>
</tr>
<tr>
<td>• Pain service nurses/ pain team are champions for the guideline</td>
<td></td>
</tr>
</tbody>
</table>
**PILOT PROJECT 4**

<table>
<thead>
<tr>
<th>A. Context - Characteristics of Organization</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization type</td>
<td>Community Hospital</td>
</tr>
<tr>
<td>Size</td>
<td>450 beds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Context - Characteristics of Nursing Unit</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Unit</td>
<td>Intensive Care Unit</td>
</tr>
<tr>
<td>Beds</td>
<td>14 beds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. Characteristics of Organizational Experiment/Pilot</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspects Influencing Organizational Learning (Processes/Activities &amp; Structural Mechanisms)</td>
<td></td>
</tr>
<tr>
<td>General Description</td>
<td>Length: 1 year</td>
</tr>
<tr>
<td>Initiation Stage</td>
<td>Assessment Activities</td>
</tr>
<tr>
<td></td>
<td>Committee reviewed guideline and selected recommendations to pilot</td>
</tr>
<tr>
<td>Implementation Stage</td>
<td>Education Activities</td>
</tr>
<tr>
<td></td>
<td>“Skills Fair” including presentations and display of pain medication devices for hands-on practice</td>
</tr>
<tr>
<td></td>
<td>In-services</td>
</tr>
<tr>
<td></td>
<td>Formative Evaluation Activities/Mechanisms:</td>
</tr>
<tr>
<td></td>
<td>Patient satisfaction survey</td>
</tr>
<tr>
<td></td>
<td>Informal, verbal feedback</td>
</tr>
<tr>
<td></td>
<td>Patient rounds</td>
</tr>
<tr>
<td></td>
<td>Brought issues to committee for discussion and resolution</td>
</tr>
</tbody>
</table>

| Results Stage                                        | No activities or mechanisms found |

<table>
<thead>
<tr>
<th>Structural Mechanisms Influencing Organizational Learning</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Resources</td>
<td>Time to attend in-services and “Skills Fair”</td>
</tr>
<tr>
<td>Other departments</td>
<td>Committee gives broader view of issues</td>
</tr>
<tr>
<td></td>
<td>Learning what’s happening in other departments</td>
</tr>
</tbody>
</table>
### PILOT PROJECT 5

#### A. Characteristics of Organization

<table>
<thead>
<tr>
<th>Organization type</th>
<th>Acute care teaching hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>846</td>
</tr>
</tbody>
</table>

#### B. Characteristics of Nursing Unit

<table>
<thead>
<tr>
<th>Type of Unit</th>
<th>General Internal Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beds</td>
<td>54</td>
</tr>
</tbody>
</table>

#### C. Characteristics of Organizational Experiment/Pilot

**Aspects Influencing Organizational Learning (Processes/Activities & Structural Mechanisms)**

| General Description | ▪ Length: 1 year  
▪ Ongoing process: “once it’s piloted, we just keep doing it until we get the feedback on whether it will work” |
|---------------------|--------------------------------------------------|
| Initiation Stage    | ▪ Developed 1 page with pain scales and pain score  
▪ Committee reviewed guideline and selected recommendations |
| Implementation Stage| Education activities:  
▪ Short in-services  
▪ Informal meetings |
|                     | Formative Evaluation Activities/Mechanisms:  
▪ Patient satisfaction  
▪ Time of delivery assessment  
▪ Random chart audits  
▪ Patient “rounding” at beginning  
▪ Informal verbal check-in with staff “how’s it going” |
| Results Stage       | ▪ No activities or mechanisms found |

**Structural Mechanisms Influencing Organizational Learning**

| Human Resources | ▪ Characteristics of pilot leader: experienced, expert  
▪ 1:1 support good, not to just talk about it |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Resources</td>
<td>▪ Need more time; lunch and learns are incentives for people to go</td>
</tr>
</tbody>
</table>
### PILOT PROJECT 6

#### A. Characteristics of Organization

<table>
<thead>
<tr>
<th>Organization type</th>
<th>Acute care teaching hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>846</td>
</tr>
</tbody>
</table>

#### B. Characteristics of Nursing Unit

<table>
<thead>
<tr>
<th>Type of Unit</th>
<th>General Internal Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beds</td>
<td>60</td>
</tr>
</tbody>
</table>

#### C. Characteristics of Organizational Experiment/Pilot

##### Aspects Influencing Organizational Learning

(Activities & Structural Mechanisms)

<table>
<thead>
<tr>
<th>General Description</th>
<th>• Length: approximately 2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiation Stage</td>
<td>• Committee reviewed guideline and selected relevant recommendations</td>
</tr>
<tr>
<td></td>
<td>• Developed a pain assessment tool with pain scales and “graphics sheet” to document pain scores</td>
</tr>
<tr>
<td></td>
<td>• Usage of pain scales and graphic tools indicate learning</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Implementation Stage</th>
<th>Education:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Posters</td>
</tr>
<tr>
<td></td>
<td>• Industry sponsored lunch and learns</td>
</tr>
<tr>
<td></td>
<td>• Informal, ‘walk around’ in-services</td>
</tr>
<tr>
<td></td>
<td>• Presentation</td>
</tr>
<tr>
<td>Formative Evaluation Activities/Mechanisms:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Pre-post chart audits</td>
</tr>
<tr>
<td></td>
<td>• Incidental audits</td>
</tr>
</tbody>
</table>

| Results Stage                   | • No formal activity, processes, tools, etc. observed at the conclusion |

##### Structural Mechanisms Influencing Organizational Learning

<table>
<thead>
<tr>
<th>Human Resources</th>
<th>• Designated facilitators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Detractor: unit is chaotic; staff is overwhelmed with change</td>
</tr>
<tr>
<td></td>
<td>• Champions/buy-in</td>
</tr>
</tbody>
</table>

| Financial Resources            | • Funding of nurse education |

| Other                          | • Planning ahead of time (e.g. evaluation, sustainability) |
### PILOT PROJECT 7

#### A. Characteristics of Organization

<table>
<thead>
<tr>
<th>Organization type</th>
<th>Community Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>155 beds</td>
</tr>
<tr>
<td>Other Aspects</td>
<td>RNAO “Spotlight Organization”; implementation of several other guidelines</td>
</tr>
</tbody>
</table>

#### B. Characteristics of Nursing Unit

<table>
<thead>
<tr>
<th>Type of Unit</th>
<th>Complex Continuing Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beds</td>
<td>42</td>
</tr>
</tbody>
</table>

#### C. Characteristics of Organizational Experiment/Pilot

**Aspects Influencing Organizational Learning (Processes/Activities & Structural Mechanisms)**

<table>
<thead>
<tr>
<th>General Description</th>
<th>Length: 2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiation Stage</td>
<td>6 RNs and RPNs representing various programs in hospital reviewed guideline</td>
</tr>
<tr>
<td></td>
<td>Developed policy on pain assessment</td>
</tr>
<tr>
<td></td>
<td>Developed pain scales</td>
</tr>
<tr>
<td></td>
<td>Developed self-learning package</td>
</tr>
<tr>
<td></td>
<td>Electronic documentation</td>
</tr>
<tr>
<td></td>
<td>Quiz to evaluate knowledge level</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Implementation Stage</th>
<th>Education:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Skills Fair</td>
</tr>
<tr>
<td></td>
<td>Self-learning package</td>
</tr>
<tr>
<td></td>
<td>Lunch and learns</td>
</tr>
<tr>
<td></td>
<td>Informal continuing education</td>
</tr>
<tr>
<td></td>
<td>Flyers and posters for patients</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Formative Evaluation Activities/Mechanisms:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audits</td>
</tr>
<tr>
<td>“computer documentation” gives opportunity to see progress: “when I go into the document for my shift, I can see when the last time the pain scale was documented”</td>
</tr>
</tbody>
</table>

| Results Stage | No formal activity, processes, tools, etc. observed at the conclusion of the pilot |

**Structural Mechanisms Influencing Organizational Learning**

<table>
<thead>
<tr>
<th>Human Resources</th>
<th>Late Career Nurses – champions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Resources</td>
<td>Late Career Nursing funding</td>
</tr>
<tr>
<td></td>
<td>Need time for staff</td>
</tr>
<tr>
<td></td>
<td>1:1 support from nurses – “just thought it was good that they came up to the unit with their binder and sat down and just went through it with us”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other</th>
<th>Set up timeline, selected implementation day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mandatory Nursing Fair: dedicate time</td>
</tr>
</tbody>
</table>
### PILOT PROJECT 8

#### A. Characteristics of Organization

<table>
<thead>
<tr>
<th>Organization type</th>
<th>Community Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>155 beds</td>
</tr>
<tr>
<td>Other Aspects</td>
<td>RNAO “Spotlight Organization”; implementation of several other guidelines</td>
</tr>
</tbody>
</table>

#### B. Characteristics of Nursing Unit

<table>
<thead>
<tr>
<th>Type of Unit</th>
<th>Oncology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beds</td>
<td>11</td>
</tr>
</tbody>
</table>

#### C. Characteristics of Organizational Experiment/Pilot

##### Aspects Influencing Organizational Learning (Activities & Structural Mechanisms)

<table>
<thead>
<tr>
<th>General Description</th>
<th>Length: 1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiation Stage</td>
<td>6 RNs and RPNs representing various programs in hospital reviewed guideline</td>
</tr>
<tr>
<td></td>
<td>Ad hoc approval of parts of the guideline by multi-disciplinary committee</td>
</tr>
<tr>
<td></td>
<td>Development of pain scale card</td>
</tr>
<tr>
<td>Implementation Stage</td>
<td>Education:</td>
</tr>
<tr>
<td></td>
<td>Nursing Fair – time and hands-on practice</td>
</tr>
<tr>
<td></td>
<td>1 to 10 Pain scale</td>
</tr>
<tr>
<td></td>
<td>In-service</td>
</tr>
<tr>
<td></td>
<td>Self-learning package</td>
</tr>
<tr>
<td></td>
<td>Orientation package</td>
</tr>
<tr>
<td>Formative Evaluation Activities/Mechanisms:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electronic documentation</td>
</tr>
<tr>
<td></td>
<td>Random audits</td>
</tr>
<tr>
<td>Results Stage</td>
<td>No formal activity, processes, tools, etc.</td>
</tr>
<tr>
<td></td>
<td>observed at the conclusion of the pilot</td>
</tr>
</tbody>
</table>

##### Structural Mechanisms Influencing Organizational Learning

<table>
<thead>
<tr>
<th>Human Resources</th>
<th>Champions - Late career nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Resources</td>
<td>Nursing Fair: time to learn</td>
</tr>
</tbody>
</table>
# Appendix D

## Cross-Case Comparisons/ Descriptive Grids: Stages and Processes

<table>
<thead>
<tr>
<th>Case</th>
<th>Initiation Stage Activities</th>
<th>Implementation Stage Activities</th>
<th>Results Stage Activities</th>
<th>Within-Case Themes – Stages and Activities Influencing Organizational Learning</th>
</tr>
</thead>
</table>
| Case 1 | Committee assessed relevancy and compatibility of guideline; selection of pain assessment tool as most feasible model to implement | Education Activities  
- RNAO Workshop  
- Newsletter  
- In-Services/lunch and learns  
- Pamphlets  
- In-person follow-up  
- Laminated pocket cards (tool)  
- eLearning Module  

**Evaluation:**  
- Chart Audits (every 6 months) | Patient satisfaction survey  
- Chart audits (every 6 months)  
- Results fed into Corporate balanced scorecard  
- Report to RNAO | - Complex implementation stage  
- Assessment of attributes of new knowledge  
- Absorptive capacity and facilitation by Acute Pain Service valuable resource for encouraging organizational learning  
- Range of education activities  
- Several formal evaluation mechanisms but process of reviewing and using results to make improvements was relatively informal  
- Usage of evaluation mechanisms during results stage but no review against goals as specific goals were not set  
- Single-loop learning  
- Potential double-loop |
<table>
<thead>
<tr>
<th>Case</th>
<th>Initiation Stage Activities</th>
<th>Implementation Stage Activities</th>
<th>Results Stage Activities</th>
<th>Within-Case Themes – Stages and Activities Influencing Organizational Learning</th>
</tr>
</thead>
</table>
| Case 2 | ▪ Questionnaire to determine knowledge of staff  
▪ Pilot leaders assessed guideline based on experience  
▪ Development of pain assessment tool | Education:  
▪ RNAO workshop  
▪ In-services  
▪ Flyers/pamphlets  
▪ Staff meetings  
▪ Teaching manual  
Evaluation:  
▪ Questionnaire re: satisfaction with tool  
▪ Verbal conversations | No activities or structural mechanisms observed | ▪ Range of education approaches developed and used  
▪ Obtained feedback on tool and provided some education but pilot cut short after some revisions made to the tool  
▪ Lack of corporate direction/support combined with inexperienced pilot project leaders resulted premature conclusion of pilot  
▪ No summative evaluation  
▪ Single-loop learning |
| Case 3 | ▪ Purpose of pilot is formalization of what already doing  
▪ Committee of 6 nurses across the organization reviewed guideline and | Education:  
▪ RNAO Workshop  
▪ Orientation package  
▪ Newsletter  
▪ Informal in-services  
Feedback: | No activity, processes, tools, etc. observed at the conclusion of the pilot | ▪ Committee valuable for cross-organization support of which recommendations to implement  
▪ Continuous education using different approaches |
### PILOT PROJECT
STAGES & PROCESSES INFLUENCING ORGANIZATIONAL LEARNING

<table>
<thead>
<tr>
<th>Case</th>
<th>Initiation Stage Activities</th>
<th>Implementation Stage Activities</th>
<th>Results Stage Activities</th>
<th>Within-Case Themes – Stages and Activities Influencing Organizational Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>chose 6 recommendations to implement</td>
<td>Patient satisfaction survey</td>
<td>No specific activity, processes, tools, etc. observed at the conclusion of the pilot</td>
<td>Committee very valuable for reviewing pain management practices and identifying improvements that need to be made</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Informal, verbal feedback</td>
<td></td>
<td>Time away to attend “Skills Fair” very valuable for practicing skills related to pain medication administration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patient rounds</td>
<td></td>
<td>No summative evaluation</td>
</tr>
<tr>
<td>Case 4</td>
<td>Committee reviewed guideline recommendations and selected ones to pilot</td>
<td>Education:</td>
<td></td>
<td>Single-loop learning</td>
</tr>
<tr>
<td></td>
<td>Developed a 3-level protocol that is incorporated into the medication order sheet</td>
<td>“Skills Fair” including presentations and display of pain medication devices for hands-on practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>In-services</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Feedback:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patient satisfaction survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Informal, verbal feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patient rounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brought issues to committee for discussion and resolution</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### PILOT PROJECT
**STAGES & PROCESSES INFLUENCING ORGANIZATIONAL LEARNING**

<table>
<thead>
<tr>
<th>Case</th>
<th>Initiation Stage Activities</th>
<th>Implementation Stage Activities</th>
<th>Results Stage Activities</th>
<th>Within-Case Themes – Stages and Activities Influencing Organizational Learning</th>
</tr>
</thead>
</table>
| Case 5 | - Developed 1 page with pain scales and pain score  
- Committee reviewed guideline and selected recommendations | Education:  
- Short in-services  
- Informal meetings  
Feedback:  
- Patient satisfaction  
- Time of delivery assessment  
- Random chart audits  
- Patient “rounding” at beginning  
- Informal verbal check-in with staff “how’s it going” | No formal activity, processes, tools, etc. observed at the conclusion of the pilot although participants said that these would have been helpful | - Consistency in tracking adoption  
- Time  
- Informal formative evaluation  
- No summative evaluation  
- Single-loop learning |
| Case 6 | - Committee reviewed guideline and selected relevant recommendations  
- Developed a pain assessment tool with pain scales and “graphics sheet” to document pain scores | Education:  
- Posters  
- Industry sponsored lunch and learns  
- Informal, ‘walk around’ in-services  
- Presentation  
Feedback:  
- Incidental audits | No formal activity, processes, tools, etc. observed at the conclusion of the pilot although participants state that survey of tool usage and documentation good | - Various approaches used for education  
- Ad hoc chart audits  
- Single-loop learning |
| Case 7 | - 6 RNs and RPNs representing various programs in hospital reviewed guideline | Education:  
- Skills Fair  
- Self-learning package  
- Lunch and learns | No formal activity, processes, tools, etc. observed at the conclusion of the pilot | - Informal continual education  
- Informal formative evaluation |
<table>
<thead>
<tr>
<th>Case</th>
<th>Initiation Stage Activities</th>
<th>Implementation Stage Activities</th>
<th>Results Stage Activities</th>
<th>Within-Case Themes – Stages and Activities Influencing Organizational Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>▪ Ad hoc approval of parts of the guideline by multi-disciplinary committee&lt;br&gt;▪ Looked at current gaps; examined feasibility&lt;br&gt;▪ Developed policy on pain assessment&lt;br&gt;▪ Developed pain scales&lt;br&gt;▪ Developed self-learning package&lt;br&gt;▪ Electronic documentation&lt;br&gt;▪ Quiz to evaluate knowledge level</td>
<td>▪ Informal continuing education&lt;br&gt;▪ Flyers and posters for patients&lt;br&gt;Feedback: ▪ Audits</td>
<td>▪ No formal activity, processes, tools, etc. observed at the conclusion of the pilot</td>
<td>▪ No summative evaluation&lt;br&gt;▪ Single-loop learning&lt;br&gt;▪ Potential double-loop learning</td>
</tr>
<tr>
<td>Case 8</td>
<td>▪ 6 RNs and RPNs representing various programs in hospital reviewed guideline&lt;br&gt;▪ Ad hoc approval of parts of the guideline by multi-disciplinary committee&lt;br&gt;▪ Development of pain scale card</td>
<td>Education: ▪ Nursing Fair – time and hands-on practice&lt;br&gt;▪ 1 to 10 Pain scale&lt;br&gt;▪ In-service&lt;br&gt;▪ Self-learning package&lt;br&gt;▪ Orientation package&lt;br&gt;Feedback: ▪ Electronic documentation&lt;br&gt;▪ Random audits</td>
<td>No formal activity, processes, tools, etc. observed at the conclusion of the pilot</td>
<td>▪ Late career nurses were champions – helped to convert explicit to tacit knowledge and shared tacit knowledge – facilitated deeper individual level learning&lt;br&gt;▪ Technology assisted with capturing information on guideline compliance&lt;br&gt;▪ Time to attend nursing fair&lt;br&gt;▪ Single-loop learning</td>
</tr>
<tr>
<td>Case</td>
<td>Initiation Stage Activities</td>
<td>Implementation Stage Activities</td>
<td>Results Stage Activities</td>
<td>Within-Case Themes – Stages and Activities Influencing Organizational Learning</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------</td>
<td>---------------------------------</td>
<td>--------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cross Case</td>
<td></td>
<td></td>
<td></td>
<td>• Potential double-loop learning</td>
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<td>Themes</td>
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<td></td>
<td>• Small subset of new knowledge selected for pilot</td>
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<td></td>
<td>• Complex implementation process</td>
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<td></td>
<td>• Range of education approaches used – both passive and active</td>
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<td></td>
<td>• Ad hoc/informal follow-up/formative evaluation primarily by individuals</td>
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<td></td>
<td>• Summative evaluation activities for a minority of the cases</td>
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<td></td>
<td>• Primarily single-loop learning</td>
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<tr>
<td></td>
<td>• Potential for double-loop learning</td>
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### Appendix E
Cross-Case Comparisons/ Descriptive Grids: Structural Mechanisms

<table>
<thead>
<tr>
<th>Case</th>
<th>Structural Mechanisms</th>
<th>Within-Case Themes: Structural Mechanisms Influencing Organizational Learning</th>
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</thead>
</table>
| **Case 1** | • Guideline review and recommendations selection committee  
  • Corporate goal, part of balanced scorecard  
  • Corporate Pain Team/Resource Nurses on the unit  
  • CPG Project Manager  
  • Budget for project manager, nursing education funds, industry support for education | • Committee, Corporate Pain Group supported the pilot  
  • Project manager was key to success of pilot  
  • Funds available for nurse education during the pilot  
  • Corporate support and linkages supported the pilot |
| **Case 2** | • Lack of organization-wide committee  
  • Lack of direction for initiative; competing initiatives  
  • Lack of agreement/buy-in from staff, senior management  
  • Lack of dedicated time and experience of pilot leader with implementing guideline  
  • Lack of time for nurses to attend education | • Intra-disciplinary/cross-departmental committee required for getting organization support  
  • Skills and abilities of pilot leaders lacking  
  • Lack of time for nurse education  
  • Lack of clear direction/expectations from corporate  
  • Lack of organization champion |
| **Case 3** | • Guideline review and recommendations selection committee  
  • Pain service nurses/pain team are champions for the guideline  
  • Education, experience and other characteristics of pilot project leader  
  • Time required to attend education short staffed  
  • Called other hospitals to learn about protocol development | • Committee very valuable for different perspectives; Pain service important champions for staff—expertise, good educators, availability, familiarity, trustworthiness  
  • Time and financial to back fill nurses |
<table>
<thead>
<tr>
<th>Case</th>
<th>Structural Mechanisms</th>
<th>Within-Case Themes: Structural Mechanisms Influencing Organizational Learning</th>
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<tbody>
<tr>
<td>Case 4</td>
<td>• Guideline review and recommendations selection committee</td>
<td>• Committee to learn about and resolve issues; Acute Pain Service leadership/facilitation effective for knowledge transfer</td>
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<td></td>
<td>• Characteristics of pilot leader – experience, “go-getter”, dynamic, energetic, approachable, personable, qualified, “do-er”</td>
<td>• Skills Fair good for new knowledge or validation of knowledge as well as hands-on practice</td>
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<td></td>
<td>• Time to attend in-services and “Skills Fair”</td>
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<td></td>
<td>• Committee gives broader view of issues</td>
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<td></td>
<td>• Learning what’s happening in other departments</td>
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<td>Case 5</td>
<td>• Characteristics of pilot leader: experienced, expert</td>
<td>• Experienced and skilled pilot project leader</td>
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<td>• 1:1 support good, not to just talk about it</td>
<td>• Time required for learning</td>
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<td></td>
<td>• Need more time; lunch and learns are incentives for people to go</td>
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<td>Case 6</td>
<td>• Committee reviewed guideline and selected relevant recommendations</td>
<td>• Lacking dedicated pilot project leader</td>
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<td>• Champions/buy-in; Need to get super-users</td>
<td>• Competing priorities on unit</td>
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<td>Case 7</td>
<td>• Committee reviewed guideline and selected relevant recommendations</td>
<td>• Technology/documentation important for helping them keep track</td>
</tr>
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<td>• Late Career Nurses – champions</td>
<td>• Staff do not have time to attend in-services; nursing fair provided time and good for practice</td>
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<td></td>
<td>• Late Career Nursing Funding from the Ministry of Health and Long-Term Care</td>
<td>• Facilitators played a supportive role</td>
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<td>• Need time for staff</td>
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<td></td>
<td>• Mandatory Nursing Fair = dedicated time</td>
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## PILOT PROJECT
### STRUCTURAL MECHANISMS INFLUENCING ORGANIZATIONAL LEARNING

<table>
<thead>
<tr>
<th>Case</th>
<th>Structural Mechanisms</th>
<th>Within-Case Themes: Structural Mechanisms Influencing Organizational Learning</th>
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</table>
| **Case 8** | • Committee reviewed guideline and selected relevant recommendations  
• Late career nurses  
• Nursing Fair – give you time | • Committee important for buy-in  
• Nursing fair provided an opportunity to practice; nurses covered  
• Late career nurses were key facilitators |
| **Cross Case Themes** | • Human resources: pilot project leaders, facilitators, corporate pain groups, committees  
• Financial resources/Time – required for nurses to attend education, learn about the guideline; funding for nurses to attend ‘nursing fair’.  
• Technology – electronic documentation  
• Corporate support for pilot |
Appendix F
List of Study Propositions

- **Proposition 1**: The organizational learning process of the organizational experiment is comprised of three stages: 1) initiation, 2) implementation, and 3) results.
- **Proposition 2**: Processes and structural mechanisms of the organizational experiment that allow for the assessment of the relative advantage of the new knowledge facilitate organizational learning (i.e., single and double-loop learning).
- **Proposition 3**: Processes and structural mechanisms of the organizational experiment that allow for the assessment of the compatibility of the new knowledge facilitate organizational learning.
- **Proposition 4**: Processes and structural mechanisms of the organizational experiment that allow for the assessment of the complexity of the new knowledge facilitate organizational learning.
- **Proposition 5**: Processes and structural mechanisms of the organizational experiment that allow for the observability of the impact of the new knowledge facilitate organizational learning.
- **Proposition 6**: Processes and structural mechanisms of the organizational experiment that allow for the trialability of the new knowledge facilitate organizational learning.
- **Proposition 7**: The involvement of individuals in the organizational experiment who have prior experience with implementing the new knowledge facilitates organizational learning.
- **Proposition 8**: The assignment of a dedicated facilitator to the organizational experiment is a structural mechanism that facilitates organizational learning.
- **Proposition 9**: Processes and structural mechanisms of the organizational experiment that capture and utilize tacit knowledge facilitate organizational learning.
- **Proposition 10**: Processes and structural mechanisms of the organizational experiment that capture and utilize explicit knowledge facilitate organizational learning.
- **Proposition 11**: Processes and structural mechanisms of the organizational experiment that convert knowledge from one form to another facilitate organizational learning.
- **Proposition 12**: Processes and structural mechanisms of the organizational experiment that allow for the gain of skills and practice with implementing the new knowledge facilitate organizational learning.
- **Proposition 13**: Processes and structural mechanisms of the organizational experiment that identify and resolve problems regarding the new knowledge facilitate organizational learning.
- **Proposition 14**: Processes and structural mechanisms that allow for summative evaluation of the organizational experiment facilitate organizational learning.
Appendix G
Glossary of Key Terms

Absorptive capacity – a term used to describe an organization’s ability to recognize the value of new knowledge and information, assimilate it, and apply it to make high-quality decisions (Cohen & Levinthal, 1990).

Bracketing – A procedure where personal views and past experience about the topic of study is identified, declared and set aside in order to allow findings to emerge from the data gathered (Jackson, 2003; Stewart and Mickunas, 1990).

Traditional standards of quality for qualitative research – standards developed by Lincoln & Guba (1985) and adhered to by the present study.
- Credibility - “the accuracy of the description of the phenomenon under investigation” (Jackson, 2002, p. 566).
- Dependability - “the stability and trackability of changes in the data over time and conditions” (Jackson, 2002, p. 566).
- Transferability - “concerned with the generalizability or fittingness of study findings to other settings, populations and contexts (Jackson, 2002, p. 574).
- Confirmability – “the objectivity of the data” (Jackson, 2002, p. 565).

Clinical Practice Guidelines – “systematically developed statements and recommendations to assist practitioner and patient decisions about appropriate health care for specific clinical conditions” that incorporate the best available evidence” (Institute of Medicine, 2002).

Experiential learning – Organizational learning through direct experience. Empirical research has consistently found that organizational learning through direct experience contributes positively to performance (Argote & Epple, 1990).

Facilitator – a person who is appointed specifically to the role of facilitation as opposed to an opinion leader, who through his or her reputation and influence acts as a change agent. The role may be internal or external (or both) while the change is being implemented. The role of the facilitator is to help and enable rather than tell or persuade (Harvey et al., 2002).

Innovation – the entity that was being implemented during the organizational experiment. For this study, the innovation was the “Pain Assessment and Management Best Practice Guideline (Revised 2007)” developed by the Registered Nurses Association of Ontario. The innovation was referred to as ‘new knowledge’ in this study.

Knowledge attributes – characteristics of the new knowledge or innovation (Rogers, 1983).
- Relative advantage - to the degree to which an innovation is perceived to better than an existing practice, using measures such as economic gain, social prestige, and savings in time and effort.
- Compatibility - the degree to which the innovation is perceived to meet the needs of the adopter. A high degree of compatibility is believed to lead to the adoption of the
innovation as it exists, while a low degree of compatibility may lead to modifications to the innovation in order to increase its compatibility or rejection altogether.

- **Complexity** - the degree to which an innovation is perceived as relatively difficult to understand and use.
- **Observability** - relates to the degree to which the results of an innovation can be readily seen by others.
- **Trialability** - the degree to which an innovation may be experimented with on a limited basis. Innovations that can be divided into smaller parts for trial have been found to be adopted by organizations at a greater rate.

**Organizational learning** – acquisition of knowledge about action-outcome relationships and the effect of the environment on those relationships” (Duncan & Weiss, 1979) and/or knowledge about the “associations between actions and their effectiveness” (Fiol and Lyles, 1985). Organizational learning is suggested to have occurred when there is evidence that knowledge has been gained through experience and/or when changes in behavior are a result of experience (Argote, 1993).

- **Single-loop organizational learning** - when an organization is presented with new knowledge indicating that assumptions may need to be questioned and fundamental change may be warranted but continues on with its previous actions, policies and objectives.
- **Double-loop organizational learning** - when new information influences an organization to modify its underlying assumptions, norms, policies and goals, leading to more fundamental changes in the way business is conducted (Argyris & Schon, 1978).
- **Triple-loop organizational learning** - also referred to as ‘meta-learning’ and ‘learning about learning’. An organization’s ability to learn about how and when they learn, as well as how and when they do not learn (Nutley & Davies, 2001).

**Organizational experiments** – intentional and systematic efforts to gather and analyze feedback in order to understand the association between adopting new knowledge and the results that are achieved (Huber, 1991). Organizational experiments are a method of ‘learning by doing’ (Argote, 1999). Organizational experiments are also referred to as ‘pilot projects’ or ‘pilots’ in this study. This study examined the **aspects** of the organizational experiments which includes: 1) **processes** and 2) **structural mechanisms**.

- **Aspects** – defined for this study as including processes and structural mechanisms that influence organizational learning (refer to below for definitions).
  1. **Processes** – defined for this study as one or more activities that organizational experiment participants engage in to learn about the new knowledge (e.g., training, mentoring, observation).
     - **Stages of the organizational experiment** – groups of organizational experiment processes that are similar in type of activity. For this study, it was proposed that organizational experiments consist of three stages:
       - **Initiation stage** - expected to include awareness of the new knowledge, attitude formation about the
knowledge, expectations about its outcomes, and the decision to proceed with implementation.

- **Implementation stage** proposed to include piloting activities and efforts to gauge the realized results of the new knowledge.

- **Results stage** – anticipated to involve knowledge gathering and decision making activities leading to a final decision about what to do with the new knowledge (i.e., full implementation, partial implementation, or no action).

2. **Structural mechanisms** – defined as including human (e.g., pilot project leader, pilot project participants, etc.), financial (e.g., dedicated budget), and technological resources (e.g., computer hardware and software, etc.) that are assigned to the pilot project.

**Pilot Project** – a type of organizational experiment. “An initial or small-scale effort designed to test an idea or working approach. Pilot projects are usually undertaken with the intention of replicating or widening the scale of implementation at a later stage” (Basler & Smit, 1997).

**Program evaluation** – activities that are completed to assess whether certain outcomes will be achieved due to the implementation of an innovation. The term ‘program’ may include any organizational action such as media campaigns, service provision, educational services, public policies, research projects, etc. (Centre for Disease Control and Prevention [CDC], 1999). A program evaluation usually involves an assessment of an innovation after its complete implementation to all of its intended recipients whereas an organizational experiment entails a trial-run of an innovation on a limited basis prior to its full implementation.

- **Formative program evaluation** - activities completing over the duration of a program to continuously assess, implement and monitor the success of changes to the program.
- **Summative program evaluation** - a determination after a period of time, whether the program should be continued or modified, whether no action should be taken for the time being, or whether it should be discontinued altogether.

**Process evaluation** – assessment of the implementation process of a program and how this process is linked to outcomes (Stecker & Linnan, 2002). Process evaluation can be used as a formative tool, to improve and refine programs while they are being implemented by helping to explain and interpret program outcomes (Helitzer et al., 1999; Israel et al., 1995; McGraw et al., 1994).

**Retentive capacity** – an organization’s ability to institutionalize and sustain usage of the new knowledge (Argote, 2000).

**Stickiness** – difficulties, problems or barriers experienced during the knowledge transfer process Szulanski (1996).