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The Influence Of Transfer System Factors And Training Elapsed Time On Transfer In A Healthcare Organization

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THE INFLUENCE OF TRANSFER SYSTEM FACTORS AND TRAINING ELAPSED TIME ON TRANFER IN A HEALTHCARE ORGANIZATION

by

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Approved by:

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Advisor Date

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DEDICATION

I am sincerely grateful and appreciative for the many words of encouragement and support throughout this journey. This work is dedicated to:

- the memory of parents, Joseph Mihalko and Betty LeBlanc who taught me how to work hard and always give my best. I wish you were here to share this with me. You are dearly missed.
- my son Aaron Michael, you inspire me with your wit and musical gifts; I am so very proud of the wonderful young man you are.
- my daughter Caitlin for her companionship and computer savvy. Thank you for the "table" tips; but mostly for your love and refusal to allow me to abandon this goal. I am so proud of your accomplishments and the strong, loving young woman you have become.
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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

Introduction

Organizations and other sponsors of training face increasing pressure to demonstrate the value or impact of their training programs on individual and organizational performance (Friedman, Hatch, & Walker, 1998). A critical element in the validation of training effectiveness is the permanent transfer of learned knowledge, skills, and behaviors to the workplace. The generalization of learned material to the job and maintenance of trained skills, are greatly influenced by training design, trainee characteristics, and work environmental factors (Baldwin & Ford, 1988; Burke & Hutchins, 2007; Ford & Weissbein, 1997). Billions of dollars in direct costs are spent annually on training programs in the United States (ASTD State of the Industry, 2008); yet, evidence of changed behaviors in the workplace following training is scarce (Baldwin & Ford, 1988; Gist, Bavetta & Stevens, 1990; Georgenson, 1982; Saks, 2002). A recent survey of chief executive officers found that 64% wanted data from organizational training evaluation measures that demonstrate application of learning such as change in behavior or use of skills or technology following training inititatives (Phillips & Phillips, 2010).

Employers seek to improve the methods used to evaluate training effectiveness and improve training outcomes, given the increasing evidence of the intervention design and delivery (Broad & Newstrom, 1992; Burke & Hutchins, 2007; Foxon, 1994) and work climate elements (Cromwell & Kolb, 2004; Foxon, 1997; Rouiller & Goldstein, 1993; Russ-Eft, 2002) that influence transfer. Using a multidimensional approach to identify all factors that promote or inhibit transfer could provide trainers and training planners with the insight necessary to design and develop strategic interventions that may enhance transfer and sustained workplace performance (Burke & Hutchins, 2007).

Much of the empiric transfer research has examined individual factor scales or constructs that influence transfer, while other studies have examined factor scales customized to the specific study (Holton, Bates, Seyler, & Carvalho, 1997). Holton, Bates, and Ruona, (2000) and others (Cromwell & Kolb, 2004; Kontoghiorghes, 2001; Kozlowski & Salas, 1997; Tracey & Tews, 2005;) propose a view of transfer from a systemic, multi-level perspective, fully integrating the examination of multiple work climate factors and secondary influences on transfer. Using Holton's (1996) HRD Research and Evaluation Model as a theoretical framework, the Learning Transfer System Inventory (LTSI) (Holton, et al., 1997; Holton, Bates, & Ruona, 2000), was developed to serve as a generalized instrument for training evaluation. This instrument has been administered to numerous training participants representing a range of organizational settings and training programs in business and industry in the U.S. and internationally (Bates & Holton, 2004; Bates & Khasawneh, 2005; Chen, 2003; Chen, Holton, & Bates, 2005; Holton, Chen, & Naquin, 2003; Kirwan & Birchall, 2006; Weldy, 2007; Yamnill & McLean, 2005) and subject to exploratory and confirmatory factor analysis confirming its validity, reliability, and strong psychometric properties (Chen, Holton, & Bates, 2005; Holton, 2005; Holton, Bates, Bookter & Yamkovenko, 2007; Holton, Bates, & Ruona, 2000; Holton, et al., 1997; Khasawneh, Bates, & Holton, 2006; Yaghi, Goodman, Holton, & Bates, 2008; Yamnill & McLean, 2001). Studies examining transfer system factors that influence transfer using the LTSI instrument in human service agencies broadly (Clarke, 2002), and healthcare organizations specifically, however, are clearly lacking in the literature. The prospect of a valid, reliable instrument to assess organizational transfer systems, would greatly benefit the planning, design, delivery, and economic utility of effective training programs in all organizational settings (Donovan, Hannigan, & Crowe, 2001).

The purpose of this study is to examine trainee perceptions of transfer system factors that influence the transfer process following a management training program in a multi-center healthcare organization using the LTSI survey instrument. If this instrument can improve the identification of factors in the individual, training design, and work environment that influence transfer, consideration should be given to furthering the use of such instruments to improve training outcomes in the healthcare setting.

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Background of the Study

Training in Healthcare Organizations

Healthcare organizations are highly complex work environments with unique training challenges for trainers and managers. Employed in one of the most highly regulated industries in the United States (U.S.), healthcare staffs are subject to multiple training programs at the individual, departmental, and organizational level in order to keep pace with the accreditation, regulatory, technological, clinical knowledge, financial, social, and organizational changes that routinely impact both operational and clinical practice (Fallon & McConnell, 2007). New hires must undergo orientation to both organization and department or program-specific policies and practices, often requiring direct supervision and mentoring to ensure mastery and competency related to clinical skills practices. Many healthcare personnel must also meet strict requirements for continuing education to ensure that they maintain professional competency and licensure or certification, as appropriate. Human resources and management personnel must ensure staff completion and documentation of training mandated by healthcare accrediting as well as state and federal safety and public health agencies (Shi, 2007). Additionally, patient care personnel are subject to training on equipment and new devices or products, new or revised procedures,

computer software, and related administrative processes each time a change, revision, or upgrade is introduced. Despite the complexity, scope, and importance of training in healthcare organizations, assessment of the effectiveness of training in this work setting has been largely overlooked in the transfer literature.

Performance Improvement in Healthcare Organizations

Since the publication of the Institute of Medicine Report in 2000 (Kohn, Corrigan, & Donaldson, 2000), the U.S. healthcare industry faces increasing economic and public pressure to reduce costs, improve quality and efficiency, and reduce medical errors. Recent legislative policy proposed by the Centers for Medicare and Medicaid Services (Public Law 109, 2006) imposed value-based purchasing of healthcare services by holding healthcare organizations accountable for improving their performance outcomes. Effective October, 2008, the inpatient prospective payment system no longer reimburses healthcare providers for the care and services rendered to patients resulting from medical mistakes. Subsequently, administrators continue to seek ways to better identify and improve processes and practices that improve quality and patient safety, and decrease the resultant costs. Recognized throughout the business community as an effective methodology to analyze and reduce error and waste, Lean Six Sigma methods are being introduced in healthcare organizations to provide staff with the skills and tools in management and clinical processes that support organizational strategic initiatives (Kontoghiorghes, 2001; Lazarus & Neely, 2003; Trusko, Pexton, Harrington, & Gupta, 2007).

Between October, 2006 and April, 2008, 378 management and front line staff at a large multi-center healthcare system in southeast Michigan participated in Lean Six Sigma Green Belt training. The healthcare system is comprised of 7 hospitals and over 125 medical facilities. Each training program consisted of eight days of instruction conducted over a three month period.

Participation in the program was considered mandatory for all managers and senior administrators but was also open to anyone else in the organization who wished to participate. Participants were full-time employees of the St. John Healthcare System who attended and completed an instructor-lead, classroom-based management training program. Enrollment in each of the eight-day training sessions was strictly limited to 50 participants. Under the supervision of a lead Master Black Belt training coordinator, Certified Black Belt instructors conducted the training sessions using lecture and team activities to present and exercise Lean Six Sigma concepts and techniques. Topics presented in the training sessions included value stream analysis, change acceleration process, team facilitation, control concepts, rapid improvement event (RIE) methods, and other Lean Six Sigma processes. A complete listing of the training program topics is presented in Appendix A. Study questionnaires were submitted by 153 training participants, with 135 evaluable questionnaires included in the final analysis. Considered to be more than just another management training program, a change in culture was introduced through a shared vision of operational excellence using Lean Six Sigma methods and strategies to drive the quality initiatives set forth by organizational leaders.

The Learning Transfer System Inventory

Both learning and transfer are critical outcomes for training professionals in all businesses and industries. It is evident from the study of transfer over the past two decades that it is complex and encompasses multiple factors in the person, training, and work climate that influence transfer in work settings (Holton, Bates, & Ruona, 2000). Organizations hoping to improve learning and performance as a direct result of training programs must be fully aware of the factors that influence or mediate transfer of learning and seek ways to diagnose those factors that may reduce or inhibit transfer in the work environment. Recognizing the need to develop

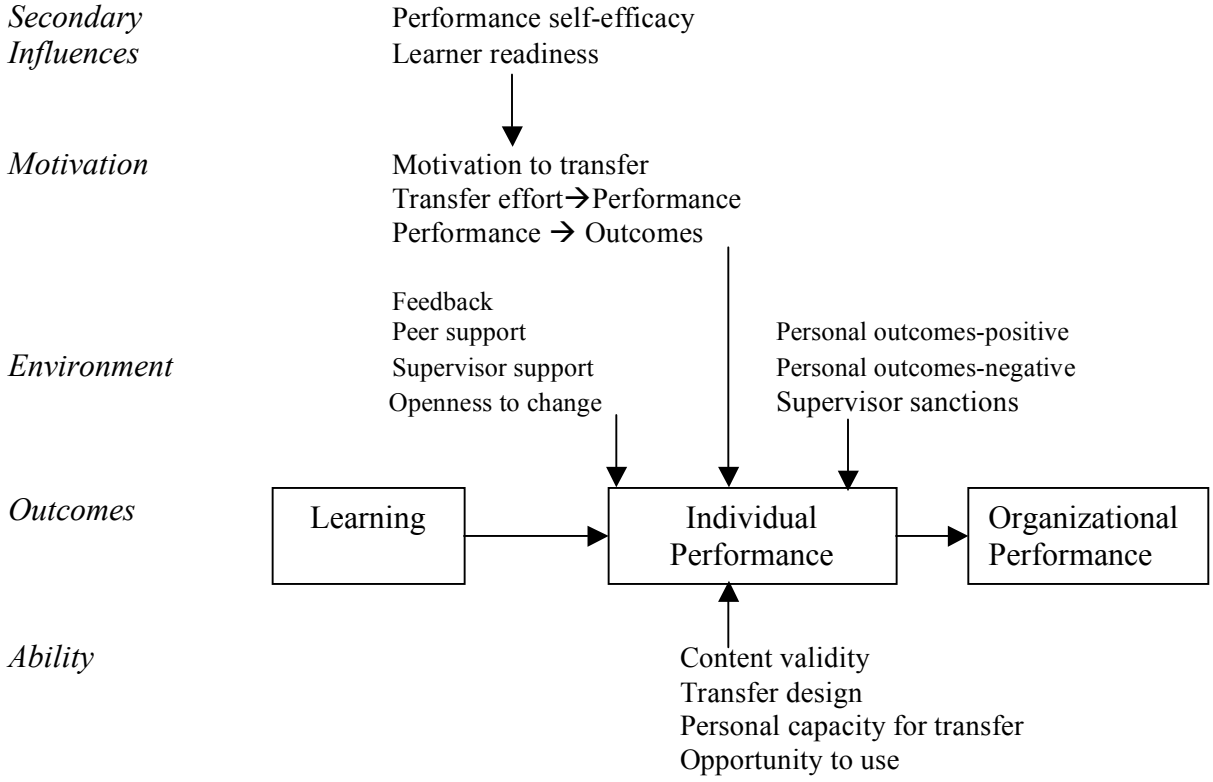
consistent measures of transfer variables using acceptable methods of scale construct validation, the Learning Transfer System Inventory (LTSI) (Holton, Bates, & Ruona, 2000) was developed to address these perceived shortcomings in the existing transfer research. The LTSI is a theoretically-based, psychometrically-sound instrument comprised of four scales, and 16 transfer system factors with potential applicability across organization types and training programs. Both training-specific and general training transfer factors are included in the 89-question survey instrument.

Version 1 of the instrument evolved from the addition and deletion of constructs from the eight-factor structure proposed earlier by Rouiller & Goldstein (1993) that resulted in a set of scales consistent with transfer of learning in work settings. Using factor analysis, Holton et al. (1997) analyzed an expanded instrument that included a total of nine constructs affecting the transfer of training: supervisor support, opportunity to use, transfer design, peer support, supervisor sanction, personal outcomes-positive, personal outcomes-negative, change resistance, and content validity. Bates, Holton, Seyler, & Carvalho (2000) were able to demonstrate initial evidence of construct, content, and criterion validity of a nine-factor transfer climate instrument suggesting organizational referents, rather than situational and consequence cues (Rouiller & Goldstein, 1993), are key to trainee perceptions of transfer climate. These findings suggested further studies were needed to validate the psychometric integrity of the proposed as well as additional transfer scales, and a need to perform construct validation analysis across work groups and work settings.

In Version 2 of the LTSI, seven additional constructs were added to the survey instrument and subjected to both exploratory and confirmatory factor analysis. The resulting instrument included the original nine constructs and seven additional constructs that address

motivation to transfer (Noe, 1986), transfer effort-performance, performance-outcomes, ability (Baldwin & Ford, 1988; Colquitt, LePine, & Noe, 2000; Hunter, 1986), learner readiness, performance self-efficacy (Chiaburu & Marinova, 2005; Gist, 1987; Mathieu, Tannenbaum, & Salas, 1992), and personal capacity for transfer (Ford, Quinones, Sego, & Sorra, 1992). These 16 constructs complete the theoretical framework proposed by Holton, Bates, and Ruona (2000). This conceptual model is presented in Figure 1. The 16 constructs included in Version 2 of the LTSI are further grouped into four scales: trainee characteristics, motivation, work environment,

Figure 1. LTSI Version 2: Conceptual Model of Constructs



(Holton, Bates, & Ruona, 2000)

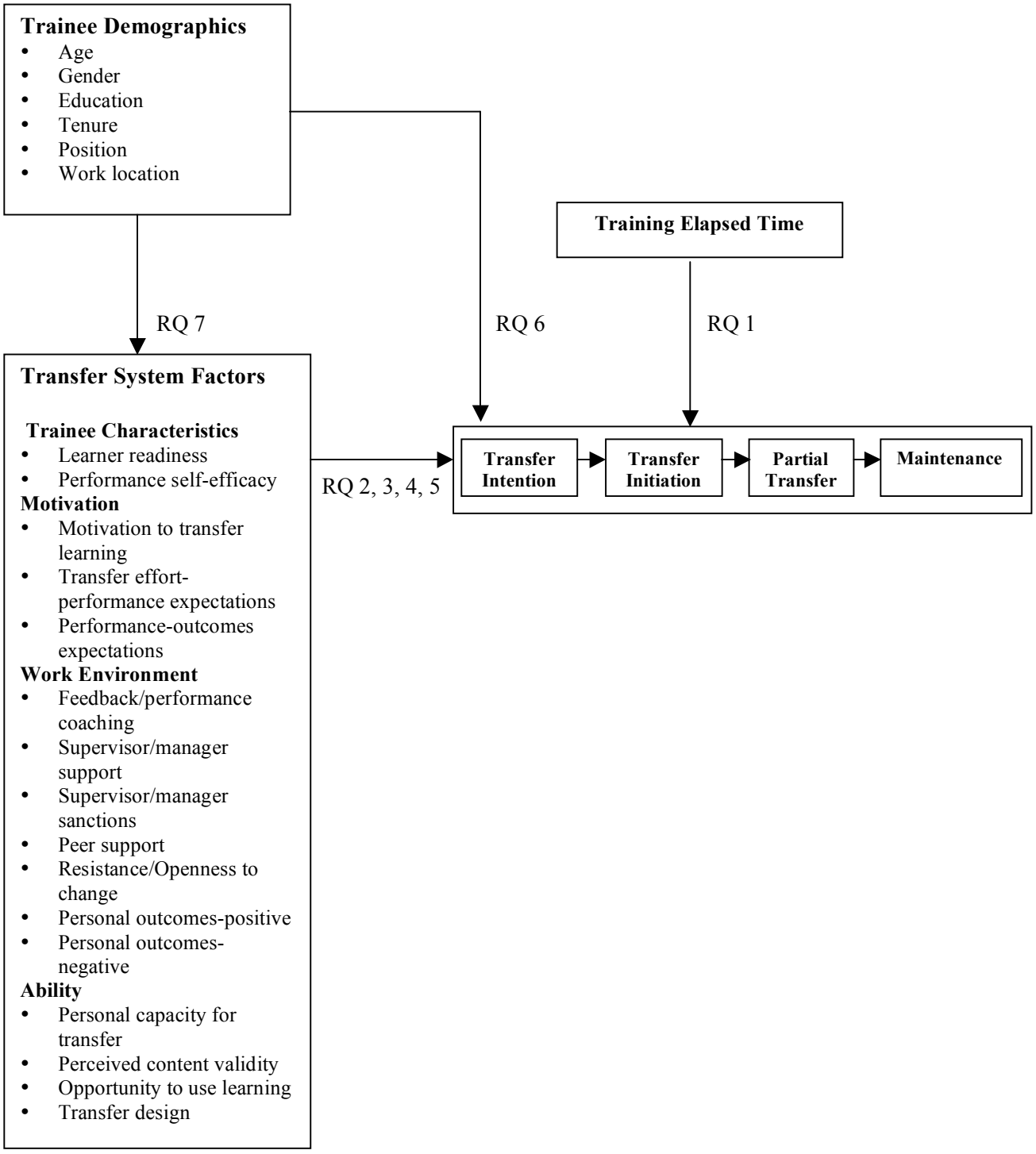
and ability (Holton, Bates, & Ruona, 2000) which correlate directly with factors identified in the transfer literature as influencing transfer outcomes. Learner readiness and performance self-

efficacy factors comprise the trainee characteristic scale. The motivation scale includes motivation to transfer, transfer effort-performance expectations, and performance-outcomes expectations. The work environment scale includes feedback/performance coaching, peer support, supervisor/manager support, resistance/openness to change, personal outcomes positive, personal outcomes negative and supervisor/manager sanctions. The ability scale includes perceived content validity, transfer design, personal capacity for transfer, and opportunity to use learning. The four transfer system scales described here were included as independent variables in this study of a heterogeneous trainee group in a multi-center healthcare organization using the Version 2 LTSI questionnaire.

Purpose of the Study

The purpose of this study is to examine the relationship between trainee perceived transfer system factors and training elapsed time on progressive stages of transfer in a healthcare organization at time intervals of 9 to 24 months following completion of an eight-day management training program. The Learning Transfer System Inventory (LTSI), a validated survey instrument developed by Holton, Bates, and Ruona (2000), was used in the participating organization to determine trainee perceptions of the motivation, work environment, trainee characteristics, and ability factors that promote or inhibit transfer of knowledge, skills, and attitudes from the training environment to the work environment. The study also investigated the relationship between trainee demographic characteristics, including age, gender, education, tenure, position, and work location, and perceived transfer system factors. These study variables and the respective research questions (RQ1-RQ7) included in this study are presented in Figure 2.

Figure 2. Model of the Research Variables



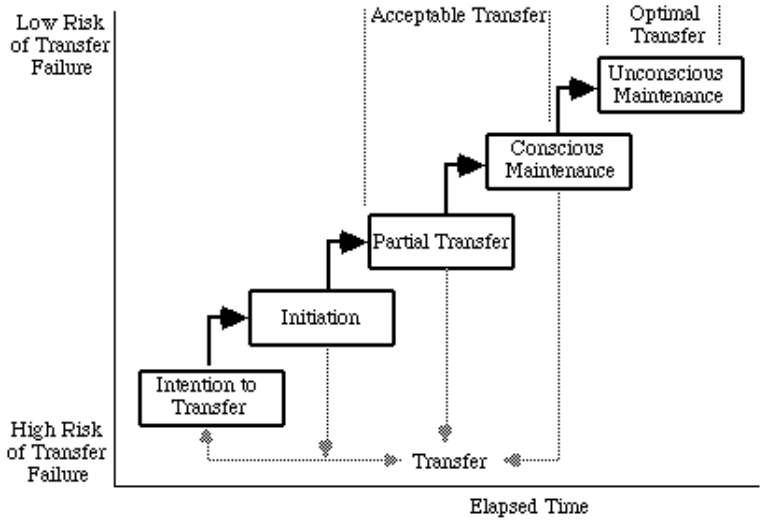
Note: RQ = Research Questions

Although much is written about the potential influences on transfer, the nature of transfer itself remains rife with questions and often open to interpretation. Much of the empiric research has examined evidence of transfer soon after training while studies assessing the generalization or maintenance of skills and knowledge are few; yet, the majority of training transfer models specify a change in performance or behavior at the individual or organizational level following training as the primary measure of transfer. Without clear definitions of transfer, however, identifying specifically when transfer has occurred is difficult, at best, especially when studying transfer in the context of cognitive, problem solving, or management development training programs (Foxon, 1993). Questioning the assumption of transfer as a product of training, Foxon (1993) proposed the conceptualization of transfer as a process composed of multiple stages with each of the stages being prerequisite to each subsequent phase. The four transfer phases described in this transfer process include:

1. Transfer intention: the motivation of the learner to apply learning in the work environment following training;
2. Transfer initiation: the attempt to apply some aspect of the learning in the work environment;
3. Partial transfer: the transfer of some of the learned skills or use of skills from time to time; and,
4. Transfer maintenance (two stages): conscious maintenance where learners use new skills on a conscious basis when the opportunity presents itself and unconscious maintenance where the new skill or knowledge is fully incorporated into the work routine and may be generalized to other aspect of work practice.

This model of transfer process, presented in Figure 3, conceptualizes the way learners commit to try, practice, discontinue, abandon altogether, or ultimately imbed in their work function the knowledge and skills learned in training on a continuum. Foxon's (1993) proposed stages of transfer support the theoretical framework of the dependent variable in this study.

Figure 3. Stages of the Transfer Process



(Foxon, 1993)

Research Questions

Transfer system constructs identified in Holton's (1996) HRD Evaluation Research and Measurement Model, including motivation, trainee characteristics, ability, and work environment, and Foxon's (1993) model of the stages of the transfer process provide the conceptual framework for this study. The following research questions guided this study.

Research Question 1

Is there a positive relationship between time since completion of training and the stages of transfer?

Research Question 2

What factors in the Learning Transfer System Inventory motivation scale (motivation to transfer learning, transfer effort-performance expectations, performance-outcomes expectations) influence the transfer process in healthcare employees?

Research Question 3

What factors in the Learning Transfer System Inventory trainee characteristics scale (learner readiness, performance self-efficacy) influence the transfer process in healthcare employees?

Research Question 4

What factors in the Learning Transfer System Inventory work environment scale (feedback/performance coaching, supervisor/manager support, supervisor/manager sanctions, peer support, resistance/openness to change, personal outcomes-positive, personal outcomes-negative) influence the transfer process in healthcare employees?

Research Question 5

What factors in the Learning Transfer System Inventory ability scale (personal capacity for transfer, perceived content validity, opportunity to use learning) influence the transfer process in healthcare employees?

Research Question 6

Are there differences in stage of transfer achieved across selected demographic characteristics, including education, position, work location, years in healthcare, years in current position, age, and gender?

Research Question 7

Are there differences in perceived transfer system factors across selected demographic characteristics, including education, job type, work location, years in healthcare, years in current position, age, and gender?

Definition of Terms

The following definitions are provided to lend clarity of the terms used in this study.

Black Belt

Experienced professionals with significant training and skill in problem solving and the application of statistical methods needed to execute Six Sigma systems. Typically a full time position, Six Sigma Black Belts support Green Belts as trainers and/or leaders of problem-solving teams (Trusko, et al., 2007).

Construct Validation

The collection, documentation and evaluation of a unified body of evidence to see how well a scale measures, operationalizes, or correlates with the theoretical psychological construct it claims to measure (Campbell, 1959).

Green Belt

Individuals who have completed training in Six Sigma processes used to analyze, design, measure, and improve processes. Green Belts generally serve as members of problem-solving teams on an as needed basis (Trusko, et al., 2007).

Learning Transfer System Inventory (LTSI)

An evaluation instrument composed of 16 factors with 89 items that assess trainee perceptions about all factors in the person, training, and organization that influence transfer of training (Holton, Bates, & Ruona, 2000).

Six Sigma

A process that uses statistical methods, problem solving, and quality principles to measure, analyze, and reengineer processes to achieve an error rate below 3.44 per million events (Trusko, et al., 2007).

Training Elapsed Time

The time difference between completion of training and another specified point in time (Baldwin & Ford, 1988).

Training

The planned learning experience designed to promote a permanent change in the knowledge, attitudes, or skills of individuals. (Campbell, Dunnette, Lawler, & Weick, 1970, as cited in Noe, 1986).

Transfer of Training

The effective generalization and maintenance of skills and knowledge gained in a training program (Baldwin & Ford, 1988).

Transfer Climate

A wide variety of organizational and perceptual variables which limit or support the application of knowledge, skills, behaviors, and attitudes learned in training (Mathieu, Tannenbaum, & Salas, 1992)

Transfer Process

The stages of learner efforts to try, practice, maintain, discontinue, or fail to use new skills on a time continuum, with each stage being a prerequisite to the next (Foxon, 1993).

Transfer System

All factors in the person, training design, and work environment that influence the transfer of learning to the job (Holton, 1996).

Significance of the Study

Findings from this study will contribute to the understanding of training transfer in the following ways:

- This information will provide an understanding of the perceptions of transfer system factors in a complex, multi-center healthcare organization.
- Information obtained from this study will be used by healthcare organizations to address perceived deficiencies as well as leverage points predictive of transfer in the planning, design, and/or delivery of management training programs.
- This study will inform the question of the relationship between training elapsed time and the stages of transfer in a healthcare organization.
- This study will inform the question of the influence of trainee perceptions of transfer system factors on the stage of transfer continuum in a healthcare organization.

- Data obtained from the LTSI instrument will contribute to the further development and refinement of this tool for research and practical purposes by HRD professionals and trainers in organizations.
- This study will contribute to the understanding of the potential generalization of the LTSI instrument as a diagnostic tool for improvement of training effectiveness in organizations.

Summary

This chapter discussed the system of factors that affect the effectiveness of organizational training as a means of improving individual and organizational performance. The research suggested that traditional approaches to training evaluation are generally inadequate in their assessment of training effectiveness. Rather, a more holistic approach, as suggested by Holton's (1996) conceptual model can help identify work climate factors that inhibit or support transfer in all work settings to improve training programs and maximize the transfer of new knowledge and skills back to the job. The LTSI was introduced as a validated, psychometrically sound instrument that can be used to estimate and target areas in need of improvement to maximize a return on training investments. Research questions were described and specific terms used for this study were defined accordingly. Finally, the significance and potential limitations of the study were also described. In the next chapter, a review of the relevant literature on the nature of transfer, factors believed to influence transfer of training, the HRD Model of Training Evaluation, and stages of transfer will be presented and discussed.

CHAPTER 2

Review of the Literature

Introduction

Broad and Newstrom (1992) proposed three primary challenges to contemporary training professionals in meeting the increasing pressure to demonstrate improved job and organizational performance following training interventions. First, organizations in the 21st century are spending hundreds of billions of dollars annually to provide training programs intended to augment the knowledge, skills, behaviors, and attitudes of their workforce (ASTD State of the Industry, 2008). Despite the desire to hold trainers, managers, and employees accountable for transfer, there remains little consensus on how best to measure training success or practically determine the true value of training in organizations (Burke & Hutchins, 2008). Second, multiple studies have reported a profound lack of generalization and maintenance of newly learned skills back on the job (Baldwin & Ford, 1988; Broad & Newstrom, 1992; Kozlowski & Salas, 1997; Noe & Colquitt, 2002; Yamnill & McLean, 2001). Finally, facing increasing pressures from economic uncertainty, globalization, rapid technological advancements, and competition domestically and abroad, organizations need to link training outcomes to business goals and to be able demonstrate a return on investment in training initiatives (Bersin, 2006; Summers & Nowicki, 2002; Swanson & Holton, 2009). Nowhere are these challenges felt more keenly, than in healthcare organizations (Nelson & Dufour, 2002; Trusko et al., 2007) where training dollars are quick to be cut during financial hardships and annual training expenditures per employee fall well below other U.S. industries (Summers & Nowicki, 2002).

This chapter includes a review of the relevant literature on transfer of training beginning with a discussion of training effectiveness, the nature of transfer, and the motivation theories that

influence employee transfer of training. Following this discussion, transfer studies that have examined the influence of organizational climate factors on the transfer of training, as well as the transfer system factors proposed by Holton, Bates, & Ruona (2000) are presented. Finally, a discussion of the transfer process is included.

Training Effectiveness

Training programs provide little opportunity to influence workplace performance if the knowledge, skills, and attitudes learned are not applied to the job. Workplace training programs focus not only on learning, but contribute to the retention of employees, improving the work culture, and promoting incentive for quality and improved performance at both the individual and organizational levels (Holton, 1996; Kim, 2004). In the contemporary workplace, a combination of proportionately decreasing entry-level youth and increasing numbers of middle-aged employees, rapid advancement in technology and globalization, and a projected decline in the manufacturing sector of business coupled with an increase in technology, information, and service workers, only accentuate the urgency to invest in human capital and demonstrate training effectiveness. The capacity for these training interventions to generate and sustain a positive impact on organizational performance by reducing costs, errors, or staff turnover, or to increase productivity, safety, or customer satisfaction, creates business value and a competitive advantage (Donovan, Hannigan, & Crowe, 2001; Friedman, Hatch, & Walker, 1998; Yamnill & McLean, 2001). While corporations continue to spend billions of dollars annually on training (ASTD State of the Industry, 2008) , few engage in the systematic evaluation of training effectiveness (Noe & Colquitt, 2002) and estimates indicate that only 10 to 40 percent of training results in positive transfer (Foxon, 1993; Georgenson, 1982).

Transfer of training, as defined by Baldwin & Ford (1988), refers to the degree that trainees effectively apply the knowledge, skills, and attitudes acquired in a learning situation to the job and maintain them over time, and suggests that transfer is a function of those factors in both the training and work environments that can promote or inhibit transfer of training (Tracey, Tannenbaum & Kavanagh, 1995). James Mosel (1957), one of the first training professionals to study transfer, proposed several reasons for lack of training transfer including the need for usable training content, learning of the usable content, and trainee motivation to modify behavior following training. Mosel (1957) also recognized the importance and influence of both organizational and supervisory support on transfer. Gaining insight into trainee perceptions of factors that influence their application of learned knowledge, skills, and attitudes back to the job would benefit training professionals by allowing them to better predict and manage factors that inhibit or promote transfer of training in organizations (Belling, James & Ladkin, 2004; Facteau, Dobbins, Russell, Ladd, & Kudisch 1995; Tannenbaum & Yukl, 1992; Zavaleta, 2003). Unless the knowledge, skills, attitudes, and behaviors learned in management training programs are applied back on the job, and maintained over time, organizations are unable to demonstrate a return on the billions of dollars invested annually in training (Kozlowski & Salas, 1997). With individual and organizational performance improvement the prime gauge of training effectiveness, it is essential that there is clarity in the knowledge and understanding of those factors which support or inhibit transfer of training in organizations (Holton et al., 1997). Earlier research conducted by Noe and Schmidt (1986) and Mathieu, Tannenbaum, and Salas (1992) further supported findings by Alliger and Janack (1989) of the complex relationships between a number of intervening variables, learning outcomes, and individual performance change. Holton (1996) proposed that without awareness of the intervening variables that influence learning and

transfer, true barriers to training effectiveness cannot be identified or corrected. Central to Holton's (1996) conceptual model of training evaluation, individual performance is a result of the achievement and subsequent application of new learning on the job. Swanson and Holton (2009) further proposed that:

> researchers are still working to operationalize the organizational dimensions important to enhancing transfer; nonetheless, there is widespread recognition that the transfer process is not something that occurs by chance or is assured by achieving learning outcomes but rather that it is the result of a complex system of influences (p. 155).

The Nature of Transfer

A critical element in the validation of training effectiveness is the permanent transfer of learned knowledge, skills, or behaviors to the workplace. U.S. companies in the public and private sector invest billions of dollars annually on training programs and performance interventions intended to facilitate learning, improve individual job performance, and increase organizational effectiveness (ASTD State of the Industry, 2008; Noe & Colquitt, 2002). The capacity for these interventions to generate and sustain a positive impact on organizational performance by reducing costs, errors, or staff turnover, or to increase productivity, safety, or customer satisfaction, creates business value.

Most organizations recognize that human capital is the single most important resource driving their organizational effectiveness and competitive advantage in the world market of the 21st century. Globalization, increasing use of technology, and focus on performance and quality have impacted the scope and complexity of the contemporary workplace placing an ever-present need for knowledgeable, skilled workers high on the radar screen of CEO's and managers alike. One of the most compelling environments seeking change in both individual and organizational performance outcomes is the healthcare industry. In its landmark report, the Institutes of Medicine reported that up to 98,000 patients in the U.S. die each year as a result of medical

errors (Kohn, Corrigan, & Donaldson, 2000). This figure, while alarming to many, does not take in to consideration the additional impact of near misses that potentially harm patients and needlessly drain precious healthcare dollars. Increasing pressures from government, accrediting, payer, and consumer groups dictate the need to carefully examine processes and practices in the delivery of care and improve the overall quality and safety of healthcare services. Citing from studies in the fields of knowledge transfer and learning organizations, Berta and Baker (2004), encourage their colleagues in healthcare management to identify and recognize the individual and contextual factors that can influence transfer in the complex acute care setting. Many healthcare organizations have begun to invest in training of their management ranks in the methods and techniques necessary to identify and address performance issues (Trusko et al., 2007) eliminate waste, and improve the overall quality of care; yet, information on the effectiveness of training transfer is lacking in the professional literature. Indeed, despite a century of study, there is yet to be agreement among scholars of transfer about the nature of transfer, the degree to which it takes place, or the principal underlying mechanisms that support or inhibit its occurrence (Barnett & Ceci, 2002).

Factors that Affect Transfer

All training events occur within a context, or a unique situation of interrelated conditions. While most instructional design models generally prescribe the use of learner and content or task analysis, many fail to consider the impact of the training or organizational environment on learning outcomes (Tracey, Tannenbaum, & Kavanagh, 1995). A topic of much attention and recent inquiry, the influence of contextual factors on learning and transfer is central to most contemporary reviews of the transfer process (Baldwin & Ford, 1988; Ford, et al., 1992; Holton, Chen, & Naquin, 2003; Tessmer & Richey, 1997). Still others believe contextual factors to have

the most significant impact on learner motivation and transfer of training (Baldwin & Ford, 1988).

Baldwin and Ford (1988) proposed a different approach to the process of examining transfer issues. In their systems-based model of the transfer process, learning and retention are viewed as primary factors influencing transfer, a position supported by Gagne' (1970). According to Gagne', “It is said that education should be concerned not simply with the acquisition of knowledge, but more importantly with the use and generalization of knowledge in novel situations” (Gagne', 1970, p.29). Baldwin and Ford (1988) posited that learner characteristics, instructional design, and work environment directly influence learning and retention, the “training outputs”. With learner characteristics and work environment, “training inputs”, also believed to have a direct impact on the conditions of transfer, the Baldwin and Ford model (1988) placed training design in a position of indirect influence on transfer. Using this model, conditions of transfer refer to the generalization of material learned to the job, and maintenance of the learned material over time on the job. They further proposed that trainee and environmental influences have the most significant impact on training outputs.

Offering another approach to training transfer, Broad & Newstrom (1992) called for the careful consideration of opportunities to incorporate transfer strategies in the pre-training, training, and post-training periods. They viewed the shared responsibility between manager, trainee, and trainer as essential in each training phase to assure active participation of all stakeholders in the process from its earliest inception through to application on the job. Their transfer partnership model promotes proactive engagement, communication, and support in addressing transfer problems and maintaining the application of training to the job. In a study conducted by Newstrom (1986, as cited in Broad & Newstrom, 1992), lack of reinforcement on

the job was cited as the greatest barrier to transfer, a finding verified by Ford et al. (1992), and others (as cited in Holton, Chen, & Naquin, 2003). The second and third ranked barriers reported by Newstrom (1986, as cited in Broad & Newstrom, 1992) were interference in the immediate work environment (e.g. time pressures, inefficiencies, lack of equipment) and work culture lacking in support of transfer, respectively.

Tessmer and Richey (1997) described the factors, types, and levels of context that can influence learning prior to, during, and following a training event, referred to as the orienting, instructional, and transfer context, respectively. Various contextual factors can exhibit social, physical, political, or cultural influences on training depending on the given situation or particular vantage point of inquiry. Additionally, these influences can arise in both the immediate and surrounding or support environment, and can directly or indirectly impact training outcomes. Facteau et al. (1995) examined the influence of social support on training motivation and transfer. Utilizing self-report of over 950 trainees, they found that supervisor support of training increased learner motivation to attend and learn from training; however, trainees reported greater transfer of training skills when subordinates and peers supported their training efforts. Noe and Schmidt (1986) have suggested that social context can influence training transfer by way of reinforcement or opportunity used to bring forth trained skills (as cited in Facteau et al., 1995). In a study conducted with airmen trainees, Ford et al. (1992) identified differential opportunities to perform trained tasks depending on several work context factors and learner characteristics. Supervisor perceptions of the trainees' capability as well as trainee self-efficacy determined the frequency of their performance of tasks.

Given the extreme variability in organization types, organizational cultures, and training situations, workplace factors that may predict transfer would be invaluable when designing or

delivering training (Holton et al., 1997; Huczynski & Lewis, 1980). Holton, Chen, & Naquin (2003) conducted a large, multi-center study of transfer using three organization types, eight organizations, and nine training types that included profit, non-profit, and public sector employers. Using a comprehensive assessment of factors believed to influence transfer, 68 individual factors were grouped by trainee characteristics, motivation, work environment, and ability. Not only did they find statistically significant differences in transfer factor systems across organization types, organizations, and training types, but they also found that trainees generally reported significant weaknesses in organizational transfer systems. Similar findings were found in Thailand by Yamnill and McLean (2005) using a translated version of the LTSI with 1,256 employees in 552 government, state, and private organizations, replicating the study conducted by Holton, Bates, and Ruona (2000). Type of organization explained the greatest variance between employee perceived transfer system factors, especially between private and government organizations.

Motivational Influences on Transfer

The low return on investment predicated by the failure of training is a common concern of professional trainers (Gegenfurtner, Veermans, Festner & Gruber, 2009). Motivation to transfer is defined by Noe (1986) as the desire of the trainee to apply the knowledge and skills mastered in training on the job. As early as 1975, Steers and Porter (1975) proposed that motivation serves as a stimulus to learning and content mastery and subsequently influences the use of new knowledge, regardless of reward or reinforcement. In Noe's (1986) proposed model of motivational influences on training effectiveness, motivation is presented as a moderator of the relationship between learning and behavior change.

Motivation to transfer is seen by many contemporary researchers to be a vital component of the transfer process (Baldwin & Ford, 1988; Burke & Hutchins, 2007; Holton, Bates, & Ruona, 2000; Gegenfurtner et al., 2009; Wieland-Handy, 2008). In order for trainees to successfully learn and apply the knowledge, skills, and attitudes learned in training programs, several important criteria must first be met (Noe, 1986; Noe & Colquitt, 2002). Trainees must be ready to learn, motivated to learn, gain the desired knowledge from the instruction, and transfer that knowledge and skill back to the job. Even with the introduction of carefully designed incentive programs, Condly, Clark, and Stolovitch (2003) found only modest gains in team and individual performance in their meta-analysis of 45 studies where incentives to motivate performance following training interventions were instituted.

Despite the administration of well-designed training curricula, trainee attitudes, expectations, values, and interests can adversely affect or further training effectiveness, and, subsequently, individual performance. Drawing from the literature in organizational behavior and training and development, Noe (1986) and others (Facteau et al., 1995; Milner, 2002; Yelon, Sheppard, Sleight, & Ford, 2004) proposed that motivational factors play a significant role in training transfer. Both an antecedent to training effectiveness and a moderator between learning and behavior change (Noe, 1986; Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991), trainee motivation is influenced by individual beliefs, assertions, and attitudes. Several motivation theories provide the theoretical framework that support the understanding and prediction of factors that influence employee motivation to transfer, including expectancy, equity, and goal-setting.

Expectancy theory. Vroom (1964), proposed that employee behavior in the work setting was more complex than first projected. His expectancy theory of motivation posits that

individuals in organizations will sustain efforts to maximize outcomes they deem to be highly desirable through their own conscious choices based on their personality, skills, knowledge, experience, and ability. Using the valence-expectancy-instrumentality model, Vroom (1964) postulated that individuals can be motivated before, during, or after training, if they believe that a positive correlation exists between effort and performance; desirable rewards follow favorable performance; important needs are satisfied by the reward; and, the desire to gratify the needs is sufficient to make the endeavor worthwhile. Valence refers to the satisfaction that the individual expects from the outcomes. Such outcomes, or rewards, may originate via intrinsic or extrinsic factors (Burke & Hutchins, 2008). Intrinsic rewards, such as personal satisfaction or achievement, are intangible, while extrinsic rewards such as pay, recognition, or promotion represent tangible outcomes. Viewed as a precursor of transfer, motivation to attend training and learn is reported in several studies to be lower in trainees who perceived extrinsic reasons to attend training, than trainees who report intrinsic reasons (Facteau et al., 1995; Kontoghiroghes, 2001). In yet another study, however, Taylor, Russ-Eft, & Chan, (2005) reported greater transfer outcomes when extrinsic rewards, such as recognition in performance appraisal, were established in the workplace. Using the model P=f(F X A), Vroom (1964) proposed that individual performance (P) results from the interaction of force (F) and ability (A), where ability refers to the individual's capacity to perform a specific task or behavior and force (F) represents an algebraic sum of the valence (desirability) of the outcomes (V) and the products of the valences of the outcomes (E).

Instrumentality refers to one's belief that specific action will result in additional desirable outcomes (second-level outcomes) or the avoidance of undesirable outcomes (Vroom, 1964). Lawson and Shen (1998) illustrated the importance of organizational follow-through on fulfilling

promises made to trainees for improved performance by describing expectancy as the overall strength of an individual's certainty that specific outcomes will transpire within a range of zero to one, where zero implies inability to do the task and one reflects the ability to do the task. Contrary to this belief that trainee satisfaction leads to improved performance, Porter and Lawler (1968, as cited in Yamnill & McLean, 2001) claimed that the reverse occurs. They proposed that high performance results in trainee satisfaction, provided the desirable rewards, or high valence is established.

Equity theory. People basically want to be treated fairly. Adams (1961, as cited in Yamnill & McLean, 2001) described equity theory as the belief that employees are either being treated equitably or not in relation to other employees in the organization. Vroom (1964) further postulated that the satisfaction enjoyed by employees is a measure of the equity of rewards received by trainees compared to the rewards desired by the trainees. Furthermore, the greater the distance between these held beliefs, the greater the discontent that exists for the individual (Yamnill & McLean, 2001). Carrell and Dittrich (1978) summarized several theorists' assumptions of equitable treatment in three key principles; that

> (1) employees perceive a fair, just, or equitable return for what they contribute to their job, (2) employees determine what their equitable return should be after comparing their inputs (skills, education, effort) and outcomes (pay, promotion, job status) with those of their co-workers, and (3) employees who perceive themselves as being in an inequitable situation will seek to reduce the inequity (p. 203).

Goal-setting theory. The goal-setting process incorporates intention and valence as two cognitive mechanisms of human behavior. The process by which behavior is modified, including direction, arousal, and persistence of effort, is also believed to operate through goal setting conducted at a level of performance intended by the individual (Locke, Shaw, Saari, & Latham, 1981; Yamnill & McLean, 2001). Three features highlight the importance of goal-setting to

training effectiveness: 1) trainee differences in the extent that they actively self-manage the setting and completion of goals; 2) the varied type and structure of goals between novices and experts; and, 3) a difference in the presence and quality of individual goals will likely influence the transfer of learned behaviors and skills to the job (Baldwin & Ford, 1988; Kraiger, Ford, & Salas, 1993; Wexley & Baldwin, 1986; Yamnill & McLean, 2001; Yelon et al., 2004). As with expectancy, goal setting may explain how and why performance is supported or impeded anytime before, during, or following training. Goal-setting is frequently included as a viable relapse prevention strategy to increase the potential for knowledge and skills acquired in training to be applied and maintained on the job (Burke & Baldwin, 1999; Foxon, 1997; Gist, Bavetta, & Stevens, 1990, Wexley & Baldwin, 1986).

In summary, theories of motivation provide a conceptual framework for transfer of training. It is essential for training practitioners to understand those factors that may facilitate or restrain trainee motivation before, during, or after training. Goal-setting and expectancy theory serve to expound upon the reasons individuals apply the skill, knowledge, and attitudes mastered in a training context and how they perceive effort, performance, and reward systems. Therefore, trainee motivation, one of the primary construct domains that influence transfer in Holton's (1996) conceptual model of training evaluation, and other secondary influences, serve as moderators of training transfer and improved work outcomes. Through the careful application and understanding of motivation theories, practitioners may better predict influences on motivation to transfer that can be addressed through the strategic design and delivery of training in organizations.

Transfer Climate

Organizations looking to improve their return on investment from training need to identify, fully appreciate, and act upon all the factors that directly influence or moderate the transfer of training. Although organizations seek to improve the bottom line through training effectiveness, few studies have truly examined why some training programs produce results but others do not (Noe, 1986). Rather, most early studies on transfer focused on instructional design, needs assessment, and evaluation methods. Recognizing that the transfer climate served as a critical factor in the transfer process, Goldstein (1986) posited that an assessment of organizational dynamics be included as an essential component of the training needs assessment process if the use of learned skills was to be realized.

Transfer climate is a complex construct that has been examined and described by many researchers of learning and transfer as a key variable in the understanding of training effectiveness and as such, may include different study variables from one study to another. Transfer climate does not equate with work environment, rather it is described by Holton et al. (1997) as a "perpetual medium through which the work environment affects job attitudes and behaviors" (p. 97). It is the "sense of imperative that arises from a person's perceptions of his or her work environment, one that influences how he or she responds" (Schneider & Rentsch, 1988, as cited in Bates & Khasawneh, 2005, p. 99). Distinctive attributes of a positive transfer climate include sufficient resources, cues to remind trainees what they learned in training, timely feedback, opportunity to use new skills, and positive results for applying new skills (Hawley & Barnard, 2005; Rouiller & Goldstein, 1993). It is further assumed that climate differs among work units within organizations as well as across organizations (Huczynski & Lewis, 1980). Early works examining the etiology of work climates recognized that employee behavior and

attitudes tend to evolve from their own perceptions of the work environment (Schneider & Reichers, 1983).

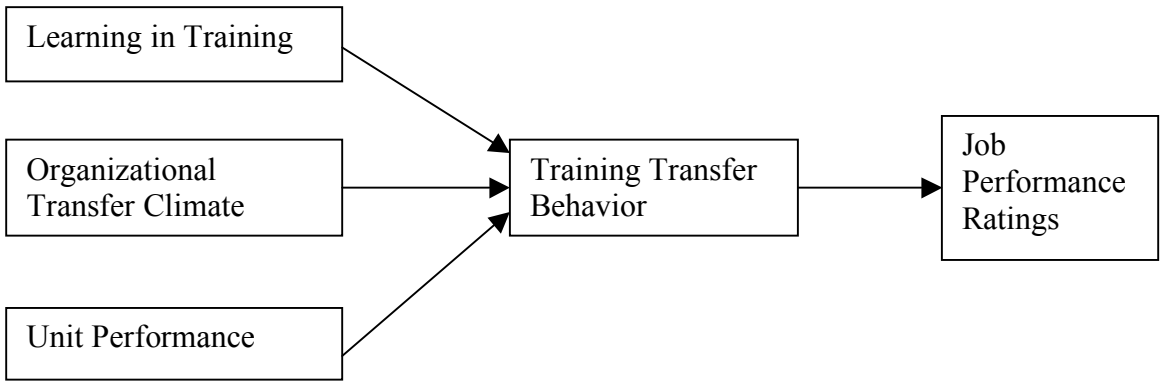
Among the first studies suggesting a supportive work climate as a factor influencing transfer, Fleishman, Harris, and Burtt (1955, as cited in Rouiller & Goldstein, 1993) found during follow-up interviews that the effects of a management training program had disappeared due to a lack of supervisor support for the goals of training. In their systematic review of factors believed to have an impact on transfer, Baldwin and Ford (1988) found little empirical evidence in the practitioner training literature to support this conviction. Several lines of research conducted by Baumgartel and his colleagues (Baumgartel, Reynolds, & Pathan, 1984; Baumgartel, Sullivan, & Dunn, 1978) reported that a supportive organizational climate reinforced transfer of skills and attitudes gained in training back to the job. Much of these data were collected immediately or soon after completion of training and involved self-report of effort to transfer. These early correlational studies, however, lacked the ability to demonstrate causality. Additionally, key work characteristics, such as supervisor support, had not been operationalized to further the study and understanding of their influence on transfer.

Lim and Morris (2006) described two categories of factors that affect transfer as work system factors and people-related factors. Work system factors include organizational commitment to training and transfer, opportunity to use training (Burke & Hutchins, 2008; Ford et al., 1992; Clarke, 2002) , alignment between training goals and organizational goals (Montesino, 2002; Richey, 1990), open communication and change resistant climate (Rollier & Goldstein, 1993), and availability of tools to apply training (Richey, 1990). Of these factors, opportunity to use has been identified in several studies (Ford et al., 1992; Lim, 2000) as a critical factor in promoting training transfer.

Three major people-related factors examined in transfer research studies include support from supervisors and coworkers (Brinkerhoff & Montesino, 1995; Cromwell & Kolb, 2004; Ford et al., 1992; Foxon, 1997; Gielen, 1996; Hawley & Barnard, 2005; Lim & Johnson, 2002; Richman-Hirsch, 2001; Tracey, Tannenbaum, & Kavanagh, 1995; Wieland-Handy, 2008), mentoring (Richey, 1990), and positive personal outcomes (Holton, Bates, & Ruona, 2000). Lim (2000) further posited that of all the climate factors that may influence transfer behavior, supervisor feedback, involvement with training, and discussion with trainees about using the new skills and knowledge have the most influence on transfer outcomes.

Utilizing a definition of climate predicated by those practices and procedures found in organizations that specify to employees what is important, Rouiller and Goldstein (1993) predicted a positive relationship between organizational transfer climate and training transfer behavior, where the likelihood of transferring key behaviors increases as the organizational transfer climate becomes more positive. Their model of transfer is presented in Figure 4. Based on social learning theory, this model of transfer presumed that trainees who learned more in training programs were also more likely to transfer skills and knowledge to the job.

Figure 4. Organizational Climate and Trainee Performance



(Rouiller & Goldstein, 1993).

Rouiller and Goldstein (1993) were among the first to develop and test an instrument to measure organizational transfer climate factors. A climate measure consisting of sixty-three situational cues, such as goal cues, task cues, and social cues, and twenty-two consequences, including positive or negative feedback, punishment, and extinction, was used to collect information from managers in a large fast-food franchise following a management training program (Rouiller & Goldstein, 1993). An on-the-job measure of the training objectives was utilized as the transfer behavior measure. Both the degree of learning ($p < .01$) and a positive organizational transfer climate ($p < .001$) were found to be significantly related to transfer behavior. Additionally, situational cues, or antecedents, and consequences were found to independently explain the variance in degree of transfer and transfer behavior. These findings represented empiric evidence of the growing belief that returning to a positive organizational transfer climate was at least as important as the degree of learning in predicting transfer and improved job performance (Brinkerhoff & Montesino, 1995; Foxon, 1997; Noe & Schmidt, 1986; Richey, 1992; Rouiller & Goldstein, 1993).

Several studies furthered this work by expanding the constructs introduced by Rouiller and Goldstein (1993). Tracey, Tannenbaum, and Kavanagh (1995) determined that encouragement from supervisor and peers to apply trained skills on the job is critical in the transfer climate environment. Research by Foxon (1997) and others (Brinkerhoff & Montesino, 1995; Hawley & Barnard, 2005; Lim & Johnson, 2002) provided further support to this finding. In a study of transfer climate conducted in Dutch and German banking organizations, however, supervisor support was not found to have a significant effect on trainee performance despite the use of transfer-enhancing interventions prior to and following training (van der Klink, Gielen, & Nauta, 2001). In their study of skill transfer, Chiaburu and Marinova (2005) found that peer

support was a good predictor of transfer; however, supervisor support was not found to be an influence on skill transfer. Studies by Facteau et al. (1995) and Hawley and Barnard (2005) also demonstrated a significant relationship between peer support behaviors and skill transfer. Thayer and Teachout (1995) proposed a training transfer model combining the cue and consequence variables proposed by Rouiller and Goldstein (1993), but added in-training transfer enhancing activities, including goal setting and relapse prevention, and post-training self-efficacy as key factors influencing transfer.

The transfer of training models proposed thus far presumed a direct relationship between transfer climate and transfer outcomes. Still other models suggested that transfer climate acts through mediated pathways rather than having a direct effect on transfer behaviors (Bates & Khasawneh, 2005; Holton et al., 1997; Machin & Fogarty, 2004). The first of two such pathways proposed by Mathieu and Martineau (1997) involves mechanisms that influence trainee opportunity to perform new tasks (Ford et al., 1992) and support from peers and supervisors (Brinkerhoff & Montesino, 1995). The second pathway concerns transfer outcomes influenced by trainee pre-training motivation. Similar findings are reported by Chiaburu and Marinova (2005) in their examination of organizational supports (peer and supervisor support) as well as individual predictors of pre-training motivation and skill transfer following a corporate training program. While they did not find evidence for a relationship between supervisor support and pre-training motivation or skill transfer, both pre-training motivation and peer support were significant predictors of transfer. In Holton's model (1996), transfer climate is incorporated as a mediating variable between organizational context, and job attitudes and performance due to trainee perceptions of the work environment. Quinones (1997) and Colquitt, LePine, and Noe (2000) also offered evidence to support both a direct and indirect influence of transfer climate on

transfer outcomes. While retaining a transfer climate construct in these models, learner motivation and self-efficacy are introduced as mediators of transfer climate influences on transfer outcomes (Kontoghiorghes, 2002; Machin & Fogarty, 2004). Bates and Khasawneh (2005) and Weldy (2007) demonstrated the importance of the learning transfer climate as a key mediator between the learning organization construct and transfer of training. They emphasized the need for organizations to invest in the analysis of both work culture and climate as a means of identifying potential changes needed to positively influence learning and subsequent application of trained skills and behaviors on the job.

Holton's HRD Evaluation Model

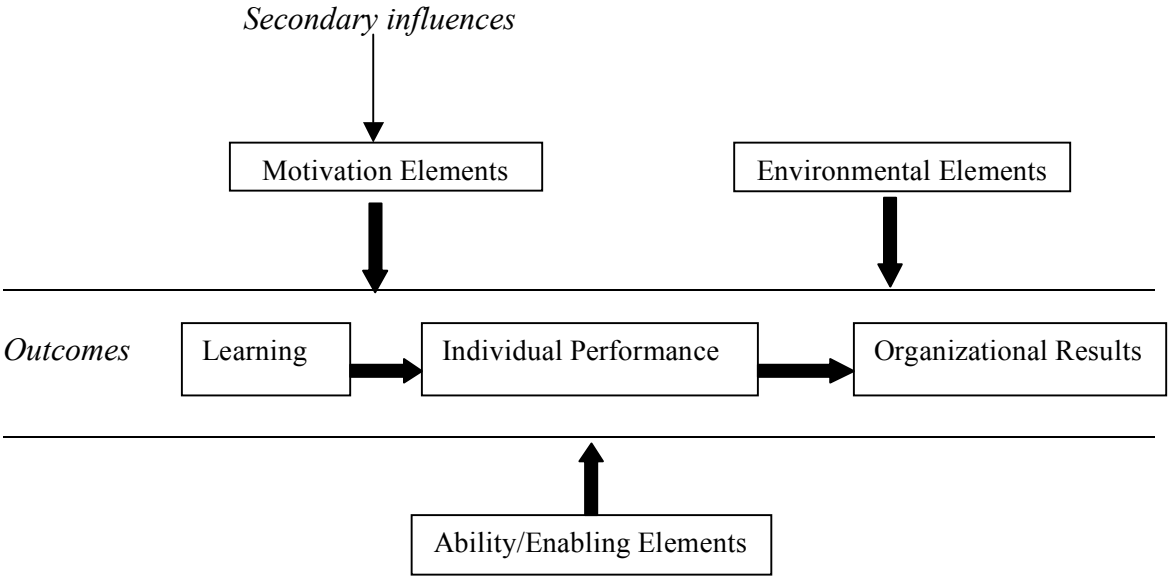
Over the last few decades, significant progress has been made in the recognition and study of the systemic nature of training effectiveness (Burke & Hutchins, 2007; Kontoghiorghes, 2002; Richey, 1992). With organizations spending over $134 billion annually (ASTD State of the Industry, 2008) on staff development and training programs, the need to identify and address the multiple factors that can influence transfer and improve training effectiveness is evident. Despite continuing progress toward a better understanding of training transfer and those factors in the environment, training design, and individual characteristics that influence training outcomes, most organizations conducting evaluation of training programs rely on Kirkpatrick's four-level evaluation model (Kirkpatrick, 1994) to evaluate training effectiveness. Often referred to as a taxonomy rather than an evaluation model, Kirkpatrick's four levels of evaluation received serious criticism by Holton (1996) and others (Alliger & Janak, 1989) who argued that the four-level model was really no more than a taxonomy of outcomes, rather than a true evaluation model that specifies training outcomes, identifies causal relationships, or accounts for the effects of primary and secondary intervening variables.

Following Baldwin and Ford's (1988) review of research on transfer of learning, much has been published about factors that influence transfer. Three primary categories of factors emerged from this research: trainee characteristics, transfer climate, and transfer design. Transfer climate is a complex construct that has been examined and described by many researchers of learning and transfer as a key variable in the understanding of training effectiveness and as such, may include different or only individual study variables from one study to another. Transfer climate does not equate with work environment, rather it is described by Holton et al. (1997) as a "perpetual medium through which the work environment affects job attitudes and behaviors" (p. 97). It is further assumed that climate differs among work units within organizations as well as across organizations. According to Huczynski and Lewis (1980), identifying influences on transfer:

> is a complex task because it is unlikely that the variables identified will be universally valid for all companies. Factors inhibiting and facilitating transfer do not exist in a vacuum but emerge from organizational structures, processes, and goals. As organizations differ, so will the transfer influences which they produce (p.229).

Building on the Noe and Schmidt (1986) framework of training evaluation, Holton's (1996) HRD Evaluation and Research Model, presented in Figure 5, provides a more comprehensive representation of evaluation incorporating a framework for diagnosing and understanding the primary and secondary influences on training outcomes that lead to individual performance, organizational results and, ultimately, strategic performance. Using the HRD model as a conceptual framework, Holton (1996) proposed the term "transfer system" to reflect a broader, more comprehensive construct of the system of influences that affect transfer. In this

Figure 5. Holton's Conceptual Evaluation Model



(Holton, 1996)

conceptual model, changes in individual performance can be achieved only when the three primary influences on training transfer are considered and addressed. Interventions that successfully drive training transfer must, therefore, be based on sound theories of performance and evaluation. In moving to a fully specified model of training transfer, both the primary and secondary intervening variables must be accounted for (Holton, 1996). Theories of motivation to transfer, transfer design, and transfer climate provide the conceptual framework for Holton's (1996) proposed model of training evaluation.

The Stages of Transfer

In their 1988 review of the transfer literature, Baldwin and Ford (1988) identified two conditions of transfer in organizational training environments. The generalization of learned material to the job and maintenance of trained skills, they believe, are greatly influenced by training design, learner, and environmental factors. Using a systems-based model of transfer,

they argued that both training outcomes (learning and retention) and inputs (training design, learner characteristics, and environmental factors) have both a direct and indirect impact on the conditions of transfer of training. Despite an extensive review of the literature examining the effects of training inputs on learning and transfer, Baldwin and Ford (1988) found that "a critical review of the existing research reveals that the samples, tasks, designs, and criteria used limit even further our ability to understand the transfer process" (p. 86).

A primary source of information on transfer and behavior change has been the collection of information directly from trainees immediately following or shortly after completing training. Depending on whether transfer is expected to occur quickly as in training technical and motor skills (Burke, 1997; Foxon, 1993), or over a prolonged period, as with training in complex interpersonal, managerial, or problem-solving skills (Broad & Newstrom, 1992; Foxon, 1993), the appropriate time to assess behavior change on the job is likely to vary from one training program to another. Extensive research conducted on American, British, and Indian managers found that fewer than 50% of management trainees had attempted to transfer their training back to the job (Baumgartel, Reynolds, & Patham, 1984). Huczynski and Lewis (1980) reported a disheartening 35% attempt among trainees to transfer training to the job and even fewer reported maintenance of trained skills into routine work practice.

Three sources of training relapse reported by Marx (1982) include: 1) failure of organizations to adequately support skill retention; 2) lack of discussion of potential relapse during training; and 3) absence of systematic means of identification and management of threats to skill retention. While incorporating relapse prevention strategies during and following training has shown promise in some studies (Burke & Baldwin, 1999; Foxon, 1997; Gist, Bavetta, & Stevens, 1990), results have been inconsistent (Burke & Hutchins, 2007; Gaudine & Saks, 2004).

In a study examining the relationship between specific work environment factors and transfer of training one to 12 months following training (Cromwell & Kolb, 2004), trainees who reported high support levels in their work environment also applied skills learned in training to a greater degree at the one year, but not at the three or six month time periods. In an earlier study, Hand, Richards, and Slocum (1973, as cited in Cromwell & Kolb, 2004), found post-training behavior changes at eighteen months but not at the three month period. Cromwell and Kolb (2004) posit that extrinsic organizational factors such as a promotion or salary increase may not be realized for a year or more and would be less likely to influence transfer outcomes in the short term.

Precisely how to define transfer from the perspective of post-training application of the newly learned skills remains challenging. Conceptualizing transfer as a specific product or outcome of training would indicate that it can be measured at some point in time following the completion of training (Foxon, 1997). Proposing a different approach, Foxon promoted the idea of a transfer time continuum, conceptualizing the integration of trained skills in to work behaviors in stages. While some training outcomes, such as procedures or motor skills, can be observed and measured shortly after training, others such as team-building or problem-solving skills take time to develop and integrate into routine job behaviors (Broad & Newstrom, 1992; Foxon, 1993). By following a single-dimension, transfer-as product approach, rather than evaluating transfer as a process, the true extent of skill transfer following training may be under represented in the research literature.

Foxon (1993) described several stages of transfer with each stage serving as a pre-requisite for the subsequent stage. Viewing transfer along the transfer time continuum reflects what is most likely to occur as trainees introduce, practice, discontinue or fail to apply newly learned skills back on the job. These stages include, transfer intention, transfer initiation, partial

transfer, and transfer maintenance. This final stage is actually comprised of two stages where learners first make a conscious choice to use new skills, followed by unconscious maintenance or full integration of new skills and knowledge into work behaviors.

Transfer intention. This is described as the motivation of the learner at the end of training to apply the new skills and knowledge back to the job (Foxon, 1993; Noe, 1986). Ajzen's (1991) theory of planned behavior proposes that "Intentions to perform behaviors of different kinds can be predicted with high accuracy from attitudes toward the behavior, subjective norms, and perceived behavioral control; these intentions, together with perceptions of behavioral control, account for considerable variance in actual behavior" (p. 179). Motivation to transfer is believed to be influenced by trainee confidence in their ability to apply new skills, perceived relevance of training, opportunity to use new skills in the work environment, and belief that using new skills will lead to improved performance on the job (Noe, 1986). While research on post-training transfer intention is limited, a study conducted by Huczynski and Lewis (1980) found that management trainees who had attended training voluntarily, believed the training program would improve their job performance, and had discussed the course content with their immediate supervisor prior to training reported a higher level of intention to transfer. In another study, Foxon (1997) examined trainee intention to transfer three months following an interpersonal skills course. She found no difference in motivation to transfer between trainees who had prepared action plans at the close of training and those who did not. However, anticipated manager support was found to be an important influence on motivation to transfer, accounting for 25% of the variance. The ability of HRD professionals to identify and address specific factors that influence pre and post-training motivation using needs assessment and contingency planning

in organizational settings is likely to encourage transfer following training (Foxon, 1993; Gaudine & Saks, 2004; Holton, 1996; Noe, 1986; Tannenbaum, et al., 1991).

Transfer initiation. Any attempt by trainees to apply some component of learned skills and/or knowledge to the job is referred to as transfer initiation (Foxon, 1993). Intuitively, initiation of transfer must precede partial transfer or transfer maintenance, although once initiated, transfer may be discontinued for any number of reasons related to the person or transfer climate. Laker (1990) described a dual dimensionality of training transfer including both a temporal dimension and a generalizability, or distance, dimension. Included in the temporal dimension are transfer initiation and maintenance. The generalizability dimension refers to near and far transfer. Most traditional definitions of transfer tend to reflect a unidimensional approach to the assessment of transfer, blurring the distinctions between the dimensions of transfer proposed by Laker (1990) and others (Axtell, Maitlis, & Yearta, 1997; Foxon, 1993; Foxon, 1997). Multiple factors are believed to influence initiation of transfer as determined by the frequency, consistency, and/or intensity of the application of knowledge and skills learned in training back to the job; however, few studies have examined transfer using the multidimensional approach described here.

Partial transfer. Partial transfer occurs when some of the knowledge and/or skills learned in training are applied and/or some or all are applied inconsistently, from time to time (Foxon, 1993). The preponderance of viewing transfer as a product of training, rather than a process, in much of the empiric transfer research, may have failed to adequately represent the true measure of transfer by ignoring the possibility of partial transfer, particularly in studies involving management or interpersonal training programs. This is especially relevant given that transfer research is often conducted shortly after completion of training.

Transfer maintenance. Described as a permanent change in the behavior, knowledge, skill, or attitude of trainees, transfer maintenance is viewed as the continued application of new skills and knowledge in the work environment over time (Baldwin & Ford, 1988; Laker, 1990). Referred to by some as retention, transfer maintenance better describes the behavioral manifestation or enactment rather than the retention of knowledge following training. This final stage is actually comprised of two stages where learners first make a conscious choice to use new skills, followed by unconscious maintenance or full integration of new skills and knowledge into work behaviors. Marx's (1986) relapse prevention model emphasized the need for trainees to prepare for the reality of the work environment by encouraging them to recognize "dysfunctional emotional responses to temporary failure, recognize the need for support-skill development, and cope with suboptimal support and reinforcement from the organization" (p.54). In addition to trainee-based accountability for transfer, other factors that may influence transfer maintenance include, trainee flexibility and autonomy on the job (Clarke & Voogel, 1985), extrinsic rewards for performance improvement (Goldstein, 1986), intrinsic rewards (Marx, 1982), and support from managers and peers (Foxon, 1997; Noe, 1986; Richey, 1992; Rouiller & Goldstein, 1993). "Without visible involvement by managers, learners do not perceive the behavioral change as strategically important to their organization"(Swanson & Holton, 2009, p. 272). Believed to be more critical in the early stages of transfer initiation when new skills are still being tried and developed, supervisor support and feedback is likely to have less influence as transfer maintenance is achieved (Laker, 1990).

Summary

In this chapter, a review of the relevant transfer literature outlined the theoretical framework used to develop and support the need for a valid tool to assess the factors in trainees, the work environment, and training design that influence transfer of training in organizational settings. A discussion of training effectiveness, factors that influence transfer, including motivation, work climate, and secondary influences, and the stages of transfer were presented. Having a valid, comprehensive, statistically sound instrument to identify and diagnose potential strengths and weaknesses in organizational transfer systems is clearly desirable to organizations who seek improved performance and strategic success from training investments. The methodology used in this study to determine the perceptions of the transfer system factors in a multi-center healthcare organization following a management training program is presented in the following chapter.

CHAPTER 3

Research Methods

This research study examined the relationships proposed in the model of trainee perceptions of transfer system factors that influence the transfer process. This chapter describes the research design and methodology employed to create the dataset used to answer the research questions. A discussion of the target sample, research design, data collection methods, survey instrumentation, and data analysis methods is included here.

Sampling Frame

This study was conducted at large, multi-hospital healthcare system in southeast Michigan. The target sample included 378 healthcare professionals who completed one of seven instructor-led, classroom-based Lean Six Sigma Green Belt training programs conducted between October, 2006 and April, 2008. The training program was mandatory for all management personnel; however, other staffs were invited to attend if they were interested. Each of the 8-day training programs was conducted internally by certified black-belt trainers over a two-month period. The training sessions included lecture, case studies, exercises, and group activities to present the information and practice skills necessary to implement Lean Six Sigma methods in the participants' respective work setting. A summary of the training program topics is presented in Appendix A. These trainees represent multiple work locations, professional disciplines and departments, varied years of work experience in healthcare and in their current position within the organization, and diverse educational background. Specific participant demographic characteristics are discussed in greater detail in Chapter 4.

Research Design

This study followed a non-experimental survey design that used quantitative questionnaire methodology to collect data at a point in time following completion of a management training program. The proposed research model was developed using Holton's (1996) conceptual HRD Evaluation Model and Foxon's (1993) stages of transfer identified in the review of transfer literature. The purpose of the study was to test the relationships proposed in this model to determine: 1) the relationship between training elapsed time and stage of transfer achieved; 2) the relationship between perceived transfer system factors and the stage of transfer achieved; 3) the relationship between demographic characteristics and stage of transfer achieved; and, 4) the relationship between demographic characteristics and perceived transfer system factors following a management training program in a healthcare organization. As presented in the proposed model, transfer system factors, including trainee motivation, trainee characteristics, ability, work environment, and training elapsed time, comprised the independent variables suggested to influence transfer. Permission to conduct this research was granted by the Internal Review Board (IRB) of the Providence-St. John Healthcare System and the Human Investigation Committee (HIC) at Wayne State University. Approval letters from the respective organizations are provided in Appendix B.

Instrumentation

A three-part survey instrument was developed to gather information from study participants at a single point in time; however, with training programs being offered over an 18-month period, time since completion of training varied between 9 and 24 months among study participants. Section One of the survey instrument included questions related to key demographic characteristics of the study population, including the training session attended, educational

background, current position, years of employment in healthcare, years in the current position, place of employment, age, and gender. These questions are specific to this training program and were developed by the researcher.

In Section Two of the survey instrument, Version 2 of the Learning Transfer System Inventory (LTSI) survey instrument developed by Holton, Bates, and Ruona (2000) was used to obtain information regarding trainee perceptions of motivation factors, trainee characteristics, ability factors, and work environment factors believed to influence the transfer of training. A fourth generation instrument, the LTSI has undergone multiple validation studies in various work settings (Chen, 2003; Chen, Holton & Bates, 2005; Holton et al., 2007), and has demonstrated strong evidence of construct and criterion-related validity (Bates, et al., 2000; Holton, Bates, & Ruona, 2000; Bates & Holton, 2004; Seyler, Holton, Bates, Burnett, & Carvalho, 1998). Permission was granted by the authors of the LTSI to utilize this instrument to collect information on the independent variables of this study. Documentation of permission to use the questionnaire is included in Appendix C.

Two construct domains are represented in the 89-question LTSI instrument. The first 46 questions in Section Two of the instrument measured 11 constructs that represent factors affecting the specific training program attended by the trainees. These constructs include learner readiness, motivation to transfer, positive personal outcomes, negative personal outcomes, personal capacity for transfer, peer support, supervisor support, supervisor sanctions, perceived content validity, transfer design, and opportunity to use. For this section of the questionnaire, study participants were instructed to think about the specific Lean Six Sigma Greenbelt training program they completed when selecting the most appropriate response. A five-point Likert scale was used for these survey items using 1=strongly disagree to 5=strongly agree. An example of a

survey item for the supervisor support scale is, “My supervisor sets goals for me which encourages me to apply my training on the job” (Holton, Chen, & Naquin, 2003) and for personal capacity to transfer, “My workload allows me time to try the new things I have learned”. Definitions of the 16-scale instrument are provided in Appendix D.

The remaining 23 questions in Section Two of the study questionnaire measured five constructs that could influence training in general. These constructs include transfer effort performance, performance outcomes, openness to change, performance self-efficacy, and performance coaching. For this portion of the questionnaire, participants were asked to consider training in general in their workplace when selecting the most appropriate response. The same five-point Likert scale described above was used to score these responses. One additional question specific to training transfer was developed by the researcher and included in Section Three of the survey instrument. This section of the survey instrument was included to examine the dependent variable, trainee transfer of learned skills to the job following training using Foxon’s (1993) model of transfer process. The trainee was asked to indicate their perceived level of transfer by selecting the appropriate answer from the four choices provided which coincide with the four stages of transfer: intention, initiation, partial transfer, and maintenance. Although Foxon (1993) described two stages of maintenance, only the first stage, described as the conscious use of new skills or knowledge by the learner when s/he believes their use to be appropriate, was used in this study for the assessment of transfer maintenance. The use of Lean Six Sigma skills in this work setting would not likely be conducted at an unconscious level, the second stage of transfer maintenance described by Foxon (1993). A copy of the entire survey instrument used in this study is included in Appendix E.

Data Collection Procedures

A list of email addresses for 378 healthcare managers and staffs who completed a Lean Six Sigma Greenbelt training program conducted between fall 2006 and winter 2008 was generated from organization training records. The email addresses were used to request trainee participation in the study and inform them of the study procedures, should they elect to participate. Initial contact of study participants via the organization's email system was made by the Vice President, Medical Education and Research, and the IRB chairman of the healthcare organization. The purpose of the research study was included in the request for participation. A copy of the email request is included in Appendix F. A Research Information Sheet was also attached to initial email to participants for their review. The information sheet is included in Appendix G. This preliminary email distribution also provided an opportunity to correct addresses that were misspelled or miscopied, and to delete those no longer active in the system. After correction of transcription errors and removal of inactivated email addresses or addresses of individuals who indicated they were on an extended leave of absence, 313 viable email addresses were identified for the Lean Six Sigma Greenbelt training participants.

One week following the initial request for participation, a second email that included a link to the electronic questionnaire was forwarded to study participants to determine their perceptions of factors that influence transfer of training to the job. Participation in the study was completely voluntary and participants were informed that they could withdraw from the study at any time by exiting the questionnaire. The questionnaire could be completed and submitted only once per study participant; however, participants could return to any question or page any time during the completion of the questionnaire or prior to final submission of a completed questionnaire. Responses were completely anonymous and encryption through SurveyMonkey

was employed to provide additional security of the database. Participants were asked to complete and return the survey within a two-week timeframe. At subsequent two week intervals, two additional follow-up email messages with the link to the questionnaire were sent to trainees to elicit full participation by non-respondents. As an incentive, participants who completed and returned a questionnaire were provided an opportunity to enter a drawing for one of three gifts, including a GPS device or one of two fifty-dollar gas cards. The drawing was conducted and gifts distributed by a disinterested party following termination of the research study.

Data Analysis

For this study, the LTSI, a fourth-generation instrument developed by Holton, Bates, and Ruona (2000), was used to measure the independent variables of trainee motivation, trainee characteristics, ability, and work environment. Permission to use this instrument was granted by the authors, with the stipulation that it could not be altered in any way (R.A. Bates personal communication May, 2006). External validity of the instrument has been demonstrated by numerous studies showing evidence of construct and criterion-related validity. As of 2005, the LTSI had been administered to over 7,000 trainees both domestically and internationally, representing multiple types of businesses, types of training programs, and jobs (Holton, 2005). With over 11 published research studies using the LTSI, strong evidence of construct validity and reliability has been achieved through common factor analysis to determine the low correlation between variables (Bates & Holton, 2004). Exploratory factor analysis further confirmed the low correlation between variables, reinforcing the uniqueness of the proposed LTSI transfer system constructs (Holton, Chen, & Naquin, 2003). Although the LTSI instrument Version 2 includes 89 items that address 16 transfer constructs, several of the survey items have not been subject to complete evaluation of their validity. Per the request of the authors of the

LTSI (R.A. Bates personal communication June 8, 2009), these items were not included in the data analysis since the validity of the survey items may not be reliable. These survey items and the transfer factors they are intended to measure are presented in Table 1.

Table 1. LTSI Items Not Included in Analysis of Transfer Factors

Factor	LTSI Item Number
Personal outcomes-positive	7, 8, 15, 18, 22
Personal capacity for transfer	11, 12, 20
Supervisor/manager sanctions	34, 35, 36, 41, 42, 46
Opportunity to use learning	50, 51, 57, 62
Feedback/performance coaching	80, 81, 88

(Bates, personal communication, May 2009)

Quantitative statistical techniques were used for the data analysis in this study. These data for this study consist primarily of rankings or categorical data that are not normally distributed. The SPSS Version 17 software package was used by the researcher to compute all research related data. Descriptive statistics were tabulated for key trainee demographic characteristics. Frequency distributions were tabulated for the independent variables including trainee demographic characteristics, elapsed time, and learning transfer system factors, and the dependent variable, stages of transfer. The Spearman rank correlation coefficient (rho) was used to test the interrelationship between training elapsed time and stage of transfer among all study participants. A Spearman's correlation was used instead of Pearson's correlation due to the lack of normality of these two study variables (Kent, 2001). Multivariate analysis of variance (MANOVA) was used because several of the research questions involved multiple dependent variables (Garson, 2009). Post hoc comparisons with univariate analysis of variance was then

conducted to further examine findings, using a Bonferroni adjustment. A Bonferroni procedure for post-hoc comparisons was conducted to determine which group means of the transfer system factors contributed most to the explanation of the perceived transfer stage achieved by trainees. A Chi-square test of independence was conducted to examine the influence of the study population demographic characteristics on perceived stage of transfer achieved as both of the variables are categorical. SPSS Version 17 statistical software was used to perform the statistical analysis.

Items 26, 27, 61, 63, 64, 73, 74, 76, and 77 were subject to reverse coding prior to executing the statistical analysis. A list of all the LTSI scale codes is provided in Appendix H. Table 2 presents an overview of the research questions along with the respective variables examined for each research question as well as their location in the study survey instrument. Data analysis methods employed to address each of the research questions are also presented. A significance value of $p < .05$ was used for the statistical analysis of all research variables.

Table 2. Data Analysis of Research Variables

Research Question	Factors	Location in the Survey Instrument	Analysis Method
1. Is there a positive relationship between time since completion of training and the stages of transfer?	Training Elapsed Time	**Section 1**: 1	Spearman's correlation
	Stage of Transfer	**Section 3:** 90	
2. What factors in the LTSI motivation scale influence the transfer process in healthcare organizations?	Motivation to transfer learning	**Section 2**: 2, 3, 4, 5	MANOVA Post-hoc comparisons
	Transfer effort- Performance Expectations	**Section 2:** 65, 66, 69, 71	
	Performance-Outcomes expectations	**Section 2:** 64, 67, 68, 70,72	
	Stage of Transfer	**Section 3:** 90	
3. What factors in the LTSI trainee characteristics scale influence the transfer process in healthcare organizations?	Learner readiness	**Section 2**: 1, 9, 10, 13	MANOVA Post-hoc comparisons
	Performance self-efficacy	**Section 2**: 82, 83, 84, 85	
	Stage of Transfer	**Section3:** 90	

Table 2 (continued). Data Analysis of Research Variables

Research Question	Factors	Location in the Survey Instrument	Analysis Method
4. What factors in the LTSI work environment scale influence the transfer process in healthcare organizations?	Feedback/Performance Coaching	**Section 2:** 79, 86, 87, 89	MANOVA Post-hoc comparisons
	Supervisor/Manager Support	**Section 2:** 32, 33, 37, 39, 40, 43,	
	Supervisor/Manager Sanctions	**Section 2:** 38, 44, 45	
	Peer Support	**Section 2:** 28, 29, 30, 31	
	Resistance/Openness to Change	**Section 2:** 73, 74, 75, 76, 77, 78,	
	Personal Outcomes-Positive	**Section 2:** 6, 16, 17	
	Personal Outcomes-Negative	**Section 2:** 14, 21, 23, 24	
	Stage of Transfer	**Section3:** 90	
5. What factors in the LTSI ability scale influence the transfer process in healthcare organizations?	Opportunity to Use Learning	**Section 2**: 50, 60, 61, 63	MANOVA Post-hoc comparisons
	Personal Capacity for Transfer	**Section 2**: 19, 25, 26, 27	
	Perceived Content Validity	**Section 2**: 47, 48, 49, 58, 59	
	Transfer Design	**Section 2**: 52, 53, 54, 55	
	Stage of Transfer	**Section 3:** 90	
6. Are there differences in stage of transfer achieved across selected demographic characteristics, including education, position, work location, years in healthcare, years in current position, age, and gender?	Trainee Demographic Characteristics	**Section 1**: 2, 3, 4, 5, 6, 7	Chi-square test of independence
	Stage of Transfer	**Section 3:** 90	
7. Are there differences in perceived transfer system factors across selected demographic characteristics, including education, position, work location, years in healthcare, years in current position, age, and gender?	Trainee Demographic Characteristics	**Section 1**: 2, 3, 4, 5, 6, 7	MANOVA Post-hoc comparisons
	Motivation Factors	**Section 2:** 2, 3, 4, 5, 64, 65, 66, 67, 68, 69, 70, 71, 72	
	Trainee Characteristics Factors	**Section 2:** 1, 9, 10, 13, 82, 83, 84, 85	
	Ability Factors	**Section 2**: 19, 25, 26, 27, 47, 48, 49, 50, 52, 53, 54, 55, 58, 59, 60, 61, 63	
	Work Environment Factors	**Section 2:** 6, 14, 16, 17, 21, 23, 24, 28, 29, 30, 31, 32, 33, 37, 38, 39, 40, 43, 44, 45, 73, 74, 75, 76, 77, 78, 79, 86, 87, 89	

Summary

The proposed model of training transfer which examines the influence of trainee perceptions of transfer system factors on transfer of training in an organizational setting was developed using relationships identified previously in the research literature. The instrument used in this study has undergone extensive research and validation in multiple organizations with multiple types of training programs. The documentation of validity and reliability of the LTSI in the research literature provides assurance of the reliability and validity of the research instrument used for this study. This chapter described the procedures used to define the study population and sampling framework, the research design, data collection methods, the research instrumentation, and methods used for data analysis. Correlation, Chi-squrare test of independence, and multivariate analysis of variance (MANOVA) methods were performed on the data set to examine the research questions guiding this study. Further details of the descriptive, correlation, and MANOVA statistical analysis as well as findings of the study are presented in Chapter 4.

CHAPTER 4

Results

This study was conducted to explore whether a comprehensive survey instrument, the LTSI, could be useful as a diagnostic tool in identifying those transfer system factors that may promote or inhibit the transfer of learning to the job (Holton, 1996). Specifically, this study examined trainee perceptions of transfer system factors that influence the transfer of training process following a management training program in a multi-center healthcare organization. Data for this study were collected via an electronically administered questionnaire requesting information about the characteristics of the study participants, transfer system factors from the LTSI, and perceived transfer of new skills and knowledge to the job at a single point in time following training; however, since the training sessions were conducted over an 18-month period, participants had completed training between 9 and 24 months prior to completion of the study questionnaire. In Chapter 4 the results of the statistical analysis for the tested relationships in the proposed research model of training transfer are presented. Non-parametric statistical methods were used including, Spearman's Correlation, cross tabulations, multivariate analysis of variance (MANOVA), and Pearson's Chi-square. The purpose of this study is to answer the following research questions that guide this study:

1. Is there a positive relationship between time since completion of training and the stages of transfer?
2. What factors in the LTSI motivation scale influence the transfer process in healthcare organizations?
3. What factors in the LTSI trainee characteristics scale influence the transfer process in healthcare organizations?

4. What factors in the LTSI work environment scale influence the transfer process in healthcare organizations?
5. What factors in the LTSI ability scale influence the transfer process in healthcare organizations?
6. Are there differences in perceived stage of transfer across selected demographic characteristics, including education, position, work location, years in healthcare, years in current position, age, and gender?
7. Are there differences in perceived transfer system factors across selected demographic characteristics, including education, job type, work location, years in healthcare, years in current position, age, and gender?

Description of Study Participants

Lean Six Sigma Greenbelt training for managers and staff was conducted between October, 2006 and April 2008, in the St. John-Providence Healthcare System (SJHS). Training was completed by 378 employees; however, following corporate downsizing in spring of 2008, 313 of the individuals who completed a Lean Six Sigma training course remained actively employed in the organization during the study period. Of the 313 SJHS employees contacted via the organization's email system, 153 individuals responded to the questionnaire, for an overall response rate of 49%. Questionnaires were excluded from further data analysis if one or more pages of the questionnaire had not been completed. Of the 153 questionnaire responses submitted, 135 (88%) of the questionnaires were completed in their entirety. The 18 remaining respondents submitted an incomplete questionnaire with only partial demographic information and 20 or fewer responses to Section 2 of the survey instrument. These 18 responses were not

included in the data analysis. The 135 evaluable questionnaires were included in the statistical analyses that follow.

Participant Demographic Data

Demographic information on the study participants was collected in Section 1 of the survey instrument. This information included: 1) training program attended, 2) highest level of education completed, 3) current position, 4) current work location, 5) years worked in healthcare, 6) years in current position, 7) gender, and 8) age. A summary of the demographic data is presented in Tables 3 through 10.

Table 3. Frequency Greenbelt Training Program Attended ($N = 135$)

Program	Training Sessions	*f*	*P*
Fall 2006	(Oct 06 - Jan 07)	15	11.1
Winter 2007	(Feb 07 - May 07)	18	13.3
Spring 2007	(Apr 07 - Jul 07)	9	6.7
Summer 2007	(Jun 07 - Sept 07)	15	11.1
Fall 2007	(Oct 07 - Jan 08)	35	25.9
Winter I 2008	(Jan 08 – Apr 08)	22	16.3
Winter II 2008	(Feb 08 – Apr 08)	21	15.6
Total		135	100.0

Training session attended and elapsed time. Seven discreet training programs were conducted to facilitate the large number of employees required to complete Lean Six Sigma Greenbelt training. Between October, 2006 and April, 2008, 378 management and front line staff employed full time at St. John-Providence Healthcare System (SJHS) in southeast Michigan participated in one of seven Lean Six Sigma Green Belt training programs. Each of the seven training programs was conducted in eight eight-hour sessions over a three-month period, utilizing the same trainers, training format, and materials across all seven programs.

In January 2009 the study questionnaire was distributed electronically via organizational email address to 313 trainees who remained actively employed in the organization. The time in months between completion of the Greenbelt training and distribution of the study questionnaire for each of the seven training sessions is presented in Table 4. The study questionnaire was completed by participants between 9 months and 24 months following participant completion of a Lean Six Sigma Greenbelt training program. The mean time between completion of training and study participation is 14.3 months.

Table 4. Time Between Completion of Training and Transfer Study Questionnaire (N = 135)

Training Program	End of Training	Months Since Training	*f*	*P*	*M*
Fall 2006	January 2007	24	15	11.1	14.3
Winter 2007	May 2007	20	18	13.3	
Spring 2007	July 2007	18	9	6.7	
Summer 2007	September 2007	16	15	11.1	
Fall 2007	January 2008	12	35	25.9	
Winter 2008 (2 sections)	April 2008	9	43	31.9	
Total			135	100.0	

Years Worked in Healthcare. Study participants indicated they worked in the healthcare field an average of 23.8 years. Years worked ranged between 3 and 40 years. Only 10.4% (n=14) of participants were employed in healthcare for ten or fewer years, while 88.7% (n= 121) have worked in healthcare for more than 10 years. Sixty-two percent (62.9%, n=85) have worked in the field for over 20 years. These data are presented in Table 5.

Table 5. Years Worked in Healthcare

Years	*f*	*P*	*M*	*SD*
			23.8	8.5
1-10	14	10.4		
11-20	36	26.7		
21-30	50	37.0		
31-40	35	25.9		
Total	135	100.0		

Education. All of the study participants completed at least some college (Table 6). Only 3% (n=4) of participants reported having only some college while 34% (n=46) completed an associates or bacchelor's degree. 48.1% (n=65) of respondents reported having a graduate degree, while 4.4% (n=6) indicated completion of a terminal degree. Overall, 92.6% (n=125) of respondents obtained a college education at the baccalaureate level or higher.

Table 6. Highest Level of Education Completed

Education	*f*	*P*
High school graduate	0	0.0
Some college	4	2.9
Associate degree	8	5.9
Bachelor's degree	38	28.1
Some graduate school	14	10.4
Master's degree	65	48.1
PhD/EdD	3	2.2
MD/DO	3	2.2
Total	135	100.0

Work location. This study was conducted in a multi-center healthcare system comprised of 7 hospitals and over 125 medical facilities. Table 7 presents the work settings where study

Table 7. Work Location

Facility	*f*	*P*
Providence Hospital	31	23.0
Providence Park Hospital	7	5.2
St. John Hospital	29	21.5
St. John-Macomb/Oakland	23	17.0
Brighton Hospital	1	0.7
River District Hospital	1	0.7
North Shores Hospital	1	0.7
Corporate Office	18	13.3
Home Care	5	3.7
Ambulatory Care	4	3.0
Other	15	11.1
Total	135	100.0

participants were employed at the time they completed the questionnaire. Nearly sixty-nine percent (68.9% , n = 93) of study participants indicated they worked in one of the seven hospitals in the healthcare system. Another 13.3% (n = 18) of respondents reported working in the corporate offices, and 6.7% (n = 9) work in home care or ambulatory services. Individuals who reported working in other health partners or support services affiliated with the healthcare organization, comprised 11.1% (n = 15) of study participants. The two largest hospitals, Providence Hospital and St. John Hospital, were represented by nearly equal numbers of survey respondents with 23.0% (n = 31) and 21.5% (n = 29) of all participants, respectively, for these facilities. Only one response was submitted from each of the three smaller hospitals; therefore, given the small number of responses for four of the seven hospitals, responses from participants employed in all the SJHS hospitals were combined for subsequent data analysis. Participants indicating employment in home care or ambulatory care were combined into a category labeled outpatient for analysis purposes.

Current position in healthcare. The Greenbelt training programs were mandated by St. John-Providence leadership for all management personnel. Non-management staffs were also permitted to complete the training on a voluntary basis, as part of an organizational effort to incorporate Lean Six Sigma methods across functional areas and work settings. Overall, 75.5 % (n = 102) of trainees served the organization in a management position. Department managers accounted for the single largest group of trainees in this study, representing 40.7% (n = 55) of all respondents. Senior management personnel (directors and executives) accounted for 28.9% (n = 39) of study participants. Another 24.4% (n = 33) of participants represented non-management personnel for whom participation in the Greenbelt training may not have been required. These data are presented in Table 8.

Table 8. Current Position

Position	*f*	*P*
First line supervisor	8	5.9
Manager	55	40.7
Director	32	23.7
Executive	7	5.2
Other (staff)	33	24.4
Total	135	100.0

Time in current position. Participants reported working in their present position a mean of 6.5 years, with a range of 6 months to 25 years. Over one half (63%) of the trainees had worked in their current position for five or fewer years. Overall, 37% (n = 50) of participants were employed in their present position more than five years and 5.8% (n = 8) for more than 15 years. These data are presented in Table 9.

Table 9. Years in Current Position

Years	*f*	*P*	*M*	*SD*
			6.5	2.8
<1	8	5.9		
1-5	77	57.0		
6-10	26	19.3		
11-15	16	11.8		
16-20	4	3.0		
21+	4	3.0		
Total	135	100.0		

Gender and age of participants. Of the 135 study participants, 71.9 % (n=97) are female and 28.1% (n=38) are male. Participants range in age from 27 to 63 years with a mean age of 43.7 years. 72.5% (98) of study participants are 45 years of age or older. These data are presented in Table 10.

Table 10. Participant Age

Age (in years)	*f*	*P*	*M*	*SD*
			43.7	8.3
25-34	8	6.0		
35-44	29	21.5		
45-54	56	41.3		
55-64	42	31.2		
Total	135	100.0		

Descriptive Statistics of Research Variables

Stage of Transfer

The dependent variable, stage of transfer, was determined by self-report. The study population was asked to indicate their perceived stage of transfer following completion of the Lean Six Sigma Greenbelt training program where 1 = “I intend to use some aspect of Lean Six Sigma skills/methods in my work environment” (intention), 2 = “I have attempted to use Lean

Six Sigma skills/methods but have discontinued their use" (initiation), 3 = "I use Lean Six Sigma skills/methods from time to time" (partial transfer), and 4 = "I use Lean Six Sigma skills/methods every time their use is appropriate" (maintenance). The frequencies of perceived stage of transfer reported by participants in this study are presented in Table 11. At least partial

Table 11. Perceived Stage of Transfer

Stage	*f*	*P*
Intention	17	12.6
Initiation	9	6.7
Partial transfer	74	54.8
Maintenance	35	25.9
Total	135	100.0

transfer following completion of the Greenbelt training program was reported by 80.7% (n = 109) of respondents, with 25.9% (n=35) reporting full transfer of skills (maintenance) to the job following training. This is in contrast to published report estimates that only 10% to 40% of training results in positive transfer (Foxon, 1993; Georgenson, 1982), although direct measures of transfer or the influence of transfer on actual job performance were not undertaken in the present study. Nearly 7% of participants indicated they attempted to use new skills on the job but had discontinued their use. Despite a mean of 14.3 months since completion of training, 12.6% (n = 17) of individuals indicated they intended to use Lean Six Sigma skills in their job but had not yet applied the skills and knowledge gained in Greenbelt training programs.

Transfer System Scales

The LTSI is a fourth generation instrument with over 15 years of research history and 7,000 domestic and international respondents in the database (Holton, 2005). Such an instrument could be used to diagnose potential barriers and catalysts of training transfer in organizations that

may be corrected by incorporating pre-training, training, and post-training strategies designed to minimize barriers and improve training outcomes. The 89 Likert scale items included in the survey instrument represent four scales and 16 subscales. Respondents selected between 1 (strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), or 5 (strongly agree). The 16 subscales are divided into two sections. The "Specific Training Program Scales" include 11 subscales with 63 items. For these items, respondents are asked to indicate their perceptions of the Lean Six Sigma Greenbelt training program they completed. The "Training in General" section contains 5 subscales with 26 items. In this section, respondents are asked to indicate their perception of the overall transfer climate in an organization using the same five-point Likert scale. From the mean scores, the four transfer system scales and 16 subscales in the LTSI can be classified as organizational barriers or catalysts of training transfer, where a mean score less than 2.5 indicates a severe barrier to transfer; a mean of 2.51 to 3.5 is a barrier; a mean of 3.51 to 4.00 is a weak catalyst; and, a mean greater than 4.01 is considered a strong catalyst for transfer.

The overall mean scores and respective diagnostic classification label for each of the four LTSI scales, motivation, trainee characteristics, work environment, and ability, were calculated. A mean score for the specific and general transfer climate scales, as well as the 16 subscales included in these two categories of transfer climate, were also tabulated. Each of these scales and subscales was also classified as a barrier or catalyst for transfer based on mean response score. These data are presented in Table 12.

Table 12. Descriptive Statistics of Transfer System Scales and Subscales (*N*=135)

Transfer System Scales	*M*	*SD*	Label
Trainee characteristics	3.73	.56	Weak Catalyst
Motivation	3.69	.47	Weak Catalyst
Work environment	2.96	.38	Barrier
Ability	2.45	.45	Severe Barrier
Specific Transfer Climate Scales	2.80	.68	Barrier
Learner readiness	3.61	.74	Weak Catalyst
Motivation to transfer	3.98	.64	Weak Catalyst
Personal outcomes-positive	2.24	.66	Severe Barrier
Personal outcomes-negative	2.16	.59	Severe Barrier
Personal capacity for transfer	3.11	.74	Barrier
Peer support	3.39	.62	Barrier
Supervisor support	3.24	.75	Barrier
Supervisor sanctions	2.02	.66	Severe Barrier
Content validity	3.30	.72	Barrier
Transfer design	3.94	.65	Weak Catalyst
Opportunity to use	3.20	.71	Barrier
General Transfer Climate	3.57	.63	Weak Catalyst
Transfer effort	3.87	.53	Weak Catalyst
Performance expectations	3.32	.72	Barrier
Resistance/openness to change	3.65	.77	Weak Catalyst
Performance self-efficacy	3.86	.59	Weak Catalyst
Feedback coaching	3.13	.56	Barrier

Based on this classification scheme, trainee characteristics (M = 3.73, SD = .46) and motivation influences (M = 3.69, SD = .47) were perceived by participants as weak catalysts of training transfer. Low mean scores for work environment (M = 2.96, SD = .38) and ability influences (M = 2.45, SD = .45) identified these constructs as a barrier and severe barrier to transfer, respectively. Further examination of the mean response scores for individual subscales across the independent variables included in the research model is presented in the discussion of findings of the research questions that follows.

Specific Training Program Scales. With a mean score for the Specific Transfer Climate factors of 2.80 (.68) the overall transfer climate for the Lean Six Sigma Greenbelt training was perceived by trainees as a barrier to transfer. Low mean scores ($M < 2.5$) for participant perception of personal outcomes positive, personal outcomes negative, and supervisor sanctions indicate that these factors were perceived by participants as severe barriers to transfer in the current study. With mean scores between 2.51 and 3.5, personal capacity for transfer, peer support, supervisor support, and content validity were perceived by participants as barriers to transfer. Participants perceived learner readiness ($M = 3.61$, $SD = .74$), motivation to transfer ($M = 3.98$, $SD = .64$), and transfer design ($M = 3.94$, $SD = .65$) as weak catalysts for transfer in this study. None of the specific training factors were perceived by participants to be strong catalysts for transfer in this study.

General Training Scales. Overall, participants who completed Greenbelt training perceived the general organizational transfer climate in the Providence-St. John Health System as a weak catalyst for transfer. Low mean scores for performance expectations ($M = 3.32$, $SD = .72$) and feedback coaching ($M = 3.23$, $SD = .56$) indicate that participants perceived these influences as barriers to transfer generally in the organization. Mean scores for transfer effort ($M = 3.87$, $SD = .53$), resistance/openness to change ($M = 3.65$, $SD = 77$), and performance self-efficacy ($M = 3.86$, $SD = .59$) identified these factors as weak catalysts for transfer. None of the general training factors were perceived by participants to be strong catalysts for transfer in this study. Further implications of the transfer system factors as barriers or catalysts for transfer in this study are discussed in Chapter 5.

Analysis of Research Questions

As presented in previous chapters, the purpose of this study was to determine whether a relationship exists between trainee perceptions of transfer system factors and perceived transfer of training 9 to 24 months after completion of a management training program. The dependent (factor) variable in this study, stage of transfer, includes four distinct stages: intention, initiation, partial transfer, and maintenance. The response (independent) variables include scores from the 16-factors in the LTSI survey instrument representing the four constructs of trainee characteristics, motivation, work environment, and ability. Additionally, the relationship between time since completion of training (training elapsed time) and study participant demographics on perceived stage of transfer achieved was examined. A MANOVA was conducted to specify which of the response variables discriminated most between categories of the factor variables (Garson, 2009). Given the small number of groups, the Bonferroni method was conducted for follow-up post hoc comparisons between groups with a statistically significant F statistic. The F test is used to test the null hypothesis that there is no difference in the means of the dependent variables for the different groups identified by the categories of independent variables.

Research Question 1

Is there a positive relationship between time since completion of training and the stages of transfer?

Since both of these variables are fully ranked and not normally distributed, a Spearman's Correlation was conducted to determine whether there is a positive relationship between elapsed time since training and stage of transfer achieved by trainees. The time between the completion of training and participation in the study survey is defined as training elapsed time for this study. Elapsed time was determined by the session end date for the specific training program identified

by the respondent in Section 1 of the study questionnaire. The mean time between completion of training and study participation is 14.3 months with a range of 9 to 24 months. In Section 3 of the study questionnaire, participants were asked to indicate the extent to which they believe they had transferred Lean Six Sigma methods into their work routine based on four categories or stages of transfer (Foxon, 1993). The results are presented in Table 13. No relationship was found between training elapsed time and perceived stage of transfer achieved by the trainees (r_s = -.074).

Table 13. Relationship Between Training Elapsed Time and Stage of Transfer (*N*=135)

Training Session	Months post-training	Stage of Transfer 1		2		3		4		Total	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
Fall 2006	24	3	2.2	2	1.5	6	4.4	4	3.0	15	11.1
Winter 2007	20	1	0.7	1	0.7	9	6.7	7	5.2	18	13.3
Spring 2007	18	0	0.0	1	0.7	6	4.4	2	1.5	9	6.7
Summer 2007	16	2	1.5	1	0.7	5	3.7	7	5.2	15	11.1
Fall 2007	12	5	3.7	2	1.5	22	16.3	2	1.5	35	25.9
Winter 2008	9	6	4.4	2	1.5	26	9.3	9	6.7	43	31.9
Total		17	12.6	9	6.7	74	54.8	35	25.9	135	100.0

Note. Stage 1=Intention; Stage 2=Implementation; Stage 3=Partial transfer; Stage 4=Maintenance

Research Question 2

What factors in the LTSI motivation scale influence the transfer process in healthcare organizations?

The motivation scale in the LTSI includes three subscales: motivation to transfer learning, transfer effort-performance expectations, and performance-outcomes expectations. To determine participant perceptions of motivation factors that may influence transfer of training the

means and standard deviations for each of the motivation scales were calculated. The descriptive data are presented in Table 14. These scales include the perception of persistence in utilizing skills and knowledge learned in training as well as the belief that effort to transfer will result in improved performance and that performance improvement will lead to outcomes valued by the individual.

Table 14. Means and Standard Deviations for Motivation Scales by Stage of Transfer

	Stage of Transfer							
	Intention		Initiation		Partial transfer		Maintenance	
Motivation Scales	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Motivation to transfer	3.66	.53	3.64	.59	3.88	.61	4.45	.51
Performance-Outcomes expectations	3.25	.61	2.91	.71	3.40	.69	3.30	.81
Transfer effort	3.63	.41	3.44	.49	3.87	.48	4.08	.57

The mean score for the overall motivation scale of 3.69 (.47) indicates that study participants agree with the extent they are motivated to transfer new skills and knowledge and believe this will positively influence their performance on the job. The motivation to transfer learning (M =3.98, SD =.64) and transfer effort-performance expectations subscales (M = 3.87, SD = .53), can also be classified as weak catalysts for transfer in this study. A MANOVA was conducted to examine both the main and interaction effects of the motivation factors on multiple stages of transfer (intention, initiation, partial transfer, and maintenance). The MANOVA output includes four multivariate test statistics for each predictor variable. For each of the four test statistics, an F statistic and associated p-value are also calculated. Pillai's Trace is one of the four multivariate criteria test statistics for the given effect used in MANOVA. By violating the underlying assumptions of normality and constant variance, Pillai's Trace statistic is believed to

be the most robust test for this study design. Significant differences in means across perceived stage of transfer achieved were identified for both the motivation to transfer learning and transfer effort-performance expectations subscales ($p < .01$) with a moderate effect size ($\eta^2 = .21$ and .16, respectively). Results of this analysis are presented in Table 15.

Table 15. Multivariate and Univariate Test Scores for Motivation Scales Across Stages of Transfer

Motivation Scales	F (d.f.= 3, 131)	Partial η^2
Motivation to transfer learning	11.25**	.21
Performance-Outcomes expectations	5.60	.03
Transfer effort-Performance expectations	1.36**	.11

Note. Multivariate F ratios were generated from Pillai's statistic.
Multivariate test (F=2.31, d.f.= 48, 354, p=.000) . Univariate d.f.= 3, 131
* p<.05, ** p<.01

Additionally, a Bonferroni procedure for post-hoc comparisons was conducted to determine which group means of the motivation to transfer and transfer effort factors contribute most to the explanation of the perceived transfer stage achieved by trainees. The results are presented in Table 16. Mean scores for the motivation to transfer learning subscale are

Table 16. Mean Scores on Two Measures of the Transfer Motivation Scale as a Function of Stage of Transfer

	Stage of Transfer							
	Intention		Initiations		Partial transfer		Maintenance	
Motivation Scale	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Motivation to transfer learning	3.66_a	.53	3.64_b	.59	3.88_c	.61	$4.45_{a,b,c}$	.51
Transfer effort-Performance expectations	3.63_a	.41	3.44_b	.49	3.87	.48	$4.08_{a,b}$	.57

Note. Means in a row sharing subscripts are significantly different.

significantly different ($p < .05$) between individuals who achieved intention ($M = 3.66$, $SD = .53$), initiation ($M = 3.64$, $SD = .59$), or partial transfer ($M = 3.88$, $SD = .61$) and those who achieved maintenance of training transfer ($M = 4.45$, $SD = .51$). For the transfer effort-performance expectations subscale, a significant difference in mean scores was found between intention to transfer ($M = 3.66$, $SD = .53$) or initiation of transfer and transfer maintenance. Trainees who indicated they had achieved transfer maintenance identified both motivation to transfer learning ($M = 4.45$, $SD = .51$) and transfer effort ($M = 4.08$, $SD = .57$) as strong catalysts for transfer in this study.

Research Question 3

What factors in the LTSI trainee characteristics scale influence the transfer process in healthcare organizations?

The trainee characteristics scale includes two subscales: learner readiness and performance self-efficacy. To determine participant perceptions of trainee characteristic factors that may influence the stage of perceived transfer achieved by participants, the means and standard deviations for each of these scales were calculated across the transfer categories. The descriptive data are presented in Table 17.

Table 17. Means and Standard Deviations for Trainee Characteristic Scales by Stage of Transfer

	Stage of Transfer							
	Intention		Initiation		Partial transfer		Maintenance	
Trainee Characteristic Scale	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Learner readiness	3.22	.82	2.89	.63	3.62	.69	3.96	.59
Performance self-efficacy	3.54	.39	3.25	.39	3.79	.52	4.31	.57

With an overall mean score of 3.73 (.56), the trainee characteristic scale was found to be a weak catalyst for transfer in this study. The trainee characteristic scale addresses the extent to which participants believe they are prepared to participate in the training and that they are capable of modifying their performance following training. Both the learner readiness (M = 3.61, SD =.74) and performance self-efficacy (M = 3.86, SD = .59) subscales were also found to be weak catalysts for transfer in this study. Each of these factors showed a significant difference in mean scores ($p < .01$) across the transfer categories with a large effect size for performance self-efficacy ($\eta^2 = .26$) and a moderate effect size ($\eta^2 = .16$) for learner readiness. Participants in this study agreed that they were able to attend and participate in the training program and they felt confident about applying new skills and knowledge in their jobs. These test results are presented in Table 18.

Table 18. Multivariate and Univariate Test Scores for Trainee Characteristic Scales Across Stages of Transfer

Trainee Characteristic Scales	F (d.f.= 3, 131)	Partial η^2
Learner readiness	8.34**	.16
Performance self-efficacy	15.67**	.26

Note. Multivariate F ratios were generated from Pillai's statistic.
Multivariate test (F=2.31, d.f.=48, 354, p=.000). Univariate d.f.=3, 131
* p<.05, ** p<.01

Post-hoc comparisons for the learner readiness and performance self-efficacy subscales across stage of transfer achieved are presented in Table 19. For participants who achieved partial transfer following the Greenbelt training, mean scores indicate that learner readiness and performance self-efficacy are weak catalysts for transfer. For the transfer maintenance group learner readiness scores indicate it is perceived as a weak catalyst, while performance self-

Table 19. Mean Scores on Two Measures of Trainee Characteristics Scale as a Function of Stage of Transfer

	Stage of Transfer							
	Intention		Initiation		Partial transfer		Maintenance	
Trainee Characteristics Scale	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Learner readiness	3.22_{a}	.82	$2.89_{b,c}$	.63	3.62_{b}	.69	$3.96_{a,c}$	.59
Performance self-efficacy	3.54_{a}	.39	3.25_{b}	.39	$3.79_{b,c}$	.52	$4.31_{a,b,c}$	.57

Note. Means in a row sharing subscripts are significantly different.

efficacy ranks as a strong catalyst for transfer for this group. Those reporting intention or initiation of transfer found learner readiness to be a barrier to transfer. Performance self-efficacy is a weak catalyst for participants with intention to transfer and a barrier for those who initiated but discontinued use of Lean Six Sigma skills following training in this study.

Research Question 4

What factors in the LTSI work environment scale influence the transfer process in healthcare organizations?

The work environment scale includes seven subscales: feedback/performance coaching, supervisor/manager support, supervisor/manager sanctions, peer support, resistance/openness to change, personal outcomes-positive, and personal outcomes-negative. These subscales reflect the work climate factors that may influence the transfer of training. The overall mean score for the work environment scale indicates that study participants perceived this factor to be a barrier to transfer in their organization ($M = 2.96$, $SD = .38$). One subscale, resistance/openness to change, was identified as a weak catalyst to transfer ($M = 3.65$, $SD = .77$) based on the overall mean score. In this study participants agree that the work environment is supportive of change and trying new things in the work group.

The mean score for several work environment factors, including peer support (M = 3.39, SD = .62), feedback/ performance coaching (M = 3.13, SD = .56), and supervisor/manager support (M = 3.24, SD = .75) were found to be barriers to transfer. In this study trainees believe their peers do not encourage or support the application of learned skills and knowledge on the job. Participants also indicated that lack of supervisor goal-setting, support, and feedback related to application of new skills or knowledge gained in training are barriers to transfer in this organization. The low mean scores calculated for supervisor/manager sanctions (M = 2.20, SD = .66), personal outcomes-positive (M = 2.24, SD = .66), and personal outcomes-negative (M = 2.16, SD = .59) indicate that study participants perceived these factors as severe barriers to the transfer process. The low mean score for supervisor sanctions indicates that respondents disagreed that applying new skills gained in training would result in a positive outcome. Overall, participants disagree that application of new skills would result in positive outcomes, or that not applying new skills on the job would lead to negative outcomes.

Mean scores and standard deviations for the seven work environment subscales across stage of transfer achieved were calculated. The mean scores for feedback/performance coaching, management support, peer support, and resistance/openness to change, hover in the center between 2.51 and 3.50 indicating a perception of a neutral work climate for respondents in the intention, initiation, and partial transfer groups. Only the transfer maintenance group demonstrated mean scores above 3.50 for these subscales, indicating a perception of these factors as weak catalysts for transfer. Mean scores for supervisor sanctions, personal outcomes positive, and personal outcomes negative, are below 3.0 across all transfer groups, indicating these factors were perceived as barriers to transfer by all study participants. These data are shown in Table 20. A significant difference in mean scores across the stages of transfer was not detected, however,

Table 20. Means and Standard Deviations for Work Environment Scales by Stage of Transfer

	Stage of Transfer							
	Intention		Initiation		Partial transfer		Maintenance	
Work Environment Scales	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Feedback/performance coaching	3.18	.51	2.72	.47	3.09	.51	3.27	.64
Supervisor/manager support	3.07	.49	3.06	1.00	3.20	.70	3.46	.88
Supervisor/manager sanctions	2.20	.59	2.22	.76	1.93	.56	2.10	.83
Peer support	3.13	.64	3.03	.78	3.38	.51	3.62	.72
Resistance/openness to change	3.37	.75	3.20	.97	3.76	.72	3.68	.77
Personal outcomes-positive	2.02	.58	1.89	.69	2.27	.70	2.24	.66
Personal outcomes-negative	2.15	.48	2.03	.58	2.21	.61	2.16	.59

for six of the seven work environment subscales. Mean scores for the peer support factor were identified across transfer groups. Results of the F test, shown in Table 21, identified a significant difference in mean scores across stage of transfer for the peer support subscale ($p < .05$); however, the effect size is small ($\eta^2 = .08$).

Table 21. Multivariate and Univariate Test Scores for Work Environment Scales Across Stages of Transfer

Work Environment Scales	F (d.f.= 3, 131)	Partial η^2
Feedback/performance coaching	2.59	.06
Supervisor/manager support	1.53	.03
Supervisor/manager sanctions	1.32	.03
Peer support	3.82*	.08
Resistance/openness to change	2.33	.05
Personal outcomes-positive	1.99	.04
Personal outcomes-negative	0.37	.01

Note. Multivariate F ratios were generated from Pillai's statistic.
Multivariate test (F=2.31, d.f.=48, 354, p=.000). Univariate d.f.=3, 131.
* p<.05, ** p<.01

Results of the follow-up post-hoc comparison, presented in Table 22, identified a significant difference in mean scores for the peer support subscale between intention to transfer and transfer maintenance. A significant difference was not found between intention to transfer and the initiation or partial transfer categories for this subscale, however.

Table 22. Mean Scores on One Measure of Work Environment Scale as a Function of Stage of Transfer

	Stage of Transfer							
	Intention		Initiation		Partial transfer		Maintenance	
Work Environment Scale	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Peer support	3.13_a	.64	3.03	.78	3.38	.51	3.62_a	.72

Note. Means is a row sharing subscripts are significantly different.

Research Question 5

What factors in the LTSI ability scale influence the transfer process in healthcare organizations?

The LTSI ability scale includes four factors: opportunity to use learning, personal capacity to transfer, perceived content validity, and transfer design. Of these four subscales, only transfer design was identified by participants as a weak catalyst in this study with an overall mean of 3.94 (*SD* =.65). This suggests that individuals believed the trainers and teaching methods used were conducive to their understanding of how the knowledge and skills gained in training could be used on the job. The remaining three subscales, opportunity to use learning, personal capacity to transfer, and content validity were identified as barriers to transfer with overall mean scores of 3.20 (.71), 3.11 (.74), and 3.30 (.72), respectively. These scores indicate that participants in this study did not believe they were given adequate opportunities or resources

in the work environment to apply new skills. Low mean scores for personal capacity to transfer and content validity indicate that the training content did not adequately reflect the job requirements for these trainees and adequate resources to make the changes necessary to transfer learning to their jobs were lacking.

Mean scores and standard deviations for the four ability subscales across stage of transfer achieved are presented in Table 23. Mean scores are progressively higher across the transfer continuum from intention, to partial transfer, and transfer maintenance and is evident across all

Table 23. Means and Standard Deviations for Ability Scales by Stage of Transfer

	Stage of Transfer							
	Intention		Initiation		Partial transfer		Maintenance	
Ability Scales	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Opportunity to use learning	2.88	.72	2.30	.62	3.22	.66	3.56	.58
Personal capacity for transfer	2.97	.65	2.14	.63	3.18	.77	3.28	.54
Perceived content validity	3.04	.69	2.33	.67	3.23	.61	3.82	.56
Transfer design	3.65	.55	3.33	.91	3.90	.62	4.31	.50

four of the ability factors. The lowest mean scores are consistently shown for the initiation of transfer group. A high mean score for transfer design ($M = 4.31$, SD = .50) was identified among individuals who indicated they had achieved transfer maintenance. They perceived this factor to be a strong catalyst for transfer in this organization. With mean scores exceeding 3.51, the transfer maintenance group perceived both opportunity to use and content validity as weak catalysts for transfer in this study.

As shown in Table 24, the differences in mean scores across stage of transfer are significant ($p < .01$) for all four of the ability subscales, with a large effect size noted for the

Table 24. Multivariate and Univariate Test Scores for Ability Scales Across Stages of Transfer

Ability Scales	F (d.f.= 3, 131)	Partial η^2
Opportunity to use learning	10.80**	.20
Personal capacity for transfer	6.99**	.14
Perceived content validity	17.06**	.28
Transfer design	8.77**	.17

Note. Multivariate F ratios were generated from Pillai's statistic.
Multivariate test (F=2.31, d.f.=48, 354, p=.000). Univariate d.f.=3, 131
* p<.05, ** p<.01

content validity factor ($\eta^2 = .28$). A medium effect size was identified for the remaining ability subscales. Post-hoc comparisons, presented in Table 25, identified significant differences in mean scores between the transfer maintenance group and the other three transfer stages, intention, initiation, and partial transfer for perceived content validity and transfer design. A

Table 25. Mean Scores on Four Measures of Ability Scale as a Function of Stage of Transfer

	Stage of Transfer							
	Intention		Initiation		Partial transfer		Maintenance	
Ability Scale	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Opportunity to use learning	2.88_a	.72	$2.30_{b,c}$	.62	3.22_b	.66	$3.56_{a,c}$	.58
Personal capacity for transfer	2.97_a	.65	$2.14_{a,b,c}$	.63	3.18_b	.77	3.28_c	.54
Perceived content validity	3.04_a	.69	$2.33_{a,b}$	.67	3.23_b	.61	3.82_b	.56
Transfer design	3.65_a	.55	3.33_b	.91	3.90_c	.62	$4.31_{a,b,c}$	.50

Note. Means in a row sharing subscripts are significantly different.

significant difference ($p < .01$) was also found between the transfer maintenance group and those who intended to transfer for perceptions of opportunities to use knowledge and skills back on the job. A significant difference in mean scores for personal capacity to transfer was found between the initiation group and the other three transfer categories. With mean scores below 2.5, the initiation group perceived opportunity to use learning, personal capacity for transfer, and content validity as severe barriers to transfer in this organization.

Research Question 6

Are there differences in stage of transfer achieved across selected demographic characteristics, including education, position, work location, years in healthcare, years in current position, age, and gender?

A Chi-square test of independence was conducted on crosstabs for each of the demographic characteristics to examine the influence of the study population demographic characteristics gathered from the survey instrument on perceived stage of transfer achieved. The test of independence between the dependent variables (stage of transfer) indicated that the variance in the stages of transfer achieved by participants cannot be explained by demographic characteristics. More than 20% of the cells had expected counts of less than five items per cell, resulting in a violation of the underlying assumption of the Chi-square test; therefore, these findings should be interpreted with caution. Based on the small sample size, it was not possible to adjust the Chi-square by reducing the variable categories in the dataset for this study.

Table 26 presents the frequencies of highest level of education completed by participants in this study by reported stage of transfer achieved. Although a wide range of education levels was reported by participants from some college completed to individuals in possession of a

terminal degree (MD or PhD), no significant difference between transfer stage groups was identified, regardless of the level of higher education completed.

Table 26. Education Level by Stage of Transfer (N=135)

	Stage of Transfer							
	Intention		Initiation		Partial transfer		Maintenance	
Education Level	Freq	%	Freq	%	Freq	%	Freq	%
Some college	2	1.5	0	0.0	2	1.5	0	0.0
Associate's degree	1	0.7	1	0.7	3	2.2	3	2.2
Bacchelor's degree	4	3.0	5	3.7	19	14.1	10	7.4
Some graduate school	0	0.0	2	1.5	9	6.7	3	2.2
Master's degree	8	5.9	1	1.5	40	29.6	16	11.9
MD/PhD	2	1.5	0	0.0	1	0.7	3	2.2
Total	17	12.6	9	6.7	74	54.8	35	5.9

The frequencies of current position held by participants in the healthcare organization by perceived stage of transfer achieved are presented in Table 27. The variance in the stages of transfer achieved by participants cannot be explained by the level of management or staff position in the organization.

Table 27. Current Position by Stage of Transfer (N=135)

Position	Stage of Transfer							
	Intention		Initiation		Partial transfer		Maintenance	
	Freq	%	Freq	%	Freq	%	Freq	%
Supervisor	1	0.7	0	0.0	5	3.7	2	1.5
Manager	7	5.2	6	4.4	27	20.0	15	11.1
Director	2	1.5	1	0.7	22	16.3	8	5.9
Executive	0	0.0	0	0.0	5	3.7	2	1.5
Other	7	5.2	2	1.5	15	11.1	8	5.9
Total	17	12.6	9	6.7	74	54.8	35	25.9

In Table 28, the frequencies of facility or work setting where study participants worked at the time they completed the study questionnaire are presented. The variance in the stages of transfer achieved by participants cannot be explained by work location in this organization.

Table 28. Work Location by Stage of Transfer (N=135)

Work Location	Stage of Transfer							
	Intention		Initiation		Partial transfer		Maintenance	
	Freq	%	Freq	%	Freq	%	Freq	%
Hospital	10	7.4	5	3.7	48	35.6	30	22.2
Corporate	4	3.0	4	3.0	8	5.9	2	1.5
Outpatient	0	0.0	0	0.0	6	4.4	3	2.2
Other	3	2.2	0	0.0	12	8.9	0	0.0
Total	17	12.6	9	6.7	74	54.8	35	25.9

Note. The outpatient category includes non-hospital clinical work settings, including long term care, home care, and ambulatory care services.

Years worked in the healthcare field reported by study participants were grouped into ten-year categories (Table 29). The variance in the stages of transfer achieved by participants cannot be explained by the length of time worked in healthcare.

Table 29. Years in Healthcare by Stage of Transfer (N=135)

	Stage of Transfer							
	Intention		Initiation		Partial transfer		Maintenance	
Years worked in healthcare	Freq	%	Freq	%	Freq	%	Freq	%
1-10	2	1.5	2	1.5	7	5.2	2	1.5
11-20	6	4.4	2	1.5	20	14.8	8	5.9
21-30	6	4.4	5	3.7	25	18.5	15	11.1
31-40	3	2.2	0	0.0	22	16.3	10	7.4
Total	17	12.6	9	6.7	74	54.8	35	25.9

Study participants reported working in their present position in the SJHS organization anywhere between several months and 25 years. The frequency distribution of five-year categories of employment in the healthcare system by perceived stage of transfer achieved is presented in Table 30. The variance in the stages of transfer achieved by study participants

Table 30. Current Position by Stage of Transfer (N=135)

	Stage of Transfer							
	Intention		Initiation		Partial transfer		Maintenance	
Years in current position	Freq	%	Freq	%	Freq	%	Freq	%
<1	2	1.5	0	0.0	4	3.2	4	3.2
1-5	9	6.7	5	3.7	42	31.1	19	14.1
6-10	4	3.2	3	2.2	13	9.6	6	4.4
11-15	2	1.5	1	0.7	9	6.7	3	2.2
16-20	0	0.0	0	0.0	3	2.2	2	1.5
21-25	0	0.0	0	0.0	3	2.2	1	0.7
Total	17	12.6	9	6.7	74	54.8	35	25.9

cannot be explained by the length of time they have been employed in their present position in the healthcare organization.

Although respondents ranged in age from 25 to 64 years, over 72% (n = 98) are 45 years of age or older. The frequency distribution of ten-year age categories by perceived stage of transfer achieved is presented in Table 31. The variance in the stages of transfer achieved by study participants following training cannot be explained by age group.

Table 31. Age by Stage of Transfer (N=135)

		Stage of Transfer							
		Intention		Initiation		Partial transfer		Maintenance	
Age (in years)		Freq	%	Freq	%	Freq	%	Freq	%
	25-34	1	0.7	0	0.0	5	3.7	2	1.5
	35-44	4	3.2	2	1.5	13	9.6	8	5.9
	45-54	8	5.9	3	2.2	31	23.0	17	12.6
	55-64	4	3.2	4	3.2	25	18.5	8	5.9
	Total	17	12.6	9	6.7	74	54.8	35	25.9

Nearly 72% (71.9%, n = 97) of the participants in this study are female, as shown in Table 32. According to the most recent Bureau of Labor Report (Bureau of Labor Statistics, 2009), overall, women constitute 79.3% of the labor force in healthcare. In this study, the variance in stage of transfer achieved by participants could not be explained by gender group.

Table 32. Gender by Stage of Transfer (N=135)

		Stage of Transfer							
		Intention		Initiation		Partial transfer		Maintenance	
Gender		Freq	%	Freq	%	Freq	%	Freq	%
	Male	6	4.4	2	1.5	22	16.3	8	5.9
	Female	11	8.1	7	5.2	52	38.5	27	71.9
	Total	17	12.6	9	6.7	74	54.8	35	25.9

Research Question 7

Are there differences in perceived transfer system factors across selected demographic characteristics, including education, position, work location, years in healthcare, years in current position, age, and gender?

The LTSI, a fourth-generation instrument developed by Holton, Bates, and Ruona (2000), was used in this study to gather information about trainee perceptions of motivation factors, trainee characteristics, ability factors, and work environment factors believed to influence the transfer of training. A MANOVA was conducted to examine the relationship between perceived transfer system factors and select demographic characteristics of the study population, including trainee work location, professional discipline, current position, years of work experience in healthcare, years in current position within the organization, and highest level of education completed. The descriptive data and results of multivariate and univariate analysis of mean scores for 16 transfer factors are presented for each of these demographic variables.

The mean scores and standard deviations for the 16 transfer system factors included in the study questionnaire by participant level of education are presented in Table 33.

Table 33. Means and Standard Deviations for Transfer System Factors by Education Level

	Education Level											
	Some College		Assoc		Bachelors		Some Grad		Masters		MD/PhD	
Transfer Factor	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Learner readiness	2.81	.55	3.16	.61	3.66	.68	3.30	.88	3.76	.67	3.42	1.08
Motivation to transfer	4.00	.20	4.00	.40	3.91	.70	4.19	.47	3.98	.67	3.95	.73
Personal outcomes-Positive	2.00	.82	2.08	.73	2.29	.68	2.38	.65	2.22	.61	2.17	1.03
Personal outcomes-Negative	2.37	.83	2.28	.47	2.12	.59	2.12	.59	2.20	.57	1.75	.81
Personal capacity	3.19	.85	2.87	.61	2.95	.73	3.01	.91	3.19	.71	3.62	.74
Peer support	3.31	.69	3.50	.71	3.30	.71	3.48	.57	3.42	.59	3.33	.49
Supervisor support	3.29	.67	3.44	.69	3.14	.77	3.12	.91	3.29	.74	3.25	.79
Supervisor sanctions	2.00	.00	2.29	.63	1.98	.73	2.00	.58	2.06	.68	1.67	.36
Content validity	3.45	.97	3.42	.48	3.35	.76	3.24	.79	3.26	.71	3.30	.72
Transfer design	3.81	.37	3.87	.35	3.92	.69	3.91	.87	3.93	.64	4.29	.46
Opportunity to use	3.19	.85	3.03	.31	3.16	.71	3.05	.69	3.25	.68	3.46	1.37
Transfer effort	3.75	.35	3.72	.67	3.80	.56	4.05	.56	3.87	.48	4.08	.56
Performance expectations	3.65	.41	3.25	.37	3.19	.89	3.17	.64	3.40	.63	3.60	1.02
Openness/Resistance	3.83	.19	3.50	.59	3.47	.84	3.50	1.03	3.78	.69	3.91	.87
Self-efficacy	3.69	.24	3.78	.63	3.77	.67	3.80	.54	3.93	.57	4.00	.61
Feedback/coaching	3.44	.12	3.12	.57	3.01	.48	3.02	.50	3.18	.62	3.25	.50

Multivariate and univariate analysis identified only one subscale, learner readiness, as exhibiting significantly different means ($p < .05$) across the education categories with only a small effect size ($\eta^2 = .10$). These data are presented in Table 34. Follow-up post-hoc comparisons of the learner readiness subscale did not identify a significant difference between group means for education level.

Table 34. Multivariate and Univariate Test Scores for Transfer System Factors Across Education Level

Transfer System Factor	F (d.f.= 5, 129)	Partial η^2
Learner readiness	2.93*	.10
Motivation to transfer	.39	.02
Personal outcomes-Positive	.38	.02
Personal outcomes-Negative	.86	.03
Personal capacity	1.31	.05
Peer support	.33	.01
Supervisor support	.38	.01
Supervisor sanctions	.67	.03
Content validity	.17	.01
Transfer design	.40	.02
Opportunity to use	.45	.02
Transfer effort	.86	.03
Performance expectations	.86	.03
Openness/Resistance	1.11	.04
Self-efficacy	.57	.02
Feedback/coaching	.87	.03

Note. Multivariate F ratios were generated from Pillai's statistic.
Multivariate test (F=.965, d.f.=80, 590, p=.565). Univariate d.f.= 5, 129
* p<.05, ** p<.01

The mean scores and standard deviations for perceived transfer system factors by current position in the organization are presented in Table 35. Management positions include executive, director, manager, and first-line supervisor job titles. Participation in the Greenbelt training program was considered mandatory for these job groups. The "other" category included team leads and other staff positions in the healthcare organization. It was not determined via the study questionnaire whether the Greenbelt training was mandatory or voluntary for individuals in the "other" category.

Table 35. Means and Standard Deviations for Transfer System Factors by Current Position

	Position									
	Supervisor		Manager		Director		Executive		Staff	
Transfer System Factor	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Learner readiness	3.38	.73	3.62	.75	3.67	.77	3.85	.75	3.54	.71
Motivation to transfer	4.28	.65	3.97	.57	3.97	.74	4.00	.89	3.95	.60
Personal outcomes-Positive	2.08	.53	2.23	.73	2.20	.69	2.24	.46	2.33	.59
Personal outcomes-Negative	1.97	.47	2.24	.65	2.05	.55	2.14	.78	3.19	.66
Personal capacity	2.88	.77	3.04	.73	3.11	.87	3.50	.35	3.19	.66
Peer support	3.53	.47	3.35	.57	3.39	.76	3.61	.43	3.37	.64
Supervisor support	3.10	.98	3.35	.58	3.08	.98	3.40	.48	3.21	.75
Supervisor sanctions	2.08	.61	2.10	.67	1.89	.71	2.05	.30	2.02	.67
Content validity	3.33	.58	3.25	.73	3.36	.81	3.46	.47	3.28	.70
Transfer design	4.25	.35	3.86	.70	3.99	.74	3.96	.22	3.93	.60
Opportunity to use	3.03	.53	3.10	.80	3.36	.76	3.61	.43	3.16	.52
Transfer effort	3.97	.36	3.81	.52	3.81	.66	4.04	.09	3.95	.47
Performance expectations	2.95	1.04	3.27	.72	3.48	.67	3.69	.38	3.28	.72
Openness/Resistance	2.77	.90	3.55	.74	3.97	.75	3.71	.71	3.71	.65
Self-efficacy	3.31	.82	3.94	.62	3.82	.55	3.89	.20	3.71	.65
Feedback/coaching	2.91	.49	3.18	.55	3.06	.62	3.43	.49	3.09	.51

Results of multivariate and univariate testing identified only one transfer system subscale, openness/resistance to change, with significantly different means across current job position categories ($p < .001$), with a moderate effect size ($\eta^2 = .13$). These data are presented in Table 36.

Table 36. Multivariate and Univariate Test Scores for Transfer System Factors Across Position

Transfer System Factor	F (d.f.= 4, 130)	Partial η^2
Learner readiness	.52	.02
Motivation to transfer	.46	.01
Personal outcomes-Positive	.30	.01
Personal outcomes-Negative	.82	.03
Personal capacity	.89	.03
Peer support	.36	.01
Supervisor support	.82	.03
Supervisor sanctions	.53	.02
Content validity	.23	.01
Transfer design	.71	.02
Opportunity to use	1.44	.04
Transfer effort	.70	.02
Performance expectations	1.50	.04
Openness/Resistance to change	4.83**	.13
Self-efficacy	2.10	.06
Feedback/coaching	1.09	.03

Note. Multivariate F ratios were generated from Pillai's statistic.
Multivariate test (F=1.18, d.f.=64, 472, p=.170). Univariate d.f.=4, 130
* p<.05, ** p<.01

Follow-up post-hoc comparisons identified significant differences in mean scores for resistance/openness to change between supervisors and the director and other staff job categories. With mean scores exceeding 3.51, managers (*M* = 3.62, *SD* = .75), directors (*M* = 3.67, *SD* = .77), executives (*M* = 3.85, *SD* = .75) and non-management staffs (*M* =3.54, *SD* = .71) identified openness/resistance to changes as a weak catalyst to transfer in this study, while supervisors (*M* = 2.77, *SD* = .90) identified this factor as a barrier to transfer. Results of the post-hoc comparison test are presented in Table 37.

Table 37. Mean Score of One Transfer System Factor as a Function of Current Position

	Position									
	Staff		Supervisor		Manager		Director		Executive	
Transfer System Factor	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Openness/Resistance	3.71_{a}	.65	$2.77_{a,b}$	.90	3.55	.74	3.97_{b}	.75	3.71	.71

Note. Means in a row sharing subscripts are significantly different.

Mean scores and standard deviations for perceived transfer system factors by current work location in the organization are presented in Table 38. Sixty-eight percent (68.9%) or 93

Table 38. Means and Standard Deviations for Transfer System Factors by Work Location

	Work Location							
	Hospital		Corporate		Outpatient		Other	
Transfer System Factor	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Learner readiness	3.57	.73	3.50	.91	4.08	.48	3.70	.59
Motivation to transfer	3.99	.58	3.87	.71	4.47	.46	3.77	.82
Personal outcomes-positive	2.22	.69	2.21	.59	2.41	.72	2.29	.50
Personal outcomes-negative	2.17	.62	2.03	.58	2.19	.42	2.27	.49
Personal capacity for transfer	3.12	.73	3.06	.74	3.08	.84	3.12	.81
Peer support	3.39	.62	3.21	.76	3.75	.57	3.50	.58
Supervisor support	3.26	.71	3.01	.90	3.30	1.09	3.50	.41
Supervisor sanctions	1.98	.65	2.35	.62	2.00	.73	2.00	.47
Content validity	3.33	.71	3.07	.81	3.49	.54	2.85	.62
Transfer design	3.95	.63	3.71	.79	4.11	.90	3.81	.24
Opportunity to use	3.23	.77	2.88	.56	3.50	.90	2.94	.24
Transfer effort	3.86	.48	3.79	.54	4.33	.45	3.38	.78
Performance expectations	3.35	.70	3.17	.73	3.33	.92	3.45	.64
Openness/Resistance	3.70	.70	3.32	.87	3.81	.90	3.71	.39
Self-efficacy	3.88	.59	3.75	.59	4.17	.38	3.87	.25
Feedback/coaching	3.10	.55	3.10	.59	3.14	.66	3.44	.66

study participants work in one of the seven hospitals in the healthcare organization in either clinical, support services, or business settings. Individuals employed in the corporate setting work exclusively in an office environment. The outpatient category includes individuals working in home care or ambulatory settings. The "other" category includes those working in long term care, physician practices, or other support services areas. Multivariate and univariate analysis identified a significant difference ($p < .05$) in mean scores for the transfer effort subscale across job position categories, with a small effect size ($\eta^2 = .09$). These data are presented in Table 39.

Table 39. Multivariate and Univariate Test Scores for Transfer System Factors Across Work Locations

Transfer System Factor	F (d.f.= 3, 120)	Partial η^2
Learner readiness	1.60	.04
Motivation to transfer	2.15	.05
Personal outcomes-Positive	0.31	.01
Personal outcomes-Negative	0.39	.01
Personal capacity	0.04	.00
Peer support	1.50	.04
Supervisor support	0.73	.02
Supervisor sanctions	1.67	.03
Content validity	1.43	.03
Transfer design	0.95	.02
Opportunity to use	1.99	.05
Transfer effort	4.11*	.09
Performance expectations	0.38	.01
Openness/Resistance	1.46	.04
Self-efficacy	1.08	.03
Feedback/coaching	0.48	.01

Note. Multivariate F ratios were generated from Pillai's statistic.
Multivariate test (F=1.004, d.f.=48, 321, p=.472). Univariate d.f.=3, 120
* p<.05, ** p<.01

Follow-up comparison tests found a significant difference in mean scores for transfer effort between hospital employees ($M = 3.86$, $SD = .48$) and outpatient employees ($M = 4.33$, SD

= .45), and between outpatient employees and other staffs (*M* = 3.38, *SD* = .78). Other staffs identified transfer effort as a barrier to transfer while the three management position categories identified it as a weak catalyst to transfer. These data are presented in Table 40.

Table 40. Mean Score of One Transfer System Factor as a Function of Work Location

	Work Location							
	Hospital		Corporate		Outpatient		Other	
Transfer System Factor	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Transfer effort	3.86_{a}	.48	3.79	.54	$4.33_{a,b}$	.45	3.38_{b}	.78

Note. Means in a row sharing subscripts are significantly different.

Mean scores and standard deviations for perceived transfer system factors by number of years worked in healthcare are presented in Table 41.

Table 41. Means and Standard Deviations for Transfer System Factors by Years Worked in Healthcare

	Years in Healthcare							
	1-10		11-20		21-30		31-40	
Transfer System Factor	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Learner readiness	3.58	1.01	3.69	.72	3.57	.68	3.63	.73
Motivation to transfer	3.98	.53	3.99	.54	3.96	.71	3.62	.73
Personal outcomes-Positive	2.08	.82	2.24	.72	2.19	.60	2.39	.61
Personal outcomes-Negative	2.04	.67	2.21	.59	2.04	.54	2.35	.61
Personal capacity	2.79	.78	3.13	.75	3.09	.77	3.23	.67
Peer support	3.17	.89	3.37	.53	3.38	.60	3.47	.62
Supervisor support	3.18	.93	3.36	.75	3.11	.74	3.33	.72
Supervisor sanctions	2.46	.67	2.10	.72	1.95	.64	1.90	.55
Content validity	3.20	.64	3.17	.78	3.38	.71	3.37	.71
Transfer design	3.87	.44	3.83	.87	4.01	.50	3.95	.65
Opportunity to use	2.88	.52	3.18	.71	3.28	.72	3.24	.72
Transfer effort	3.69	.53	3.87	.52	3.86	.54	3.93	.52
Performance expectations	2.83	.82	3.31	.83	3.30	.60	3.55	.65
Openness/Resistance	3.09	.97	3.52	.72	3.73	.77	3.93	.61
Self-efficacy	3.65	.40	3.83	.78	3.87	.51	3.98	.53
Feedback/coaching	3.00	.66	3.14	.52	3.15	.53	3.15	.56

Multivariate and univariate test scores identified significant differences in mean scores for supervisor sanctions, performance expectations ($p < .05$), with a small effect size ($\eta^2 = .06$ and $\eta^2 = .07$, respectively), and openness/resistance to change ($p < .05$), with a moderate effect size ($\eta^2 = .10$) , across the four categories of years worked in healthcare. These results are presented in Table 42.

Table 42. Multivariate and Univariate Test Scores for Transfer System Factors Across Years Worked in Healthcare

Transfer Factor	F (d.f.= 3, 130)	Partial η^2
Learner readiness	0.20	.01
Motivation to transfer	0.03	.00
Personal outcomes-Positive	0.96	.02
Personal outcomes-Negative	2.09	.05
Personal capacity	1.11	.03
Peer support	0.72	.02
Supervisor support	0.98	.02
Supervisor sanctions	2.75*	.06
Content validity	0.80	.02
Transfer design	0.60	.01
Opportunity to use	1.09	.03
Transfer effort	0.65	.02
Performance expectations	3.29*	.07
Openness/Resistance to change	4.64*	.10
Self-efficacy	1.01	.02
Feedback/coaching	2.62	.01

Note. Multivariate F ratios were generated from Pillai's statistic.
Multivariate test (F=.976, d.f.=48, 351, p=.523). Univariate d.f.=3, 130
* p<.05, ** p<.01

Post-hoc comparison tests of these three subscales identified significant differences in means for only two of these transfer variables; performance expectations and openness/resistance to change. Significant differences in performance expectation mean scores are identified between

the 1-10 year employment in healthcare category (*M* =2.83, *SD* = .82) and individuals employed 31-40 years (*M* = 3.55, *SD* = .65). The individuals employed in healthcare for the greatest number of years (31-40 years) identified performance expectations as a weak catalyst to transfer while those employed the fewest years (1-10 years) found it to be a barrier to transfer in this study. Mean scores for openness/resistance to change are also significantly different between the 1-10 year category (*M* =2.83, *SD* = .82) and categories indicating 21-30 years and 31-40 years worked in healthcare (*M* = 3.30, *SD* .60 and *M* = 3.55, *SD* = .65, respectively). These data are presented in Table 43.

Table 43. Mean Scores of Two Transfer Factors as a Function of Years Worked in Healthcare

	Years in Healthcare							
	1-10		11-20		21-30		31-40	
Transfer System Factor	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Performance expectations	2.83_{a}	.82	3.31	.83	3.30	.60	3.55_{a}	.65
Openness/Resistance to change	$3.09_{a,b}$	.97	3.52	.72	3.73_{a}	.77	3.93_{b}	.61

Note. Means in a row sharing subscripts are significantly different.

Mean scores and standard deviations for perceived transfer system factors as a function of the number of years study participants had worked in their current position at SJHS are presented in Table 44. With the exception of individuals who had worked for less than one year in their current position, the remaining participants were assigned to five-year age categories for analysis purposes.

Table 44. Means and Standard Deviations for Transfer System Factors by Years Worked in Current Position

	Years in Position											
	<1		1-5		6-10		11-15		16-20		21-25	
Transfer Factor	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Learner readiness	3.57	1.90	3.69	1.75	3.36	1.76	3.73	1.54	3.35	.65	3.69	.47
Motivation to transfer	4.00	.73	4.00	.63	3.91	.70	3.93	.59	4.10	.65	4.25	.74
Outcomes positive	2.37	.51	2.24	.71	2.06	.54	2.31	.73	2.53	.56	2.41	.74
Outcomes Negative	2.07	.37	2.17	.59	2.22	.65	1.98	.60	2.60	.63	2.06	.43
Personal capacity	3.17	.81	3.06	.70	3.17	.77	3.05	.91	3.15	.80	3.63	.32
Peer support	3.32	.53	3.43	.67	3.36	.55	3.15	.46	3.55	.97	3.63	.32
Supervisor support	3.42	.58	3.25	.77	3.19	.74	3.18	.74	3.77	.71	2.54	1.24
Supervisor sanctions	2.00	.61	2.06	.71	1.93	.58	1.98	.71	2.27	.43	1.92	.42
Content validity	3.18	.88	3.31	.65	3.26	.83	3.21	.78	3.84	.68	3.35	.62
Transfer design	3.80	.89	3.94	.63	3.83	.69	3.98	.55	4.15	.72	4.43	.52
Opportunity to use	3.28	.63	3.18	.66	3.12	.78	3.22	.83	3.40	1.04	3.69	.66
Transfer effort	3.80	.59	3.83	.55	3.95	.47	3.82	.45	4.00	.73	4.25	.29
Performance expectations	3.36	.59	3.26	.82	3.41	.50	3.39	.51	3.12	1.04	3.80	.33
Openness/Resistance	3.53	.61	3.55	.87	3.83	.65	3.84	.51	3.77	.56	3.88	.85
Self-efficacy	3.58	.75	3.81	.58	3.89	.50	4.20	.49	4.0	1.04	3.88	.25
Feedback/Coaching	3.05	.52	3.11	.54	3.17	.58	3.05	.41	3.35	1.04	3.25	.79

Multivariate and univariate tests did not identify significant differences in mean scores for any of the 16 transfer system subscales across categories of years worked in current position. This suggests that the variance in mean scores for the transfer system subscales were not explained by the length of time participants were employed in their current position. These results are presented in Table 45.

Table 45. Multivariate and Univariate Test Scores for Transfer System Factors Across Years Worked in Current Position

Transfer System Factor	F (d.f.= 5, 129)	Partial η^2
Learner readiness	1.01	.04
Motivation to transfer	0.25	.01
Personal outcomes-Positive	0.73	.03
Personal outcomes-Negative	0.95	.04
Personal capacity	0.53	.02
Peer support	0.73	.03
Supervisor support	1.34	.05
Supervisor sanctions	0.30	.01
Content validity	0.68	.03
Transfer design	0.82	.03
Opportunity to use	0.55	.02
Transfer effort	0.76	.03
Performance expectations	0.64	.02
Openness/Resistance	0.83	.03
Self-efficacy	1.69	.06
Feedback/coaching	0.33	.01

Note. Multivariate F ratios were generated from Pillai's statistic.
Multivariate test (F=.949, d.f.=80, 590, p=.605). Univariate d.f.=5, 129
* p<.05, ** p<.01

Mean scores and standard deviations for perceived transfer system factors as a function of study participant age in years are presented in Table 46. Participants were categorized into ten-year age groups for analysis purposes.

Table 46. Means and Standard Deviations for Transfer System Factors by Age

	Age in Years							
	25-34		35-44		45-54		55-64	
Transfer System Factor	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Learner readiness	3.94	.81	3.57	78	3.65	.71	3.51	.74
Motivation to transfer	4.06	.44	3.97	.62	4.02	.61	3.93	.73
Personal outcomes-Positive	2.08	.73	2.21	.79	2.25	.59	2.27	.67
Personal outcomes-Negative	2.06	.65	2.19	.52	2.11	.52	2.24	.71
Personal capacity	3.00	.64	3.19	.66	3.08	.72	3.12	.84
Peer support	3.38	.74	3.37	.51	3.39	.58	3.40	.74
Supervisor support	3.10	.83	3.39	.73	3.15	.73	3.30	.80
Supervisor sanctions	2.67	.56	1.95	.67	2.02	.65	1.95	.64
Content validity	3.35	.52	3.28	.81	3.39	.66	3.18	.76
Transfer design	3.94	.42	3.93	.80	3.97	.61	3.89	.67
Opportunity to use	2.88	.85	3.20	.59	3.27	.62	3.17	.86
Transfer effort	3.53	.63	3.74	.56	3.96	.46	3.88	.55
Performance expectations	2.60	.88	3.22	.85	3.40	.62	3.42	.67
Openness/Resistance	3.23	7.6	3.45	.70	3.65	.77	3.88	.78
Self-efficacy	3.84	.27	3.76	.68	3.91	.60	3.86	.57
Feedback/coaching	3.03	.66	3.06	.53	3.14	.51	3.16	.62

Multivariate and univariate analysis identified significant differences in mean scores for the supervisor sanctions and performance expectation subscales ($p < .05$) with a small effect size for both variables ($\eta^2 = .06$ and $\eta^2 = .08$, respectively). These data are presented in Table 47.

Table 47. Multivariate and Univariate Test Scores for Transfer System Factors Across Age

Transfer System Factor	F (d.f.= 3, 131)	Partial η^2
Learner readiness	0.84	.02
Motivation to transfer	0.22	.01
Personal outcomes-Positive	0.20	.01
Personal outcomes-Negative	0.54	.01
Personal capacity	0.19	.00
Peer support	0.02	.00
Supervisor support	0.79	.02
Supervisor sanctions	2.93*	.06
Content validity	0.71	.01
Transfer design	0.14	.00
Opportunity to use	0.75	.02
Transfer effort	2.32	.05
Performance expectations	3.55*	.08
Openness/Resistance to change	2.68	.06
Self-efficacy	0.41	.01
Feedback/coaching	0.08	.01

Note. Multivariate F ratios were generated from Pillai's statistic.
Multivariate test (F=.987, d.f.=48, 354, p=.000). Univariate d.f.=3, 131
* p<.05, ** p<.01

Post-hoc comparison tests identified a significant difference in mean scores for supervisor sanctions between the 25-34 (*M* = 2.57, *SD* = .56) and both the 35-44 (*M* 1.95, *SD*= .67) and 55-64 (M = 1.95, SD =.64) year age categories. Comparison of mean scores for performance expectations as a function of employee age identified significant differences between the 25-34 year old category (M = 2.60, *SD* = .88) and both the 45-55 year (*M* = 3.40, *SD* = .62) and 55-64 year *(M* = 3.42, *SD*= .67) age categories. These data are presented in Table 48.

Table 48. Mean Score of Three Transfer System Factors as a Function of Age

	Age							
	25-34		35-44		45-54		55-64	
Transfer System Factor	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Supervisor sanctions	$2.67_{a,b}$	.56	1.95_{a}	.67	2.02	.65	1.95_{b}	.64
Performance expectations	$2.60_{a,b}$	.88	3.22	.85	3.40_{a}	.62	3.42_{b}	.67

Note. Means in a row sharing subscripts are significantly different.

Mean scores and standard deviations for perceived transfer system factors as a function of gender are presented in Table 49.

Table 49. Means and Standard Deviations for Transfer System Factors by Gender

	Male		Female	
Transfer System Factor	*M*	*SD*	*M*	*SD*
Learner readiness	3.59	.63	3.62	.78
Motivation to transfer	3.97	.58	3.99	.66
Personal outcomes-Positive	2.17	.62	2.27	.67
Personal outcomes-Negative	2.18	.54	2.15	.61
Personal capacity	3.07	.60	3.12	.79
Peer support	3.27	.48	3.43	.67
Supervisor support	3.10	.70	3.30	.77
Supervisor sanctions	1.89	.55	2.08	.69
Content validity	3.26	.54	3.32	.78
Transfer design	3.91	.49	3.95	.71
Opportunity to use	3.26	.60	3.18	.75
Transfer effort	3.93	.35	3.84	.58
Performance expectations	3.39	.60	3.30	.76
Openness/Resistance	3.46	.76	3.73	.77
Self-efficacy	3.79	.49	3.89	.62
Feedback/coaching	3.18	.57	3.11	.55

Multivariate and univariate tests did not identify significant differences in mean scores for any of the 16 transfer system subscales across gender in the present study. This suggests that the variance in mean scores for the transfer system subscales was not explained by difference in gender. These data are presented in Table 50.

Table 50. Multivariate and Univariate Test Scores for Transfer System Factors Across Gender

Transfer System Factor	F (d.f.= 1, 133)	Partial η^2
Learner readiness	0.06	.00
Motivation to transfer	0.02	.00
Personal outcomes-Positive	0.64	.01
Personal outcomes-Negative	0.07	.00
Personal capacity	0.12	.00
Peer support	1.95	.01
Supervisor support	1.91	.01
Supervisor sanctions	2.07	.02
Content validity	0.18	.00
Transfer design	0.10	.00
Opportunity to use	0.31	.00
Transfer effort	0.71	.01
Performance expectations	0.50	.00
Openness/Resistance	3.39	.03
Self-efficacy	0.78	.01
Feedback/coaching	0.46	.00

Note. Multivariate F ratios were generated from Pillai's statistic.
Multivariate test (F=1.67, d.f.=16, 118, p=.899). Univariate d.f.=1, 133
* p<.05, ** p<.01

Summary

In this chapter, the results of the data analysis were presented for seven research question to determine the influence of transfer system factors, elapsed time since training and select demographic characteristics on the perceived stage of transfer. Chapter Five will present a

discussion of the findings of this analysis and their implications for practice. A discussion of the study limitations and recommendations for future research will also be addressed.

CHAPTER 5

Discussion

Introduction

The purpose of this study was to examine the influence of potential transfer system factors, including trainee characteristics, motivation, work environment, and ability factors, and time elapsed since training on the transfer of training process in a healthcare organization. In previous chapters, the background of the current study, research questions, a review of related literature, research methodology, and summary of the research data were presented. In this chapter, a discussion of the research findings and implications for practice is presented. Limitations of the study and recommendations for future research are also addressed.

Analysis of Research Findings

Research Question 1

Much of the empiric research on transfer of training has examined evidence of transfer soon after training while studies assessing the generalization or maintenance of skills and knowledge are few. Research question one examined whether a positive relationship exists between elapsed time since training and stage of transfer achieved by study participants following a management training program in a healthcare organization. Study participants completed training between 9 and 24 months preceding their completion and submission of the study questionnaire. A primary source of information on transfer and behavior change has been the collection of information directly from trainees immediately following or shortly after completing training (Binkerhoff & Montesino, 1995; Ford et al., 1992; Gaudine & Saks, 2004). Based on the way learners commit to try, practice, discontinue, abandon altogether, or ultimately

imbed in their work function the knowledge and skills learned in training, Foxon (1993) proposed the conceptualization of transfer as a process, composed of multiple stages with each of the stages being prerequisite to each subsequent phase. Depending on whether transfer is expected to occur quickly as in training technical and motor skills (Burke, 1997; Foxon, 1993), or over a prolonged period, as with training in complex interpersonal, managerial, or problem-solving skills (Broad & Newstrom, 1992; Foxon, 1993), the appropriate time to assess behavior change on the job is likely to vary from one training program to another. Considerable research examining the nature of transfer has found that in several studies fewer than 50% of management trainees attempted to transfer their training back to the job (Baumgartel, Reynolds, & Patham, 1984; Burke & Day, 1986). A disheartening 35% attempt among trainees to transfer training to the job, and even fewer reporting maintenance of trained skills into routine work practice, was reported by Huczynski and Lewis (1980).

This study attempted to examine the influence of prolonged time on perceived stage of transfer achieved at time intervals between 9 and 24 months following training. The Greenbelt training programs in which the study respondents participated, introduced complex problem-solving and analytical skills necessary to promote, support, and strengthen a culture of quality and process improvement throughout a large, multi-center healthcare system. Seven training sessions were conducted over an 18-month period. Correlation analysis of the data showed that there was no relationship between time since completion of the Greenbelt training program and the stage of training transfer (r_s = -.074) achieved by participants in this study. Although 42.2% (n = 57) of respondents completed the training program at least 16 months prior to participation in this study, these individuals were no more likely to achieve transfer maintenance or partial transfer than those who had completed training within the previous 12 months. These findings

support other research studies reporting the lack of a significant difference in the extent of transfer soon after and one year following training (Axtell, Maitlis, & Yearta, 1997). In a recent study of transfer, Cromwell and Kolb (2004) examined the extent of transfer achieved at one month, six months, and one year after training. Significant transfer at one year was identified for individuals reporting high levels of peer and supervisor support. Given the many transfer climate factors that can influence transfer in organizations, the importance and interaction of all these influences before, during, and after training must be considered in the assessment of transfer. While incorporating relapse prevention strategies during and following training has shown promise in some studies (Burke & Baldwin, 1999; Foxon, 1997; Gist, Bavetta, & Stevens, 1990), results have been inconsistent (Burke & Hutchins, 2007; Gaudine & Saks, 2004). With only a single self-report measure of transfer included in this study and evaluation of perceptions of transfer at a single point in time, it is difficult to draw conclusions about the influence of time on stage of transfer following training in the present study. The implications of these findings will be examined further in the discussion of study limitations.

Research Question 2

Research question two examined the relationship between the LTSI motivation factors and the stage of transfer achieved by study participants. Combined mean scores for the three motivation subscales suggest that trainees perceived motivation factors to be weak catalysts for transfer in this organization. Participants agreed with the extent they are motivated to transfer new skills and knowledge and believe this will positively influence their performance on the job. Mean scores across stage of transfer for the motivation to transfer factors are significantly different and increase progressively from intention to transfer, to partial transfer, and transfer maintenance, respectively. Although not found to be significantly different across stages of

transfer, mean scores for performance outcomes also demonstrated progressively higher mean scores across the intention, partial transfer, and transfer maintenance categories, consistent with Foxon's (1993) conceptualization of the transfer process as a continuum. Rather than an outcome or product of training (Foxon, 1993), transfer should be seen as a process where learners attempt, practice, disband, or ultimately generalize and maintain the knowledge and skills acquired in training. The Lean Six Sigma Greenbelt training program completed by trainees in this study included complex analytical and problem-solving skills and techniques. Application and mastery of such skills are likely to vary from one individual to the next based on the degree of personal commitment, motivation, opportunity to use skills, and reinforcement by peers and supervisors.

Mean scores for the initiation group fell consistently below mean scores for the other three transfer categories for all three of the motivation factors. Only motivation to transfer was perceived to be a weak catalyst for this transfer group, with transfer effort and performance expectations identified as barriers to transfer. Although these participants agreed with the extent they are motivated to transfer training, they did not perceive a positive influence on improved performance on the job or positive outcomes for their efforts.

Unlike the intention, initiation, and partial transfer groups, individuals who indicated they had achieved transfer maintenance identified both motivation to transfer and transfer effort as strong catalysts for transfer. There is considerable evidence in the literature suggesting that trainee attitudes, expectations, values, and interests can adversely affect or promote training effectiveness, and, subsequently, individual performance (Milner, 2002; Noe, 1986; Noe & Schmidt, 1986). Motivation to transfer is believed to be influenced by trainee confidence in their ability to apply new skills, perceived relevance of training, opportunity to use new skills on the

job, and belief that using new skills will lead to improved performance in the work environment (Noe, 1986). Several studies (Facteau et al., 1995; Milner, 2002; Noe, 1986; Yelon et al., 2004) proposed that motivational factors play a significant role in training transfer. Believed to serve both as an antecedent to training effectiveness and a moderator between learning and behavior change (Noe, 1986; Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991), trainee motivation is influenced by individual beliefs, assertions, and attitudes. Consistent with much of the transfer research, study participants showed evidence of motivation to transfer skills and knowledge gained from training programs and the belief that this will positively impact their job performance.

Overall, these results indicate that trainees in this healthcare organization perceived motivation to transfer as a weak catalyst to transfer. Mean scores were significantly different and increased progressively across the stage of transfer continuum, attaining the strong catalyst designation among participants in the transfer maintenance group.

Research Question 3

Considered to have a secondary influence on motivation in Holton's conceptual model of transfer (Holton, et al., 1997), performance self-efficacy and learner readiness comprise key trainee characteristics that influence transfer. The influence of trainee characteristics on stage of transfer among trainees in a healthcare organization was examined in the third research question guiding this study. Overall, this construct was seen by study participants as a weak catalyst for transfer in the organization. The two subscales included in this construct, learner readiness and performance self-efficacy, were seen as weak catalysts to transfer, indicating agreement by participants that they felt prepared to participate in training and that training would allow them to

modify their work performance by incorporating new skills and knowledge back to the job. These findings support other studies that have examined the influence of motivation on transfer (Facteau et al., 1995; Foxon, 1997; Gegenfurtner et al., 2009).

In the present study, only the transfer maintenance group perceived performance self-efficacy as a strong catalyst for transfer. With a mean score approaching the strong catalyst classification, the learner readiness score for the maintenance group was significantly different than the mean scores for the intention to transfer and initiation of transfer groups. Situated in Bandura's (1986) social cognitive theory construct of human behavior, self-efficacy is the belief about one's ability to produce designated levels of performance that have an impact on life events. Through cognitive, motivation, affective, and selection processes, self-efficacy beliefs influence how individuals feel, think, motivate themselves, and behave (Bandura, 1994). Study participants who achieved transfer maintenance reported strong indicators of both motivation factors and self-efficacy which could explain their capacity to achieve sustained transfer of knowledge and skills following this training program, despite the barriers to transfer they identified by for other work environment factors.

Overall, the results indicate that trainee characteristics in the healthcare organization under study were significantly different across the stage of transfer groups; demonstrating lower mean scores for the intention to transfer group, and progressively increasing mean scores through the partial transfer and transfer maintenance groups. The lowest mean scores for the trainee characteristic scale were observed for the initiation to transfer group who perceived both learner readiness and performance self-efficacy as barriers to transfer. The individuals in this transfer category perceived a lack of ability and/or confidence to use the skills acquired in training and did not feel adequately prepared to participate in the Greenbelt training program. Although only

a small portion of study participants are included in this transfer group (6.7%, n=9), the potential reasons for this disparity may warrant further investigation.

Research Question 4

Research question four examined the influence of work environment factors on the stage of transfer achieved in a healthcare organization. Noted by some researchers to be the most influential factor in training transfer (Brinkerhoff & Montesino, 1995; Foxon, 1997; Noe & Schmidt, 1986; Richey, 1992; Rouiller & Goldstein, 1993), the overall work environment was perceived by healthcare trainees in this study as a barrier to transfer of training. Mean scores for individual subscales in the work environment construct revealed factors that ranged from severe barriers to weak catalysts for transfer in this organization. Although mean scores were highest among the transfer maintenance group for five of the seven subscales, a significant difference in mean scores for the work environment factors across the four transfer groups was not identified for six of these factors. A significant difference in mean scores was identified for the peer support subscale. Post-hoc analysis identified a significant difference in mean scores between the intention to transfer and transfer maintenance groups for the peer support subscale. With a mean score exceeding 3.51, the maintenance of transfer group perceived peer support to be a weak catalyst for transfer. Previous studies have found peer support to be a positive influence on transfer (Cromwell & Kolb, 2004); however, low mean scores for this factor among the other three stage of transfer categories in this study indicate that peer support was perceived as a barrier to transfer. Additionally, supervisor support, and feedback performance coaching were perceived as barriers to transfer with no significant difference in mean scores across the stage of transfer groups.

In recent studies, supervisor support and peer support have been recognized as important work climate factors that influence transfer (Cromwell & Kolb, 2004; Holton, Chen & Naquin, 2003). In this study, neither of these factors was perceived as a catalyst for transfer across three of the transfer groups. These findings suggest that trainees generally experienced a lack of support from peers and managers to use new skills on the job. Introduction of Lean Six Sigma processes and techniques to identify performance problems and improve processes requires the buy-in and full support of all employees in the organization to be successful. Participation on process improvement teams would be a determining factor on the ability of individuals to actively engage in the application and subsequent mastery of these skills and techniques. While the transfer maintenance group may work in areas where greater opportunities exist to participate in performance improvement activities allowing them to work directly with peers and managers involved in Lean Six Sigma projects, the other participants did not perceive the same level of support or reinforcement of training in their work setting.

Personal outcomes positive, personal outcomes negative, and supervisor sanctions, were perceived as severe barriers to transfer by trainees in this organization, indicating a general lack of reinforcement for transfer of skills and knowledge following training. Continual reinforcement of Lean Six Sigma practices in the analysis and management of performance problems by organizational leaders, management, and peers needs to be addressed if improved transfer is to be realized. Setting clear, expectations for trainee participation on performance improvement teams may need to be imbedded in job descriptions and performance appraisals to ensure active, ongoing application and further enhancement of the skills learned in training.

Resistance/openness to change was the only work environment fact seen as a weak catalyst for transfer in this study across all stage of transfer groups. The mean scores between

transfer stages were not significant, however, suggesting that negative outcomes are generally not anticipated by study participants for not using the knowledge and skills learned in training. Beginning April 2008, major organizational downsizing resulted in a large number of position layoffs and restructuring of management positions and reporting relationships at SJHS that may have contributed to the perceived lack of management and peer support by study participants. Similar to other environmental factors related to support and reinforcement discussed previously, this organization would benefit from the incorporation of protocols that routinely engage trainees with performance improvement teams and other support systems to ensure modeling of desired behaviors and routine application and maintenance of new skills in the work setting.

Research Question 5

Research question five examined the influence of ability factors on the perceived stage of transfer achieved in a healthcare organization following a management training program. Results of the analysis identified statistically significant differences in mean scores across the four stages of transfer for all four of the subscales in the ability scale. Of the four subscales, only transfer design achieved an overall score indicating it was perceived by trainees to be a weak catalyst in this study, although the transfer maintenance group perceived this factor as a strong catalyst to transfer. Consistent with Foxon's (1993) model of the transfer process as a continuum, mean scores for all four subscales progressively increased from intention, to partial transfer, and finally, to maintenance of transfer. As noted previously for other transfer system factors, the lowest mean scores were reported for the ability subscales by individuals in the transfer initiation group, who identified these subscales as severe barriers to transfer in this organization.

Training design across stage of transfer groups was perceived to be appropriate in supporting trainees' understanding of how to apply new skills on the job. While the initiation

group perceived training design as a barrier to transfer, the other three transfer groups perceived it to be a weak catalyst with progressively higher mean scores from intention, to partial transfer, and transfer maintenance. Individuals who indicated they achieved maintenance of transfer considered transfer design to be a strong catalyst. Consistent with the perception of several factors in the motivation and trainee characteristics scales as strong catalysts for transfer, the transfer maintenance group represents a group of trainees who felt prepared, motivated, and capable of learning and applying their new Greenbelt skills on the job. With the addition of transfer design as a strong catalyst for transfer, these individuals perceived the strategies used in training to adequately articulate the benefits of training and how to apply the skills on the job. With the potential to be a strong catalyst for transfer, these findings suggest that trainers need to identify ways to incorporate transfer design strategies that link learning with on-the-job performance and practical ways to implement new skills for all trainees.

With low mean scores for the remaining ability subscales, participants identified opportunity to use learning, personal capacity to transfer, and content validity as barriers to transfer, although mean scores were not significantly different across the stage of transfer groups. Overall, study participants believed they lack adequate opportunities to apply new skills and the necessary resources to implement changes in order to transfer skills learned in training.

As has been discussed previously, organizational leaders and managers can support improved transfer effectiveness by encouraging formal processes that assure equal opportunity to participate on teams and exercise Lean Six Sigma methods. Proper needs analysis and allocation of resources, including reassigned time and administrative support necessary to conduct and execute performance improvement initiatives, are also suggested by these findings. Establishing

mechanisms that hold managers and staff accountable for job performance could further reinforce the ongoing application of knowledge and skills learned in training.

Research Question 6

Research question six examined whether differences in stage of transfer were achieved based on trainee demographic characteristics. The variance in stage of transfer achieved by study participants cannot be explained by trainee age, gender, job title, years worked in healthcare, years in current position, work location, or level of education in this organization. The small number of participants in several of the demographic categories resulted in fewer than five cases per cell in over 20% of cases for the research variables, therefore, violating an underlying assumption of the data set for this study.

Research Question 7

Research question seven examined whether trainee perceptions of transfer system factors in this organization differ significantly across participant demographic characteristics. No significant difference was found in mean scores for the 16 transfer system factors by level of education, gender, or number of years worked in current position. Significant differences in means scores for four of the transfer system factors were identified for one or more of the selected trainee characteristics. A significant difference in mean scores was identified for the openness/resistance to change subscale for both current position and number of years worked in healthcare. For this transfer system factor, a significant difference in mean scores for openness/resistance to change was found between supervisors and the staff and director categories. Supervisors are the only job category that perceived openness/resistance to change as a barrier to transfer. This indicates that they disagreed that not applying new skills would result in negative outcomes. Alternatively, the supervisor group identified both transfer design and

motivation to transfer as strong catalysts for transfer and personal capacity and content validity as weak catalysts for transfer. The small number of responses for this job category (n=8) may be inadequate to draw further conclusions regarding the difference in mean scores for this variable.

Higher mean scores for directors, executives, and staff indicated they perceived openness/resistance to change as a weak catalyst. Significantly different mean scores for this factor were also identified between groups of trainees who had been employed in healthcare for 10 or fewer years and individuals with over 20 years of work experience in the health field. Participants with ten or fewer years experience working in healthcare perceived openness/resistance to change as a barrier while those individuals with more than ten years in the field perceived it to be a weak catalyst.

A significant difference in mean scores was found for the transfer effort subscale across work location categories, with considerable variability in the perception of this factor as an influence on transfer. Both hospital and corporate-based trainees perceived transfer effort as a weak catalyst, while participants employed in outpatient settings perceived it as a strong catalyst. Participants in the "other" location category identified transfer effort as a barrier to transfer in this organization. Individuals working in ambulatory settings in this organization may have a greater sense of community and contact with supervisors as they generally employ fewer staff providing a more supportive environment than the hospital or corporate settings.

Mean scores for the supervisor sanctions subscale were found to be significantly different as a function of trainee age. Mean scores for the youngest age group (25-34 years) differed significantly from the 35-44 year and 55-64 year age groups in this organization. Low mean scores for the three older age groups indicate that the younger workers were more likely to be

sanctioned by their supervisor/manager for not applying new skills back on the job than the older employees.

Mean scores for performance expectations differed significantly across both the participant age and years worked in healthcare categories. Mean scores for the youngest age group (25-34 years) differed significantly from the 45-54 year and 55-64 year age groups in this organization; however, all age groups perceived this factor as a barrier to transfer in this healthcare organization. Mean scores for performance expectations also differed significantly between individuals with 10 or fewer years experience working in healthcare and those with over 30 years in the field. Despite the differences in participant perceptions of these four transfer system factors for a few demographic categories, these findings are inconclusive, given the small number of responses in several categories of the demographic variables in this study.

Summary of Research Findings

The purpose of this research study was to examine the relationship between perceived transfer system factors and training elapsed time on progressive stages of transfer in a healthcare organization following completion of an eight-day management training program. The results of this study indicated that participant perceptions of several of the transfer system factors in the LTSI developed by Holton, Bates, and Ruona (2000) differed significantly along the transfer continuum with mean scores increasing progressively through the stages of transfer. The variance demonstrated for motivation to transfer learning, learner readiness, performance self-efficacy, peer support, opportunity to use learning, personal capacity to transfer, perceived content validity, and transfer design across the four stages of transfer support the concept of

transfer as a process rather than a product, or direct outcome of training (Foxon, 1993; Laker, 1990).

These findings provide additional support for previous studies regarding the importance of transfer climate in promoting or inhibiting the transfer of learning (Burke & Hutchins, 2007; Burke & Hutchins, 2008; Chiaburu & Marinova, 2005; Clarke, 2002; Ford & Weissbein, 1997; Lim & Morris, 2006; Rouillier & Goldstein, 1993). The generally low mean scores reported on the majority of the transfer system factors reinforces the perceived underlying weakness in this organization's transfer system (Holton, 2000). This is evident in the overall classification of six transfer factors as weak catalysts, seven factors as barriers, and three factors as severe barriers for transfer in this healthcare organization. None of the subscales reached the strong catalyst classification in this study from combined mean scores. With a majority of transfer factor means falling between 2.51 and 3.50, a neutral perception of the overall transfer system in this organization is realized.

Overall, trainees in this healthcare organization who perceived a more supportive work environment had a greater likelihood of progressing to maintenance of the skills and knowledge learned in training. For individuals who achieved the maintenance stage of transfer, motivation to transfer learning, performance self-efficacy, and transfer design were perceived as strong catalysts for transfer in this study. These individuals indicated that they have a high motivation to transfer skills and knowledge learned in training, are capable of modifying their performance following training, and the trainers and teaching methods employed during training were conducive to their understanding of how the knowledge and skills could be used on the job. The transfer maintenance group also identified opportunity to use, content validity, transfer design, peer support, resistance/openness to change, and learner readiness as weak catalysts for transfer

of training in this study. The transfer maintenance group identified six transfer system factors as barriers to transfer; five of them in the work environment scale, and one in the motivation scale. Only three factors were perceived by this group to be severe barriers to transfer; supervisor sanctions, personal outcomes positive, and personal outcomes negative. This suggests that the transfer maintenance group did not perceive extrinsic indicators to be as great an influence on transfer as intrinsic factors, such as self-efficacy and motivation to transfer.

Mean scores for the initiation of transfer group were consistently lower than all other stage of transfer groups. Individuals in this group had begun to use the new skills but then discontinued their use on the job. Only motivation to transfer was perceived by this group to be a weak catalyst for transfer. They identified learner readiness, performance self-efficacy, transfer design, feedback/coaching, supervisor support, and peer support as barriers to transfer. Personal capacity for transfer, opportunity to use learning, perceived content validity, supervisor sanctions, personal outcomes positive, and personal outcomes negative were perceived as severe barriers to transfer by these individuals. These findings suggest that although trainees who began to apply trained skills but discontinued use indicated they were motivated to transfer, they had encountered issues with confidence in their ability to transfer new skills and lacked the reinforcement and support systems necessary to sustain their use. Collectively the perceptions of the intention to transfer group indicates that there were many barriers in the work environment prohibiting transfer of training.

Mean scores for the intention to transfer group hovered around the midpoint overall, indicating a neutral perception of the transfer climate. None of the 16 transfer system factors were perceived by this group to be a strong catalyst for transfer. Motivation to transfer, transfer effort, transfer design, and performance self-efficacy were perceived as weak catalysts, however.

These findings suggest that those who intended to transfer, but had not yet done so, believed the training was appropriate, they had the ability to change their performance following training, and that those changes would lead to outcomes they valued. Similar to the initiation of transfer group, supervisor sanctions, personal outcomes positive, and personal outcomes negative were also perceived by these trainees as severe barriers to transfer.

The partial transfer group also perceived a neutral transfer climate ovrerall. They did not perceive any of the transfer system factors as strong catalysts for transfer, and only five of them, as weak catalysts, including: learner readiness, performance self-efficacy, resistance/openness to change, motivation to transfer, and transfer effort. Like the intention to transfer and initiation of transfer groups, the partial transfer group indicated supervisor sanctions, personal outcomes-positive, and personal outcomes-negative as severe barriers to transfer. The remaining eight transfer factors were perceived as barriers to transfer by these individuals.

Motivation and trainee characteristic factors were generally perceived by study participants to be favorable to the transfer process as reflected in the moderate mean scores for these variables. Participants agreed that they are motivated to transfer learning, are able to participate in training programs, and believe the training programs clearly link learning with job performance. They also indicated their agreement that changes in job performance will result in outcomes they value, and that they can change their performance on the job when they want to.

The low overall mean scores for the work environment and ability scales in this study, and their respective subscales, echo the findings of other researcher studies on transfer (Brinkerhoff & Montesino, 1995; Foxon, 1997; Noe & Schmidt, 1986; Richey, 1992; Rouiller & Goldstein, 1993). Much of the empiric evidence supports the growing belief that returning to a positive organizational transfer climate is at least as important as the degree of learning in

predicting transfer and, ultimately, leading to improved job performance. In a study conducted by Newstrom (1986, as cited in Broad & Newstrom, 1992), lack of reinforcement on the job was cited as the greatest barrier to transfer, a finding verified by Ford et al. (1992), and others (as cited in Holton, Chen, & Naquin, 2003). The second and third ranked barriers reported by Newstrom (1986, as cited in Broad & Newstrom, 1992) were interference in the immediate work environment (e.g. time pressures, inefficiencies, lack of equipment) and work culture lacking in support of transfer, respectively. The results of this study are consistent with these previous findings. Overall, study participants identified a lack of opportunity to use new skills on the job and resources necessary to support the changes required to incorporate and sustain the use of these skills are inadequate. Participants also indicated that there is a lack of recognition, feedback, or reinforcement of the use of new skills on the job by management, peers, and the organization at large.

In several studies, the relationship between specific work environment factors and transfer of training at various time intervals following training have found mixed results. Cromwell and Kolb (2004) showed that trainees applied skills learned in training at the one year, but not at the three or six month time periods. In an earlier study, Hand, Richards, and Slocum (1973, as cited in Cromwell & Kolb, 2004), found post-training behavior changes at eighteen months but not at the three month period. In the present study, no correlation between time since completion of training and stage of transfer achieved by participants was identified. However, with the collection of survey data at only one point in time, this may not have provided an adequate assessment of this variable in this study sample.

Participant demographic characteristics did not explain the stage of transfer achieved in this study population. Differences in perception of transfer system factors were also negligible

across a majority of the transfer system subscales and demographic characteristics examined. Although mean scores for several transfer system factors were found to be significantly different across select demographic groups, including current position, years worked in healthcare, age, and work location, the findings from this analysis were not remarkable. Further studies need to be conducted to determine whether different demographic groups perceive transfer climate factors differently in healthcare organizations and if those difference influence the transfer process.

Implications for Practice

A critical element in the validation of training effectiveness is the permanent transfer of learned knowledge, skills, or behaviors to the workplace. U.S. companies invest billions of dollars annually on training programs and performance interventions intended to facilitate learning, improve individual job performance, and increase organizational effectiveness (ASTD State of the Industry, 2008; Noe & Colquitt, 2002); yet, research indicates that at best 35% to50% of management trainees attempt to transfer their training back to the job (Baumgartel, Reynolds, & Patham, 1984; Huczynski and Lewis;1980) and even fewer report maintenance of trained skills into routine work practice. Three sources of training relapse reported by Marx (1982) include: 1) failure of organizations to adequately support skill retention; 2) lack of discussion of potential relapse during training; and 3) absence of systematic means of identification and management of threats to skill retention. The ability to identify and address potential obstacles to training effectiveness could aid trainers and managers in the overall design of training programs and support strategies to minimize or remove those obstacles and improve transfer.

Implications for Instructional Design

Transfer systems in organizations are complex, unstable, and highly variable from one organization to another. The LTSI survey instrument provides a systematic approach to examine and manage perceived trainee perceptions of factors in the organizational climate, such as transfer design, feedback/coaching, peer support, opportunity to use learning, content validity, and capacity for transfer unique to an organizational setting that influence transfer of training. Such information can be used by instructional designers and managers to identify potential obstacles to training effectiveness via the design of training and support strategies used for instructional programs before, during, and after training (Smith & Ragan, 1999). With the greatest risk for failure at the early stages of transfer, attention to those factors that may inhibit the transfer process should be identified in the early stages of training design and development (Burke, 1997; Burke & Hutchins, 2008; Liebermann & Hoffman, 2008), and strategies introduced to improve initiation and maintenance of transfer in organizations. Strengthening factors identified as catalysts, and weakening barriers to transfer in the pre-training, training, and post-training environments has shown promise for enhancing the many individual and organizational attributes operating to promote transfer (Axtell, Maitlis, & Yearta, 1997; Burke & Baldwin, 1999; Ford et al., 1992; Foxon, 1997). Furthermore, ongoing assessment and evaluation of training design strategies and the conduct of organizational training are essential if organizations are to realize the successful transfer and generalization of knowledge and skills learned in training.

Implications for Performance Improvement

This study examined the perception of multiple transfer system factors in a multi-center healthcare system following a management training program using the Learning Transfer System

Inventory survey instrument (Holton, Bates, & Ruona, 2000). Use of this instrument provided a systematic approach to the examination of the perceived motivation, trainee characteristics, work environment, and ability factors unique to this training situation and aided in the identification of potential weaknesses in the transfer climate of this organization. Recognizing work environment factors, particularly peer and supervisor support, opportunities to use learning, as well as work load, stress levels, and links to organizational strategic initiatives can assist organizations in designing appropriate support systems and relapse prevention strategies that may promote transfer maintenance and improve performance outcomes (Axtell, Maitlis, & Yearta, 1997; Burke & Baldwin, 1999; Burke & Hutchins, 2008; Ford et al., 1992; Foxon, 1997).

In this study, transfer of training following an eight-session Lean Six Sigma Greenbelt training program for management personnel in a healthcare organization was examined. Increasingly recognized as an effective methodology to analyze and reduce error and waste, Lean Six Sigma methods are being introduced in healthcare organizations to provide staff with the skills and tools in management and clinical processes that support organizational strategic initiatives (Kontoghiorghes, 2001; Lazarus & Neely, 2003; Trusko, Pexton, Harrington, & Gupta, 2007). Like other management development programs, this program was conducted as part of an organization-wide strategy to incorporate these methodologies as a way of identifying and analyzing complex problems and important improvement efforts aimed at reducing waste and improving processes that ultimately drive quality and patient safety initiatives. While individuals at all levels of the organization are expected to participate on Lean Six Sigma teams, there is a reliance on trained Greenbelt and Blackbelt leaders to drive this process throughout the organization.

As with other evaluation methods, the LTSI provides a means of ongoing assessment and evaluation of the progress being made in organizations to recognize and resolve performance issues related to the design and conduct of organizational training programs (Holton, Bates, & Ruona, 2000). Performance technologists can use this type of diagnostic tool as part of a comprehensive assessment of resources for task support, the physical work environment, job design, performance support systems, and incentive programs in specific work units or organizations that can be introduced to improve training effectiveness (Villachica & Stone, 1999). The HPT model proposed by Van Tiem, Moseley, and Dessinger (2004) provides a systematic approach to the analysis, intervention selection and design, intervention implementation and change, and evaluation of complex performance problems like those identified by the LTSI in this study. With the increasing need to demonstrate value and validate effectiveness, performance improvement and training professionals can only benefit from the use of well designed and validated diagnostic tools and methods to better identify and respond strategically to performance issues in organizations.

With increasing pressure by state and federal regulatory and accrediting agencies to hold healthcare organizations accountable for compliance with published standards and reduction of medical errors, administrators must now contend with the imposed value-based purchasing of healthcare services and improving their performance outcomes. Ensuring that learners have the knowledge, resources, and support from peers, supervisors, and organizational leadership identified by study participants as barriers to transfer in this organization, requires systemic examination and strategic management to realize the successful transfer and generalization of trained skills across the organization's operating units.

Implications for Healthcare

With the publication of the Institute of Medicine Report in 2000 (Kohn, Corrigan, & Donaldson, 2000), the U.S. healthcare industry faces increasing economic and public pressure to reduce costs, improve quality and efficiency, and reduce medical errors. Recognized throughout the business community as an effective methodology to analyze and reduce error and waste, Six Sigma entered the healthcare landscape to provide leaders and staff with the necessary skills and tools to reduce defects in management and clinical processes that align with the strategic goals of the organization (Lazarus & Neely, 2003; Trusko, Pexton, Harrington, & Gupta, 2007). Much like other performance improvement interventions, Six Sigma focuses on reducing variation in the quality of products or services (Van Tiem, Dessinger, & Moseley, 2006). Gains in productivity, efficiency, quality, profitability, and customer and stakeholder satisfaction can be measured and benchmarked for ongoing evaluation of effectiveness and quality.

Multiple tools, techniques, and statistical methods are included in the Six Sigma tool kit to facilitate the analysis, measurement, and tracking of the outputs of processes and services; however, the key to successful practice of Six Sigma is the people charged with the oversight and execution of these practices (Van Tiem, Dessinger, & Moseley, 2006). In order to be effective, Six Sigma must be accepted and sustained within the organizational culture, requiring visible support from leadership through first line supervisors. Training is a key factor in the overall success of Six Sigma. Leadership roles are created for individuals who undergo extensive training in Six Sigma methods and techniques. These certified Black Belts and Green Belts are responsible for implementation of Six Sigma projects and leading Six Sigma teams throughout the organization. With an average cost of $30,000 to $40,000 to train a Black Belt and nearly $8,000 to train a Greenbelt, organizations are making a considerable investment in the

infrastructure needed to support and sustain this initiative (Trusko, Pexton, Harrington, & Gupta, 2007.

This study examined the perceptions of the training transfer climate for 135 management and staff employees in a large healthcare organization following Lean Six Sigma Greenbelt training. With the low overall mean scores identified for work environment and ability factors, participants identified a weak transfer climate in this healthcare organization. The data obtained from this study may be useful to leaders and trainers of the Lean Six Sigma initiative to modify the design of the ongoing training programs and support systems necessary to minimize the perceived barriers and promote catalysts to transfer identified by study participants. A diagnostic tool, like the LTSI, can facilitate the awareness of potential barriers and catalysts for transfer that occur before, during, or following management training programs so that a positive return on investment for scare training dollars can be realized.

Limitations of the Study

This study used a non-experimental, survey design. Therefore, a control group was not included. Rather than a random sample, a convenience sample of management trainees was used for the collection of data. Another limitation, is that this study relied on self-reports from trainees; therefore, the reliability of the information submitted by trainees could be in question. Additionally, organizational restructuring conducted in the spring of 2008 may have influenced the attitudes or perceptions of trainees completing the survey or compelled others not to participate in the study. A number of trainees who had completed the Lean Green Belt Training, were no longer employed in the organization at the time this study was conducted, as evidenced by the inactive email addresses. Additionally, training presentations, hand-out materials, and

exercises were prepared by experienced, certified Six Sigma Black Belt trainers and consistently applied for each training session. The faculty for each offering of the training course was selected from a group of Black Belt faculty based on their availability and geographic location of the course. Although the training coordinator attended and supervised all training sessions, potential inconsistencies in the delivery of the training content and facilitation of group exercises could have influenced the study findings relative to the training experience itself.

The target sample may have contributed to the lack of significance in several of the analyses. Of particular note was the small number of responses from employees at three of the hospitals in the organization; therefore, comparisons between hospital locations could not be examined. Although part of the same organization, individual hospitals would be expected to exhibit evidence of different cultures and organizational dynamics. Additionally, a small n for many of the categories of demographic variables affected the analysis both of the influence of demographic variables on stage of transfer achieved as well as the perceptions of organizational transfer system factors by various demographic groups.

Influences on participant transfer of learned knowledge, skills, and attitudes to the job are multidimensional and complex. This study did not include variables within the learning or organizational performance constructs of the transfer context. Other secondary influences that can influence motivation or learning such as personality traits or job attitudes were not included in this study.

This study examined one type of training program that was administered to a select trainee audience in a single healthcare organization. No attempt is made to generalize these findings outside the boundaries of this study.

Future Research Opportunities and Challenges

While much empiric research has been conducted on the nature of transfer systems and influences on transfer in both private and public sector organizations, few studies have examined transfer of training in healthcare organizations. Healthcare organizations are highly complex work environments with unique training challenges for trainers and managers. Healthcare personnel are subject to multiple training programs at the individual, departmental, and organizational level in order to keep pace with the accreditation, regulatory, technological, clinical knowledge, financial, social, and organizational changes that routinely impact both operational and clinical practice (Fallon & McConnell, 2007). Despite the complexity, scope, and importance of training in healthcare organizations, assessment of the effectiveness of training in this work setting has been largely overlooked in the transfer literature. The importance of well constructed training programs and evaluation of the effectiveness of these program begs the continued examination of work environment influences on training transfer and strategies that will support individual motivation and transfer in healthcare organizations (Berta & Baker, 2004; Summers & Nowicki, 2002; Zavaleta, 2003). Future research incorporating an assessment of specific performance indicators, such as participation on or leadership of teams or projects consistent with training initiatives and the success of such endeavors, would provide more objective evidence of performance outcomes and training transfer.

Transfer system factors identified as barriers to transfer in this study warrant further investigation relative to potential secondary influences on individual motivation and transfer as well as targeted intervention strategies that can positively impact training outcomes and maintenance of skills on the job. Such studies should include the examination of transfer outcomes at multiple points in time after completion of training to gain a better understanding of

the transfer process referenced in this study. Personal outcomes or expectations may not be evident in the short term, especially as they pertain to training of cognitive and judgmental skills; therefore, additional studies should examine transfer over longer periods of time to allow trainees and managers time to imbed skills and knowledge in the work setting and better assess performance outcomes related to training objectives.

The identification of multiple severe barriers to transfer by the initiation to transfer group in this study warrants further research into specific factors and potential secondary influences that may be unique to these individuals or work environments that resulted in discontinuation of the use of new skills and knowledge on the job. Overall, the findings from this study support the conceptualization of transfer as a process proposed by Foxon (1993) and others (Laker, 1990). Given the significant variance in mean scores for multiple transfer system factors in this study across the stage of transfer groups, future research should be directed at replicating the present research, including further exploration of the dimensions of transfer, and how instructional designers and performance technologists can influence improvements in training design and organizational support systems.

Additional studies should be conducted with a larger population of healthcare trainees and multiple types of training programs to examine trainee perceptions of unique transfer system factors with different types of training within and between specific operating units. A larger sample would also permit the examination of potential differences in perceived transfer system factors across different demographic groups and whether those differences influence the transfer process.

Examination of the influence of mandatory versus voluntary participation in training on transfer has been shown to influence training outcomes in some studies (Cohen, 1990; Hicks &

Klimoski, 1987). Although the majority of participants in the present study were required to attend the Greenbelt program, the status of the "other" attendees was unclear and could not be evaluated. Further studies should include this variable as a potential influence on trainee perceptions of transfer system factors and transfer of training to the job.

Finally, support from peers and supervisors, identified as barriers in this study, requires additional study. While the LTSI measures trainee perceptions of peer and supervisor support in their work setting, future studies should examine how staff and managers define and perceive support systems in their respective work environments as well as the frequency and longevity of support systems needed to imbed and sustain transfer of new skills.

Conclusions

This study contributed to the increased understanding of the influence of work environment, motivation, trainee characteristics, and ability factors on transfer outcomes following a management training program in a healthcare organization. Specifically, these findings support the concept of transfer as a continuum rather than a product or outcome of training. Individuals with high performance self-efficacy and motivation to transfer learning were more likely to identify a more positive transfer climate and achieve transfer maintenance, despite the perception of weak work environment factors in this organization. This study also contributed to the understanding of the potential generalization of the of the LTSI instrument as a diagnostic tool for identifying and improving training effectiveness by raising awareness of the perceived barriers and catalysts of transfer in a healthcare organization.

Appendix A

SJHS Lean Six Sigma Green Belt Coursework

Day	Agenda Topics	Exercises
1	Lean Six Sigma (LSS) Overview Enterprise Value Stream Mapping Value Stream Analysis Project Roadmaps Roles in LSS Define Phase Define Deliverables	Customer Identification Customer Needs Mapping SIPOC (Suppliers/Inputs/Process/Outcomes/Customers) Problem Statement Business Case Value Stream Map (VSM)
2	Intro to Lean Thinking Value & Waste Flow & Six Sigma Task Time & Level Loading Visual Controls & Pull Standard Work & Metrics Change Acceleration Process & WorkOut Tools for Define Phase	Cup exercise with metrics
3	Intro to Measurement Data Collection Project Targets Sampling Measurement System Analysis Process Mapping	Inpatient Radiology Exercise with VSM & data collection
4	Excel Class Team Facilitation Process Ownership Intro to Analyze RIE (Rapid Improvement Event) Standard Work & Documentation	Excel class Team Facilitation discussion RIE documentation review
5	Rapid Improvement Event RIE Day 1 RIE Day 2	Inpatient Radiology Exercise-Day 1 -Process map -Value Added, Value Enabling, Non-Value Added steps -Wastes -Effort-Impact Matrix Inpatient Radiology Exercise-Day 2 -Create Solutions -New Work Cell plan -Develop measure

Day	Agenda Topics	Exercises
6	RIE Day 3 RIE Day 4	Inpatient Radiology Exercise-Day 3 -Train the "associates" -Run new cell & measure -"See & Solve" Inpatient Radiology Exercise-Day4 -Train "new" associates -Run new cell & measure -FMEA(Failure Mode Effects Analysis) -Develop metrics for Process Owner follow-up Inpatient Radiology Exercise for Report-Out
7	Control Concepts Control Chart development & interpretation Process Owner Transition Pilot Roll-out Translation Error-proofing Team Recognition	Selecting Control Charts Interpreting Control Charts Roll-out/ Spread of RIE changes to other areas/sites Error-proofing Team recognition Impact-Effort Matrix
8	Control Planning Project Closure Transition to Sustain Phase Review of the Big Picture The Lean Green Belt Role	Contingency Planning Toot your own horn (sharing project accomplishments & learning WIIFM? (What's in it For Me?) [Final exam]

Appendix B

Research Approval Letters

ST JOHN HEALTH PROVIDENCE

16001 West Nine Mile Road
Southfield, MI 48075

Wednesday, December 10, 2008

Beverly Mihalko

RE: IRB Study # 08169

Dear Mihalko:

Meeting Date: 1/7/2009 **At:** Providence Hospital & Medical Ctrs.

Protocol Title:
The Influence of Transfer System Factors and Training Elapsed Time on Transfer in a Healthcare Organization

This is to advise you that the above referenced Study has been presented to the Institutional Review Board, and the following action taken subject to the conditions and explanation provided below.

Internal #: New Appl
Expiration Date: 12/09/09
On Agenda For: Expedited
Reason 1:
Description Date Received- 12/10/2008; Reason Expedited- Appendix D (3) - Recording of data....>28yrs old ..non-invasive
IRB ACTION: **Expedited**
Action This research presents minimal risks. Review annually.
Explanation:

As part of the Institutional Review Board requirements, which are mandated by the FDA, you are required to report back to the IRB in the event of any of the following: significant adverse reactions, changes to the study protocol, termination in the study.

Our Federal Wide Assurance Number is 00003036

Providence Hospital and Medical Centers Institutional Review Board is in full compliance with Good Clinical Practices as defined under the U.S. Food and Drug Administration (FDA) regulations and the International Conference on Harmonisation (ICH) Guidelines.

Sincerely yours,

Howard Schubiner, M.D.
Chairperson

EH/kb

WAYNE STATE UNIVERSITY

HUMAN INVESTIGATION COMMITTEE
101 East Alexandrine Building
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://hic.wayne.edu

Full AAHRPP Accreditation

NOTICE OF EXPEDITED APPROVAL

To: Beverly Mihalko
Technology Support

From: Ellen Barton, Ph.D. E. Barton
Chairperson, Behavioral Institutional Review Board (B3)

Date: December 15, 2008

RE: HIC #: 127108B3E

Protocol Title: The Influence of Transfer System Factors and Training Elapsed Time of Transfer in a Healthcare Organization

Sponsor:

Protocol #: 0812006658

Expiration Date: December 14, 2009

Risk Level/Category: 45 CFR 46.404 - Research not involving greater than minimal risk

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The above-referenced protocol and items listed below (if applicable) were **APPROVED** following *Expedited Review* (Category 7*) by the Chairperson/designee *for* the Wayne State University Behavioral Institutional Review Board (B3) for the period of 12/15/2008 through 12/14/2009. This approval does not replace any departmental or other approvals that may be required.

- Information Sheet (dated 12/1/08)

Appendix C

Learning Transfer Systems Inventory Agreement

Permission is hereby granted to use the Learning Transfer Systems Inventory (LTSI), an organizational assessment instrument, owned by Elwood F. Holton III and Reid A. Bates. Permission is granted to the following people for the timeframe, payment and purposes specified below:

Permission granted to: *(Name, company, address, phone number, e-mail, etc.)*	Beverly Mihalko Doctoral Candidate - Wayne State University 29940 Northbrook Farmington Hills, MI 48334 248-626-1720 mph.bjm@yahoo.com
Purpose	Dissertation Research
Time Period	October - December 2008
Other Conditions	
Payment	Waived on the condition that the instrument is used for research purposes only and not for any service for which the user receives monetary compensation. Otherwise the LTSI will be provided at a cost of U.S. $5.00 per copy.

It is understood that, by agreeing to use the Learning Transfer Systems Inventory, you are accepting the following conditions:

1. Any use other than that specified above is prohibited without to prior written authorization by the authors (E. F. Holton III & R. A. Bates).

2. No changes whatsoever can be made to the LTSI without prior written consent of the authors.

3. The authors retain full copyright authority for the LTSI. Therefore, the LTSI cannot be

copied or reproduced in any fashion without the authors= prior written consent. Every copy must carry the following copyright notice

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4. Discussion and presentation of the LTSI will accurately reflect the composition of the instrument and will use only original scale names, scale definitions, and item groupings.

5. A copy of all data collected with the instrument are given to the authors free of charge and in a timely manner. This data will only be used for research purposes and will not be reported in such a manner that would identify individual organizations, without written permission of the organization.

6. Unless otherwise acceded, the authors will share in the authorship of any publications that result from the use of the instrument or the data collected with the LTSI.

7. The authors reserve the right to withdraw the LTSI from use at any time if any terms or conditions of this agreement are violated.

8. Any reports published or presented resulting from data collected using the LTSI shall clearly indicate that instrument authors did not participate in preparing the reports.

9. By signing this agreement, LTSI users acknowledge that the scoring algorithms will be retained by the authors and that the data collected with the LTSI must be submitted to the authors for scoring.

TWO COPIES of this Permission Agreement should be signed and returned to Dr. Reid Bates to indicate your agreement with the above restrictions and conditions. A fully executed copy will be returned to you for your records. Upon receipt of the signed agreement and payment of the royalty/license fee you will be sent a copy of the LTSI that you may reproduce.

LTSI user (print name) Beverly J. Mihalko	
Title Doctoral Candidate-Wayne State University	
LTSI user signature Beverly J Mihalko	Date 9-12-08
Elwood F. Holton III or Reid A. Bates, LTSI authors Reid Bates	Date 9-17-08

Appendix D

Definition of Learning Transfer System Inventory Scales

Construct	LTSI Scale	Scale Definition
Ability	Personal capacity for	How individuals' work load, schedule, transfer personal energy and stress-level facilitate or inhibit transfer of learning into the workplace.
	Perceived content validity	The degree to which skills and knowledge taught in training are similar to performance expectations as well as to what is needed to perform more effectively. Similarity of methods and materials to those used in the work environment.
	Transfer design	Does the training program clearly link learning with on-the-job performance and demonstrate how to apply new knowledge and skills?
	Opportunity to use learning	Does the organization provide individuals with opportunities to apply new skills? Is there adequate provision of resources to apply new skills such as equipment, information and materials as well as financial and human resources?
Motivation	Motivation to transfer learning	The direction, intensity and persistence of effort toward utilizing in a work setting skills and knowledge learned in training.
	Performance-Outcomes Expectations	The expectation that effort devoted to transferring learning will lead to changes in job performance.
	Transfer effort-Performance Expectations	The expectation that changes in job performance will lead to outcomes valued by the individual.

Construct	LTSI Scale	Scale Definition
Trainee Characteristics	Learner readiness	The extent to which individuals are prepared to enter and participate in a training program.
	Performance self-efficacy	An individual's general belief that they are able to change their performance when they want to.
Work Environment	Personal outcomes-Positive	Formal and informal indicators from an organization about an individual's job performance.
	Personal outcomes-negative	The extent to which managers support and reinforce the use of learning on-the-job.
	Peer support	The extent to which peers reinforce and support use of learning on-the-job.
	Supervisor support	The extent to which prevailing group norms are perceived by individuals to resist or discourage the use of skills and knowledge acquired in training.
	Supervisor sanctions	The degree to which applying training on the job leads to outcomes that is positive for the individual.
	Openness to change	The extent to which individuals believe that if they do not apply new skills and knowledge learned in training that it will lead to outcomes that are negative.
	Feedback/performance coaching	The extent to which peers reinforce and support use of learning on-the-job.

Appendix E

Learning Transfer System Questionnaire

SECTION ONE

Please select the most appropriate answer to the following questions.

1. Select the training program session you participated in for Lean Six Sigma Greenbelt training.
   - □ Fall 2006 (Oct 06-Jan 07)
   - □ Winter 2007 (Feb 07-May-07)
   - □ Spring 2007 (Apr 07-Jul 07)
   - □ Summer 2007 (Jun 07- Sept 07)
   - □ Fall 2007 (Oct 07-Jan 08)
   - □ Winter I 2008 (Jan 08-Apr 08)
   - □ Winter II 2008 (Feb 08- Apr 08)

2. Please indicate the *highest level* of education you have completed.
   - □ High school graduate
   - □ Some college
   - □ Associate's degree (2 years)
   - □ Bachelor's degree (4 years)
   - □ Some graduate school
   - □ Master's degree
   - □ PhD/EdD
   - □ MD/DO
   - □ Other, please specify: _____

3. Current Position
   - □ First-line Supervisor
   - □ Manager
   - □ Director
   - □ Senior executive
   - □ Other, please specify: _____

4. Select the institution where you are currently working.
   - □ Providence Hospital and Medical Centers
   - □ Providence Park-Novi
   - □ St. John Hospital and Medical Centers
   - □ St. John-Macomb/Oakland
   - □ Brighton Hospital
   - □ River District Hospital
   - □ North Shores Hospital
   - □ St. John Health Corporate
   - □ Other: please specify: _____

5. Years you have worked in healthcare: _____

6. Years in current position: _____

7. Age (in years): _____

8. Gender: □ Male □ Female

SECTION TWO

Learning Transfer System Inventory

Please circle the number (1, 2, 3, 4 or 5) to the right of each item that most closely reflects your Opinion about training.

1 - Strongly disagree	**2 - Disagree**	**3 - Neither agree nor disagree**
	4 - Agree	**5 - Strongly agree**

For the following items, please think about <u>THIS SPECIFIC TRAINING PROGRAM</u>:

1. Prior to the training, I knew how the program was supposed to affect my performance.	1 2 3 4 5
2. Training will increase my personal productivity.	1 2 3 4 5
3. When I leave training, I can't wait to get back to work to try what I learned.	1 2 3 4 5
4. I believe the training will help me do my current job better.	1 2 3 4 5
5. I get excited when I think about trying to use my new learning on my job.	1 2 3 4 5
6. If I successfully use my training, I will receive a salary increase.	1 2 3 4 5
7. If I use this training I am more likely to be rewarded.	1 2 3 4 5
8. I am likely to receive some 'perks' if I use my newly learned skills on the job.	1 2 3 4 5
9. Before the training, I had a good understanding of how it would fit my job related development.	1 2 3 4 5
10. I knew what to expect from the training before it began.	1 2 3 4 5
11. I don't have time to try to use this training.	1 2 3 4 5
12. Trying to use this training will take too much energy away from my other work.	1 2 3 4 5
13. The expected outcomes of this training were clear at the beginning of the training.	1 2 3 4 5
14. Employees in this organization are penalized for not using what they have learned in training.	1 2 3 4 5
15. If I use what I learn in training, it will help me get higher performance ratings.	1 2 3 4 5
16. Employees in this organization receive various 'perks' when they utilize newly learned skills on the job.	1 2 3 4 5

<u>Please turn to the next page</u>

1 - Strongly disagree 2 - Disagree 3 - Neither agree nor disagree
4 - Agree 5 - Strongly agree

For the following items, please think about <u>THIS SPECIFIC TRAINING PROGRAM</u>:

17.	If I do not use my training I am unlikely to get a raise.	1 2 3 4 5
18.	I am more likely to be recognized for my work if I use this training.	1 2 3 4 5
19.	My workload allows me time to try the new things I have learned.	1 2 3 4 5
20.	There is too much happening at work right now for me to try to use this training.	1 2 3 4 5
21.	If I do not use new techniques taught in training I will be reprimanded.	1 2 3 4 5
22.	Successfully using this training will help me get a salary increase.	1 2 3 4 5
23.	If I do not utilize my training I will be cautioned about it.	1 2 3 4 5
24.	When employees in this organization do not use their training it gets noticed.	1 2 3 4 5
25.	I have time in my schedule to change the way I do things to fit my new learning.	1 2 3 4 5
26.	Someone will have to change my priorities before I will be able to apply my new learning.	1 2 3 4 5
27.	I wish I had time to do things the way I know they should be done.	1 2 3 4 5
28.	My colleagues appreciate my using new skills I have learned in training.	1 2 3 4 5
29.	My colleagues encourage me to use the skills I have learned in training.	1 2 3 4 5
30.	At work, my colleagues expect me to use what I learn in training.	1 2 3 4 5
31.	My colleagues are patient with me when I try out new skills or techniques at work.	1 2 3 4 5
32.	My supervisor meets with me regularly to work on problems I may be having in trying to use my training.	1 2 3 4 5
33.	My supervisor meets with me to discuss ways to apply training on the job.	1 2 3 4 5
34.	My supervisor will object if I try to use this training on the job.	1 2 3 4 5
35.	My supervisor will oppose the use of techniques I learned in this training.	1 2 3 4 5

<u>Please turn to the next page</u>

1 - Strongly disagree 2 - Disagree 3 - Neither agree nor disagree
4 - Agree 5 - Strongly agree

For the following items, please think about <u>THIS SPECIFIC TRAINING PROGRAM</u> :

36.	My supervisor thinks I am being less effective when I use the techniques taught in this training.	1 2 3 4 5
37.	My supervisor shows interest in what I learn in training.	1 2 3 4 5
38.	My supervisor opposes the use of the techniques I learned in training.	1 2 3 4 5
39.	My supervisor sets goals for me which encourage me to apply my training on the job.	1 2 3 4 5
40.	My supervisor lets me know I am doing a good job when I use my training.	1 2 3 4 5
41.	My supervisor will not like it if I do things the way I learned in this training.	1 2 3 4 5
42.	My supervisor doesn't think this training will help my work.	1 2 3 4 5
43.	My supervisor helps me set realistic goals for job performance based on my training.	1 2 3 4 5
44.	My supervisor would use different techniques than those I would be using if I use my training.	1 2 3 4 5
45.	My supervisor thinks I am being ineffective when I use the techniques taught in training.	1 2 3 4 5
46.	My supervisor will probably criticize this training when I get back to the job.	1 2 3 4 5
47.	The instructional aids (equipment, illustrations, etc.) used in training are very similar to real things I use on the job.	1 2 3 4 5
48.	The methods used in training are very similar to how we do it on the job.	1 2 3 4 5
49.	I like the way training seems so much like my job.	1 2 3 4 5
50.	I will have the things I need to be able to use this training.	1 2 3 4 5
51.	I will be able to try out this training on my job.	1 2 3 4 5
52.	The activities and exercises the trainers used helped me know how to apply my learning on the job.	1 2 3 4 5
53.	It is clear to me that the people conducting the training understand how I will use what I learn.	1 2 3 4 5

<u>Please turn to the next page</u>

1 - Strongly disagree 2 - Disagree 3 - Neither agree nor disagree
4 - Agree 5 - Strongly agree

For the following items, please think about <u>THIS SPECIFIC TRAINING PROGRAM</u> :

54.	The trainer(s) used lots of examples that showed me how I could use my learning on the job.	1 2 3 4 5
55.	The way the trainer(s) taught the material made me feel more confident I could apply it.	1 2 3 4 5
56.	The resources I need to use what I learned will be available to me after training.	1 2 3 4 5
57.	I will get opportunities to use this training on my job.	1 2 3 4 5
58.	What is taught in training closely matches my job requirements.	1 2 3 4 5
59.	The situations used in training are very similar to those I encounter on my job.	1 2 3 4 5
60.	There are enough human resources available to allow me to use skills acquired in training.	1 2 3 4 5
61.	At work, budget limitations will prevent me from using skills acquired in training.	1 2 3 4 5
62.	Our current staffing level is adequate for me to use this training.	1 2 3 4 5
63.	It will be hard to get materials and supplies I need to use the skills and knowledge learned in training.	1 2 3 4 5

Please complete questions 64 - 89 on the following pages.
Note that these items have new instructions
Please read them carefully

1 - Strongly disagree 2 - Disagree 3 - Neither agree nor disagree
4 - Agree 5 - Strongly agree

For the following items, please <u>THINK ABOUT TRAINING IN GENERAL</u> in your organization

64.	The organization does not really value my performance.	1 2 3 4 5
65.	My job performance improves when I use new things that I have learned.	1 2 3 4 5
66.	The harder I work at learning, the better I do my job.	1 2 3 4 5
67.	For the most part, the people who get rewarded around here are the ones that do something to deserve it.	1 2 3 4 5
68.	When I do things to improve my performance, good things happen to me.	1 2 3 4 5
69.	Training usually helps me increase my productivity.	1 2 3 4 5
70.	People around here notice when you do something well.	1 2 3 4 5
71.	The more training I apply on my job, the better I do my job.	1 2 3 4 5
72.	My job is ideal for someone who likes to get rewarded when they do something really good.	1 2 3 4 5
73.	People in my group generally prefer to use existing methods, rather than try new methods learned in training.	1 2 3 4 5
74.	Experienced employees in my group ridicule others when they use techniques they learn in training.	1 2 3 4 5
75.	People in my group are open to changing the way they do things.	1 2 3 4 5
76.	People in my group are not willing to put in the effort to change the way things are done.	1 2 3 4 5
77.	My workgroup is reluctant to try new ways of doing things.	1 2 3 4 5
78.	My workgroup is open to change if it will improve our job performance.	1 2 3 4 5
79.	After training, I get feedback from people on how well I am applying what I learn.	1 2 3 4 5
80.	People often make suggestions about how I can improve my job performance.	1 2 3 4 5

<u>Please turn to the last page</u>

1 - Strongly disagree 2 - Disagree 3 - Neither agree nor disagree
4 - Agree 5 - Strongly agree

For the following items, please <u>THINK ABOUT TRAINING IN GENERAL</u> in your organization

81.	I get a lot of advice from others about how to do my job better.	1 2 3 4 5
82.	I am confident in my ability to use new skills at work.	1 2 3 4 5
83.	I never doubt my ability to use newly learned skills on the job.	1 2 3 4 5
84.	I am sure I can overcome obstacles on the job that hinder my use of new skills or knowledge.	1 2 3 4 5
85.	At work, I feel very confident using what I learned in training even in the face of difficult or taxing situations.	1 2 3 4 5
86.	People often tell me things to help me improve my job performance.	1 2 3 4 5
87.	When I try new things I have learned, I know who will help me.	1 2 3 4 5
88.	If my performance is not what it should be, people will help me improve.	1 2 3 4 5
89.	I regularly have conversations with people about how to improve my performance.	1 2 3 4 5

SECTION THREE

For the following item, please think about <u>THE LEAN SIX SIGMA TRAINING PROGRAM</u>

*NOTE: FOR THIS QUESTION, PLEASE SELECT **ONLY <u>ONE</u>** OF THE FOLLOWING ANSWERS*

1 - I intend to use some aspect of Lean Six Sigma skills/methods in my work environment.

2 - I have attempted to use Lean Six Sigma skills/methods but have discontinued their use.

3 - I use Lean Six Sigma skills/methods from time to time.

4 - I use Lean Six Sigma skills/methods every time their use is appropriate.

Reflecting on the Green Belt training program you completed, which of the following **best** describes your application of Lean Six Sigma skills and methods since completing the training. 1 2 3 4 5

Appendix F

Participant Contact Notices

Initial Survey Participant Email Message

Dear Colleagues,

By the end of this week, you will receive an email with a link to a survey concerning employee perceptions of the influence of work environment factors on training effectiveness. This survey is being conducted by a doctoral candidate as part of a PhD research project through Wayne State University.

All St. John/Providence employees who completed the Lean Six Sigma Green Belt training programs are being asked to complete the questionnaire. Your participation in this survey is voluntary and all responses will be completely anonymous. Only aggregate survey data will be shared with St. John/Providence. Participants will have an opportunity to enter a drawing at the end of the survey. A GPS and two $50 gas cards will be awarded. The survey will take approximately 20 minutes of your time.

I greatly appreciate you taking the time to complete the questionnaire. The information gained from this survey will contribute to further understanding of workplace influences on training to improve training effectiveness in healthcare organizations.

This research project has been approved by the St.John/Providence IRB and Wayne State University HIC. An information sheet describing the research protocol is attached.

Thank you in advance for your participation.

Ernest L. Yoder, MD, PhD, FACP
Vice President, Medical Education and Research
St. John Health and Ascension Michigan

Howard Schubiner, MD
Chair, Institutional Review Board
Providence Hospital and Medical Centers

Participant Email Message with Questionnaire: Subsequent Mailings

Dear Colleagues,

As a St. John/Providence employee who completed a Lean Six Sigma Green Belt training program in 2007-08, you are being asked to complete a questionnaire about trainee perceptions of workplace influences on training effectiveness.

Your participation in this survey is voluntary and all responses will be completely anonymous. Participants will have an opportunity to enter a drawing at the end of the survey. A GPS and two $50 gas cards will be awarded.

Below is a direct link to the survey. You will need approximately 20 minutes to complete the questionnaire.

Thank you in advance for your participation.

Ernest L. Yoder, MD, PhD, FACP
Vice President, Medical Education and Research
St. John Health and Ascension Michigan

Howard Schubiner, MD
Chair, Institutional Review Board
Providence Hospital and Medical Centers

Final Request to Participate

Dear Colleagues,

This will be the final request for participation in the SJHS Training Survey. Your response can be submitted **until March 14**. If you have already completed the SJHS Training Survey, your participation is most appreciated.

Below is a direct link to the survey. You will need approximately 20 minutes to complete the questionnaire.

Thank you in advance for your participation.

Ernest L. Yoder, MD, PhD, FACP
Vice President, Medical Education and Research
St. John Health and Ascension Michigan

Howard Schubiner, MD
Chair, Institutional Review Board
Providence Hospital and Medical Centers

Appendix G

Research Information Sheet

Title of Study: The Influence of Transfer System Factors and Training Elapsed Time on Transfer
in a Healthcare Organization

Principal Investigator (PI): Beverly J. Mihalko
Instructional Technology
College of Education, Wayne State University
248-770-1042

Purpose:
You are being asked to be in a research study of the work climate factors that promote or inhibit transfer of learned skills and/or knowledge to the job because you participated in the St. John Health System Lean Six Sigma Green Belt training program. This study is being conducted across the St. John Health locations as part of a research study for dissertation work at Wayne State University, Detroit, MI.

Study Procedures:
If you take part in the study, you will be asked to complete:

- a form that requests some demographic information, and
- a survey to determine your perceptions of work climate factors that may influence the use of learned skills and/or knowledge for the Lean Six Sigma training you participated in as well as for training in general in your organization.

You will have the option of not answering any questions that you are not comfortable answering in the survey. The survey will be conducted electronically using SurveyMonkey and will be encrypted. It will take approximately 20-25 minutes of your time to complete the survey.

Benefits
As a participant in this research study, there be no direct benefit for you; however, information from this study may benefit other people now or in the future. The findings from this proposed study will further the understanding of factors that inhibit or promote transfer of training in the healthcare setting. Additionally, the proposed study could contribute to further understanding of the use of the this survey instrument as a generalizagble diagnostic tool for improvement training effectiveness in organizations.

Risks
There are no known risks at this time to participation in this study.

Costs
There will be no costs to you for participation in this research study.

Compensation
You will not be paid for taking part in this study. Upon completion of the survey you will have the opportunity to enter a drawing for a Garvin GPS system or one of two $50 gas cards.

Confidentiality:
All information collected about you during the course of this study will be kept without any identifiers.

Voluntary Participation /Withdrawal:
Taking part in this study is voluntary. You are free to not answer any questions or withdraw at any time. Your decision will not change any present or future relationships with St. John Health or Wayne State University or its affiliates

Questions:

If you have any questions about this study now or in the future, you may contact Beverly Mihalko at the following phone number 248-770-1042. If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

Participation:
By completing the survey you are agreeing to participate in this study.

Appendix H

Learning Transfer System Inventory Scale Codes

Factor	LTSI Item Numbers	For Research Purposes Only USERS IGNORE
Specific Training Program Scales		
Learner Readiness	1, 9, 10, 13	
Motivation to Transfer Learning	2, 3, 4, 5	
Personal Outcomes-Positive	6, 16, 17,	7, 8, 15, 18, 22
Personal Outcomes-Negative	14, 21, 23, 24	
Personal Capacity for Transfer	19, 25, 26, 27	11, 12, 20
Peer Support	28, 29, 30, 31	
Supervisor/Manager Support	32, 33, 37, 39, 40, 43	
Supervisor/Manager Sanctions	38, 44, 45,	34, 35, 36, 41, 42, 46
Perceived Content Validity	47, 48, 49, 58, 59	
Transfer Design	52, 53, 54, 55	
Opportunity to Use Learning	56, 60, 61, 63	50, 51, 57, 62
Training in General Scales		
Transfer Effort—Performance Expectations	65, 66, 69, 71	
Performance—Outcomes Expectations	64, 67, 68, 70, 72	
Resistance/Openness to Change	73, 74, 75, 76, 77, 78	
Performance Self-Efficacy	82, 83, 84, 85	
Feedback/Performance Coaching	79, 86, 87, 89	80, 81, 88

Reverse Coded Items: 26, 27, 61, 63, 64, 73, 74, 76, & 77

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ABSTRACT

THE INFLUENCE OF TRANSFER SYSTEM FACTORS AND TRAINING ELAPSED TIME ON TRANFER IN A HEALTHCARE ORGANIZATION

by

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Organizations and other sponsors of training face increasing pressure to demonstrate the value or impact of their training programs on individual and organizational performance. A critical element in the validation of training effectiveness is the permanent transfer of learned knowledge, skills, and behaviors to the workplace. The generalization of learned material to the job and maintenance of trained skills, are greatly influenced by training design, trainee characteristics, and work environmental factors. Using a multidimensional approach to identify all factors that promote or inhibit transfer could provide performance technologists and instructional designers with the insight necessary to design and develop strategic interventions that may enhance transfer and sustained workplace performance. Much of the empiric research has examined evidence of transfer soon after training while studies assessing the generalization or maintenance of skills and knowledge are few; yet, the majority of training transfer models specify a change in performance or behavior at the individual or organizational level following training as the primary measure of transfer. The purpose of this study was to examine trainee perceptions of transfer system factors that influence the transfer process as a continuum in a multi-center healthcare organization 9 to 24 months following a management training program

using the validated Learning Transfer System Inventory (LTSI) survey instrument. In addition, the study examined the influence of time elapsed since completion of training on stage of transfer achieved.

Results showed that trainees who perceived a more supportive work environment had a greater likelihood of progressing to maintenance of the skills and knowledge learned in training. Individuals who achieved the maintenance stage of transfer specifically, perceived motivation to transfer learning, performance self-efficacy, and transfer design as strong catalysts for transfer in this study while mean scores for trainees who achieved only partial transfer or no transfer of skills indicated a perception of a weak transfer climate overall. Time since completion of training was not found to be a significant influence on the stage of transfer achieved.

Previous studies have suggested that the transfer climate in organizations is complex and unique to specific types of organizations and training programs. These study results support previous findings and contribute to the understanding of transfer as a process. These and other findings are discussed as well as implications for instructional designers, performance technologists, and the business of healthcare. Limitations related to the study and recommendations for future research are also presented.

AUTOBIOGRAPHICAL STATEMENT

Beverly Jo Mihalko received her Bachelor of Science degree in microbiology from Eastern Michigan University in 1974. In 1982, she received a Master of Public Health (MPH) degree in epidemiology from the University of Michigan, School of Public Health in Ann Arbor, Michigan. Beverly also holds certifications in infection control (CIC) and healthcare safety management (CHSP) and is registered medical technologist (ASCP).

Beverly began her career in healthcare as a medical technologist, working in the diagnostic bacteriology laboratory at the Children's Hospital of Michigan, in the Detroit Medical Center. Upon completion of the MPH, Beverly pursued a career in hospital epidemiology and infection control at Saratoga General Hospital in Detroit, Michigan. In 1985, she accepted a management position as Director of Infection Control and Safety at Providence Hospital and Medical Centers in Southfield, Michigan. In 1999 Beverly joined the Oakwood Healthcare System as Corporate Director of Infection Control and Safety. Beverly is currently the Associate Dean of Allied Health Programs at Davenport University in Grand Rapids, Michigan.

Beverly is a member of the Association for Professionals in Infection Control and Epidemiology (APIC), the American Public Health Association (APHA), the Association for University Programs in Health Administration (AUPHA), and the American Society for Training and Development (ASTD). She has held numerous elected positions and appointments in addition to membership in several professional organizations. Beverly has presented extensively on infection prevention and healthcare safety issues and initiatives for over 20 years.