

School of Health Sciences, Jönköping University

# Improvement Capability at the Front Lines of Healthcare

Helping through Leading and Coaching

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# **Abstract**

This thesis addresses improvement capability at the front lines of healthcare with a focus on interprofessional health care improvement teams who provide care and improve care. The overall aim is to explore high performing clinical microsystems and evaluate interventions to cultivate health care improvement capabilities of frontline interprofessional teams.

## **Methods**

Descriptive and evaluative study designs were employed in the five studies that comprise this thesis. A total of 495 interprofessional health care providers from a variety of health care contexts in the United States (Study I, II, III & IV) and Sweden (Study V) participated in the studies. The mixed methods research included qualitative observation, interviews, focus groups and surveys analyzed with qualitative manifest content analysis. The quantitative data were analyzed with statistics appropriate for non-parametric data.

## **Findings**

Study I and II describe how leaders who understand health care improvement can create conditions for interprofessional teams to provide care and simultaneously improve care. Study III evaluates clinical microsystem processes and tools successfully adapted in two different hospitals. Frontline staff reported that they needed help to balance providing care and improving care. Study IV and V explored and tested team coaching to help interprofessional teams to increase their improvement capabilities

within improvement collaboratives. The participants perceived team coaching mostly positively and identified supportive coaching actions. In Study V, an intervention with “The Team Coaching Model” was tested in Sweden and showed increased acquisition of improvement knowledge in the intervention teams compared to teams who did not receive the coaching model.

## **Conclusions**

The thesis findings show leaders can help cultivate health care improvement capability by designing structures, processes and outcomes of their organizational systems to support health care improvement activities, setting clear improvement expectations of all staff, developing the knowledge of every staff member in the microsystem to know their operational processes and systems to promote action learning in their daily work, and providing help with team coaching using a Team Coaching Model.

# Original Studies

This thesis is based on the following papers, which are referred to by their Roman numerals in the text:

## Study I

Godfrey M.M., Nelson E.C., Wasson J.H., Mohr J.J., Batalden P.B.  
(2003) Microsystems in health care: Part 3. Planning patient-centered services. *Joint Commission Journal of Quality and Safety*, 29(4), 159-70.

## Study II

Huber T.P., Godfrey M.M., Nelson E.C., Mohr J.J., Campbell C., Batalden P.B.  
(2003) Microsystems in health care: Part 8. Developing people and improving work life: what front-line staff told us. *Joint Commission Journal of Quality and Safety*, 29(10), 512-22.

## Study III

Godfrey M.M., Melin C.N., Muething S.E., Batalden P.B., Nelson E.C. (2008)  
Clinical microsystems, Part 3. Transformation of two hospitals using microsystem, mesosystem and macrosystem strategies. *Joint Commission Journal of Quality and Patient Safety*, 34(10), 591-603.

## Study IV

Godfrey M.M., Andersson Gäre B., Nelson E.C., Nilsson M., Ahlström G.  
(2013) Coaching interprofessional health care improvement teams: The coachee, the coach and the leader perspectives. *Journal of Nursing Management*, DOI: 10.1111/jonm.12068.

## **Study V**

Godfrey M.M., Thor J., Nilsson M., Andersson Gäre B. (2013) Testing a Team Coaching Model to develop improvement capability of frontline teams: A comparative intervention and process evaluation pilot study; Manuscript submitted.

The articles have been reprinted with the kind permission of the respective journals.

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# Acknowledgements

The African proverb “it takes a village to raise a child” popularized by Hillary Clinton in her 1995 book, *It Takes a Village and Other Lessons Children Teach Us*, comes to mind when thinking about what it takes to “raise a doctoral student.” In my case, I would say, “it takes several countries, academic institutions, health care organizations, many colleagues, friends and a family to raise a doctoral student.”

I am indebted to more people that I can name. In light of this, I would like to offer my appreciation to the following “villages” and hope those who are not listed by name, know I include them in the various villages. The villages in the United States start with The Dartmouth Institute for Health Policy and Clinical Practice where I started my formal health care improvement education. Having the opportunity to study with Paul Batalden, Eugene Nelson, Gerry O’Connor, Jack Wennberg, Elliott Fisher and Stephen Plume provided me with a strong base to grow from. Being part of this innovative community has been exciting and filled with many opportunities, one being the opportunity to pursue my doctoral studies, and I am appreciative. Tina Foster has been supportive in so many ways as one of the leaders at TDI. Thank you Tina.

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I am a better person because of this doctoral experience. I will be forever grateful to Jönköping University for supporting my doctoral studies. I want to thank Gerd Ahlström, my main supervisor. As an American studying in Sweden, I'm sure I have given her many challenges. Her expertise and guidance has been invaluable and I will carry her lessons forward with me always. I am very grateful to Paula Lernstål-Da Silva, the PhD coordinator who has worked hard to keep me out of trouble. Paula your friendship and support means a lot to me. Thank you.

One last thought about Tim, my husband. We were talking one day and he asked "What is time?" I wasn't sure what he was asking so I said "what *is* time?" he smiled and said "Time is Tim, Tim with an *e*." I got the message. The "time" has come Tim. The doctoral studies and travels are coming to close....

I have had the opportunity to sit at the feet of giants. They are the people seeking to have better health and those who strive to provide it every day everywhere around the world. I am blessed to be with those at the frontlines of healthcare to learn and study. I am committed to give back, to "pay it forward" because of the gifts and experiences I have been given by all the villages and the giants. Thank you to every one of you.

## LOST

Stand still. The trees ahead and bushes beside you  
Are not lost. Wherever you are is called Here.  
You must treat it as a powerful stranger.  
Must ask permission to know it and be known.  
The forest breathes. Listen. It answers.  
I have made this place around you.  
If you leave it, you may come back again, saying Here.  
No two trees are the same to Raven.  
No two branches are the same to Wren.  
If what a tree or a bush does is lost on you.  
You are surely lost. Stand still. The forest knows  
Where you are. You must let it find you.

David Wagoner

Traveling Light: Collected and New Poems

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# Definitions

**Best Practice:** Technique or methodology that, through experience and research, has proven to reliably lead to a desired result. A commitment to using the best practices in any field is a commitment to using all the knowledge and technology at one's disposal to ensure success.

**Clinical Microsystem:** Small group of people who work together on a regular basis to provide care to discrete populations of patients. It has clinical and business aims, linked processes, and a shared information environment; and it produces performance outcomes. Microsystems evolve over time and are often embedded in larger organizations. They are complex adaptive systems, and as such they must do the primary work associated with core aims, meet the needs of their members, and maintain themselves over time as clinical units (Nelson *et al.* 2009).

**Coaching:** A collaborative relationship formed between a coach and coachee for the purpose of attaining professional or personal development outcomes which are valued by the coachee (Grant *et al.* 2010, p. 126).

**Context:** The circumstances that form the setting for an event, statement or idea and in terms of which it can be fully understood and assessed (Merriam-Webster, Incorporated © 2013).

**Cultivate:** To foster the growth of, to prepare the setting, to develop something such as an attitude, ability or skill, to bestow attention, care. To direct special attention to; to devote time and thoughts to (Merriam-Webster, Incorporated © 2013).

**Frontline:** Related to, being, or involved in a front line, e.g. frontline staff (Merriam-Webster, Incorporated © 2013).

**Front Line:** The most advanced, responsible, or visible position in a field or activity, e.g. at the front line of health care (Merriam-Webster, Incorporated © 2013).

**Interprofessional Teams:** Multiple health workers from different professional backgrounds work together with patients, families, carers and communities to deliver the highest quality care (World Health Organization, 2010).

**Macrosystem:** Larger umbrella organizations that microsystems and mesosystems are embedded in (Nelson *et al.* 2009, p. 10).

**Mesosystem:** Two or more linked clinical or support microsystems (Nelson *et al.* 2011, p. 7).

**Practice:** A professional business e.g. Primary Care Practice (Merriam-Webster, Incorporated © 2013)

**Quality Improvement Collaborative:** Typically a “breakthrough series” (BTS) developed by the Institute for Healthcare Improvement (IHI). The collaborative model, usually 12 to 18 months in duration, engages multidisciplinary teams from various clinical sites in a collaborative structure, uses data-driven feedback, encourages frequent small tests to assess implementation of changes, and provides ongoing support to assist teams to achieve results (Lannon & Peterson 2013).

**Qulturum:** The center for development of improvement knowledge and innovation in healthcare in Jonkoping County Council, Jonkoping County, Sweden (<http://www.lj.se/infopage.jsf?nodeId=31736>).

**Team Coaching:** Direct interaction with a team intended to help members make coordinated and task appropriate use of their collective resources in accomplishing the team’s work (Hackman & Wageman 2005, p. 69).

# Abbreviations

CF - Cystic Fibrosis

CFF - Cystic Fibrosis Foundation

DMIC - Dartmouth Microsystem Improvement Curriculum

ICN - Intensive care nursery

IOM - Institute of Medicine

LS - Learning session in collaborative

RWJF - Robert Wood Johnson Foundation

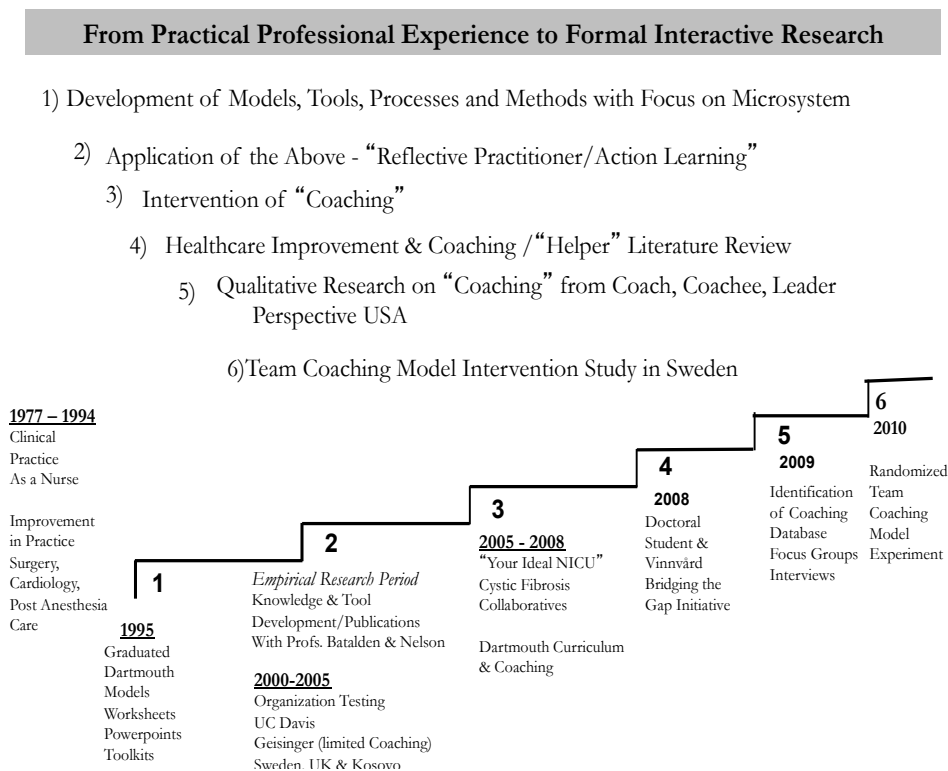
VON - Vermont Oxford Network

# **I.0 Introduction**

The origin of this thesis is based on 35 years of experience as a nurse, patient, family member, and health care improvement professional. I began my professional career as a nurse, always patient-centered and interested in improving the processes of care for better outcomes and experiences for both patients and staff. In the graduate program at the Center for Evaluative Clinical Sciences at Dartmouth, I was able to study evolving health care improvement models and the tools needed to lead change within an interprofessional learning environment.

Using my newly acquired knowledge and skills in improvement and research in my work in the Post Anesthesia Care Unit (PACU) at Dartmouth-Hitchcock Medical Center, I conducted an intervention comparison study to test a novel model of care delivery against the usual model of care. The new model of care resulted in a higher volume of patient flow through the PACU with shorter lengths of stay; increased patient, family and staff satisfaction; and improved clinical outcomes for patients. I found the new tools and research attitude exciting and rewarding. The new health care improvement knowledge informed my role as a reflective practitioner and supported my interest and engagement in improvement and redesign.

Figure 1. Evolution from clinical nurse to interactive practitioner-researcher



From 1995 until 2008 (Figure 1, steps 1-3), the pragmatic period, my professional focus turned to development and testing of practical tools and models based on my graduate school experiences and two bodies of research (Institute of Medicine 2001 and Nelson *et al.* 2002). These tools and methods were piloted in diverse health care systems across the United States, United Kingdom, Kosovo and Sweden to test adaptability and utility. In addition to understanding the adaptability and utility of these tools, I began to learn more about what would best help professionals improve care as they deliver care.

In 2000, I started my treasured relationship with Sweden, specifically Jönköping County Council in Jönköping, Sweden. I traveled several times a year to Qulturum to study, learn and support the improvement of the health care system together with Swedish colleagues. All of the tools and processes developed in the USA were put to full use, which helped me learn the Swedish health care system, processes, roles and systems of care. The tools and processes were informative in learning about the system, as I had no preconceived assumptions and beliefs about Swedish health care. My “knowing” the US health system had inhibited my full use of these helpful tools and processes in the USA and I was surprised with this new insight. I learned a great deal about teaching in a different country and in a new culture. There were many “Swedish moments” when I would pause and my colleagues would translate my lessons from English to Swedish. I realized the determination and commitment my Swedish friends had to learn improvement as I watched them simultaneously learn and translate the lessons into Swedish.

I was struck by the cultural differences between the United States, where I was born and raised, and Sweden. The more I visited Sweden, the more I was aware of similarities and differences. I reflected on the American approach of pushing and telling versus the Swedish way of attracting and inquiring. In the middle of the health care reform debate in the USA, I thought about the “collective” Swedish people and the “individualistic” US citizens. The Swedish health system is committed to ensuring the health of all citizens and considers health care a public responsibility (Anell *et al.* 2012). My Swedish colleagues would look inquisitively at me when we would discuss the polarizing debates in the US about health care for all. Why wouldn’t we want health care aimed at assuring good health for the entire population on equal terms?

In 2008, my focus moved to improvement in health care coupled with research (Figure 1, steps 4-6). As a doctoral student, I studied theories and research methodologies in research to add scientific rigor to improvement efforts.

In my experiences working with frontline teams in several countries who were under constant pressure to make improvement in their daily work, I observed their efforts often resulted in minimal if any improvements. Some staff was fortunate to attend a workshop to learn about improvement tools and processes, other staff tried to follow along not sure of the expectations and still others kept their distance. Leaders inconsistently engaged in improvement giving the message of “we must improve” and then a few staff members would take on the challenge, as the leader would disappear. The complexity of the workplace with too many patients and changing acuity levels and staff resources would often trump any organized improvement efforts.

Staff frequently would share stories about a changing organizational improvement agenda or “flavor of the month.” They would report if you waited a month or two, another method of improvement would appear. Research in other settings has shown only 15 percent of staff can list the goals of the organization; of that 15 percent, only 40 percent know what to do about the goals and only 9 percent feel a commitment to the goals (FranklinCovey 2008). Given this, it is not surprising that the frontline staff was often uninformed, uninvolved, and discouraged.

Inconsistent results, the stories from frustrated staff, confusion of leaders and the increasing national and international attention on health care reform convinced me that having more scientific research knowledge might better inform and guide efforts to improve health care.

My relationship with Jönköping County Council supported my decision to pursue my doctoral study at Jönköping University, Jönköping,

Sweden. A new research program, “Bridging the Gaps,” aimed at engaging four schools and the County Council of Jönköping in interactive research to inspire new methods for design of continuous learning, innovation and improvement and to create exemplars in practice and research at the clinical microsystem level was starting (Nelson *et al.* 2011). The research was partially funded by the “Vinnvård Research Program,” which had a vision to bridge knowledge and practice between professionals within multiprofessional organizations and between various levels in the health care system (Vinnova 2013). I was intrigued with the thought of participating in this innovative approach to health system improvement. Having spent almost a decade in the Jönköping health system, it felt natural to formalize my study of health care improvement as a doctoral student in a country I had grown to love. The idea of being able to pause and reflect on my collected experiences and explore new theory and perspectives with the hope of making a meaningful contribution to health care improvement invigorated me.

## **2.0 Background**

### **Quality Improvement in Health Care**

Florence Nightingale was an early leader of health care quality improvement in the mid-1800s. A nurse, teacher, statistician and action researcher, Florence worked tirelessly to reduce the number of soldiers dying from poor sanitary conditions in the military field hospitals during the Crimean War. She developed practices such as hand washing, cleaning surgical equipment and making sure the beds and wards were clean. Her efforts resulted in a measured decrease in mortality from 60 percent to 2.2 percent (Kalisch & Kalisch 2004). After her return from the front, she continued to reform British hospitals, established a nursing training school and wrote prolifically advancing knowledge on nursing education, organization of hospitals and the importance of sanitary conditions.

In the United States, industry improvement methods and processes that originated in the 1800s influenced the development of health care improvement (Schroder & Robinson 1991). During the Second World War, the US government created programs to enhance industrial outputs and educated management on continuous improvement techniques and methods. Deming, Juran and Shewhart advanced the field of continuous improvement increasing the efficiencies of American industry (Schroder & Robinson 1991).

Avedis Donabedian was an early physician health services researcher interested in quality of health care. In 1966, Donabedian published a summation and analysis of health services research from the 1950s to early 1960s titled “Evaluating the Quality of Medical Care,” which

was republished in 2005 (Donabedian 1966, Donabedian 2005). Outlining how health care quality could be assessed, Donabedian inferred that the quality of care could be determined using the three categories of structure, process and outcomes (Donabedian 1988). One first needs to assess the quality of health care using these three dimensions before planning health care improvement.

Paul Batalden, a modern day leader of quality improvement in health care, met with Deming in 1981 and shortly thereafter began translating and adapting industry improvement methods to health care (Batalden & Stoltz 1993). Joining together with another leader of improvement, Don Berwick, they created the Institute for Healthcare Improvement in 1991 with a vision of transforming health care in the United States (Kenney 2008).

Health care quality improvement has been defined as “combined and unceasing efforts of everyone—healthcare professionals, patients and their families, researchers, payers, planners and educators—to make the changes that will lead to better patient outcomes (health), better system performance (care) and better professional development (learning)” (Batalden & Davidoff 2007, p. 2).

The context and framework for consideration of quality improvement in this thesis were generated from two original research projects. The aim of the first project, conducted by the Institute of Medicine (IOM), was to identify and study best practices in small clinical units in North America (Donaldson & Mohr 2001). The second research conducted by The Center for Evaluative Clinical Sciences at Dartmouth and supported by The Robert Wood Johnson Foundation, aimed to understand and disseminate the principles and processes of clinical microsystems that provided superior services to specific sub-populations of patients (Nelson *et al.* 2002).

Realizing that the United States health care system was causing harm, was filled with variation in practice and outcomes, both over and under treating the general population, and consuming 13.4% of the gross domestic product (World Bank 1999), the Institute of Medicine conducted an assessment of the health care system in 1999. The IOM research was reported in *Crossing the Quality Chasm: A New Health System for the 21<sup>st</sup> Century* (Institute of Medicine 2001). The overwhelming consensus was the health care system needed fundamental change and redesign to close the identified quality gaps.

Prior to this time, James Brian Quinn of the Tuck School of Business at Dartmouth had conducted international service industry research to learn why some service organizations were better than others (Quinn 1992). In his research, Quinn identified the most successful service organizations focused on what he called the smallest replicable units (SRUs) or minimum replicable units (MRUs) to intentionally design high quality, efficiency, timeliness and service excellence in daily operations.

Based on Quinn's research, the term "clinical microsystem" was coined to represent the smallest replicable units in health care. Microsystems were defined as small, organized patient care units with specific clinical purpose, subpopulation of patients, technologies and practitioners who work directly with patients (Donaldson & Mohr 2001).

One component of the IOM assessment was an exploratory study aimed to identify the key characteristics that enable small health care units or clinical microsystems to continuously improve the quality of care (Donaldson & Mohr 2001). Eight key characteristics of high performing microsystems (integration of information, measurement, interdependence of the care team, supportiveness of the larger system, constancy of purpose, connection to community, investment in improvement, and alignment of role

and training) were identified through surveys and telephone interviews conducted by Donaldson and Mohr (2001).

The Dartmouth research expanded and deepened the IOM understanding of the health care microsystems through a case study design of 20 high performing clinical microsystems (Nelson *et al.* 2002). These high performing clinical microsystems were identified using purposive sampling (Patton 1994). Recognized expert improvement leaders were asked to nominate microsystems with reputations for excellent outcomes and innovative models of delivery and to suggest other knowledgeable people who could identify similarly innovative microsystems. The clinical microsystems included in the study had to have a minimum of two nominations by the research steering committee. Once the “best of the best” microsystems across North America were discovered through the benchmarking process, further study to learn how the organizations achieved the best in class status led to development of tools and processes to help clinical practices in their improvement actions.

Benchmarking is defined as a process to find and implement best practices (Camp & Tweet 1994). Grounded in social comparison theory, benchmarking compares one with others who are “better” to provide inspiration for improvement (Taylor & Lobel 1989). Clinical benchmarking aims to identify and implement “best practices” that had not previously been considered or thought possible (Johnson *et al.* 2007). Identification of the best performers outside of one’s usual context or profession invites inquiry about the processes and systems to consider adapting in one’s local context. The systematic process of searching for the best of the best builds awareness of current performance compared to best known performance, creates tension for change and offers a sense of “possibility” to emulate the best known practices (Johnson *et al.* 2007).

The qualitative study explored performance of the microsystems in five categories: level of performance, patient experience, information and information technology, investment in improvement, and leadership (Nelson *et al.* 2002). The findings of the study of the twenty high performing microsystems confirmed the eight IOM success characteristics and expanded to ten the characteristics that contribute to a microsystem's ability to provide high quality, cost-effective care while creating a positive and attractive work place. The ten success characteristics identified were leadership, culture, macro-organizational support of microsystems, patient focus, staff focus, interdependence of the care team, process improvement, performance measures, information, and information technology. Table 1 illuminates the details of the IOM and Dartmouth research to clarify design similarities, differences and knowledge learned from the two research projects.

Table 1. Overview of Institute of Medicine and Dartmouth research from 1999-2002

| Design and Sampling | Methods | Settings | Focus | Analysis | Findings |
|---------------------|---------|----------|-------|----------|----------|
|---------------------|---------|----------|-------|----------|----------|

Institute of Medicine (Donaldson and Mohr 1999-2001)

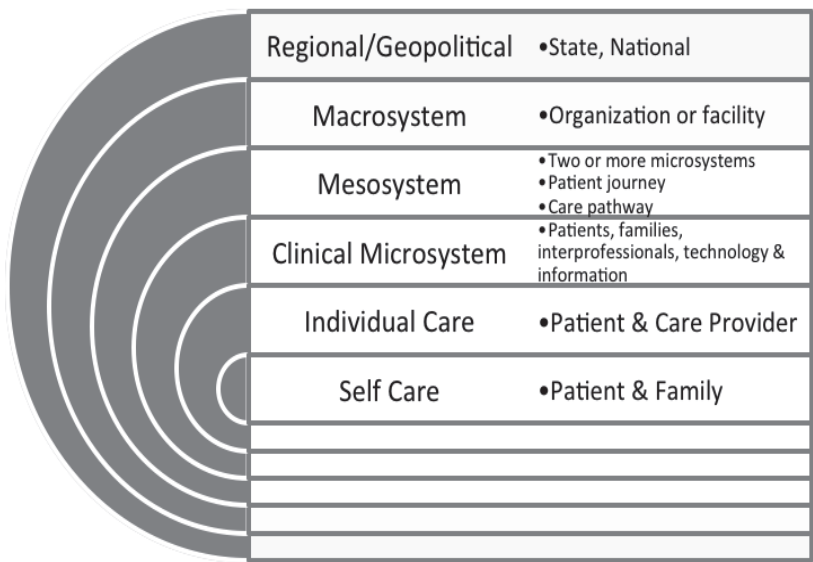
|  |   |  |  |   |  |
|--|---|--|--|---|--|
| Qualitative<br>Case study<br>Snowball sampling | Surveys (n=43)<br><br>Interviews (n=48)<br><br>90 minute structured telephone interviews with leaders | 43 care units: primary care, specialty care, hospice, emergency and hospital critical care microsystems in North America | Identify key characteristics that enable health care microsystems to continuously improve the quality of care. | Content analysis<br><br>Cross-case analysis | Eight themes of most effective microsystems:<br><br>1. Integration of information<br>2. Measurement<br>3. Interdependence of the care team<br>4. Supportiveness of the larger system<br>5. Constancy of purpose<br>6. Connection to community<br>7. Investment in improvement<br>8. Alignment of role and training |
|--|---|--|--|---|--|

Robert Wood Johnson Foundation  
Center for Evaluative Clinical Sciences at Dartmouth (Nelson *et al.* 2000-2002)

|   |   |  |   |   |  |
|---|---|--|---|---|--|
| Qualitative<br>Case study<br>Theoretical sampling | Surveys (n=20)<br>Self-assessment of IOM identified success characteristics<br><br>Interviews (n=28)<br>20-90 minute in person individual structured interviews<br><br>Office practice profile<br>Financial and clinical data | 20 care units: primary care, specialty care, hospice, home health care, nursing home, hospital emergency and critical care microsystems in North America | Begin the dissemination of principles and processes of high performing health care microsystems | Content analysis<br><br>Cross-case analysis | Ten themes of success characteristics of microsystems:<br><br>1. Process improvement<br>2. Staff focus<br>3. Performance results<br>4. Leadership<br>5. Patient focus<br>6. Information and information technology<br>7. Interdependence<br>8. Education and training<br>9. Organizational support<br>10. Community and market focus |
|---|---|--|---|---|--|

The Institute of Medicine and the Dartmouth research also highlighted that health care systems are actually comprised of “systems within systems” (IOM 2000) Figure 2. Identifying, assessing and creating strategic plans to improve the system where patients, families and health care professionals meet - the clinical microsystem - is fundamentally essential in the improvement of the entire health care system (IOM 2000).

Figure 2. Health care systems within systems (Quality By Design, Nelson *et al.* 2009, adapted p. 234)



To improve health care systems, the Dartmouth researchers identified that the focus must begin on the microsystem processes in order to enable staff to work at their highest potential (Nelson *et al.* 2002).

Essential to the adaptation of best practices is the important step (often neglected) of gaining deep knowledge of the local context of the

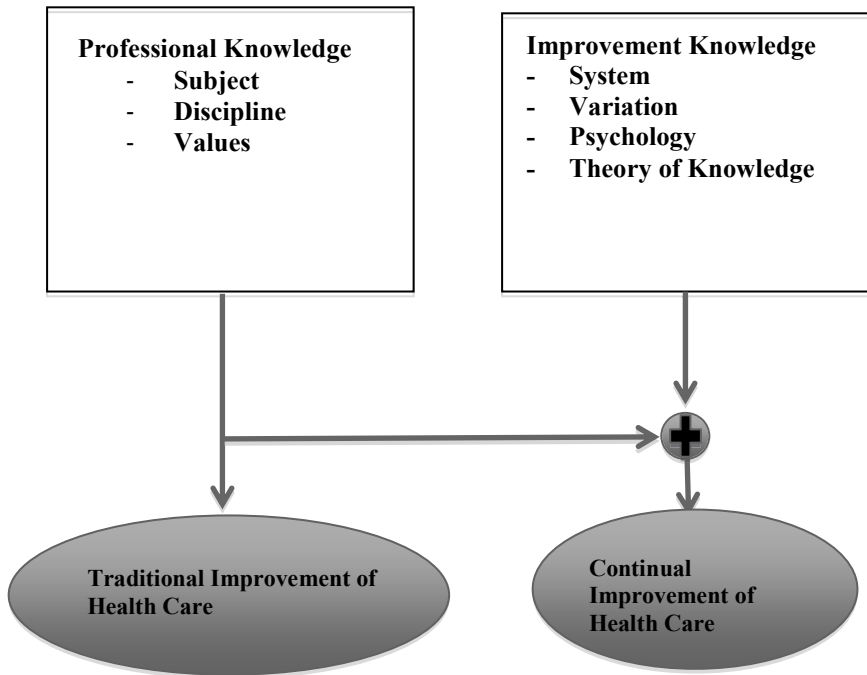
clinical microsystem. As early as 1966, Donabedian reported that to understand the quality of the health care system, the structure, process and outcomes should be explored (Donabedian 1988). Recently, health care improvement leaders have reinforced Donabedian's message noting improvement is local and is the "context" "where everything begins" (Stevens 2010, Vandenbroucke 2001). Assessing and understanding the local context is essential to health care improvement. The context in this thesis is centered on the study of the clinical microsystem.

## **Profound Knowledge through Integration of Professional Knowledge and Improvement Knowledge**

Traditionally, health care improvement has depended on professional knowledge of *subjects* (e.g. anatomy, physiology), knowledge of *discipline* (e.g. nursing for nurses, medicine for physicians and pharmacy for pharmacists) and *professional values* (Figure 3). With this professional knowledge a professional may be able to make some improvements in care.

Deming described a system of profound knowledge that he believed would provide a map of theory to understand organizations and organizational transformation (Deming 1993). Once individuals understand the profound knowledge, Deming believed they could set an example, be a good listener, teach others and help people move into new philosophies of practice toward organizational transformation. Batalden and Stoltz (1993) translated Deming's system of profound knowledge into the health care context noting that "continual improvement becomes possible when professional knowledge is linked with improvement knowledge" (p. 426). The profound knowledge model is illustrated in Figure 3.

Figure 3. Professional knowledge and improvement knowledge create profound knowledge (Batalden & Stoltz 1993, p. 426) reproduced with permission by Paul Batalden



The four components of improvement knowledge described by Deming include appreciation of a system, understanding of variation, the psychology of change and theory of knowledge.

The *appreciation of a system* reminds us that outcomes of care occur as a result of people, processes and work settings. Understanding the system of production raises awareness of the interdependencies and interrelationships within a system of health care in which people work together to achieve a common aim. Working toward a common aim was suggested to create a shared importance for all members of the health care system resulting in their making the best contributions toward the common aim and committing to decision making in the best interest of everyone

concerned. The greater the interdependence within the system, the greater the need for communication and cooperation (Deming 1993, Batalden & Stoltz 1993).

*Understanding variation* raises awareness of inconsistent care delivery and can lead to understanding the causes and consequences of variation in health care delivery. Measurement offers insights into the types of variation in the processes and performance of the system and helps determine the needed approach to address the variation.

*Psychology of change* supports understanding of the people within the system, their interactions, the interpersonal and social structures, and processes. Understanding interactions between people and their contexts, between providers and patients, and between managers and staff can inform one about differences in people, their learning styles and motivations. Psychology of individuals, groups, society and change itself further supports understanding how people might react to a change, why they resist change and what strategies to employ to result in more successful change.

The *theory of knowledge* informs how systems can be understood and how improvement can be made and predicted while observing and learning (Batalden & Stoltz 1993). Deming challenged leaders to move beyond opinions and hunches in daily leadership and to apply and test theories to advance knowledge in a systematic fashion. The model Deming promoted was the Plan-Do-Study-Act cycle introduced to him by Walter Shewhart to create iterative cycles of learning to drive continuous improvement (Deming 1993).

Consideration of this “profound knowledge” to guide improvement in health care systems provides a direction to inform interprofessional education and development. Traditionally, years of study and practice are devoted to acquiring professional knowledge to ensure competency, but only minimal time is committed to acquiring improvement knowledge. The

exploration of different teaching and development strategies for health care professionals is necessary to determine the most effective, efficient and value-added methods to help frontline staff learn to provide care and simultaneously improve care in their daily work. Experiential learning theory may provide guidance to efforts to educate health care professionals in improvement knowledge (Kolb 1984).

## **Experiential Learning Theory**

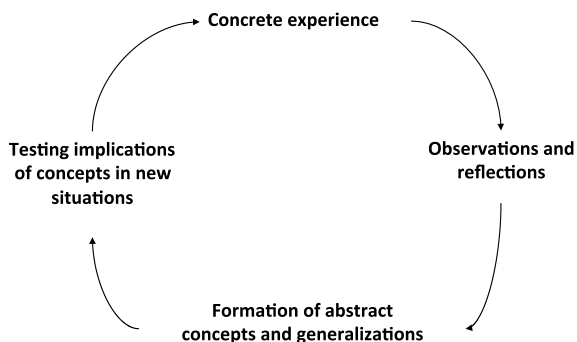
Lifelong learning and development is essential in the continuously changing health care workplace. As previously noted, professional knowledge alone is not enough to meet the challenges of providing care and improving care. Thus it is important to carefully examine current learning methods with an eye to revitalizing health care professionals' development and understanding the learning needs specific to improving health care.

David Kolb, a psychologist and educational theorist who researched experiential learning and learning styles, defines learning as "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (Kolb 1984, p. 41). His experiential learning theory "provides a framework for examining and strengthening the critical linkages among education, work and personal development" (Kolb 1984, p. 4). Experiential learning theory is based in social psychology, philosophy and cognitive psychology and provides a "holistic integrative perspective on learning that combines experience, perception, cognition and behavior" (Kolb 1984, p. 21). Kurt Lewin, a German-American psychologist; John Dewey, an American philosopher, psychologist and educational reformer; and Jean Piaget, a Swiss biologist and psychologist all influenced Kolb's development

of experiential learning theory for adult learning. A review of their frameworks may provide deeper insight into the experiential learning theory.

Lewin's four-stage learning model (Kolb 1984) highlights the importance of personal experiences to derive *reflection and learning*. His action research conducted in a laboratory setting utilized "T-group" training based at Massachusetts Institute of Technology (MIT) (Argyris 1964). In T-group training, researchers worked with various organizational workgroups to diagnose group dynamic problems, find solutions, practice solutions and carefully plan actions to take back to their work settings. The four-stage model illustrates how the T-group learning based in concrete experiences, observation and reflection can result in the development of abstract concepts and generalizations, which can then be tested in new settings like those provided in the T-group laboratories (Kolb 1984) Figure 4. After testing in the T-group laboratories, the new behaviors could be applied in the usual workplace with more confidence as a result of the laboratory experiences. Lewin believed organizational ineffectiveness could be due to an imbalance between *observation, reflection, data collection and action* (Kolb 1984).

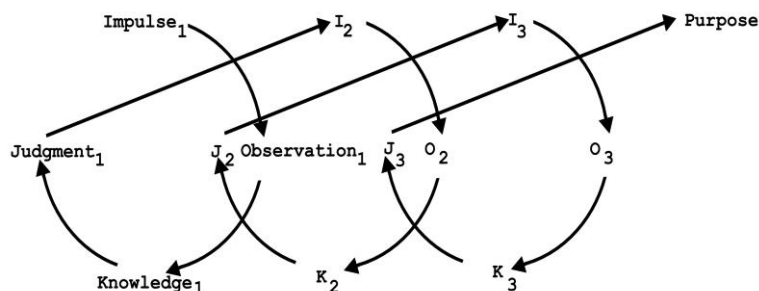
Figure 4. Lewinian experiential learning model (Kolb 1984, p. 21)



Dewey's naturalistic model of reflective thought and actions is based on adaptation of a person to his environment. As in Lewin's model, learning is a process where knowledge is created through transformation of experiences. Kolb graphically displays John Dewey's model of experiential learning (a naturalistic model of *reflective thought and action*) to explore how learning transforms the impulses, feelings and desires of concrete experiences into higher-order, purposeful action (Kolb 1984).

As illustrated in Figure 5, Dewey makes a distinction between the primary and subsequent experiences. The primary experience is the realization that the routinized habit doesn't work. This creates uncertainty, which leads to a disruption in the usual patterns. It is *reflection about the disruption* in the usual habit and flow of actions that leads to defining the problem, studying conditions, forming a hypothesis and then testing the hypothesis. The difference between Dewey's model and Kolb's is that Kolb includes reflective activity outside the problem, leading to hypothesis generation and testing (Miettinen 2000). According to Miettinen (2000), the Dewey model of multiple iterative cycles of learning, reflection and knowledge represents learning cycles more accurately than the Kolb cycle. Dewey's experiential learning illustrates how knowledge and judgment interacting with the environment carries from one learning cycle to the next. Learning is advanced through repetitive cycles of action, observation, gaining knowledge and judgment rather than just one cycle of learning.

Figure 5. Dewey's concept of experiential learning according to Kolb (Miettinen 2000, p. 64) reproduced with permission by Miettinen



Piaget's model of learning and cognitive development is the third framework in Kolb's learning theory. Piaget identified four major stages of cognitive growth from birth to age 16: experience, concepts, reflection and action that form the continuum for adult development (Kolb 1984). The learning process is a cycle of interactions between the individual and the environment resulting in either an accommodation process (reflecting the environment) or an assimilation process (thoughts, concepts and interpretations occurring without environmental consideration).

Kolb's experiential learning theory is dependent on environments where knowledge is created through experience transformation. Reflective thought and action in changing environments does not occur naturally in busy work environments. Creating space to develop reflective thought and action within the context of clinical microsystems is essential for learning and improvement. Formal improvement knowledge development, which could lead to "profound knowledge" could occur outside the workplace (such as in the T-groups) to provide space to reflect, learn and practice new behaviors to be taken back to the workplace (Argyis 1964). Schein references this protected space where all assumptions are suspended to practice new thinking and habits as a "cultural island" (Schein 2009). The

quality improvement collaborative model may represent an adaptation of these learning models and experiential learning concepts.

## **Quality Improvement Collaboratives**

The Quality Improvement Collaborative is one intervention using experiential learning theory to increase frontline staff awareness, learning and practice of “profound knowledge.” Quality improvement collaboratives focused on some aspect of improvement have been used in a variety of health care settings in multiple organizations and systems around the world (Peterson *et al.* 2007, Powell, Rushmer & Davies 2008, Schouten *et al.* 2008, Wilson, Berwick & Cleary 2003). The earliest collaborative (Dartmouth Co-op Project, 2012-2013) started in 1972 and included primary care practices interested in improving outcomes of care (Ayers *et al.* 2005). Formal learning workshops and regular reporting of quality improvement activities and results supported interprofessional health care improvement teams in learning and practicing improvement. The majority of the collaboratives around the world are based on the Institute for Healthcare Improvement Breakthrough Series (BTS), which includes learning sessions followed by action periods where the improvement team returns to the care unit to apply what they have learned and practice improvement (Kilo 1998, Wilson *et al.* 2003). The BTS is grounded in Kolb’s experiential learning theory.

A systematic review of quality improvement collaboratives revealed unpredictable and limited results (Schouten *et al.* 2008). Evaluations of improvement collaboratives have shown generally favorable results, but the observed effects have not consistently been shown to be a direct result of the collaborative (Schouten *et al.* 2008, Lindenauer 2008, Cretin *et al.* 2004, Øvretveit *et al.* 2002). Both randomized trials and quasi-experimental

interventional studies with pre and post measures show inconsistent improvement results (Øvretveit 2011, Howard *et al.* 2007, Dellinger *et al.* 2005, Landon *et al.* 2004, Homer *et al.* 2005, Horbar *et al.* 2001).

Despite ongoing questions about their effectiveness, quality improvement collaboratives continue to thrive (Øvretveit 2011, Schouten *et al.* 2008, Lindenauer 2008, Howard *et al.* 2007, Dellinger *et al.* 2005, Homer *et al.* 2005, Cretin *et al.* 2004, Landon *et al.* 2004). In Nembhard's study on collaboratives (2009), six features were identified as most helpful for advancing improvement efforts overall: the faculty of the collaborative, staff ideas, change packets, Plan-Do-Study-Act (PDSA) cycles, learning session interactions, and a collaborative Internet site to store improvement tools and change ideas. Nembhard further suggested that problems with methodology might explain the differences in collaborative results, as the reinforcement of basic improvement skills and knowledge within the context of the workplace may not have been addressed (Nembhard 2009).

To further explore the advancement of improvement in collaboratives, Gustafson conducted a cluster-randomized trial to determine which of four improvement collaborative interventions worked the best to improve quality (Gustafson *et al.* 2013). The four interventions included group teleconferences, clinic-level coaching, face-to-face group learning sessions and a combination of all three. The group teleconferences failed to show any differences in outcomes. The clinic-level coaching (consisting of one site visit, monthly phone conferences and email correspondence) and the combination of group teleconferences, clinic-level coaching and face-to-face group learning sessions were equally effective in achieving study aims. This was the first time that cost related to the interventions was measured. The clinic-level coaching alone achieved the study aims and was more cost-effective than the other interventions (Gustafson *et al.* 2013).

Since the research of Wilson *et al.* (2003), where he and his colleagues reported difficulty in studying the “black box” of collaboratives due to the lack of documentation, there has been more consistent reporting on collaborative models and processes. However, there is little reported on the period *between* the learning sessions when teams meet the challenges of providing patient care *and* simultaneously improving care (Øvretveit 2003, Øvretveit *et al.* 2002). Improvement teams are often faced with on-the-job crises, organizational inertia and no reinforcement of basic improvement skills all of which might contribute to failure of achieving their goals (Hohenhaus 2009, Schonlau *et al.* 2005).

Kolb’s experiential learning theory states that knowledge is created through transformation of experiences. Reflective thought and action in changing environments help individuals to adapt. While improvement collaboratives may provide the space to learn health care improvement, what happens after the formal learning sessions? How does reflective thought and action in iterative cycles occur in the clinical microsystem? How are they reinforced and encouraged? What sort of help do busy, stressed health care professionals need in a changing health care environment to “stand still” and take time to engage in reflection, learning and action in their daily practice?

## **Coaching Reflective Practice**

Donald Schön, a leading thinker of reflective professional learning and learning systems, based his doctoral thesis on John Dewey’s theory of inquiry. Dewey believed that knowledge was an adaptive human response to environmental conditions aimed at actively restructuring these conditions (reflection). Schön believed professional education should combine teaching with coaching in the art of “reflection-in-action” through a

“reflective practicum” that included coaching in reflective activities to help learners become proficient in reflection in their daily learning experiences (Schön 1987). Schön used the architectural design studio as an example to describe how professionals could learn by doing, and reflect on their actions with the help of fellow learners and senior practitioners also known as coaches. The coaches would primarily reframe, demonstrate, advise, question, criticize and occasionally teach conventional content including theories. A typical studio course would start with a presentation of an assignment to a group of learners who later present their preliminary work and the challenges they encountered. The coach would reframe problems, demonstrate working out a solution, engage the learners in reflection, determine next steps including real world considerations, and end with a final reflection (Schön 1987).

The clinical microsystem is likewise filled with individuals who have a great deal of knowledge about what works and what doesn’t work in the daily delivery of health care. But opportunities to reflect, share, interpret experiences and learn are limited and often missing. Helping professionals, patients and families to find the time and space to engage in reflective thinking might lead to new habits, new insights and engaged microsystems.

Coaching, which has been used in a variety of fields, (Stober & Grant 2006, Cox *et al.* 2010, Flaherty 2010, Wildflower 2013) may represent an opportunity to support this reflection during and after the action. A lack of consensus about the definitions of facilitation, mentoring, training and coaching can lead to confusion. Examples and descriptions which highlight similarities and differences among these terms are shown in Table 2.

The similarities between coaching and developmental facilitation are striking. Cultivating capability of the team is the ultimate goal in coaching and developmental facilitation. In contrast, basic facilitation is aimed at solving an immediate problem with the group without any intentional

developmental efforts. Mentoring and training are not as close to coaching. Mentoring focuses on an individual sharing expert knowledge with someone who is less expert, usually in a professional and career setting. Training is perhaps more similar to basic facilitation since the training has a focus on the performance of specific tasks rather than overall development.

Table 2. Comparison of coaching, facilitation, mentoring and training

| <b>Action</b>       | <b>Definition</b>  | <b>Practice and Skills</b>  |
|---------------------|--|---|
| <b>Coaching</b>     | <p>“Unlocking a person’s potential to maximize their own performance. It is helping them to learn rather than teaching them” (Whitemore 2009).</p> <p>“A collaborative, solution-focused, results-oriented and systematic process in which the coach facilitates the enhancement of work performance, life performance, life experience, self-directed learning and personal growth of the coachee” (Grant 1999; basic definition also referred to by the Association for Coaching, 2006).</p> <p>“A professional partnership between a qualified coach and an individual or team that supports the achievement of extraordinary results, based on goals set by the individual or team” (ICF 2005).</p> <p>“The art of facilitating the unleashing of people’s potential to reach meaningful, important objectives” (Rosinski 2003).</p> <p>“At the heart of coaching lies the idea of empowering people by facilitating self-directed learning, personal growth and improved performance” (Passmore 2011, pg 34).</p> | <p>Concentrates on helping the coachee learn how to achieve goals.</p> <p><b>Skills:</b><br/>Knowledge, techniques and skills to help and not direct. Discovery based inquiry approach.</p> <p>Coachee has self-direction and ownership and often determines the agenda and goals to be achieved.</p> <p>Incorporates appreciative and helping approach.</p> <p>Grounded in what’s right, what’s working, what’s wanted and what is needed to achieve what is wanted.</p> <p>Use of metacognitive skills: think about one’s thoughts, feelings and behaviors are essential to learning new skills.</p> <p>Knowledge and control of self and knowledge and control of process. Important in self-regulation of commitment, attitude, attention, and executive control of behavior.</p> <p>Formal contract or ground rules<br/>Usually 2 to 12 months<br/>Performance focused for the individual and the needs of the organization<br/>Generalist knowledge</p> |
| <b>Facilitating</b> | <p><i>Basic</i> facilitation helps a group solve a problem but does not help the group learn the capability to solve future problems. Short term fix.</p> <p><i>Developmental</i> facilitation helps a group learn to improve processes while solving a substantial problem. Long term development. (Schwarz 2002)</p>   | <p>Process and content expert. Not decision maker</p>   |
| <b>Mentoring</b>    | <p>Traditionally involves an individual with expert knowledge in a specific domain passing the knowledge to someone without that knowledge or expertise.</p>   | <p>Be the resource for the mentee.</p> <p><b>Skills:</b> Interpersonal skills, training and teaching skills.</p> <p>Shared ownership of performance between mentor and mentee</p> <p>Less formal over 3-5 years</p> <p>Focus: Career and one individual focused. Longer term career issues-obtaining the right experiences and longer term thinking</p> <p>Sector knowledge important including organization and specialty</p>  |
| <b>Training</b>     | <p>Prepare trainees to perform effectively on specific tasks.</p>  | <p>Trainer determines training agenda and trainees adapt to the process and structure.</p>  |

Most coaching programs are directed at coaching individuals such as executives, new nursing graduates and surgeons (Hu *et al.* 2012, Gawande 2011, Johnson *et al.* 2011, Byrne 2007). While individual mastery may result in one's own individual development, the delivery and improvement of care and services requires effective interprofessional teams (Nelson *et al.* 2009, Batalden & Davidoff 2007, Edmondson 2003). Team coaching occurs in a variety of fields including education, business, industry, sports and organizational development and measured results have included improved productivity, morale, and team dynamics (Grant *et al.* 2010, Anderson *et al.* 2008, Brumwell, Reynolds & Horne 2006, Elliot 2006).

As outlined by Grant (2010), coaching practice is in its infancy with the majority of coaching literature (mostly on life or personal coaching, executive and workplace coaching) published in the last ten years. Grant identified a total of 425 published papers between 2000 and 2009, fifty percent of which were opinion papers, descriptive articles or theoretical discussions. The empirical literature to date is primarily contextual or survey-based research reporting on the characteristics of coaches, coachees and the delivery of coaching services. The vast majority of 101 empirical outcome studies are case studies that describe coaching effectiveness without exploring coaching interventions. There are only two randomized, controlled trials of workplace coaching published between 1980 and May 2009 (Grant *et al.* 2010).

Team coaching is distinct from individual coaching since the focus is on the whole team and collective performance is the goal (Peters & Carr 2013). Hackman and Wageman define team coaching as “direct interaction with a team intended to help members make coordinated and task-appropriate use of their collective resources in accomplishing the team's work” (2005, p. 69). The team coach provides objectivity for the team and

facilitates conversations that enable the team to modify their working together to achieve the team goals (Peters & Carr 2013).

Organizational team coaching has emerged from several fields that are listed in Table 3 (Peters & Carr 2013).

Table 3. Fields that inform organizational team coaching

| Field                  | Researcher  | Year         |
|------------------------|---|--------------|
| Group Process          | Lewin   | 1948         |
| Group Development      | Tuckman   | 1965         |
| Process Facilitation   | Schein  | 1969         |
| Systems Thinking       | Argryis<br>Senge, Kleiner, Roberts,<br>Ross & Smith | 1990<br>1994 |
| Developmental Coaching | Kozlowski, Gully, Salas<br>& Cannon-Bowers          | 1996         |

Salas, Cooke and Rosen emphasize the importance of focusing on intact work teams in organizational settings rather than artificial teams based in research (2008). Based on experience with intact leadership teams, Wageman defines team effectiveness as the ability to create outputs and performance at a level that meets or exceeds expectations, the ability to work together effectively in the present and build capacity for the future, and the creation of team experiences that contribute positively to individual team member's learning, well-being and development (2008). Wageman's essential and enabling conditions that enhance team effectiveness are listed in Table 4.

Table 4. Wageman team effectiveness essential and enabling conditions

| Essential conditions   | Enabling conditions   |
|--|---|
| <ol style="list-style-type: none"> <li>1. Real team with clear membership and boundaries.</li> <li>2. Compelling direction or purpose to guide team's work.</li> <li>3. Right people with knowledge, skill and experience to perform team's work.</li> </ol> | <ol style="list-style-type: none"> <li>1. Solid team structure of less than 10 members with clear norms and agreements on how to work together.</li> <li>2. Supportive organizational context to provide information, time and resources to do their work.</li> <li>3. Competent team coaching to help the team grow individually and as a team.</li> </ol> |

Hawkins emphasizes the generative relationship between the team and the coach where all members of the relationship are constantly learning (Hawkins 2011). Harkening back to Schön, Clutterbuck states that team coaching is a “learning intervention designed to increase collective capability and performance of a group or team, through application of the coaching principles of assisted reflection, analysis and motivation for change” (Clutterbuck 2010, p. 271).

The seemingly simple action of helping is fundamental to coaching. Edgar Schein, an accomplished organizational theorist who was the first to identify that organizations consist of multiple units of culture and not just one organizational culture, has devoted much of his professional career to the study of and consequent teaching about helpful relationships (Schein 1969, 1999, 2009). Through his years of practical application and study, Schein developed and improved his own consulting style he labeled “process consultation” (Schein 1969, 1999). Schein’s ten essential principles of process consulting include being careful, staying in touch with the current reality, accessing one’s own ignorance, recognizing everything you do is an intervention, remembering the client owns the problem and the solution,

going with the flow, understanding timing is crucial, being constructively opportunistic, realizing everything is a source of data and errors are a source of learning and finally, when in doubt, share the problem with the client (Schein 1999). Humble inquiry and helping is central to Schein's process consultation.

Humble inquiry involves the art of asking instead of telling (Schein 2013). Further defined, humble inquiry is the fine art of asking questions, which you don't already know the answers to, to build a relationship based on curiosity and interest in the other person (Schein 2009). The various theorists' frameworks included in this thesis background all include some form of helping. Deming's system of profound knowledge includes helping people with organizational transformation; Kolb's experiential learning theory includes Lewin, Dewey and Piaget's reflective learning to help people gain knowledge; and Schön is explicit in the importance of helping people with coaching to learn to reflect-in-action (Deming 1993, Kolb 1984, Schön 1987).

Literature and research about coaching interprofessional health care improvement teams is limited. The majority of the literature is descriptive, exploring coaching interventions and outcomes. Much of the knowledge about coaching interprofessional health care teams is based on anecdotal stories, subjective opinions and hearsay (Knox 2010). However, a few studies are of interest for this thesis.

Thor's case study research included improvement helpers or facilitators in a large hospital setting in Sweden (2005). Important factors that facilitated improvement included providing a framework for improvement, helping teams apply improvement tools, clarifying the facilitator role, organizing logistics of meeting places, providing refreshments, time keeping, documenting meetings and progress, and teaching by example.

In randomized controlled trials of multifaceted interventions, Baskerville (2005) described the role of nurses as facilitators to improve primary care practice and improve preventive care performance in Canada. The Medical Home National Demonstration project in the United States (Nutting 2006) included four learning sessions and regular group conference calls with one subgroup being self-directed with access to web-based improvement tools. A second subgroup had ongoing assistance from a change facilitator, practice content experts, and telephone and email support. In instances where there was a facilitator, the results were better than for those who did not have the facilitator support.

Research on helping interprofessional health care improvement teams is limited. There is little research on team coaching and even less describing the role of external coaches versus team leaders and managers acting as team coaches (Peters & Carr 2013). This thesis will contribute to the body of knowledge in the field of team coaching of interprofessional health care improvement teams to inform design of improvement strategies that get us closer to desired goals and outcomes.

## **3.0 Rationale for the Thesis**

Globally, health care is facing rising external pressures from patients and families, regulatory bodies, and in the United States, the Affordable Care Act (World Bank 2013, The Mid Staffordshire NHS Foundation Trust Public Inquiry 2013, Centers for Medicare and Medicaid 2013). The imperative to improve the health care systems in the United States and other countries is more urgent than ever. Well-intended interventions responding to the calls to improve health care systems have not resulted in the needed innovation

and improvement. The Institute of Medicine (2001) and Dartmouth research findings (2002) provide evidence that development of frontline staff and clinical microsystems can lead to high performing health care systems. According to these studies, clinical microsystems are the building blocks of health care organizations and should be the focus of needed improvements (Nelson *et al.* 2002). Confirming the important focus on clinical microsystems, Luther & Resar suggest that listening to, developing and helping those who interact with patients and families in the microsystem every day may give clues to designing the innovative health care systems that have been so elusive (Luther & Resar 2013).

Collaboratives at many levels (organizational, regional and national) have attempted to cultivate improvement capability at the frontlines of health care with inconsistent results. Financial investments continue to be made in improvement methodologies that are not producing desired results. Interprofessional members of clinical microsystems do not consistently learn and apply improvement knowledge, tools and processes in their own contexts. Drawing from experiential learning theory and Schön's reflective practice framework to provide help to frontline teams in the form of coaching might result in the profound knowledge Deming, Batalden and Stoltz describe (Schön 1983, Deming 1988, Batalden & Stoltz 1993). Research is needed to inform health care improvement strategies that are designed to cultivate improvement capability in the most effective way for all members of the microsystem. The research findings might help inform improvement efforts to result in more high performing microsystems with the capabilities to respond to the call for health care improvement.

## 4.0 Overall Aim and Specific Aims

The overall aim of this thesis is to explore high performing clinical microsystems and evaluate interventions to cultivate health care improvement capabilities of frontline interprofessional teams so they are able to provide care and simultaneously improve care.

### **The specific questions of the studies were:**

- What specific activities, information, and knowledge are needed to design and plan patient care and patient-centered services that meet patient expectations and improve the work environment for staff? (Study I)
- What guiding principles, useful insights, and practical methods can help microsystem leaders improve their workforce and cultivate a positive working environment for their coworkers? (Study II)
- What lessons and insights can be learned from two different hospital experiences where clinical microsystem knowledge was adapted and applied in their local context? (Study III)
- What team coaching activities support health care improvement knowledge and skill development from the perspectives of coachees, coaches and unit leaders in two national improvement collaboratives? (Study IV)
- What are the effects of a team coaching model (TCM) within an improvement collaborative on participant acquisition of improvement knowledge? What are the participant perceptions of the TCM experience compared to participants without a TCM? (Study V)

## 5.0 Methods

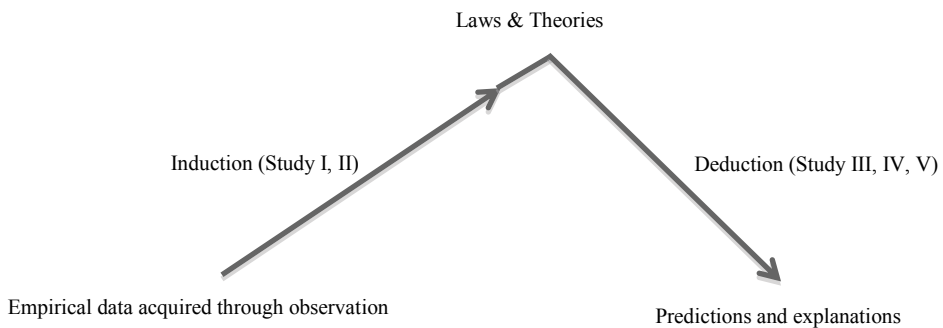
This thesis investigated the activities of interprofessional health care improvement teams in different health care contexts in the United States and Sweden between 2000 and 2010. The research perspective is based on the clinical microsystem concept from the Institute of Medicine and Dartmouth research (Institute of Medicine 2001, Nelson *et al.* 2002, Nelson *et al.* 2003, Wasson *et al.* 2003, Batalden, Nelson, Mohr *et al.* 2003, Mohr *et al.* 2003, Kosnik & Espinosa 2003, Batalden, Nelson, Edwards *et al.* 2003). The studies in this thesis are based on inductive research (Study I, II), deductive research (Study III, IV) and experimental research (Study V) see Table 5.

Table 5. Study designs of the five studies in this thesis

| Study period (year) | Design   | Setting   | Participants  | Intervention  | Data collection   | Analysis  |
|---------------------|--|---|---|---|---|---|
| I (1999-2001)       | Case study<br>Explorative<br>Mixed methods             | Rural Primary Care Practice (n=1)   | Clinical Director, MD, Nurse Practitioner, Educator, Office Manager, Patient Service Representatives (n=4)<br>Medical Assistants n=2  | None  | Interviews, observations, review of medical records and practice performance data | Qualitative manifest content analysis   |
| II (1999-2001)      | Case study<br>Explorative<br>Mixed methods             | Urban Primary Care Practice (n=1)   | Managing Director, Medical Director, Practice Leader, MD Leaders (n=3), MD, RN, Information Technician, Patient Service Representatives (n=2)   | None  | Interviews, observations, review of medical records and practice performance data | Qualitative manifest content analysis   |
| III (2005-2008)     | Case study<br>Evaluation                               | Hospitals (n=2)<br>Large Urban Academic Medical Center (577 beds)<br><br>Rural Community Hospital (125 beds)  | Senior Leaders<br>Urban hospital (n=4): Chief Executive Officer, Chief Operating Officer, Chief Medical Officer, Vice President of Quality<br><br>Rural hospital (n=2): Executive Quality Officer, Chief Safety Officer | Adaptation and implementation<br>Internal improvement collaborative with leadership development | Interviews, observations, review of improvement process and results               | Qualitative manifest content analysis   |
| IV (2008-2010)      | Sequential mixed methods<br>Intervention<br>Evaluation | National Improvement Collaborative USA<br><br>Cystic Fibrosis Foundation (CFF) (CF Centers n=49)<br>Vermont Oxford Network (VON)<br>Intensive Care Nurseries (ICN) (n=12) | CF Centers & ICNs Coaches<br>Interprofessional Health Care Teams and Patient or Family Members (n=382)<br>Coaches (n=9)<br>Unit Leaders (n=30)  | Improvement collaborative with team coaching  | Surveys, focus groups, interviews   | Fisher's exact 2-tailed test<br>Non-parametric analysis:<br>qualitative manifest content analysis |
| V (2010)            | Quasi-experimental<br>Intervention study               | Patient Care Units (n=7) in three hospitals, Jönköping County Council, Sweden   | Nurses and Assistant Nurses (n=40)<br>Faculty (n=4)<br>Coach<br>Leaders (n=5)   | Improvement collaborative with randomized team coaching   | Surveys, interviews, pre/post test  | Fisher's exact 2-tailed test<br>Non-parametric analysis:<br>qualitative manifest content analysis |

The research started with empirically-derived observations and facts that formed key themes which later were explored and tested through deductive and experimental research. To advance knowledge specific to health care improvement, the deductive process of identified salient themes in the IOM, Dartmouth, Study I and Study II empirical data resulted in discovery of ideas and hypotheses for further research (Chalmers 1999). Inductive research can be used to offer and illustrate how experience is the source for scientific deductive experimentation (Figure 6).

Figure 6. Inductive research leading to laws and theories to deductive experimentation (Adapted Chalmers 1999, p. 54)



To ensure a broad understanding of the inquiry into improvement capability of frontline healthcare teams, mixed methods and experimental research designs were used in the studies of this thesis (see Table 5).

Study I and Study II are exploratory designs using a case study design (Creswell 2009, Patton 2002). The use of a case study in an inductive research strategy focuses on understanding the dynamics that are present within one context (Eisenhardt 1989). Because the two primary care practices had reputations of excelling in their performance, the case study design provided the best design to explore and describe the practices to learn about their dynamics. Case studies combine quantitative and qualitative data

collection methods including observations, interviews and questionnaires resulting in rich descriptions, generation of theories or the testing of theory. In this thesis, the case study design in Study I and II was chosen to explore and describe the concepts of high performing microsystems.

The two case studies in Study III were strategically selected based on their adaptation of the clinical microsystem knowledge and experiences over five years. The case study design could describe the status of the microsystems and hospitals after the clinical microsystem theory adaptation and application in the two different hospitals.

Action research was used in Study III and IV since the Dartmouth researchers had been independently requested by the senior leaders to help adapt clinical microsystem knowledge (processes and tools), collect data, and design the improvement actions specifically for their organizations. Thus, the researchers had dual roles as developers and researchers.

A descriptive, sequential, mixed method research design with an emphasis on qualitative data including surveys, focus groups and interviews from three different participant groups was used in Study IV (Tashakkori & Teddlie 2003). This action research involved the Cystic Fibrosis Foundation (CF) and the Vermont Oxford Network Intensive Care Nurseries (ICN). All leaders expressed interest in adapting clinical microsystem knowledge to their unique populations based on the patient-centered focus of the clinical microsystem theory where patients and family members are part of the microsystem (Nelson *et al.* 2002).

Study V is a quasi-experimental pre/post pilot intervention that builds on descriptive study findings of Studies I-IV to test an emerging hypothesis that team coaching contributes to the development of interprofessional teams' abilities to provide care and improve care (Bruce, Pope & Stanistreet 2008).

This thesis originated in the United States and concluded in Sweden. The research was performed in different contexts: a rural (Study I) and urban primary care practice (Study II), and a rural community hospital and urban academic medical center (Study III). Study IV was conducted during two national health care improvement collaboratives. Study V was conducted in Jönköping County Council, Sweden.

## **5.1 Participants**

### **Study I**

A rural primary care practice in the US was selected as a case study between 1999 and 2001 (Yin 2009, 2002). This primary care practice was selected based on the inclusion criteria of “best” integration of technology, information, optimized staff roles, never-ending attention to practice performance measures, staff development and clear visionary leadership (Nelson *et al.* 2002).

This case study included four patient service representatives (PSR), two medical assistants, one physician, one nurse practitioner, educator and the practice leaders (a physician leader and an office manager) see Table 5. The selection procedure of the participants was purposive to ensure representation of all roles in the practice. The leadership team consisted of the lead physician and an administrative partner who shared similar passions about excellence in health care delivery and were able to present a united and reinforcing front to the interprofessional staff.

## **Study II**

The selection criteria for Study II were the same as Study I. This urban primary care practice was chosen for its reputation for intentionally designed technology and information systems, and development of all practice staff to provide care and services while continuously improving them.

This case study included three physicians, one registered nurse (RN), two medical assistants, two practice service representatives (PSRs who answered telephones, triaged patient requests and made appointments), an information technologist, a practice leader and an administrative practice leader Table 5. The selection procedure of the participants was purposive to ensure all roles in the practice were represented.

## **Study III**

The selection procedure for Study III used criterion sampling identifying one large, urban, academic hospital and one medium-sized, rural, community hospital that had adapted clinical microsystem tools and processes. The two hospitals had engaged with Dartmouth researchers to adapt and apply the original microsystem knowledge to each of their unique settings. The two case studies included senior leaders (n=6), see Table 5.

## **Study IV**

The national leaders of the two organizations, the Cystic Fibrosis Foundation and the Vermont Oxford Network, contacted the Dartmouth researchers for guidance in designing and supporting the improvement efforts of frontline healthcare teams in a variety of health care organizations across the United States. The two independent improvement collaboratives included the author's input into the program design based on the prior studies with the

individual primary care microsystems and the two hospitals. The CF and the ICN programs were designed using the Dartmouth Microsystem Improvement Curriculum (DMIC) and team coaching actions that had been identified in the field by the Dartmouth researchers to help improvement teams in early 2003. The team coaching was linked to the DMIC and consisted of coaching during learning sessions, telephone calls and emails between learning sessions, and frequent encouragement and help.

The participants in this mixed methods study were coachees (members of interprofessional health care teams and patients or family members) (n=382), coaches (n=9) and unit leaders (n=30) from the two national improvement collaboratives that included different health care settings across the United States in overlapping time periods. Local Cystic Fibrosis (CF) Centers or Intensive Care Nursery (ICN) teams whose leaders had responded to the requests for collaborative applications from the CF and the ICN national leaders and were accepted met the inclusion criteria. The accepted CF and ICN teams (CF n=49, ICN n=12) assigned coaches (CF n=31, ICN n=8). Leaders (CF n=12, ICN n=18) were included in this study.

## **Study V**

An intervention pilot was conducted within a patient safety improvement collaborative involving seven health care improvement teams from three hospitals A (n=1), B (n=5) and C (n=1) in Jönköping County Council, Sweden from January to June 2010. Purposeful sampling included team members (n=40) who registered for the patient safety improvement collaborative, the collaborative faculty (n=4), leaders of the participating units (n=5) and the team coach.

## 5.2 Intervention—Study III, IV, & V

Study III and IV were based in action research since the Dartmouth faculty collaborated with organizational leaders to plan the improvement strategy and develop the improvement curriculum based on the Dartmouth microsystem improvement curriculum (DMIC).

In Study III, the Dartmouth researchers collaborated with two hospital organizations to test emerging clinical microsystem principles, tools and techniques in their unique settings. Dartmouth researchers collaborated with the urban and rural hospitals to design an improvement curriculum and supporting infrastructures for clinical microsystem development specific to each organization that included the content shown in Table 6. The curriculum was offered to selected interprofessional improvement teams representing specific clinical microsystems identified by the senior leaders. Members of the hospital quality department were recruited to support the improvement teams at the urban academic hospital following the monthly learning sessions. The rural hospital intentionally developed interdisciplinary staff to coach the improvement teams during and after the monthly learning sessions.

The intervention in Study IV, co-designed by the author and leaders of the two national improvement collaboratives, was an experiential learning series including team coaching based on field experiences reported in Study III. The interventions included face-to-face learning sessions at the beginning and end of the improvement collaborative complemented by monthly 90-minute conference calls with all collaborative participants. The coaches provided support during these activities and initially conducted individual site conference calls weekly and then monthly. The ICN

Table 6. Building improvement capability and creating the conditions to become high performing microsystems at two hospitals (Study III)

| Set expectations  | Basic knowledge and skills   | Provide all staff time and space to apply improvement knowledge   | Create supporting infrastructure  | Provide recognitions and rewards and real time information environment   |
|---|--|---|---|--|
| Action learning series for select microsystem teams and leaders led by senior organization leaders in collaboration with the Dartmouth researchers. | Dartmouth Microsystem Improvement Curriculum (Nelson <i>et al.</i> 2009) | One four-hour learning session each month which was supplemented with weekly one-hour interdisciplinary team meetings and time to test improvements and a mid-month conference call with the Dartmouth researchers to provide support, encouragement and clarification of improvement activities. | <p>Align improvement goals with organizational strategic vision, mission and operating plans.</p> <p>Engage outside experts to design learning series and support improvement knowledge development for leaders and frontline teams.</p> <p>Provide improvement “helpers” from the organization to support the improvement team meetings and actions.</p> <p>Develop regular reporting structures to ensure progress reporting to senior leaders.</p> | <p>Developed dashboards and instrument panels of current performance at all levels of the organization.</p> <p>Announcements and communication of improvement progress and people involved reported through newsletters, websites and meetings including Board of Trustee reporting. Regular leader praise and acknowledgements.</p> <p>Movie tickets, coffee coupons, pizza parties and food were a few of the rewards.</p> |

collaborative coaches also conducted four site visits to the participating ICNs. The CF collaborative coaches did not conduct site visits.

Study V was a quasi-experimental intervention study with a pre-post design in a Swedish improvement collaborative. The leaders of the collaborative were included in the research design, interventions, data collection and analysis. All seven teams received the improvement collaborative intervention but were randomized to the intervention of team coaching (n=3) or not (n=4) (see Table 7).

Coaching literature consistently identifies phases of coaching that start with an initial contact and establishment of a relationship between the coach and the client. This phase includes preparation to coach through discussion with the client to review aims, or working together and making assessments and diagnoses of the current situation. This is accomplished through the coach listening, exploring and coming to agreement with the client about how the coaching can help achieve the desired goals. This is followed by the actual coaching phase that includes skill development of the client, reflective conversations, client focus on pre-determined aims, and other supportive coaching actions. The final stage brings closure to the coaching and includes review of the coaching process and achievements, and evaluation of the coaching outcomes (Jarvis *et al.* 2006, Stober & Grant 2006, Clutterbuck 2007, Cox *et al.* 2010, Flaherty 2010, Lennard 2010, Hawkins 2011, Passmore 2011).

The team coaching model has three phases based on general coaching literature, empirical evidence and the findings in Study IV (Table 7).

Table 7. Study V three-phase team coaching model intervention

| <b>PrePhase</b>   |  | <b>Action Phase</b>  |  | <b>Transition Phase</b>  |
|---|--|--|--|--|
| <b>“Getting Ready”<br/>“Meeting them where they are”<br/>Humble Inquiry</b>   | <i>Origins</i><br>Batalden “work before<br>the work”<br>Kierkegaard/Schein | <b>The Art &amp; Science of Team<br/>Coaching</b>  | <i>Origins</i><br>Flaherty, Grant,<br>Clutterbuck,<br>Passmore | <b>Reflection, Celebration and Renew</b>   |
| <ul style="list-style-type: none"> <li>• Discussion with unit leader to discuss aim of team and coaching</li> </ul>   | Study IV   | <ul style="list-style-type: none"> <li>• Build relationships through helping activities and keeping the improvement team on track</li> </ul>                     | Study IV   | <ul style="list-style-type: none"> <li>• Reflection of team and coach on improvement journey and accomplishments.</li> </ul>   |
| <ul style="list-style-type: none"> <li>• Set expectations of leader, coaching and team including regular communication and progress reports to leader</li> </ul>  | Study IV   | <ul style="list-style-type: none"> <li>• Provide easy, accessible and timely communication via predetermined methods</li> </ul>                                  | Study IV   | <ul style="list-style-type: none"> <li>• Assess team capability and current team coaching needs based on new improvement capabilities</li> </ul>   |
| <ul style="list-style-type: none"> <li>• Determine team meeting frequency, location and strategy to ensure time for meeting and improvement activities</li> </ul>                                       | Study I, II, III   | <ul style="list-style-type: none"> <li>• Offer encouragement via email, telephone, in person no matter the size of the progress</li> </ul>                       | Study IV   | <ul style="list-style-type: none"> <li>• Create new team coaching transition plan based on assessments</li> </ul>  |
| <ul style="list-style-type: none"> <li>• Explore past improvement efforts to learn methods and tools used and what worked and didn't work</li> </ul>  | Schein   | <ul style="list-style-type: none"> <li>• Clarify improvement aims, expectations and improvement knowledge</li> </ul>   | Study IV   | <ul style="list-style-type: none"> <li>• Celebrate accomplishments</li> </ul>  |
| <ul style="list-style-type: none"> <li>• Review organization levels-systems micro/meso/macro</li> </ul>   | Microsystem theory   | <ul style="list-style-type: none"> <li>• Reframe to provide new perspectives, a sense of possibility and examples to encourage improvement activities</li> </ul> | Study IV   | <ul style="list-style-type: none"> <li>• Re-energize for next improvement focus and plan how to sustain and monitor improvements made.</li> </ul>  |
| <ul style="list-style-type: none"> <li>• Identify organization resources to support improvement e.g data sources, quality support, Human Resource department</li> </ul>                                 | Study IV   | <ul style="list-style-type: none"> <li>• Provide timely feedback on progress noting gains and additional considerations</li> </ul>                               | Study IV   | <ul style="list-style-type: none"> <li>• Renew the improvement team through review of membership and if any changes will be occurring. Determine how new members will be oriented to the improvement process.</li> </ul> |
| <ul style="list-style-type: none"> <li>• Conduct meeting with leader and team to clarify aim, set expectations and timeline, and communication methods. Leader articulates support of coach.</li> </ul> | Study IV   | <ul style="list-style-type: none"> <li>• Reinforce effective meeting skills using timed agendas and meeting roles to enhance group dynamics</li> </ul>           | Study IV   | <ul style="list-style-type: none"> <li>• Evaluate the team coaching for continued coach development</li> </ul>   |
| <ul style="list-style-type: none"> <li>• Visit the unit to see the workplace and observe social patterns and work processes</li> </ul>  | Study IV   | <ul style="list-style-type: none"> <li>• Teach improvement technical skills as needed</li> </ul>   | Study IV   |  |

The transition phase of the Team Coaching Model was developed from reflection in the experiential learning theory (Kolb 1984), reflective practice described by Schön (1987), review of coaching models, and experiences from the field. The transition phase has not been researched as the pre-phase and action phases have been.

One pre-post quantitative survey and three qualitative data collection tools were used to evaluate experiences of the participants. Four learning sessions with between session action periods were held during the six-month improvement collaborative. The usual collaborative groups had the support of the collaborative faculty while the intervention groups were supported by the team coaching model (see Figure 7).

The coach who provided the team coaching during the study, a senior Kulturm staff leader who had been formally trained in coaching at The Dartmouth Institute Microsystem Academy ([www.clinicalmicrosystem.org](http://www.clinicalmicrosystem.org)), had over 12 years of experience coaching health care improvement teams throughout Sweden. The coach used a detailed “Team Coaching Manual” based on the Team Coaching Model to guide the timing and content of coaching actions throughout the improvement collaborative (Godfrey *et al.* 2013). At the beginning, during and immediately after the collaborative, the coach and the author communicated by email, telephone and in person to discuss the team coaching model, team coaching manual, and the coach actions, reflections and experiences to ensure the team coaching was being carried out as originally planned and to make adjustments as a result of the coach’s field experience. Few adjustments were made as the coach consistently followed the team coaching manual. The adjustments were primarily based on the responses and growing maturity of the teams being coached with less coaching needed over time compared to the first coaching meeting. The three-phase Team Coaching Manual is described in detail in appendix A, and

includes the assessment tools associated with the transition phase illustrated in Figure 7.

The usual collaborative group was exposed to the “usual” improvement collaborative process: learning session interactions with the faculty, and unplanned and sporadic collaborative faculty interactions between learning sessions.

## **5.3 Data Collection**

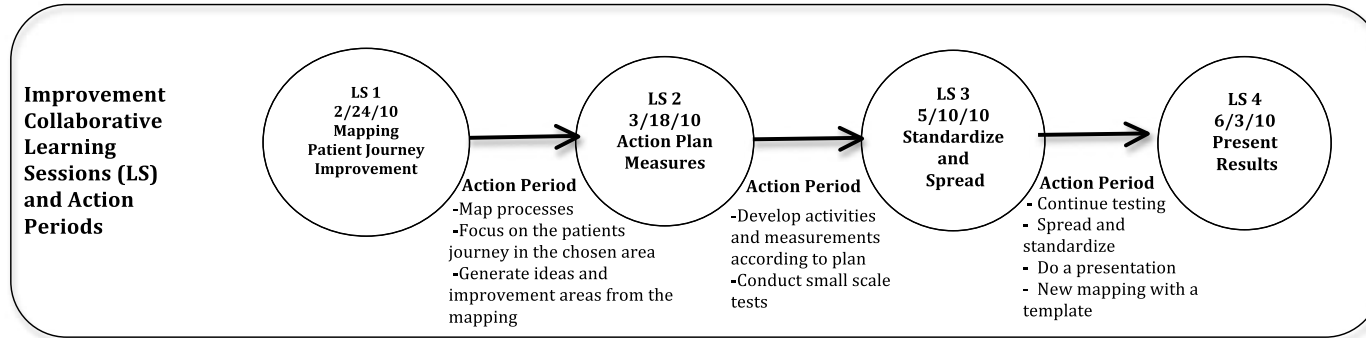
Both quantitative and qualitative data collections were used. The rich descriptions from the qualitative data collection and analyses further expanded the quantitative findings to provide a more robust understanding of the findings (Tashakkori & Teddlie 2003).

### **Study I & II**

One of the methods of data collection in Studies I and II included individual, structured, telephone interviews with leaders of the selected microsystems (the Office Clinical Director at the rural primary care practice and the Managing Director at the urban primary care practice). Individual, on-site, structured interviews were conducted with office practice members at the rural primary care practice (n=6) and urban primary care practice (n=6) and were recorded to supplement the written notes taken during the interviews by two Dartmouth researchers. One focus group of 6-12 practice members (including representatives of each role in the practice) was held during lunch at each practice. The focus group was moderated by other experienced members of the Dartmouth research team using a moderator guide. The focus groups were also recorded to supplement written notes. Two to four

## Figure 7. Safety Improvement Collaborative Process for Non-Intervention and Intervention Groups with Team Coaching Model

Both groups participated in four learning sessions over 6 months with action periods to practice new knowledge at their care unit between each learning session. The non-intervention group had no additional help or support. The intervention group was part of the Team Coaching Model.



### Non-Intervention Group n=4

### Intervention Group with Team Coaching Model\*\* n=3

#### Pre-Phase “Getting Ready & Meeting Them Where They Are”

1. **Expectations:** Meet with leadership to discuss improvement aim and overview of coaching process. Discuss roles and logistics of meetings including **time** and **expectations** of each other and the team.
2. **Explore the context:**
  - Roles, functions & culture
  - Past and current improvement experiences, tools and lessons learned.
  - Identify connections with meso and macrosystem including **resources** to help the improvement e.g., **information technology, data, human resources, organization improvement resources**
3. **Organize coach site visit**

#### Action Phase “Art & Science of Team Coaching”

1. Offer **encouragement** through face-to-face meetings, telephone and conference calls, web sessions, emails and texting.
2. Provide **helping actions** including **reframing** different perspectives, keeping the team **on track** with **clarifying** the aim, expectations, improvement process and timelines.
3. Provide **constructive feedback** on the process and group dynamics.
4. **Determine communication** modes specific to the team and agree to be accessible with timely responses. Discuss virtual or face-to-face communication the team finds most supportive.
5. Strive to develop **coaching relationship** that promotes team strengths and efforts.
6. **Support improvement technical skills** with teaching of improvement tools and processes.
7. Meet regularly with the leader(s) to communicate progress and needed leadership support.

\*\*The Team Coaching Model here illustrates the phases the three teams in the intervention group received by the coach during the Improvement collaborative. The coach met with the teams in the **Pre-phase** to establish a relationship and learn about the practice before the start of the collaborative. During the **Action Phase** (the start through the end of the collaborative), the coach met weekly with the improvement teams at their hospitals to support their improvement learning and to help them reflect on what they were learning. In the **Transition Phase** at the end of the collaborative, the coach assessed the team for new improvement skills and knowledge, and how the group was meeting and accomplishing the improvement work to determine a plan to coach less since the team had new capabilities.

#### Transition Phase “Reflecting, Celebrating & Renewing”

1. Reflect on improvement experience and what went well or what not to do again!
2. Review measured results to determine how to track for continuous improvement.
3. Assess team improvement knowledge and group dynamics status.
4. Create the coaching transition plan including specific targets and frequency of coaching.
5. Celebrate!
6. Renew commitment and re-energize for next improvement focus.
7. Evaluate Coaching.

hours of direct observation of the practice core processes included answering telephones, making appointments, greeting patients and registering for appointments. Additional observation of core clinic processes included patient encounters with the care providers and the flow through the office practice including exiting the clinic practice (Studies I and II). Observation of an interdisciplinary practice meeting at both primary care practices provided qualitative data about the culture, processes, group dynamics and leadership of the practices. A review of medical records provided data on selected quantitative outcomes for specific subpopulations of patients. Additional practice performance data were collected through the review of operational data. Examples of the collected data included eye exams for diabetics, advance directives, influenza vaccination rates, smoking inquiries, the daily and annual number of patient appointments, ease of access to providers for appointments and by telephone, office visit cycle times and practice financials.

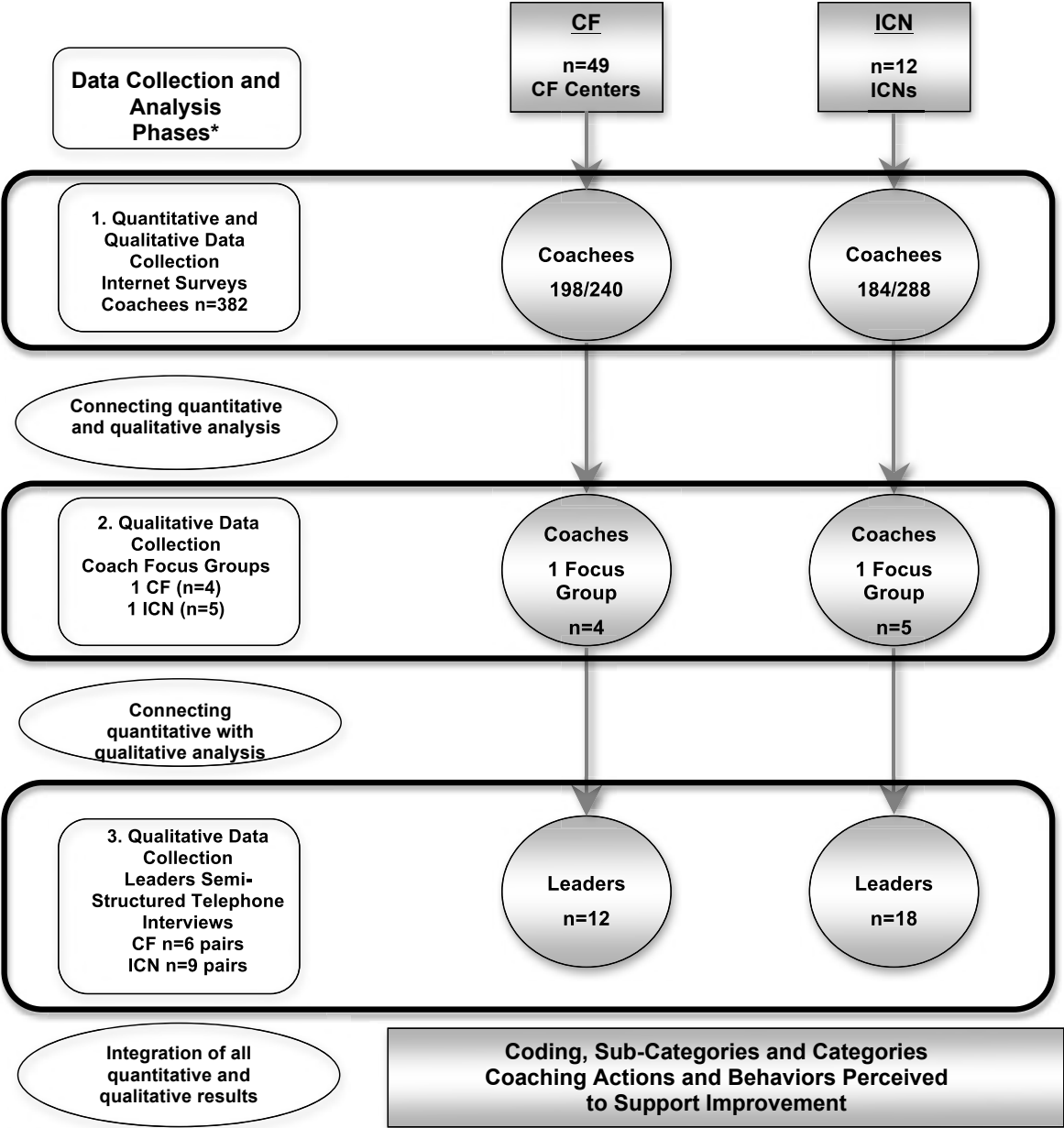
### **Study III**

This explorative, comparative case study was based on adaptation and implementation of the clinical microsystem tools and processes in the two hospitals. One focus group conference call was held with the leaders and the three Dartmouth researchers. The discussion was moderated by one of the experienced Dartmouth researchers and the other two researchers took notes. A semi-structured interview guide was used to facilitate the conversation. The notes were reviewed and agreed upon by the Dartmouth researchers and then reviewed with the focus group members (member checking) to invite corrections and modifications.

## Study IV

A mixed method, sequential, exploratory study design collected quantitative and qualitative data (Figure 8) from interprofessional improvement teams who received team coaching (Östlund *et al.* 2011, Ivankova *et al.* 2006). Three phases of data collection included the first phase of a 15-question survey completed by the coachees (n=382) consisting of a five-point Likert scale (Strongly Agree=4, Agree=3, Disagree=2, Strongly Disagree=1 and Can't Answer=0) and eight open-ended questions. The second phase included two focus group discussions of the coaches (n=9) using a moderator guide derived from the phase one coachee surveys to further expand insight into team coaching. The final data collection phase consisted of semi-structured telephone interviews with leaders of the microsystem teams who participated in the team coaching (n=30) (Figure 8).

Figure 8. . Mixed methods three-phase data collection and analysis phases (Study IV, Figure 1)



Both the coachee survey and coaching evaluation survey (Study IV) had face and content validity indicated through small pilot testing and consistent respondent results.

## **Study V**

Qualitative methods included a team coaching evaluation survey (Appendix B) (Godfrey *et al.* 2013), focus groups for team members and their leaders, and individual semi-structured interviews with collaborative faculty and the intervention coach.

*Focus Groups.* Five one-hour focus groups of usual collaborative group and intervention group unit leaders (n=3) and team participants (n=2) were conducted by the author. Each focus group consisted of three to five participants (Krueger & Casey 2000, Krueger 1998). Translators were offered and accepted by the team participant groups but not by the leader groups since they expressed a higher confidence in speaking English. The moderator guide was based on prior focus group guides inquiring about coaching experiences (Godfrey *et al.* 2013). The focus groups allowed for clarification and probing questions to gain deeper understanding about the coaching experiences especially since the participants were translating questions and responses from their native Swedish language to English (Maxwell 2005). Focus groups were recorded using a digital recorder. The recording was transcribed by an independent professional and the transcripts were compared with the author's meeting notes. If there were discrepancies between the transcriptions and the author's notes, the author would listen to the digital recordings to confirm or correct the documentation.

*Faculty and Coach Interviews.* The collaborative faculty leader and the intervention coach documented reflections and insights throughout the collaborative and shared them regularly with author. They also participated

in separate 60-minute, semi-structured interviews with author within one week after the collaborative ended. The interviews were recorded and processed using the same steps as the focus group process.

## **Quantitative Data Collection**

*Quality Improvement Knowledge Application Tool* (QIKAT) survey (Appendix B).

The QIKAT used to assess individual knowledge of improvement is currently being validated after being used with a large number of participants in various clinical settings (Personal communication, Ogrinc, September 2012). The self-assessment section of the QIKAT survey, which uses an eight-item, four-point ordinal scale (Not at all=0, Slightly=1, A bit=2, Much=3) was used to collect pre and post data (Ogrinc *et al.* 2004, Morrison *et al.* 2003). The QIKAT paper survey was distributed to all learning session (LS) participants at the beginning of each session (four times during the six-month collaborative) to track changes in self-assessed improvement knowledge and ability. The survey was translated from English to Swedish using a one-way translation process described in the literature (Råholm, Thorkildsen & Löfmark 2010, Peña 2007, Hilton & Skrutkowski 2002). Two bilingual Swedish administrative staff members reviewed the English survey and translated it to Swedish discussing discrepancies between themselves and coming to agreement on the translation. The translation was reviewed by the author to ensure original questions were preserved and discrepancies were discussed to result in the final translated survey.

Single surveys and surveys without codes were excluded from the analysis (n=18). For the remaining participants who had at least two completed surveys, the first survey was considered the pre-test and the last

returned survey was used as the post-test. Inclusion criteria determined that pre-test surveys completed in either LS 1 or LS 2 with a post-test survey completed in LS 4 would be included in the study (n=19) Table 8.

In the usual collaborative group, four of the nine members attended all four of the learning sessions. In the intervention group, five of the ten members attended all four learning sessions.

Table 8. Number of participants with included pre-posttest survey responses in usual collaborative group and intervention group

|  | Pre-posttest<br>Learning Session 1 & 4 | Pre-posttest<br>Learning Session 2 & 4 |
|--|--|--|
| <b>Usual Collaborative Group</b> (n=9) | 5                                      | 4                                      |
| <b>Intervention Group</b> (n=10)       | 9                                      | 1                                      |

*Team Coaching Evaluation Survey.* At the completion of the collaborative, a team coaching evaluation survey was distributed to all participants in the collaborative since both groups received the usual collaborative help and the intervention group also received the team coaching model. The English survey was translated to Swedish using the one-way translation process previously described (Råholm, Thorkildsen & Löfmark 2010, Peña 2007, Hilton & Skrutkowski 2002). The survey included a 19-item survey with a four-point scale (Strongly Disagree=0, Disagree=1, Agree=2, Strongly Agree=3) and eight open-ended questions shown in Appendix B. Both the QIKAT and the coaching evaluation surveys had been pilot tested separately in small sample groups repeatedly in

multiple settings and have shown consistency in responses (Godfrey *et al.* 2013, Ogrinc *et al.* 2004, Morrison *et al.* 2003).

## **5.4 Data Analyses**

### **Qualitative Content Analysis**

The qualitative data were analyzed using manifest qualitative content analysis (Krippendorff 2003, Neuendorf 2002). The qualitative data included a variety of data collection methods: interview transcripts with leaders and staff (Study I, II, IV & V) and the coach and faculty (Study V); focus groups of staff, leaders, and coaches (Study I, II, III, IV & V); and open-ended survey questions (Study IV and V).

In Study I-III, the transcribed recordings and notes from the focus groups and individual interviews were analyzed using manifest content analysis as outlined by Krippendorff (2003). The author and the research team independently and collectively reviewed the qualitative data to gain insights and identify patterns from the respondents' comments. The researchers discussed the analysis to identify agreement and explore disagreement in the coding, resulting in some reformulation of codes and categories. The qualitative analysis of coding and condensing data to create subcategories and categories in Study I was performed by the author, ECN and JJM and reviewed by JHW and PPB to strengthen the validity of the analysis (Krippendorff 2003, Neuendorf 2002). The same process was followed in Study II, with analysis of coding and condensing data performed by four Dartmouth researchers and validated by two researchers. In Study III, the analysis was performed by three Dartmouth researchers and reviewed by two researchers.

In Study IV and V, the author read the qualitative data in each study several times to gain insights and identify patterns from the respondents' comments. In Study IV, NVivo8 software was used to organize and support the analysis of the qualitative data. Meaning units were identified in the text from the survey's open-ended responses, focus groups and telephone interviews. The meaning units generated 88 codes that were scrutinized and compared in order to collapse similar codes into fifteen subcategories. The subcategories were compared with each other and synthesized into four main categories. During the coding process, the main supervisor reviewed the codes and categories to mitigate single source bias. The two authors discussed the analysis to identify agreement and explore disagreement in the coding, resulting in some reformulation of codes and categories. Finally, the comments related to each category and subcategories were quantified across the three perspectives.

In Study V, the open-ended coaching evaluation questions, transcribed recordings and notes from focus groups and individual interviews were analyzed using manifest content analysis as outlined by Krippendorff (2003). The author reviewed these texts to identify patterns and identified 24 subthemes and then synthesized them into five main themes. The creation of subthemes and themes was performed by the author and second author (author and JT) to strengthen the validity of the analysis (Krippendorff 2003, Neuendorf 2002).

## **Quantitative Analysis**

### *Study IV*

The quantitative analysis of the coachee surveys was reported for each item at the descriptive level, and differences between the two groups, CF and

ICN, were analyzed using Fisher's exact test on ordered categorical data recommended for use with small samples (Motulsky 2010). Since calculation of means and standard deviations is not recommended on ordered categorical data, non-parametric analysis was selected. The data analysis process was reviewed and guided by the fourth author (MN) using SAS<sup>®</sup> 9.2 software. A p-value  $\leq 0.05$  was considered statistically significant. A sensitivity analysis to determine the influence of non-respondents to the survey showed no difference in results due to the high ceiling effect found in the survey responses.

## Study V

The study's primary outcome was change in *self-assessed improvement knowledge (QIKAT)* during the six months of the study. The changes were evaluated on an individual basis in the usual collaborative group and intervention groups using the first and last survey of each respondent. To evaluate if the two groups were fairly homogenous at baseline, an analysis of the distribution of the answers on the QIKAT at baseline was performed. The hypothesis was that the distribution on the four-point scales would be equal at baseline for the two groups (tested with Fisher's exact test). We found some differences between the baseline distributions on some of the QIKAT items but none of them were significant.

Since the data produced by the QIKAT survey consists of paired ordered categorical data, nonparametric tests, such as McNemars test or Wilcoxon signed rank test are suitable tests to use. However, information about the direction or strength in change from pre-posttest cannot be detected by these tests. Therefore we employed a method for analysis of paired ordered categorical data developed by Svensson (Ljungkvist *et al.*

2005, Svensson 2001, 1998). The analysis is of the individual data and calculated for each group separately.

The quantitative analysis of the *coaching evaluation* surveys was reported for each item at the descriptive level and the differences between the usual collaborative group and intervention groups were analyzed using Fisher's exact test on ordered categorical data. A p-value less than 0.05 was considered statistically significant. The quantitative analyses were reviewed, discussed and guided by a statistician using SAS Stat software 9.2<sup>®</sup> as well as an Excel<sup>®</sup> macro developed for analysis of changes in paired ordered categorical data (Avdic & Svensson 2010).

## **5.5 Ethical Considerations**

Participation in the studies was voluntary, confidential and based on informed verbal consent. Study I, II and IV were granted ethical approval from the Committee for the Protection of Human Subjects (CPHS) at Dartmouth College (Study I & II, CPHS #15249 & Study IV, CPHS #22131) (Trustees of Dartmouth College, 2013). Permission was obtained from the leaders of each study setting before approaching individuals or interprofessional teams. Confidentiality and voluntary participation were discussed with all participants in each study before interviews, focus groups or observations. In all the studies, the risk of causing emotional or psychological problems to the participants was considered. Participants were informed they could terminate their participation at any time without any consequences. The author requested to be notified if any participant perceived emotional or psychological problems as a result of participation, in order to facilitate any needed follow up. All data were abstracted and

aggregated at the group level to avoid any individual identification and to maintain confidentiality. As an American in Sweden, I placed a great deal of emphasis and consideration on being culturally sensitive, approaching participants with respect, and using humble inquiry. Translators were available at all stages of Study V to ensure participant comfort and ability to communicate effectively. Frequent pauses were built into the interviews and focus groups to ensure effective communication and to clarify and make corrections as needed about my understanding of the knowledge gained through the discussions (Maxwell 2005). The actual use of the translators was minimal due to respondents' varied levels of English competency. Frequently, the members of the group would help one another with their English communication rather than turn to the translator.

During the recruitment for Study V, every team that inquired about the improvement collaborative participation was informed that this was part of a doctoral research study and that the surveys and interviews would be used to learn about the collaborative. With that knowledge, none of the teams declined to participate. Confidentiality and voluntary participation were discussed with all participants before each learning session, at the time of the administration of the surveys, and at the beginning of each focus group and semi-structured interview. Verbal consent was obtained from all participants. No personal identifier data was collected and pre-posttests surveys had anonymous codes (Codex 2011).

## **Quality Improvement Ethical Framework**

Beyond the research ethic principles of autonomy, beneficence, nonmaleficence and justice, there is growing concern about ethical issues in the field of quality improvement (Lynn 2007). A moral obligation to ensure all quality improvement activities are conducted in an ethical manner including practicing the highest standard of quality improvement

methodology has been established (Lynn 2007). Since there is a moral imperative for interprofessional staff to engage in health care quality improvement (QI), quality improvement activities should be part of good professional clinical practice (Lynn 2007). Further, the ability to improve care is expected through educational accrediting organizations in the US requiring health care professionals to be competent in improving their own practices (Cronenwett *et al.* 2007, Hamp & Stockman 2002, Leach 2001).

A QI ethical framework raises an issue of the QI methodology utilized and if the methodology results are consistent and predictable. There are many examples in quality improvement where methods and interventions are introduced based on assumptions of benefit rather than evaluative evidence (Lynn 2007). To deepen the understanding of “how to improve the improvement,” researchers from several disciplines are in the process of developing, clarifying and debating what improvement science may consist of (The Health Foundation 2011, Batalden & Davidoff 2007). The Health Foundation in the United Kingdom has convened a network of international researchers from disciplines within the field of health care improvement to more deeply understand improvement science (The Health Foundation 2011). Ultimately, the goal of improvement science is to ensure the quality improvement efforts are based as much on evidence as the best practices they seek to implement. The Institute for Healthcare Improvement recently published their position on the science of improvement (Perla, Provost & Parry 2013). The authors explore the philosophical and theoretical foundations of improvement based on Deming’s system of profound knowledge to advance the field of improvement. The challenge will be to ensure theoretical models translate into deeper understanding of change processes and meaningful action in the field.

## 6.0 Findings

### **6.1 The clinical microsystem 5Ps: purpose, patients, professionals, processes, patterns with leadership guide the assessment, design, redesign and creation of patient-centered services. (Study I)**

The findings of Study I described how members of a high performing clinical microsystem can design patient-centered services with a focus on purpose, patients, professionals, processes, and patterns in their primary care practice.

The physician leader set expectations of all staff to have knowledge of the population served, the people providing care, the processes of care and the patterns of the practice to inform the design and continuous improvement of patient-centered services. Understanding the “current state” or inner workings of the microsystem is the starting place to improve a clinical microsystem’s capability to provide patient-centered services. Assessing structure, process and outcomes to identify gaps between current and ideal states can guide improvement plans for transformation. The structure, process and outcome domains were modified to create a process for clinical microsystem assessment consisting of the *patient* subpopulations that are served by the microsystem, the *people* who work together in the microsystem, the *processes* the microsystem uses to provide care and services, and the *patterns* that characterize the microsystem’s functioning and culture as well as its outcomes. Examples of the four Ps in the primary practice are displayed in Study 1, Table 1 (Godfrey *et al.* 2002). Considering the individual “Ps” and the interconnectedness of the “Ps” helps all members

of the staff see details of their practice that might inform improvement and innovation.

This study described processes to help frontline teams understand their structure, process and outcomes of care through the creation of a 5P assessment workbook (later published under the title of *Assessing Your Practice Workbook*). The Dartmouth researchers realized a fifth P - the *purpose* of the microsystem was needed because of the observed importance and impact of a clear and shared purpose in the microsystem. It was observed that learning about the 5Ps helped the clinical microsystem members understand their current state to be able to identify the gap between the current and desired future state. Examples of the “Ps” in other health care settings are offered in Study 1, Table 2 to show the adaptability of the “5P” framework. The 5P assessments and related actions in Study 1, Table 4 and the common wastes (e.g. high no-show rate, exam rooms not stocked) of a microsystem in Study 1. Table 5 illustrates how new microsystem knowledge might inform improvement and redesign.

The physician leader in partnership with the office manager leader clearly communicated the practice’s vision of patient-centered services and continuous improvement to the staff and patients. Realizing that staff was a valuable asset to the practice, the leaders intentionally designed programs and systems to help staff be the best they could be in their roles. All staff participated in classes on quality improvement and effective interpersonal skills in the practice. After ninety days of satisfactory employment, staff had the opportunity to attend further quality training at the local community college. The development of staff was enhanced with the use of helpful practice assessment tools and processes such as flowcharting.

Technology was designed into the standardized daily processes of answering and triaging patient phone calls, receiving electronic patient health surveys in advance of scheduled appointments, and the use of a

Problem Knowledge Coupler™ that linked evidence-based medicine to reported signs and symptoms of patients. In addition, an electronic health record documented care of the patient, provided alerts to staff when patients needed preventive care and printed a summary of the visit for the patient. These information systems all contributed to role optimization for each staff member in the office and the design of smooth, effective and safe patient care services.

Communication was a continuous process in the practice and included email with patients and staff, annual all staff off-site retreats for planning practice improvement, weekly improvement meetings, daily huddles and off-hours, out-of-practice social events. A huddle is a brief (less than 5 minutes) stand-up discussion and review of needed follow-up work from the day before, and review of scheduled patients to be seen today including any special needs of those patients. This proactive process helped the staff anticipate patient and provider needs before the workday began.

Data transparency was a value of the practice. Performance data was displayed publically in the waiting area and staff was regularly informed in meetings and daily huddles how the practice was performing compared to projected performance and the budget. Extensive databases provided reports on both outcomes of care and monitored processes to identify improvement ideas and actions. A staff member reported that “data and statistical control charts inform the practice and the data wall is used daily to improve our processes.” Another patient service representative pointed out the many process flowcharts in the practice and said “we collect data on them to give us a baseline to know what to improve.”

Staff felt valued in the practice and had a high sense of self-worth. Practice members were observed to be respectful and collaborative in the daily work of the practice and in the team meetings. The interdependence of the members of the team was witnessed through each step of the patient visit.

The standardization of the processes for each role helped staff see how each role contributed to the overall process. All staff members were active participants in the improvement meetings since it was clearly stated by the leaders that anyone could make improvements using the standardized methodology. Indeed, all staff were expected to participate in continuous improvement while providing care and services to patients and families.

The physician leader was the inspiration for the development of the frontline team in the rural primary care practice. He had developed and executed the microsystem improvement strategy based on years of personal study of improvement outside of health care in the manufacturing, airline, entertainment, technology, service, banking and automobile industries.

The physician and the practice manager consistently reinforced the improvement knowledge, encouraged participation in improvement activities, shared performance data and regularly tested new ideas to improve the practice performance and patient outcomes.

The everyday patterns of the practice included routine processes of improvement: reflecting, thinking and behaving with a focus on patients and the performance of the practice. Every staff member viewed his or her work as providing care and improving care.

The main findings of this study show that leaders of microsystems can create conditions that promote high performance. Consistently articulating a clear vision, setting expectations of improvement daily work, utilizing technology to standardize and optimize staff roles, providing consistent data to inform planning and improvement, and continuous communication and learning opportunities including helpful tools supported practice development and high performance. Formal analysis of the “5Ps” provides the foundation to creating a culture of improvement and engaging all members of the microsystem to be the best they can be while continuously improving the practice and reflecting on their daily work.

## **6.2 Creation of a human resource value chain linked to the organization's vision, goals, values and staff professional development contributes to a culture of doing your job and improving your job. (Study II)**

The findings of Study II describe principles, actions and processes that can help leaders cultivate a positive working environment for the members of the clinical microsystem.

The mission, vision and principles of the practice were communicated at the time of interview, when hired, through orientation and in the daily work and ongoing development of the staff. The operating manager leader provided a clear direction to create the supportive conditions, enabling successful and continuous health care improvement in this urban primary care practice. He focused on encouraging staff development and cultivated a positive workplace where everyone's opinions and ideas were accepted. The work climate was observed to show respect for everyone in the practice including patients and families, which minimized the turbulence of a busy practice and resulted in more active problem solving to achieve the stated goals of the practice.

Intentional development of a human resource value chain included attraction and recruitment, selection of staff, orientation, continuous training and education, performance management and ongoing support and growth for all staff. Linking the human resource value chain to the mission, vision and goals created a social work environment focused on service excellence, continuous improvement and optimized professional roles.

*The human resource chain* created the framework for a clear predictable workplace with expectations of staff to provide care and services and to improve them. The external recruiting agency was knowledgeable of the practice mission and goals and reviewed them with potential candidates

before they were interviewed at the practice. Candidates with predetermined and desired personality traits, talents and skills such as strong customer service attitudes were hired to enrich the workforce. The work-study programs with local colleges and schools encouraged students to work and practice their new knowledge and skills in the primary care practice while attending college. The enthusiastic students in the work-study programs added to the vibrant workplace. Educational programs were offered to all staff to grow their talents and knowledge base. Specific skill labs were held to build cross training capability of all staff for all the workstations in the process of care in the practice. After two years of employment, staff had the opportunity to take administrative courses to further advance their knowledge and professional career.

*The staff orientation* (see Study II) to the practice created the conditions for employee success. The practice mission, goals, expectations of high customer service, performance evaluation, fiscal responsibility and continuous quality improvement were clearly explained in the orientation. Key factors for successful orientation included setting clear expectations, training time to learn roles, peer evaluation based on practice standards, a culture of helping each other to be their best and cross training to ensure coverage of all roles.

*The ongoing training and education* included skill labs, special education nights and a rigorous performance evaluation program (PEP). The first PEP is completed after 90 days and includes a 360 degree review from all staff and then reviews are held quarterly to ensure employee growth and follow up in their development. The PEP had nine categories of performance that contributed to the culture of service excellence and continuous improvement. The categories included attendance, attitude, team effort, patient care and service, effective use of time, practice knowledge,

communication skills, organizational skills and professional appearance. The categories are further explained in Study II, Table 2.

The practice in this study used *state-of-the-art office and medical equipment* such as ergonomically correct desks and chairs, digital blood pressure machines, computer stations, electronic health records, and electronic scheduling and billing processes. In addition, the practice performance data were captured electronically in real time to track and promote all staff review of practice performance and to provide early detection of problematic processes to make immediate improvements.

*Regular communication processes* within the practice including email for all staff and regular all-staff meetings fostered understanding of the practice, esprit de corps and continuous improvement. Monthly dinner meetings were a form of “open forum” for any topic staff wished to raise and also included special educational topics. All staff members knew they had two jobs: to first do their work, and second to improve their work. Staff was observed to be clearly patient focused and customer service oriented in their communications and actions. These had been developed through the clearly communicated expectations of patient-centered care and the technology that helped them have the information they needed to meet the patient and practice needs.

The main findings of this study show that clear leadership communication of mission, values and principles in a practice can set clear expectations of service excellence, personal and professional development, and continuous improvement activities for all staff in a microsystem. A human resource value chain provides a clear staff path from recruitment through ongoing development that intentionally matches and develops staff to the practice to achieve the mission, values and principles of the practice and is an important element to the development strategy. Continuous education, frequent communication and development of staff support

members were other important elements in the intentional development of staff in the workplace. Leaders created a workplace that had cutting-edge equipment and technology to further support staff to exceed patient expectations and to be the best they can be.

### **6.3 Adaptation and implementation of clinical microsystem processes and tools to local contexts and organizational support. (Study III)**

Study III describes the action research efforts developed from the insights of Study I and II including clinical microsystem processes and tools and the roles of senior leadership in two different hospital settings.

Both hospitals had active and engaged senior leader teams who had formal health care improvement education. They also had attentive Boards of Trustees (BOT) and the support of the organization to achieve the BOT vision for improvement. However, these two hospitals were very different in many ways as Table 1, Study III illustrates. The urban, academic medical center BOT determined their medical center's aim was "to be the leader of improving child health." The rural community hospital BOT's aim was to "become a model community hospital providing best care, continuous improvement and sharing what they were learning."

The leader champions of the improvement work were the Chief Executive Officer (CEO) and a lead physician of the academic medical center; and the CEO, Chief Nursing Officer and Chief Quality Officer of the community hospital. In order to attain the bold visions and aims of the organizations, the senior leaders realized they needed to develop improvement knowledge and capability of all frontline staff at the

microsystem level and the leadership at the meso and macrosystem levels of the organizations.

Neither of the two hospitals had the internal capability to provide all the health care improvement education that was needed to achieve the improvement aims, so the leaders independently contacted the Dartmouth research group. Internal learning collaboratives using the Dartmouth Microsystem Improvement Curriculum were designed for each hospital. Senior leaders selected lead improvement teams that included frontline managers from selected clinical microsystems to attend on-site learning sessions on building improvement capabilities in their units. The urban medical center developed an 18-month learning series for six inpatient care units that included the physician and nurse co-leaders of each unit. The improvement series was designed for each microsystem to learn and practice improvement knowledge and teamwork. Since frontline microsystem leaders needed to learn healthcare improvement and how to lead and support improvement activities, the co-leaders of each participating microsystem were included in the learning series.

The rural community hospital leaders attended a graduate level improvement course at Dartmouth and practiced using the microsystem tools and processes in one clinical microsystem. Participation in the course and the opportunity to practice using the microsystem tools and processes enabled the leaders to learn more about microsystem improvement and to adapt the tools and processes to the local context of the community hospital. Following the Dartmouth course experience, an internal experiential six-month learning series was designed for three microsystems. The leaders of the organization formed an improvement team for their own process improvements and participated in the learning series. This single action both advanced the leaders' knowledge of improvement and increased their

credibility with the staff as reported through open conversations between staff and leaders during the learning sessions.

At both hospitals, participation in the internal improvement collaborative series allowed leaders to recognize that frontline teams needed help learning and practicing improvement. They also recognized the challenges posed by limited time and limited knowledge, and thus arranged for formal help for the improvement teams. The urban medical center enlisted the help from their quality improvement department and the rural hospital enrolled interested staff in a coaching development program at The Dartmouth Institute Microsystem Academy (Trustees of Dartmouth College, 2013) to learn skills to help frontline teams with improvement. These resources helped each improvement team during the on-site learning sessions and then followed up with the improvement teams between learning sessions to offer technical help and encouragement.

The senior leaders of the medical center and community hospital initiated “walkarounds” for the senior leaders to visit the microsystem units to encourage staff and review improvement progress. Quarterly improvement progress reports from the frontline leaders to senior leaders made microsystems accountable for their efforts to achieve organizational improvement goals. As the clinical microsystems engaged in their improvement work and tried to assess their “5Ps”, the challenge of accessing microsystem-level performance data was exposed. Since the organization did not report detailed microsystem-level data and information, it was difficult to collect resulting in a great deal of expressed frustration by the frontline staff. This resulted in redesign of the data and information systems to provide unit-level data. In addition, the organizations were able to create a directory of data and information key contacts to help the frontline staff access data to inform improvement work.

This study shows the improvement results achieved by the frontline staff while building their improvement capability. Both hospitals showed improvement in outcomes over a period from the initial improvement development through the learning series to four years later (Study III, Figure 2, 3 and 5).

The main findings of this study were that clinical microsystem tools and processes were successfully adapted to the local context of two very different hospitals to support development of improvement capability, and that measured improvement occurred and was sustained well beyond the learning series. The provision of supportive resources such as quality department staff or individuals educated in team coaching contributed to the development of frontline improvement capability. Visible demonstration of leadership investment and interest such as walkarounds and regular opportunities to communicate with improvement teams showed improvement teams their value and importance in achieving the organization's vision. These walkarounds also allowed leaders to see the system barriers to improvement and aided in their mitigation (Study 3, Table 2 & 3). Finally, leadership at all levels of the organization built infrastructure to report progress and to hold improvement teams accountable for the improvement aims.

## **The overall findings of Study I, II & III**

The research progressed from inductive (Study I & II) to deductive action research in Study III to test the findings from the previous studies. The three case studies confirmed the previously identified success characteristics of high performing clinical microsystems as illustrated in Table 9. The column titles in the table represent the research findings from the publication of Nelson and colleagues (2002).

Table 9. Findings in the case studies presented according to the five categories of success characteristics of high performing clinical microsystems (Nelson *et al.* 2002)

|           | Leadership   | Staff   | Patient   | Performance  | Information & Technology  |
|-----------|--|---|---|--|---|
| Study I   | Physician self-educated in improvement promoted and reinforced improvement expectations. Practice manager was a partner with the physician leader.   | Expectation to learn and practice improvement in daily care of patients. Communication through email, daily huddles and monthly all staff meetings. Access to local community college for formal quality improvement program.   | Patient satisfaction surveys in real time. Copies of individualized plans of care upon leaving practice.  | Any staff member could trigger standardized improvement methodology. Regular improvement discussions. Practice performance measures plentiful and accessible by all staff.   | Technology supports patient triage system called Problem Knowledge Coupler to use evidence- based decision making. Patient health status surveys. Electronic health record for documentation to ensure patient and all staff had current knowledge of plan of care. |
| Study II  | Practice manager self-educated in improvement knowledge designed, promoted and reinforced improvement expectations. Clear vision, values and expectations for all staff.   | Hired for talent through human resource value chain process. Structured orientation and performance evaluation program. Regular educational opportunities to learn about practice performance and improvement. Communication included email for all and regular staff meetings. | High level of customer services based on assessed needs.  | Real time data collection for reporting of practice performance. Regular improvement discussions and meetings to reinforce practice improvement.   | State-of-the-art equipment, electronic health records, scheduling and billing processes. Regular electronic reporting of practice performance.  |
| Study III | Board of trustees setting direction and expectations of improvement. Self educated senior leaders of two hospitals. Clear vision, values and expectations for all staff. Identified the need for outside resources to develop and support building frontline staff improvement capability. | Selected clinical microsystem teams to focus development of improvement capabilities including microsystem leaders. Participated in customized Dartmouth microsystem improvement curriculum in internal learning collaboratives.  | Urban medical center engaged patients and families in improvement, patient and family bedside rounds along with review of patient/family reported assessments. Rural community hospital utilized patient satisfaction data. | Customized Dartmouth microsystem improvement curriculum in internal learning collaboratives. Quality departments actively involved in microsystem improvement. Urban medical center utilized quality department staff to support microsystems. Rural community hospital developed improvement coaches. | Both hospitals redesigned information system to provide clinical microsystem level of data rather than service line data.   |

## **6.4 Coachees, coaches and leaders perceive team coaching as mostly positive for development of interprofessional teams' improvement capability (Study IV)**

The findings in Study IV describe how team coaching can assist and support interprofessional staff and leaders in the development of improvement capability in their clinical microsystems.

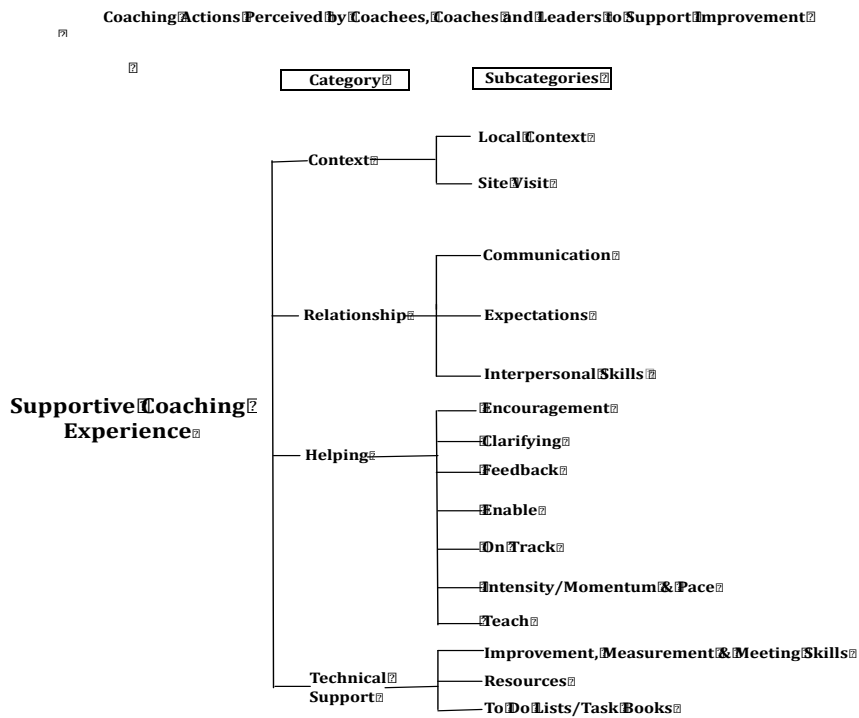
The Cystic Fibrosis Foundation (CFF) and the Vermont Oxford Network (VON) are recognized national leaders of health care improvement and were designing new national improvement collaboratives. The CFF leaders were interested in improving outcomes for people with CF and the VON leaders aimed to improve care for premature babies. Independent of each other, the two leadership groups approached the Dartmouth researchers to help design and execute the improvement collaboratives. Both national leader groups supported applied clinical microsystem theory and team coaching to develop improvement capability of frontline teams.

Study IV describes the process and logistics of the improvement collaboratives. Microsystem leaders were included in the improvement teams and coaches were used. Appendix A in Study IV describes differences in improvement experience of the participants in both collaboratives as well as descriptions of the coach characteristics for each collaborative. In brief, the CF collaborative had less experience in improvement compared to the ICN collaborative. The CF coaches came from within the CF community whereas the ICN coaches were not part of the ICN community.

Through surveys, focus groups and semi-structured telephone interviews, the analysis explored all three participant perspectives: coachees (team members), coaches and leaders. All three groups in both

collaboratives reported mostly positive experiences and could discuss benefits of team coaching. Coachees, coaches and unit leaders in both collaboratives reported four categories (and 15 sub-categories) of coaching actions that were perceived to support improvement work: understanding the *context of care*, building *relationships*, offering *help* and providing *technical help* (Figure 9).

Figure 9. Coaching actions perceived by coachees, coaches and leaders to support improvement (Study IV, Figure 1)



All three group perspectives in both the CF and ICN collaborative described the category of *helping* as the most beneficial. The CF coachees

were generally more satisfied with their coaching than the ICN coachees. Specific differences emerged in the categories of relationship, helping and technical support. The qualitative data further informed the quantitative results to provide deeper knowledge and detail.

The CF coachees wished their coach had made a *visit* to their CF Center while the ICN coachees expressed frustration over the *lack of clarity and expectations of the coaching role*. Because the ICN coachees had multiple years of improvement experience, they did not like learning new improvement tools and processes (technical support) and didn't welcome the coaching feedback related to their improvement development (helping).

The CF and ICN coaches concurred with the coachee comments. There were no negative comments made by the CF coaches in relation to their coaching experience. The ICN coaches faced some *challenging relationships with leaders and teams in the ICNs* related to the coaching expectations (relationships) and improvement tools and processes (technical support).

The coach focus groups identified new information specific to their role as coaches. Categories *unique to coaching* included *development* as coaches, ongoing *support* as coaches and the need for *networking* to support one another in their coaching roles. They articulated the benefit of sharing stories and struggles to gain support and learn about coaching

Leaders in the CF and ICN collaboratives identified the category of *helping* the most frequently. Similar to the CF coachees, the CF leaders offered negative comments about not having a site visit. The ICN leaders concurred with the ICN coaches in their negative comments about the coaching relationship and offered that *relationships improved after the ICN site visit*.

Another interesting aspect of the leader comments was that they indicated they learned about health care improvement and leadership by

working with the coaches. This was an important finding that *it can't be assumed that microsystem leaders know how to make or lead improvement*. In the semi-structured telephone interviews, many leaders reported that they *learned to lead differently* by watching the improvement coaches. They saw and experienced the benefits of developing the microsystem team's own capability to improve care.

Important coaching considerations that emerged in Study IV included the importance of reviewing a team's past improvement experiences (novice vs. expert) and then customizing coaching to fit the experience level rather than using a "one size fits all" approach to coaching. The CF coaches were already well-known members of the community and were reported to have better understanding of the cystic fibrosis patients. The ICN coaches were external to the community and were challenged with *not knowing the community well and not having knowledge of the context of care delivery*.

Study IV also identified specific coaching behaviors: understanding the context of care, building relationships, offering help and providing technical help that were valued by coachees, coaches and leaders involved in improvement collaboratives. All participants recognized the importance of having a coach visit their microsystem to enhance relationships and to have a better understanding of the workplace.

The main findings of this study show that interprofessional improvement teams perceive team coaching mostly positively. The hypothesis that "team coaching can help develop improvement capabilities in interprofessional teams" emerged from this study. Four categories of team coaching were identified as supportive to improvement activities: understanding the context of care, building relationships, offering help and providing technical help as needed. Over 80% of the reported benefit of coaching was related to the personal experience of learning and practicing

health care improvement. The technical skills of improvement were perceived to be less important. In addition, the leaders self-reported a need to learn improvement knowledge and skills and that working with coaches enabled them to lead in a more effective and participatory way.

### **6.5 Team coaching increases health care improvement teams' and leaders' knowledge and skills and is perceived positively by staff and leaders. (Study V)**

The findings in Study V show the intervention group had a greater acquisition of improvement skills on the QIKAT than the usual collaborative group ( $p < 0.05$ ). The changes in the comparative answers between pre and posttest surveys completed by the usual collaborative group and the intervention group showing the difference within each group are shown in Study V, Table 5. The usual collaborative group showed one statistically significant change ( $p < 0.05$ ) for one pre-posttest question while the intervention group had statistically significant changes between pre-posttest for all questions on the Quality Improvement Knowledge and Application Tool (QIKAT). The analysis on the qualitative data on team coaching perceptions from the focus groups with leaders and team members and interviews with the faculty and the coach yielded 24 subthemes that were condensed into five main themes (Study V, Table 6). The five themes included *create conditions for the team to be successful* with improvement activities, *leadership engagement and development*, *staff engagement and development*, *descriptions of the benefits of team coaching*, and *recommendations to include team coaching* in future improvement collaboratives.

The three phases of the Team Coaching Model aided planning and provided support and guidance to the improvement teams. In phase one, the pre-phase, the improvement collaborative's aim and logistics were described and expectations were set for participation in the collaborative with coaching. The coach learned about the improvement team's experiences with health care improvement and what had and had not gone well in the past. The coach communicated and established a relationship with the improvement team's leader to discuss the importance of providing time for the team to learn and practice health care improvement during daily work. Meeting times with the leader and coach were established along with clear expectations about how and when the coach and leader would communicate about the team's progress toward the improvement aims.

The action phase of the team coaching model, phase two, included the coaching actions described in Study IV. The coach nurtured the relationship with the improvement team with frequent and timely communications including emails, telephone calls and in person meetings. When the coach interacted with the improvement team, expressions and actions of encouragement, praise and inspiration helped the team stay energized. The coach reminded the team of their goals, helped them stay focused on the improvement aim, and offered constructive feedback to the team.

The final phase of the team coaching model provided reflective time for the improvement team, leaders and coach to review the improvement experience to date. Celebrating the team's accomplishments and experiences (including new habits and skills) acknowledged the team's progress. Evaluating the coaching experience aided in the continuous development of the coach and reinforced the shared learning. Through the use of improvement knowledge and skills assessments, the team and the coach

were able to determine future improvement actions to support the continuous improvement journey.

Individual benefits were also reported from the team members and leaders. The team members reported personal growth and confidence in participating in health care improvement. Members who usually were quiet and not regular participants in team improvement activities were fully engaged and proudly shared the results of the team. The leaders of the teams who received the team coaching acknowledged the benefit of having a coach to keep them informed about the team's progress and challenges. The leaders described previous improvement collaborative experiences when they were not aware of the improvement aims or activities of their staff. The leaders were unanimous in stating their desire to have their improvement teams participate in improvement collaboratives with coaches.

Participants described important information the leader or coach could communicate to help prepare an improvement team to join an improvement collaborative. A leader who did not have a coach in the improvement collaborative stated that, "A meeting before the collaborative started to [learn about the collaborative process and expectations] would have been helpful. We lost time in making improvements as a result of not understanding what we were to do and not having access to data." A staff member who did have a coach reported, "I have participated in one collaborative before and didn't know what to do. This time with the coach, we had a clear aim when we arrived for the first meeting." The coach commented, "It was very interesting after the first meeting I had with the leader [before the start of the collaborative] that I realized the leader didn't know anything about the collaborative or how to support the team and set expectations." The coach reported the lack of leadership improvement knowledge. "I asked questions to help the leader define the aim and become familiar with the improvement tools and techniques." Coach Study V. A

member of an improvement team without a coach in an improvement collaborative shared how her unit supervisor was not supportive to help make time and to support the learning. A leader who had a coach in the improvement collaborative shared, “I have supported the improvement team by asking questions, showing my interest and letting them have time [to do improvement] on the unit.”

## 7.0 Discussion

The main findings from the five studies of this thesis are discussed in regard to the overall research aim to explore high performing clinical microsystems and to evaluate interventions to cultivate health care improvement capabilities of frontline interprofessional teams to be able to provide care and simultaneously improve care. There are four key findings in this thesis are important for any organization that hopes to improve care. First, an understanding of the *clinical microsystem* by all interprofessional staff is where improvement capabilities can be enhanced with specific actions (Study I, II, III, IV, V). Secondly, *leaders* from the clinical microsystem to the top of the organization where the Board of Trustees and senior leaders are, play critical roles in creating the conditions throughout the organization to support successful improvement (Study I, II, III). Third, frontline staff need *help in developing* new habits of providing care and improving care (Study III, IV, V). Finally, *coaching* the interprofessional improvement teams in developing new skills is beneficial according to both frontline microsystem members and microsystem leaders (Study IV, V). The findings in this thesis may be helpful to leaders at all organizational levels, leaders of health care improvement, and those health care educators or professionals

providing improvement education programs aimed at helping frontline staff develop improvement capability.

## **Clinical microsystems: the context**

The findings of the original IOM and Dartmouth research confirm the *importance of focusing on and studying the smallest replicable unit or the foundational building blocks* of health care, the clinical microsystems where patients, families and health care teams meet (Donaldson & Mohr 2001, Nelson *et al.* 2002). As noted in the background section of this thesis, the context of this thesis is the clinical microsystem. The clinical microsystem theory was strengthened through the evaluation of the case studies in diverse health care contexts from rural and urban primary care practices, an urban academic medical center and a medium-sized community hospital (Study I, II & III) as well as through national and regional improvement collaboratives (Study IV). Ongoing interplay between deductive and inductive theory testing and theory generation together with improvement efforts in practice have led to a strengthening of the theories underlying the work of this thesis (Chalmers 1999). (Study I, II, III, IV, V). This reinforces the finding that the clinical microsystem is a starting place to build organizational improvement capability (Study I, II, III, IV, V).

Multiple studies have tried to elucidate how local context can help or hinder health care improvement (Øvretveit 2011, Øvretveit *et al.* 2011, Taylor *et al.* 2011, Thor *et al.* 2010, Kitson *et al.* 2008, Øvretveit 2005, Rycroft-Malone *et al.* 2002, Øvretveit *et al.* 2002). Øvretveit highlights the need to research and understand which aspects of context influence improvement success in order to both accelerate and spread improvements and to develop the science of improvement (Øvretveit 2011).

The 5Ps (purpose, patients, professionals, processes and patterns) identified in Study I, represent an example of a helpful framework with accompanying tools to guide improvement interventions and ongoing monitoring of the microsystem (Study I, III & IV). Other contextual considerations in the microsystem include *carefully designed measurement strategies* including measurement of the improvement tests of change (Plan-Do-Study-Act (PDSA) cycles) and monitoring of both operational performance and clinical outcomes. Findings in Study I and II show how practice performance measurement and PDSA cycles can be integrated into daily work. Study III and IV, highlighted how microsystems can learn through the improvement collaboratives to use the 5Ps, and to use measurement to track improvement over time. The thesis findings report also that in all the studies, regular communication and social contact in the microsystem facilitate reflection and discussion about improvement, measured results and lessons learned (Study I, II, III, IV, V). These regular meetings for shared reflection-in-action allowed leaders and staff to review improvement activities and connect the results back to the shared common aim of their system (Study I, II, III, V). The meeting agendas included time to discuss the impact of change on the microsystem, support interpersonal and social processes and structures, and to modify improvement plans if needed (Study I, II, III, V).

Focused attention at the clinical microsystem provided learning opportunities for all staff to understand the 5Ps of purpose, patients, professionals, processes and patterns. This understanding was essential to developing the ability to improve care while delivering care. Importantly, local microsystem leadership was actively engaged in supporting the development of high performing microsystems (Study I, II, III, V).

## Leadership

This thesis also found that leadership influenced the cultivation of frontline teams' improvement capabilities (Study I, II, III, IV, V). Many researchers have identified the important role that leaders play in leading and supporting health care improvement at all levels of the organization (Batalden *et al.* 2002, Bate *et al.* 2008, Øvretveit 2005, Øvretveit 2010, Batalden & Davidoff 2011, Brandrud *et al.* 2011). However, research that specifically focuses on leadership for improvement in healthcare is limited (Øvretveit 2010). A qualitative study that collected data through interviews of managers reported that *engaged leadership* in improvement at all levels of the organization was essential to the improvement process (Protopsaltis *et al.*, 2004). In Study I, II, and III, leaders from the frontline of care to the top of the organization had improvement knowledge that guided their design and execution of improvement programs. This “profound knowledge” described by Deming, Batalden and Stoltz informed “the what” that these leaders did to create conditions at the microsystem level to develop frontline staff improvement capabilities (Study I, II, III, IV, V) (Deming 1993, Batalden & Stoltz 1996, Øvretveit 2010). Strategies such as providing basic improvement knowledge to all and making measurement and performance data readily available helped team members see their clinical microsystem from a larger organizational system perspective and to link the microsystems' performance to large organizational goals (Study I, II, III, V).

Leaders at both the top of the organization and at the frontline of care were clearly aligned and articulated a consistent vision of health care delivery excellence including clear expectations for all staff to provide care and simultaneously improve care (Study I, II, III). Leadership behaviors that connect the vision and improvement activities with results help to reinforce and support microsystem improvement. This is in line with Øvretveit, who

described that some leaders believe their ability to motivate and influence others to work on improvement contributes to successful improvement (Øvretveit 2010).

As described in Study III, senior leaders of the two hospitals created regular reporting structures that included meetings to discuss findings and explore the implications of their reports. The progress reports would inform discussions with staff about the improvement activities and further explore what was going well and if there were any adjustments that needed to be made in the improvement plans. The leaders would also ask if they could help support the improvement or if there were any challenges they could address. To keep informed about improvement progress and to stay connected to the frontline staff, the senior leaders at both hospitals designed “walkarounds” to visit microsystems and engage in improvement discussions with all staff members (Study III). These are much like the “Gemba walks” described in the Toyota Production System or LEAN management, and require going to the actual workplace to understand the work processes, to ask questions and to learn about the work (Womack 2011, Imai 1997). The senior leader walkarounds also modeled reflection and learning in the daily work, and made visible to the frontline staff the value that senior leaders placed on the improvement work at the microsystem level. The continuous engagement of senior leaders appears to support sustainability of improvement efforts in an organization compared to when leadership is absent (Wageman 2008, Øvretveit 2010, Brandrud *et al.* 2011).

At the microsystem level, local microsystem leaders used individual conversations, email, weekly improvement meetings and monthly all staff meetings to discuss and share improvement efforts and progress and to link to the larger system vision (Study I and II). The use of daily huddles by all members of the microsystem provided opportunities to keep the staff on track with improvement and to cultivate a community of learning (Study I,

II, III, IV) (Bodenheimer *et al.* 2013). The regular and predictable meeting times in the flow of the daily work of the practice created space for staff to reflect on how they were providing care and if any improvements needed immediate attention or could be planned through the standardized improvement process of the practice (Study I, II, III). This created space Kolb and Schön refer to when they note that reflection is essential to be able to learn about the context, make and reflect on interventions to result in subsequent learning and action (Kolb 1964, Schön 1987).

*The Human Resource systems* in Study I and II linked expected staff behaviors and improvement actions to the mission and values of the organization from the first interview, at hiring and orientation, and in regular performance evaluations. These performance evaluations reinforced expectations linked to the mission and values and resulted in individual staff development plans to support continuous professional development. The quarterly performance evaluation discussions with the microsystem leaders also reinforced to the staff their importance in and value to the practice (Study I & II). Findings from the international research conducted by the Gallup organization in 24 different companies with over 100,000 employees reinforce the importance on developing frontline staff (Buckingham & Coffman 1999). Similar to the rural primary care staff development processes and the urban primary care practice's "HR value chain," the researchers emphasize the importance of hiring for talent and then developing individuals to meet the needs of the business (Study I & II).

*Information systems* that provided real time data and information to all levels of the organization, particularly to the clinical microsystems, promoted staff understanding of both local context and systems of care (Study I, II and III). Rich information environments support the functioning of clinical microsystems to provide performance data and information to the members to inform their improvement activities (Nelson *et al.* 2003). The

rural and urban primary care practices in Study I and II had easy access to the microsystem data as a result of customized data collection systems they had created. This data helped to inform the creation of the 5Ps assessment tools to determine improvement activities and goals. However, in the two hospitals in Study III, data at the microsystem level was not easily accessible or even known. The 5P assessment tool developed from Study I to assess the microsystem context was then used in the internal improvement collaboratives in both hospitals to guide the clinical microsystems improvement plans. This experience led to a realization at both hospitals that the organizational informatics systems were not designed to provide data that was useful or actionable at the microsystem level. This led to redesign of the informatics systems to provide the real time microsystem-specific data and information (Study III). This finding supports the Institute of Medicine and Dartmouth research that identified information and information technology as an important characteristic of high performing microsystems and further strengthens the microsystem theory (Nelson *et al.* 2002).

Leaders can also design *basic health care improvement education* to develop the improvement knowledge of frontline staff (Study I, II, III, IV, V). Batalden and Stoltz describe how health professionals have knowledge of their profession and discipline but typically do not have the improvement knowledge necessary to develop what Deming called “profound knowledge” (Batalden & Stoltz 1996). The rural and urban primary care practices provided basic improvement education and determined standardized improvement methods that would be used by staff in everyday practice (Study I and II). The two hospitals in Study III and the national improvement collaboratives selected the Dartmouth Microsystem Improvement Curriculum (DMIC) as their improvement curriculum to educate all collaborative participants in basic improvement methodology (Trustees of Dartmouth College 2013). The collaborative models (Study III,

IV and V) included learning sessions followed by action periods in the local contexts to encourage practice of the new knowledge. All five studies framed their educational curriculum in experiential learning theory to enhance didactic learning with application of the knowledge in the microsystem (Kolb 1964).

The source for learning about health care improvement can be within an organization or can occur outside of the organization in an improvement collaborative (Study III, IV & V). The findings in Study IV and V suggest that before an improvement team joins a collaborative, leaders can clearly describe the collaborative process, including the aims and goals, timeline and expectations of participating to the members of the improvement team. To help facilitate the learning of the improvement teams, leaders who pay attention and follow up with the improvement teams after learning sessions can encourage and support the teams' successful adaptation of knowledge to the local context (Study IV, V). The repeated process of learning and then returning to the local context helps to build sustainable improvement capability of staff, but leadership support is needed (Study IV & V). An important ingredient of experiential learning may be missing when improvement teams return to their workplace and are not encouraged by leaders to apply the knowledge, reflect and advance learning (Study IV, V). This finding begins to provide insight into the action period back at the workplace after learning sessions that may not provide the supportive environment improvement teams need to practice the new improvement knowledge (Nembhard 2009).

*Leaders who stay connected to the microsystems* engaged in improvement gain important knowledge about those microsystems and their organization. Honest conversations between microsystem members and the senior leaders can identify the need for help to learn and practice improvement as shown with the two hospitals in Study III. This may be one

of the important actions that leaders of improvement could do that might address Øvretveit's interest in what supports improvement (Øvretveit2010).

## Helping

To cultivate health care improvement capabilities of frontline interprofessional teams, both leaders and improvement teams expressed the need for help (Study III, IV and V). Edgar Schein, a leading organizational theorist, has studied, researched and published on the topic of helping relationships since the late 1960s. His work provides insightful guidance to creating helping relationships (Schein 1969, 1987, 1999, 2009). Helping is a conscious action to help someone to accomplish something and involves investment of time, emotions and ideas. Successful helping processes “underlie cooperation, collaboration and many forms of altruistic behaviors” which are desired in teamwork and in health care improvement (Schein 2009, p. 7, Institute of Medicine 2001). As the findings in Study III, IV and V illustrated, collaborative participants and their leaders described different reasons for needing help ranging from getting organized to join an improvement collaborative, to learning improvement tools and processes, to creating time in the daily work of providing care to learn and practice improvements. Schein points out that helping is a complex phenomenon that is often taken for granted. The act of helping requires some understanding of what help is being requested and a degree of trust between the helper and the person (team) receiving the help. Often, assumptions of what help is needed are made without engaging in a thoughtful inquiry process to clearly understand what help is *really* needed and being requested. Further, the helper should consider what might be helpful in the situation.

Finally the person requesting the help should be able to accept the help that is offered resulting in achievement of the desired goal (Schein 2009).

Schein's insights and focus on helping as a special relationship illustrate the honor and respect that this relationship demands. Schein shares the perspective of Kierkegaard's secret of the art of helping (Hong and Hong 1998). "If one is truly to succeed in leading a person to a specific place, one must first and foremost take care to find him where *he* is and begin there" p. 45. Helping is a process of offering, giving or receiving semi-formal or formal help. According to Schein, one must have respect and "save face" with interactions and not assume a "one up" position when helping. This type of interaction can flatten the multiple hierarchies that exist in health care (such as professional education, roles and gender) and enhance the helping relationship as in Study III, IV and V.

Schein and Kierkegaard share the insight that the helper's use of humble inquiry signals a desire to help and serve, not to be dominating (Schein 2013). To help is to be patient, open to learning and mistakes, and to not know or understand everything. This philosophy underlies the Team Coaching Model of mutual respect and mutual learning between the coach and the team as described in Table 7.

The leaders in the primary care practices who had improvement knowledge and capability were *helping* the team to accomplish its work of continuous improvement. The leaders in Study I, II and III planned regular interactions with the staff to learn about the staff's improvement experiences. These interactions coupled with leaders' need to know about the progress of the work and needed support increased mutual understanding of the improvement work.

This understanding by leadership resulted in increased staff trust when leaders consistently followed through on articulated needs and barriers to the improvement work. By Schein's definitions and descriptions of successful helping relationships, the leaders and interprofessional teams were able to establish mutually satisfying helping relationships.

## **Reflective Coaching**

Team coaching to help interprofessional improvement teams and leaders was reported as beneficial (Study IV, V). Leaders may not have the opportunity to teach, reinforce and coach frontline teams even if they have the knowledge and skills. Competing interests, time constraints and organizational priorities may interfere with their ability to directly cultivate the improvement capabilities of frontline teams. Leaders may also find team coaching helpful to support the development of improvement capability of the improvement teams and of themselves. Schön describes the role of coaching in a studio course format that is similar to improvement collaboratives but has an even stronger emphasis on reflection (Schön 1987). Further, Schön asserts that coaches are needed to help learners become proficient in reflection-in-action in their daily learning experiences (Schön 1987). The literature on improvement collaboratives does not describe the specific and detailed actions that occur when teams return to their local contexts between learning sessions (Wilson *et al.* 2003, Nembhard 2009). Since team coaching was the intervention in both Study IV and V, participants provided insights into the *benefits of team coaching* and offered *suggestions for future improvement collaboratives*.

In both studies, leaders reported how they learned about both health care improvement and how to lead differently as a result of being exposed to team coaching. As a result they reported acting differently to support the

improvement teams' work of learning and practicing improvement. They realized that *ensuring time* in clinical practice to hold improvement meetings and *access to data specific to the clinical microsystem* was important for the improvement teams to be successful (Study IV and V). To support a team to be effective, Wageman describes essential and enabling conditions (Wageman 2008). Within the conditions, Wageman includes supportive organizational context to provide information, time and resources to do the team work. The importance of improvement knowledge reinforces Deming, Batalden and Stoltz's guidance that all staff should have this knowledge in order to create a successful learning organization (Deming 1993, Batalden & Stoltz 1993). Deming believed that once individuals have profound knowledge, they become role models, and can teach and help people move forward to organizational transformation. As reported in Study IV and V, the leaders changed their behaviors as a result of learning about health care improvement and were more attentive and supportive of the frontline improvement teams.

After observing the struggles of the improvement teams trying to practice improvement while providing care in Study III, the leaders recognized the improvement teams needed help. The leaders of the two organizations chose two different approaches to supporting the frontline staff (Study III). The large medical center chose to use internal resources from the quality department to help frontline staff, while the rural community hospital developed staff through external resources. The interested staff in Study III, the coaches in Study IV and the coach in Study V all attended a formal health care improvement coaching program at Dartmouth to develop knowledge and skills to coach the frontline teams ([www.clinicalmicrosystem.org](http://www.clinicalmicrosystem.org), Nelson *et al.* 2007)

In Study IV, there were important differences between the two collaboratives. The CF collaborative was a community of "young improvers"

focused on improvement for a population of patients with chronic disease while the ICN collaborative, a community with at least ten years of improvement experience, was focused on acute care for premature babies. The CF collaborative developed novice coaches who were “internal” to the CF community, while the ICN collaborative had experienced improvement coaches who were “external” to the ICN community. The findings of Study IV included insights about team coaching which emphasized the cultural-social aspects of improvement work (Bates *et al.* 2008). An example of this was whether the frontline team received a site visit by the coach (Study IV). This is an interesting extension of the senior leaders doing walkarounds in their organization’s microsystems as reported in Study III to offer encouragement and helping to mitigate barriers to improvement. Since the national improvement collaborative had no authority in the local microsystems, the provision of coaches to establish relationships to offer encouragement, praise, helping and some technical support was perceived by the coaches, coaches and the leaders as supportive to improvement activities.

The Study IV findings also identified learning needs of the leaders of the participating microsystems. All leaders in both national collaboratives reported they gained health care improvement knowledge and learned to lead differently as a result of the team coaching.

The coaches in both collaboratives reported their own developmental needs. They expressed interest in a supportive coaching network to receive encouragement, support, to learn and to share coaching experiences to help advance their own learning and reflective activities (Study IV, V).

Many leaders are unaware of how to best lead their teams to high performance that consistently meets or exceeds the team’s goals (Wageman, Nume, Burrell & Hackman 2008). This was further confirmed through interviews with leaders of the CF and ICN improvement teams (Study IV) and the leaders of the Safety improvement collaborative in Sweden (Study

V). The Study IV leaders reported they learned improvement knowledge and how to lead a team through participation in the improvement collaboratives. As a result of the team coaching experience with the coach, the leaders stated they learned new leadership skills such as patience, inquiry and coaching. The leaders realized how they could help reinforce the improvement knowledge of improvement of the microsystem teams through showing interest in improvement efforts, review of improvement data and frequently offering encouragement. Creating time and space for improvement work and for reflection on that work was an important leadership activity. To support a team to be effective, Wageman describes essential and enabling conditions that include a supportive organizational context to provide information, time and resources to do the team work (Wageman 2008).

Lewin believed organizational ineffectiveness could be due to an imbalance between *observation, reflection, data collection and action* (Miettinen 2000). Reflection-in-action is essential for effective change, so leaders of clinical microsystems aspiring to become high performing should explore the support busy interprofessional improvement teams need. It is in the work of improvement that observation, reflection, data collection and action occur. This mirrors experiential learning models.

Coaching, as discussed in the background section of this thesis, has been used in many fields and has generally focused on coaching of individuals. The literature is filled with books by consultants, opinion articles, and theoretical papers, but there is very little published research on coaching (Grant 2010). Team coaching focuses on the whole team and is distinct from individual coaching. Hackman and Wageman, experts in organizational learning and leading researchers of team effectiveness, offer a definition of team coaching as “*direct interaction with a team intended to help members make coordinated and task appropriate use of their collective*

*resources in accomplishing the team's work*” (2005 p. 69). Review of the literature reveals little on coaching interprofessional improvement teams in health care. A few publications exist and provide support to the idea of a helpful team coach, but detailed descriptions of the interactions between the interprofessional teams and the person doing the team coaching are missing.

A combination of field experiences, gleanings from the coaching literature, theoretical underpinnings, and the findings from Study I, II, III and IV were used to create the evidence-based team coaching model. Grant refers to evidence-based coaching as “intelligent and conscientious use of best current coaching knowledge integrated with practitioner expertise in making decisions about how to deliver coaching” (Stober & Grant 2006, p. 5). Because there is limited team coaching research and even less academic literature specific to team coaching of interprofessional improvement teams, best practices can be found in other established fields to inform the development of grounded frameworks that can further inform team coaching. (Grant 2004). In light of this, the theoretical underpinnings of clinical microsystem theory, profound knowledge, experiential learning and reflective practice can be applied to navigate the changing environment of health care improvement. The team coaching model is based in experiential, empirical and evaluative knowledge and research. The foundation of the model includes Kolb’s experiential learning theory, Donald Schön’s reflection-in-practice learning model, and the humble inquiry and helping concepts of Schein (Kolb 1984, Schön 1987, Schein 2009). The three-phase team coaching model is further based on the research findings in this thesis and aims to identify how to best cultivate improvement capability at the frontlines of healthcare.

Team coaching emerged as a helpful response to the inconsistent or missing support in the workplace described by others (Øvretveit 2003, Schouten 2008, Knox 2010). Quality improvement in health care has

primarily been focused on the technical methodology and metrics of health care improvement. This thesis contributes to the early insights into the human processes of cultivating health care improvement capability in the daily work of every member of the clinical microsystem. The findings show that actions of leaders are critical and are needed to create the conditions for high performing microsystems capable of providing and improving care. “Whenever an improvement strategy is designed and implemented, beyond the attention to the technical processes and knowledge to make improvement, human processes can be expected to play a huge part in determining the level and quality of care patients receive” (Bate *et al.* 2008, p. 4)

## **8.0 Method Discussion**

This thesis research design moved incrementally from an inductive process used to explore certain aspects of clinical microsystem theory (Study I, II) to deductive testing of the theory in Study III and IV, and concluded with an experimental design to test an intervention hypothesized to support improvement capability in the clinical microsystems (Study V). The mixed methods design to study improvement capability at the frontline of health care has provided deep and broad insights in the context of clinical microsystems and into the interventions that support cultivation of improvement capability. In addition, the action research facilitated the interplay between theory and practice, and scholar and practitioner and is a fruitful approach when studying the dynamic process of quality improvement. Dewey’s experiential learning cycle of observation, reflection and learning generated knowledge that is beneficial to scholar and

practitioner (Tashakkori & Teddlie 2003). Ellström's perspective on knowledge creation and interactive research reinforces Dewey's perspective and further suggests interactive research contributes to the threefold task of practitioner, researcher and educator (Ellström 2008). The aim of interactive research is to generate a synergy of the three to result in deeper insights and knowledge. But there are methodological implications to take into consideration where action research was used (Study III, IV & V). Reliability and validity may be impacted by the collaborative relationship of the researcher and practitioner relationship during the research and are addressed in the following discussion (Ellström 2008).

Trustworthiness is defined differently in qualitative and quantitative research. Qualitative research trustworthiness is based on four criteria: credibility, dependability, confirmability and transferability (Lincoln & Guba 1985). In quantitative research it is defined as internal validity, reliability, objectivity and external validity (Polit & Beck 2012).

### *Trustworthiness in the qualitative studies (Study I, II, III, IV, V)*

*Credibility* can be considered internal validity, which refers to the confidence in the truth of the data and analysis (Polit & Beck 2012). Credibility was strengthened using different data collection methods in survey distribution and analysis, recordings and field notes of the focus groups and interviews, focus group moderator guides, interview guides and discussion notes. The use of different methods and data collection methods to engage multiple informants from various settings provided corroboration of the findings. In Study I and II, the sampling methodologies included participation in interviews and focus group discussion by all members of the clinical practices to collect a variety of perspectives from a patient service representative greeting patients, to the physician. Multiple Dartmouth

researchers reviewed field notes and the recorded narratives to confirm conclusions, summaries and themes.

In Study III, all the researchers participated in the one conference call. Three researchers took written notes during the conference call to then compare with the moderator after the call to ensure consistency in the findings. No differences were found in the comparisons. The summarized notes were shared with the participants of the conference call (member checking) to further validate the findings with minimal corrections made. It was important in this study that the author and another Dartmouth researcher had participated in the action research and had observed and participated in the improvement collaboratives so they were more knowledgeable about the processes and the context of the two hospitals. The threat to the credibility is that only the senior leaders provided information in one phone call rather than multiple informants or multiple interviews.

In Study IV, the sequential mixed methods design allowed each phase of the data collection and analysis to build on the knowledge gained in the previous phases (Tashakkori & Teddlie 2003). The survey findings were scrutinized to inform the content of the focus group moderator guide to ensure the aim of the study was being addressed. The combined findings from the surveys and focus groups then informed the semi-structured interview guides for the telephone interviews with the leaders. An independent, experienced, qualitative researcher conducted the focus group discussions to minimize the threat of bias in the study.

Lincoln and Guba (1985) state that member checking is the most critical technique for establishing credibility of a study. The findings and interpretations of Study I, II, III, IV and V were shared with participants at appropriate intervals in the studies. Study I, II and III findings were reviewed verbally and through the review of the draft documents with the case study members. Any discrepancies or unclear findings were discussed,

clarified and corrected as indicated. Review of the focus groups and leader interview findings were conducted through conference call discussions with the participants in Study IV. Study IV draft summary documents were reviewed by national leaders of the collaboratives to ensure accurate summaries.

Frequent debriefing with research supervisors who were experienced in qualitative research provided a sounding board to develop interpretations based on the findings and to challenge when biases, preferences or limited perspectives were identified (Shenton 2004). Face-to-face and virtual meetings using Adobe Connect addressed research issues from the design to the data collection and data analysis. Inquiries related to research questions, methodology, data analysis and other pertinent research issues were discussed regularly. Consensus was achieved through critical analyses and repeated discussion to explore other perspectives and challenge conclusions.

Peer scrutiny of the research occurred through doctoral student study groups and discussions, presentations at meetings, and private conversations with trusted colleagues who offered fresh perspectives and at times challenges to my assumptions. The questions and observations stimulated further clarification, explanation and development of the design and clearer articulation of the findings (Shenton 2004).

*Confirmability* can be regarded as the objectivity of the research (Polit & Beck 2012). Objectivity in the research ensures the findings are the result of the research participants' data and not the preferences of the researcher. A threat to this could be author bias due to my presence within the context of the action and interactive research design that might have influenced the findings in the field. My reputation of being interested in promoting health care improvement and coaching could have influenced the participants to provide more favorable responses. To counter this, multiple researchers were involved in all the studies where I was involved in

observations, interviews and focus groups to confirm or counter my conclusions. Triangulation addresses potential researcher bias through the use of a variety of methods, data, participants and researchers (Shenton 2004). Mixed methods by design provides triangulation through the use of observation, surveys, focus groups and interviews and multiple participants were included in the studies (multidisciplinary staff, coaches, coaches, leaders and faculty). Although I was involved in the research design of Study V, I was not involved in the design of the improvement collaborative content or process. However, I did develop the team coaching manual and had oversight of the coaching intervention. Discussion of the ways the author might have influenced the data as the “research instrument” through which the qualitative data was collected follows (Patton 1990).

In Study IV, the use of a focus group moderator was an attempt to remove me from participating and potentially influencing the participants. However, the moderator informed the group I would be reviewing the transcript of the conversation, which may have influenced the group to respond in a more favorable way to the questions. I was the interviewer for the leadership semi-structured telephone interviews, which could have discouraged negative responses. At the beginning of the telephone interview in the introductions and explanations, I encouraged the leaders to provide honest and open responses to help advance the knowledge of coaching health care improvement. I also stated there would be no consequences from me as a result of their honesty. In review of the transcripts, many leaders offered comments that were supportive of coaching or that raised issues and was negative feedback. The findings of the analysis of the leader interviews in Study IV showed more negativity was expressed about the coaching from one group compared to the other, which shows evidence of the honesty in responses that was requested.

The author conducted the focus groups and interviews in Study V with the help of translators who were not consistently engaged in the discussions. More often than not, the participants would enter into a dialogue amongst themselves explaining and defining questions while at the same time, sharing perspectives. The author's role as interviewer with Swedish colleagues who may have wished to "please" me by providing "the right answers" may have impacted the data collection with participants providing more favorable responses. However, the focus groups and interviews allowed the author to observe facial and physical behaviors and follow up when there seemed to be uncertainty or confusion about the questions and comments. To minimize threats to credibility due to using a translator, the author met with the translators in advance of the discussions to describe the aim of the discussion and to review the semi-structured interview guide (Kapborg & Beterö).

*Transferability* is the degree to which the study actually identifies and investigates the phenomenon intended to study and that the context is descriptive enough to be transferred to similar contexts (Polit & Beck 2012). This involves the provision of sufficient contextual information about the study setting that enables readers to consider the findings in their own situations. Clear descriptions of the research settings from two primary care practices (Study I & II) and two hospitals in rural and urban settings (Study III) were provided. The description of the national improvement collaboratives involving Cystic Fibrosis care and intensive care nursery practices across the United States helped to illustrate the diverse health care settings (Study IV). Study V provided descriptions of the Swedish hospitals and units involved in the study. Descriptive characteristics of the participants are provided in the five studies. The combination of diverse health care settings and multiple roles of the participants suggests transferability. Mixed methods research design in Study III created a

multidimensional view and stronger inferences of team coaching than a single method research study (Tashakkori & Teddlie 1998). The sample size of the survey contributes to the transferability, and the subsequent purposive sampling in the focus groups and interviews increases the inference quality (Tashakkori & Teddlie 2003).

### *Trustworthiness in the qualitative studies (Study IV, V)*

In quantitative research *validity* refers to “the approximate truth of an inference” that an effect resulted from a hypothesized cause (Shadish *et al.* 2000, p. 34). They suggest four types of study validity.

*Internal validity* concerns the validity of the inferences that the experimental intervention, rather than something else, is responsible for the outcome (Study V). Threats to internal validity include selection, history and maturation (Polit & Beck 2012). Selection did not pose a major problem in Study IV since there were no significant differences in the demographic and clinical characteristics of the participants in the CF or ICN collaboratives. In Study V, a threat to internal validity was the drop out rate of the participants. Over the six month-period, about 50% of the participants did not attend all the learning sessions or complete the surveys. Attendance in the learning sessions was variable by the participants in the non-intervention group. The intervention group was more consistent in attending the learning sessions. Drop outs were due to patient volume, acuity and associated staffing needs along with staff holiday time. Administering the Quality Improvement Knowledge and Application Tool (QIKAT) to measure pre and post self-assessments of improvement skills may have been a threat to the internal validity due to the fact that the activity of testing can change people’s attitudes and behaviors (Polit & Beck 2012). The pre-test self-assessment conducted before each learning session may have sensitized the

intervention group participants to be more aware of the collaborative content and raised their attention and efforts (Polit & Beck 2012).

*Statistical conclusion validity* addresses whether relationships exist between the intervention and participant responses. In Study IV, the ceiling effect of the survey analysis was addressed through sensitivity testing showing no change in the outcome. In Study V, paired ordered categorical data analysis was conducted showing statistical significance in the increased improvement knowledge of the intervention group.

*Construct validity* involves the validity of the inferences from the “observed data, settings and cause-and-effect operations included in the study to the constructs that these instances might represent” (Shadish *et al.*, 2000 p. 38). Study V provided detailed descriptions of the intervention, outcomes, setting and population to help enhance construct validity. There was a threat to construct validity by the surveys used for quantitative measurement in Study III, IV and IV. The first survey (coaching evaluation survey) in the thesis was conducted during the two national improvement collaboratives and at the end of the regional improvement collaborative in Sweden (Study IV, V). The survey was developed from empirical evidence of coaching experiences with hundreds of improvement teams over ten years. The survey aim was to learn from participants in the collaborative who had coaching, what actions and behaviors the coaches exhibited that supported participant improvement activities. The survey was designed using simple questions followed by open-ended questions and was tested with several participants to ensure the objective of the survey was being met and the questions made sense to the participants (Fowler 1993). The surveys were then distributed via the Internet resulting in the findings that are reported in Study IV. For the evaluation of the team coaching in Study V, the same survey was used and translated into Swedish. The coaching

evaluation was translated and distributed as a paper survey to the collaborative participants.

The second survey, an adapted QIKAT questionnaire, was translated and distributed in Study V and was used to assess individual knowledge of improvement. It is currently being validated after being used with a large number of participants in various clinical settings (Personal communication, Ogrinc, September 2012).

To minimize the threats to credibility, the translation of both surveys from one language to another was conducted using a one-way translation process described in the literature (Råholm, Thorkildsen & Löfmark 2010, Peña 2007, Hilton & Skrutkowski 2002). Two bilingual Swedish administrative staff members reviewed the English survey and translated it to Swedish discussing discrepancies between themselves and coming to agreement on the translation. The translation was then reviewed by the author to ensure original questions were preserved and discrepancies were discussed to result in the final translated survey.

*External validity* concerns the extent to which evidence from the setting in Study IV and V can be generalized to other contexts (Polit & Beck 2012). To consider the generalizability of causal inferences from one context to another, clear and detailed descriptions of the context and interventions are important. An intervention like the team coaching model might be influenced because of the pairing with other elements like a very enthusiastic and experienced coach or a workplace setting that is supportive of development of improvement capability. These factors were not evaluated in Study V.

*Reliability* refers to the accuracy and consistency of the information obtained in a study. The collected data from Study IV and V were reviewed with research faculty to ensure accuracy of the data and analysis.

*Treatment fidelity* (Polit & Beck 2012) was assessed to determine if the interventions were being carried out as instructed in the Team Coaching Manual. Careful review with the coach of the coaching expectations and the Team Coaching Model manual before the coaching intervention began contributed to treatment fidelity. Monitoring intervention and timeline adherence over the course of the improvement collaborative helped to ensure treatment fidelity. In addition, during the leader interviews and team focus groups, the discussion confirmed by the participants the interventions had been carried out as instructed in the Team Coaching Manual.

There are limitations to the studies in this thesis. The samplings for the various studies were mostly based on recommendations or were self-selected. Despite the samplings, the multidisciplinary participants and the varied health care settings contribute to the heterogeneity of the overall sample. Improvement results were not measured or reported except for Study III. Due to the multiple causal links in Study V, one cannot definitely say team coaching was the cause of the change in the intervention group improvement knowledge. Many causal links such as evaluation of the unit of care context, the leadership and other environmental factors need to be further explored and understood. On the other hand, a charismatic coach who was well known may have provided a coaching style not easily replicated. With that acknowledgement, the team coaching model manual based on participant findings related to coaching in Study IV, did increase the likelihood of transferability to other contexts.

Study V was a small Swedish study with many translation considerations, and a high risk of miscommunication in written and spoken word and meaning. The use of qualitative research complemented the quantitative findings and allowed deeper understanding of the contexts in Study IV and V.

## 9.0 Conclusion and Implications

The overall aim of this thesis was to explore high performing microsystems and evaluate interventions to cultivate health care improvement capabilities at the front lines of healthcare. The findings from this thesis can be helpful to the continuing efforts to improve health care around the world. The knowledge to be considered falls in two categories: the practitioner and the scholar.

Practical actions for anyone interested in cultivating improvement capabilities, from single microsystems of care to whole hospitals or national professional organizations leading improvement include four main considerations. The first category of action is to focus on the frontline of health care delivery, the clinical microsystem. Develop improvement education programs for every member of the microsystem to have the knowledge to provide care and improve care every day. The microsystem is where patients and health care teams meet. To have the most efficient, effective and high value care, the lessons from the high performing microsystems can guide the cultivation of the microsystems toward high performance.

The second category of action is leading. Organizational leaders have the possibility to create the conditions in the local context of the microsystem and at levels throughout the organization that support health care improvement. Leaders at all levels of the organization can cultivate improvement capabilities through the systems they design and lead, and articulate a clear vision of improvement to set expectations that all staff provide care and improve care. To be able to role model, teach and reinforce health care improvement, leaders must learn improvement knowledge.

Scheduling regular time to learn about the processes and systems in the daily work will not only inform leader strategies, but also build helping relationships with the frontline staff. Learning new leadership behaviors that are supportive to the staff and that offer support and encouragement will also help to cultivate new habits of providing care and improving care while developing a respectful workplace.

Leaders can develop strategic organizational-wide improvement education programs, or maybe interprofessional improvement teams can be enrolled to attend improvement collaboratives inside or outside of the organization. No matter how interprofessional staff learn improvement knowledge, leaders can best support the members by inquiring how the improvement knowledge is being used in everyday care delivery and if they are meeting any challenges that the leader can help mitigate. Protected time is essential for improvement teams to meet, learn, practice improvement and then reflect on what they are learning. Supporting staff in action learning while providing care to patients and families is a challenge that is not easy to resolve, but leaders and staff must commit to finding creative ways to make time for this important work. Improvement teams need easy access to data that is specific to their microsystem to inform their improvement plans and to know if the changes they are making using a standardized improvement methodology are making a difference or not. Expecting all staff to become familiar with the 5Ps of the microsystem supports informed decision making and prioritization of improvement.

The larger organizational environment can further cultivate health care improvement capabilities by developing Human Resource programs focused on continuous development of all staff and linking performance evaluations to the strategic improvement mission of the organization. Senior leaders and the Board of Trustees can create regular reporting structures to further reinforce the expectations of all staff to provide care and improve

care including scheduling regular time to go the microsystem to see and hear about providing care and improving care.

Senior leaders and microsystem leaders should consider interactive research opportunities with academic colleagues to evaluate improvement activities to discover what improvement strategies work when, how and where. Intentionally planning to evaluate improvement activities and outcomes also speaks to responsible use of resources for health care improvement. Developing systems to measure and track improvement is essential to provide regular processes of feedback to inform continuous improvement and determine if improvement teams need help to achieve their goals based on progress reports. The organization can explore technology systems that help to optimize all roles in the organization, but also provides real time data and information that not only supports patient care, but also informs staff about the system and operational performance to encourage continuous improvement in their daily work.

Academic colleagues can seek opportunities to collaborate with practitioners using interactive research methods and encourage more rigor to the improvement processes. Action research provides a rich learning arena to participate with the health care improvement teams to more deeply understand the context of health care. More study and detailed documentation of the particularities of the context to customize interventions to best meet the needs of the members of the microsystem and the patients is important. Future health care improvement research should address the current imbalance of the technical aspects of improvement to include a more balanced approach that includes the human and social processes of organizations to deeply understand how to create successful improvement efforts. Improvement methodologies including large or small collaboratives, organizational strategies and microsystem-level education should be

evaluated to determine what key elements are essential to learn and make improvement in what contexts.

The third category of action is helping busy health care professionals including leaders to learn and practice improvement in their daily work. Regular activities to check in with the staff and leaders to assess how they are doing with improvement plans are important. Leaders may find they do not have the amount of time to help frontline teams with improvement due to competing priorities. To be able to turn to a coach to support the ongoing development of the improvement team could be the help leaders and teams need. As Edgar Schein reminds us, no matter who we wish to be helpful to, engaging in humble inquiry and being mindful of the process of helping can build more productive and respectful relationships, especially in an health care environment where there are so many different hierarchies to deal with. Helping relationships can further cultivate the improvement capabilities of front line staff to achieve the desired improvement everyone is seeking.

The fourth category of action is team coaching. The team coaching model provides a guided pathway for coaches to activate leaders and members of the microsystem through three phases of team coaching that promotes experiential learning. The team coaching model offers a contextually relevant coaching guide that incorporates theory and lived experiences of practitioners along with a specific aim to cultivate improvement capability of the frontline staff. This theoretically and empirically grounded team coaching model is flexible and responsive to the local context. Designed to cultivate improvement capabilities of the staff over time, the coach does not plan to build a relationship where the interprofessional team members become dependent on the coach. The team coaching model is a development model grounded in theory from Schön, Kolb and Schein. The team coaching manual that was tested in Study V could be modified to be a flexible guide, not a prescriptive model, that

coaches could customize to the local context. The three phases of the model are essential to engage interprofessional improvement teams in a helping relationship between each other, with leadership and with the coach. The design of future coaching studies should encompass research on developing and evaluating coaching models and outcomes. What are the attributes of a successful coach in health care improvement? Evaluative research of team coaching could measure the impact of team coaching specific to health care improvement and include not only perceptions of coaching that have been published, but advance the research to measurement of the improvement outcomes including financial evaluations. Exploration and testing of different variations of team coaching including coaches who are internal or external to an organization or clinical microsystem, peer and manager coaching, face-to-face coaching versus virtual coaching, or a mix of both could further advance coaching knowledge. Longitudinal studies could evaluate the sustainability of improvement capability and measure improvement results after the transition phase of team coaching.

Future research might also examine the quality improvement ethical framework to ensure responsible use of limited financial and human resources and oversight of improvement activities in an organization. Seeking best known improvement methods and processes that have a high level of consistency in results illustrates responsible use of finances and human resources.

Finally, research findings specific to health care improvement including how to cultivate improvement capabilities of the frontlines of health care should be published to advance the field of health care improvement and team coaching. Coaching research literature specific to team coaching in health care improvement is undeveloped and would benefit from more rigorous research in the field.

In conclusion, this thesis contributes to the field of health care improvement in that it reports findings on the development of improvement capability at the frontlines of healthcare, describes improvement team activities in the clinical microsystem including action learning and reflection, identifies the critical role of leaders in the microsystem and at all levels of the organization to support improvement, and offers a team coaching model in early development that provides a guide to coaching health care improvement and building helping relationships. This thesis also contributes to the ongoing development of the clinical microsystem theory by verifying early research findings through the empirical findings of the five studies.

## **10.0 Summary in Swedish**

### **Svensk sammanfattning**

Denna avhandling handlar om förbättringskompetens i vårdens första led, där patienter och vårdens professionella möts, med fokus på interprofessionella förbättringsteam som samtidigt ger vård och förbättrar vården. Det övergripande syftet var att undersöka högpresterande kliniska mikrosystem och utvärdera interventioner som syftar till att förädla och utveckla förbättringskompetensen hos vårdens interprofessionella team.

## Metoder

Deskriptiva och utvärderande studie designer användes i de fem studier som avhandlingen bygger på. Totalt 495 hälso- och sjukvårdsanställda från olika professioner och flera olika vårdkontexter i USA (Studie I, II, III & IV) och Sverige (Studie V) deltog i studierna. Mixed methods användes och inkluderade observationer, intervjuer, fokusgrupper och enkäter, datan analyserades med manifest innehållsanalys. Kvantitativa data analyserades med icke-parametriska test.

## Resultat

Studie I och II beskriver hur ledare, som förstår och har engagemang för ?? förbättringsarbete inom vården, kan skapa förutsättningar för interprofessionella team att ge vård samtidigt som de förbättrar vården. Studie III utvärderar hur processer och verktyg för att analysera och genomföra förbättringar i kliniska microsystem användes och anpassades på ett framgångsrikt sätt på två olika sjukhus. Anställda i vården pekade samtidigt på att de behövde hjälp att balansera mellan de två uppgifterna att ge vård och samtidigt förbättra den. I studie IV och V testades och utvärderades team coaching som stöd för interprofessionella team att öka sin förbättringskompetens inom projekt som byggde på lärande seminarier, "learning collaboratives". Deltagarna uppfattade team coaching huvudsakligen positivt och identifierade också coaching aktiviteter som var stödjande. I Studie V utvärderades en intervention med "The Team Coaching Model" som testades i Sverige. Resultaten visade på en större ökning av förbättringskompetensen hos interventionsteamerna jämfört med de team som inte fått del av team - coaching modellen.

## **Konklusioner**

Resultaten i denna avhandling visar att ledare kan stödja utvecklingen av förbättringskompetens genom att: sätta tydliga mål för och förväntningar på förbättringar, stödja utvecklingen av förbättringskunskap hos vårdens professioner genom aktionslärande grundat i det lokala mikrosystemet och erbjuda hjälp genom att använda en ”Team Coaching Model”.

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# Appendices A & B

## Appendix A. Team Coaching Model Manual

**Pre-Phase**  
Safety Study Circle  
**(2-4 weeks before first learning session)**  
Getting ready for improvement

February 10, 2010

**Introduction:**

This Team Coaching Manual is designed to ensure coaching interventions for the 3 interdisciplinary groups are completed consistently and according to a predetermined coaching model and timeline.

The goal of your TEAM COACHING INTERVENTION is to support and partner with the interdisciplinary improvement group from each setting to help them achieve the following:

1. Improve overall group function and dynamics specific to improvement skills, knowledge and ability to improve outcomes for the selected health care safety topic.
2. Improve individual knowledge, skills and abilities to improve the group improvement capabilities.
3. Improve microsystem leader awareness of support needed for the interdisciplinary group to achieve desired health care improvement.

1. NAME OF MICROSYSTEM:

2. LOCATION:

3. LEADER(S) NAME(S):

| LEADER NAME | TITLE | TIME IN LEADER<br>ROLE |
|-------------|-------|------------------------|
|             |       |                        |
|             |       |                        |
|             |       |                        |

NOTE: PRIOR EXPERIENCE WITH IMPROVEMENT

4. INTERDISCIPLINARY GROUP NAMES AND ROLES- Are all roles of the microsystem represented in this lead improvement group?

If NO, please explain why not.

| NAME | ROLE | TIME IN MICROSYSTEM |
|------|------|---------------------|
|      |      |                     |
|      |      |                     |
|      |      |                     |
|      |      |                     |
|      |      |                     |

Note prior experience with improvement.

Additional notes:

1. **Contact LEADER(S) of the microsystem** to introduce yourself and your team coaching role specific to the Safety Study Circle. Arrange a time to meet in person to discuss overall Safety Study Circle process and to learn from the leader(s) their understanding of the improvement process and their experience with improvement. (Email or Telephone- please note how)

EMAIL TELEPHONE

2. **Meet with Leader(s)** of the microsystem for 1 hour to discuss

- a. Aim of microsystem involvement in Safety Study Circle.  
Describe Study Circle process and benefits. What is the current outcome measure that will be improved?
- b. Logistics of Study Circle (Meeting dates, times, places)
- c. What are the leader expectations of you with coaching?
- d. What are YOUR expectations of the leader? Include setting a time/day/place for 30-60 minute meeting with the leader to review group progress.
- e. What are the leader expectations of the Interdisciplinary group?
- f. Logistics of weekly meetings. How will the leader support and encourage the group to meet regularly? Review the PACE document to identify currently known activities and events of the microsystem and crosswalk to the Study Circle Learning Sessions.
- g. Discuss the pre-work before the first Learning Session meeting.
  - i. Hold FIRST meeting with lead improvement group using effective meeting roles (Time keeper, leader, recorder, facilitator) and timed agenda
  - ii. Leader presence at the first meeting to encourage the group engagement in the work in the Study Circle and statement of GOAL
  - iii. Leader offers support and expectations for the group such as weekly one-hour meetings, attendance at meetings, and completion of the task lists between all meetings.
  - iv. Coach reviews the overall Study Circle process with the group including the learning session dates, times and places

- v. Review the PACE document with the group and invite input into known activities.
- vi. Coach reviews expectations of weekly meetings including use of effective meeting skills and follow up actions to prepare for each of the Study Circle learning sessions.
- vii. Coach discusses HOW will this interdisciplinary group communicate and get “everyone” in the game of improvement so everyone will know how to do improvement.
- viii. Group invited to share what they EXPECT of the leader and the coach.
- ix. Agreement between all about expectations for the study circle work.
- x. Group creates GROUND RULES on how to work with one another during and between the meetings.
- xi. Coach introduces the 5Ps concept to the group to set expectations to collect data and information about the 5Ps in their microsystem. Outline who will collect what data to discuss in March after Study Circle #1 meeting. (February 24, 2010)

3. **Hold 1<sup>st</sup> meeting with Interdisciplinary group before February 24, 2010** for one hour.

- i. Hold FIRST meeting with lead improvement group using effective meeting roles (Time keeper, leader, recorder, facilitator) and timed agenda
- ii. Leader presence at the first meeting to encourage the group engagement in the work and statement of GOAL
- iii. Leader offers support and expectations for the group such as weekly one-hour meetings, attendance at meetings, and completion of the task lists between all meetings.

- iv. Coach reviews the overall Study Circle process with the group including the learning session dates, times and places
- v. Review the PACE document with the group and invite input into known activities.
- vi. Coach reviews expectations of weekly meetings including use of effective meeting skills and follow up actions to prepare for each of the Study Circle learning sessions.
- vii. Coach discusses HOW will this interdisciplinary group communicate and get “everyone” in the game of improvement so everyone will know how to do improvement.
- viii. Group invited to share what they EXPECT of the leader and the coach.
- ix. Agreement between all about expectations for the study circle work.
- x. Group creates GROUND RULES on how to work with one another during and between the meetings.
- xi. Group determines day/time/place to meet weekly for one hour
- xii. Coach introduce the 5Ps concept to the group to set expectations to collect data and information about the 5Ps in their microsystem. Outline who will collect what data to discuss in March after Study Circle #1 meeting. (February 24, 2010)

**LEADER NOTES:** Date of leader meeting:

Length of meeting:

1. How did the leader respond to your email/telephone call to meet for one hour?

2. What did you learn about asking the leader about setting expectations?
3. Were you able to set up regular weekly coaching/leader meetings?
4. What were the leaders responses to requesting weekly meetings with you the coach?
5. What was the leader discussion about the PACE document? Was it helpful in planning the improvement work with the interdisciplinary group?
6. Other concerns and thoughts.

**TEAM MEETING NOTES:** Date of 1<sup>st</sup> meeting

Length of meeting:

1. What are your overall reflections about the meeting?
2. What did the leader do well?
3. What could the leader improve?
4. How did the meeting roles work?
5. How well did the timed agenda work?
6. What were the discussions about expectations?
7. List the GROUND RULES
8. When and where will the group meet weekly for one hour?

9. Was the PACE document helpful for the interdisciplinary group planning?
10. How would you rate the meeting on a scale of 0-10 thinking about group dynamics, completion of agenda and an action oriented to do list at the end of the meeting?
11. What went well about the meeting?
12. What improvements can be made for the next meeting?

### **YOUR COACHING REFLECTIONS ABOUT THE PRE-PHASE.**

How much time have you spent to prepare and meet with the leader(s) and the group?

Did the leader(s) and or the group contact you before or after your meetings for additional information and questions? Did they contact you by email, telephone or in person?

Please write additional thoughts and reflections...what are you observing and noticing?

### **Action Phase**

POST Safety Study Circle Learning Session #1

February 24, 2010

1. **After the 1<sup>st</sup> learning session (by March 4<sup>th</sup>-7 days) contact** each site via email, telephone or in person to determine the group is clear on the goals and next steps. Be specific in reviewing the next steps, timeline and who will do what. **Congratulate them on a strong positive start that will ensure their success!**
2. Let the group and leader know when and HOW you will contact them each week until the next learning session and what you EXPECT to hear about.

3. **Reinforce they can contact you as they need in between.** Each contact should focus on the goals and action items.
4. **Weekly group meetings** to be held. Ensure effective meeting skills being used.
5. **Meet with leader** of the unit (**by March 4<sup>th</sup>**) to review progress and COACH the leader how to encourage, praise and notice the improvement efforts. What do the leaders say? What are their concerns? How do they let the group know they are watching them and interested in their good work?
6. **Encourage teams/leaders to contact you as needed through emails and phone calls** to get answers and guidance for their action items post Session #1. Please respond to emails/phone calls as soon as you can and note when you receive the request and when you respond. Example-email received at noon 25/02 responded immediately, or responded 2 hours later.
7. **Please note date/time and type of communication/what your response was** within what timeframe.
8. **Please follow up with Sophi to obtain the baseline (last 12 months) resistant bacteria screening rates for each of the 3 microsystems.**
9. Please note *what* the **group asks questions about and or discusses.** What is on their mind?
  - Meeting skills
  - Group dynamics
  - Sharing knowledge and gathering information from staff who are not at the meeting. How are they connecting the rest of the staff?
  - Focus on improvement
  - Measurement
  - Improvement tools
  - Leadership support
10. **Describe the communication plan** for staff who are not part of this.
11. What are the group members doing between weekly meetings?
12. What tools/process do you need to reinforce and further explain?

13. **The week of March 8, 2010**, communicate with the group to ensure they are ready for Study Circle #2. What questions do they have? Are they ready for the next learning session? Review the agenda for the Study Circle #2 so they will be prepared.
14. What thoughts are you having about the pre-work, study circle #1 and the action period? How is the leader helping or not? Do you see linkages in the coaching role? What helps coaching? What could make coaching better? Have you asked the groups if your coaching is helping and what would be more helpful?

**Action Phase**  
Safety Study Circle Session #2  
March 18, 2010

**During this Study Circle, spend time with each site during the meeting.** Please tell them to contact you during the learning session if they have questions or need clarifications.

**1. Please note *what* the group asks questions about and or discusses.** What is on their mind?

- Meeting skills (do they use meeting skills during this session?)
- Group dynamics
- Improvement focus and tools
- Measurement
- Leadership support

**2. What tools/process** do you need to reinforce and further explain?

**3. Discuss with each site your plan to come to their site in the first two weeks of April** and participate in their weekly meeting and also observe their unit to see how the unit works. Ask them if they want you to talk with other staff members about the safety improvement work they are doing, or if they would want to have a staff meeting to talk about their improvement work and have you discuss the importance of their work. If they want you to speak to staff, plan to carry out their wishes. Determine the date and time you will spend 3-4 hours at their site in the **first two weeks of April**.

**4. What thoughts are you having during study circle #2?** How is the leader helping or not? What helps coaching? What could make coaching better? Have you asked the groups if your coaching is helping and

what would be more helpful? What do you notice about coaching the sites now? Do they need less of your attention?

**Transition Phase**  
POST Safety Study Circle 3  
May 22, 2010

**During this period of time BEFORE the Final Study Circle in June you have 3 goals.**

1. **Continue to coach them on their improvement activities to reach their goals.** Please make notes on how they are working together as an interdisciplinary team, which of the improvement skills they can carry out independent of your coaching and what measured results they are getting.
2. **PLEASE HOLD A TRANSITION MEETING:** Assess their skills specific to meeting skills and improvement skills to determine what their coaching needs are after spending these months with you.

During the Transition Phase it is important for the group to assess their individual and group skills from having been in this study circle and having been coached by you. Please plan a meeting to review the following assessment tools, congratulate them on their progress and have them think about the following questions along with completing the assessment tools.

- What have they done well as a group?
- What are they proud of?

When thinking about their study circle experience and improvement journey, what would they NEVER do again?  
What would they ALWAYS be sure to do in their continued improvement journey?

**Skills Assessment**-please use the attached assessment tools.

You will see in the transition tool there are 4 tools.

**The first tool** is for the INDIVIDUAL to assess their individual meeting skills.

**The second tool** is for the WHOLE GROUP to assess their group meeting skills.

**The third tool** is for you to ask them about the IMPROVEMENT SKILLS and document their responses.

**The FINAL tool** is your COACHING TRANSITION PLAN. If you were to continue coaching these teams, what would your plan be to help them continue to grow as an improvement group.

Also at this meeting with your group help them CELEBRATE their accomplishments and acknowledge their good work. Ask them how they wish to celebrate and spread their good work.

What will they work to improve after the Study Circle ends?

3. Are the groups still meeting in their setting weekly or how frequently are they meeting?
4. Does the group or leaders of the group contact you for assistance between the study circle meetings?
5. Remind the group to communicate to their leaders ABOVE them about their progress and results they have achieved. How do they do that?
6. **Describe the communication plan** for staff that is not part of this. How is this group getting the rest of the staff who are not part of the regular improvement meetings interested and involved in improvement?
7. **Support your groups to be ready to tell their improvement** story and results for June 2010 final study circle.
8. **Meet with leader** of the unit (**before June 3rd**) to review progress and COACH the leader how to encourage, praise and notice the improvement efforts. What do the leaders say? What are their concerns? How do they let the group know they are watching them and interested in their good work? How will the leaders ensure the improvement work continues AFTER the final study circle?
9. What thoughts are you having about the assessing the group progress and ending this coaching experience through the safety study circle? How is the leader helping or not? Do you see how the leader could coach more? What has helped you coach? What could make coaching better?
10. Ask the groups if your coaching is helping and what would make your coaching more helpful?

## Individual group members complete the personal meeting skills assessment tool.

Personal Meeting Skills Checklist

| Behavior   | Never | Occasionally | Often |
|--|-------|--------------|-------|
| 1. I suggest a procedure for the group to follow, or a method for organizing the task.   |       |              |       |
| 2. I suggest a new idea, new activity, new problem, or a new course of action.   |       |              |       |
| 3. I attempt to bring the group back to the agenda when joking, personal stories, or irrelevant talk goes on too long.   |       |              |       |
| 4. I suggest, when there is some confusion, that the group make an outline or otherwise organize a plan for completing the activity.   |       |              |       |
| 5. I initiate attempts to redefine goals, problems, or outcomes when things become hazy or confusing.  |       |              |       |
| 6. I elaborate on issues with concise examples, illustrations.   |       |              |       |
| 7. I suggest resource people to contact and bring in materials.  |       |              |       |
| 8. I present the reasons behind my opinions  |       |              |       |
| 9. I ask others for information and/or opinions.   |       |              |       |
| 10. I ask for the significance and/or implications of facts and opinions.  |       |              |       |
| 11. I see and point out relationships between facts and opinions   |       |              |       |
| 12. I ask a speaker to explain the reasoning or what tools were used to lead him/her to a particular conclusion.   |       |              |       |
| 13. I relate my comments to previous contributions.  |       |              |       |
| 14. I pull together and summarize various ideas presented.   |       |              |       |
| 15. I test to see if everyone agrees with, or understands, the issue being discussed, or the decision being made.  |       |              |       |
| 16. I summarize the progress the group has made.   |       |              |       |
| 17. I encourage other members to participate and try to unobtrusively involve quiet members.   |       |              |       |
| 18. I actively support others when I think their point of view is important.   |       |              |       |
| 19. I try to find areas of agreement in conflicting points of view and try to address the cause of the problem (e.g., "How could we change our solution so that you could support it?" or "It sounds to me that we all agree to X, Y, and Z.") |       |              |       |
| 20. I use appropriate humor to reduce tension in the group.  |       |              |       |
| 21. I listen attentively to others' ideas and contributions.   |       |              |       |
| 22. I use appropriate technology.  |       |              |       |

The GROUP answers these questions together about how the GROUP behaves during meetings.

### Team Improvement Skills Assessment

Below are the Team Improvement Skills Assessment as well as an example and instructions.

Site Name:

Date:

What frequency if any does your team wants continued coaching?

|   | <b>With<br/>Coach<br/>reminder</b> | <b>Never</b> | <b>Inconsistently</b> | <b>Most<br/>of the<br/>Time</b> | <b>Always</b> |
|---|------------------------------------|--------------|-----------------------|---------------------------------|---------------|
| <b>Weekly/bi-weekly meetings</b>            |                                    |              |                       |                                 |               |
| <b>Effective meeting skills</b>             |                                    |              |                       |                                 |               |
| <b>Ground Rules</b>                         |                                    |              |                       |                                 |               |
| <b>Huddles</b>                              |                                    |              |                       |                                 |               |
| <b>Communication strategy</b>               |                                    |              |                       |                                 |               |
| <b>Patient/family involvement</b>           |                                    |              |                       |                                 |               |
| <b>Improvement Discipline</b>               |                                    |              |                       |                                 |               |
| <b>Theme</b>                                |                                    |              |                       |                                 |               |
| <b>Aims</b>                                 |                                    |              |                       |                                 |               |
| <b>Flowcharts</b>                           |                                    |              |                       |                                 |               |
| <b>Fishbones</b>                            |                                    |              |                       |                                 |               |
| <b>PDSA</b>                                 |                                    |              |                       |                                 |               |
| <b>Safety Change Ideas and Benchmarking</b> |                                    |              |                       |                                 |               |
| <b>Run charts/control charts</b>            |                                    |              |                       |                                 |               |
| <b>SDSA</b>                                 |                                    |              |                       |                                 |               |
| <b>Playbook</b>                             |                                    |              |                       |                                 |               |
| <b>Reports to Senior Leaders</b>            |                                    |              |                       |                                 |               |

## Appendix B. Translated Quality Improvement Knowledge Application Tool (QIKAT) and Coaching Evaluation Survey Tools administered during and at the end of improvement collaborative.

| <b>QIKAT Survey Questions<br/>Administered at the beginning of each learning session</b> | <b>Not At All (0)</b> | <b>Slightly (1)</b> | <b>A Bit (2)</b> |
|--|-----------------------|---------------------|------------------|
| a. How sure do you feel in making improvement work at present?                           |                       |                     |                  |
| b. How sure do you feel clearly defining problems, goals and purposes?                   |                       |                     |                  |
| c. How sure do you feel studying the care process?                                       |                       |                     |                  |
| d. How sure do you feel making flowchart for process?                                    |                       |                     |                  |
| e. How sure do you feel testing PDSA?  |                       |                     |                  |
| f. How sure do you feel developing measurements?   |                       |                     |                  |
| g. How sure do you feel developing a plan for data collection?                           |                       |                     |                  |
| h. How sure do you feel preserving change over time?                                     |                       |                     |                  |

| <b>Coaching Evaluation Survey Questions<br/>Administered at the end of collaborative</b> | <b>Strongly Disagree (0)</b> | <b>Disagree (1)</b> | <b>Agree (2)</b> |
|--|------------------------------|---------------------|------------------|
| a. Our coach supported our exercises in an effective way during the learning sessions.   |                              |                     |                  |
| b. Our coach was able to help us when we were stuck.                                     |                              |                     |                  |
| c. Our coach gave us support and guidance to help us to be an effective team.            |                              |                     |                  |
| d. Our coach developed a positive working relation with our team.                        |                              |                     |                  |
| e. Our coach has participated in telephone conferences with our team.                    |                              |                     |                  |
| f. We had enough contact by our coach by phone meetings.                                 |                              |                     |                  |
| g. We had contact to our coach via email.  |                              |                     |                  |
| h. Our coach has been easily available.  |                              |                     |                  |
| i. Our coach has responded to our wishes in reasonable time.                             |                              |                     |                  |
| j. Our coach has provided us with material, resources and advice.                        |                              |                     |                  |
| k. Our coach encouraged us in a helpful manner.  |                              |                     |                  |
| l. Our coach has helped to keep us on the right track.                                   |                              |                     |                  |
| m. Our coach has explained the improvement work in an effective way.                     |                              |                     |                  |
| n. Our coach promoted self-development.  |                              |                     |                  |
| o. Our coach is sensitive to local issues.   |                              |                     |                  |
| p. Did your coach visit your workplace?  |                              |                     |                  |
| q. Our coach helped our team to understand the improvement work.                         |                              |                     |                  |
| r. Our coach took active contact with all the co-workers at the workplace.               |                              |                     |                  |



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