



2014

Adherence to Home Programs in Patients with Acute Orthopedic Injuries of the Upper Extremity

Brien J. Buckentine
University of North Dakota

Justin L. Fredrickson
University of North Dakota

[How does access to this work benefit you? Let us know!](#)

Follow this and additional works at: <https://commons.und.edu/ot-grad>



Part of the [Occupational Therapy Commons](#)

Recommended Citation

Buckentine, Brien J. and Fredrickson, Justin L., "Adherence to Home Programs in Patients with Acute Orthopedic Injuries of the Upper Extremity" (2014). *Occupational Therapy Capstones*. 34.
<https://commons.und.edu/ot-grad/34>

This Scholarly Project is brought to you for free and open access by the Department of Occupational Therapy at UND Scholarly Commons. It has been accepted for inclusion in Occupational Therapy Capstones by an authorized administrator of UND Scholarly Commons. For more information, please contact und.common@library.und.edu.

ADHERENCE TO HOME PROGRAMS IN PATIENTS WITH ACUTE ORTHOPEDIC
INJURIES OF THE UPPER EXTREMITY

by

Brien J. Buckentine, MOTS & Justin L. Fredrickson, MOTS

Advisor: Anne M. Haskins, PhD, OTR/L

An Independent Study

Submitted to the Occupational Therapy Department

of the

University of North Dakota

In partial fulfillment of the requirements for the degree of

Master's of Occupational Therapy

Grand Forks, North Dakota

May 17, 2014

This Independent Study, submitted by Brien J. Buckentine and Justin L. Fredrickson in partial fulfillment of the requirements for the Degree of Master's of Occupational Therapy from the University of North Dakota, has been read by the Faculty Advisor under whom the work has been done and is hereby approved.

Faculty Advisor

Date

PERMISSION

Title Adherence to Home Programs in Patients with Acute Orthopedic Injuries of the Upper Extremity

Department Occupational Therapy

Degree Master's of Occupational Therapy

In presenting this Independent Study in partial fulfillment of the requirements for a Degree of Master's of Occupational Therapy from the University of North Dakota, we agree that the Department of Occupational Therapy shall make it freely available for inspection. We further agree that permission of extensive copying for scholarly purposes may be granted by the professor who supervised our work, in her absence, by the Chairperson of the Department. It is understood that any copying or publication or other use of this Independent Study or part thereof for financial gain shall not be allowed without written permission. It is also understood that due recognition shall be given to us and the University of North Dakota in any scholarly use which may be made of any material in this Independent Study.

Signature _____ Date _____

Signature _____ Date _____

TABLE OF CONTENTS

List of Tables and Figures.....	viii
Acknowledgements.....	ix
Abstract.....	xii
Chapter	
I. Introduction.....	1
Definitions.....	3
Delimitations.....	5
Summary.....	5
II. Review of Literature.....	7
Prevalence of Non-Adherence to Home Programs.....	8
Demographics.....	8
Routines, Habits, and Roles.....	11
Client Factors Affecting Patient Roles.....	13
Client factors and medical conditions.....	13
Splinting and hand dominance.....	14
Strength and range of motion.....	14
Client Interaction with the Environment (Clinic/Home).....	15
Meaningfulness and Home Program.....	17
Occupation-Based, Preparatory, Purposeful Interventions.....	18
How current Occupations Affect	

	Non-Adherence to Home Programs.....	19
	References Available for Home Program.....	20
	Reinforcements for Completing Home Program.....	20
	Education of Patients in the Clinic.....	23
	Patient satisfaction with the therapist interaction.....	23
	Time allotted with the therapist.....	24
	Patient understanding of exercises/mastery of home program.....	25
	Patient ability to recognize changes and adapt home program as necessary.....	28
	Efficiency, effectiveness, and satisfaction in response to changes in home programing.....	30
	Problem and Purpose Statement.....	31
III.	Methodology.....	33
	Design.....	33
	Description of Setting and Typical Clientele.....	34
	Locale of the study.....	34
	Respondent Characteristics.....	34
	Instrumentation.....	35
	Procedures.....	46
	Institutional review board (IRB) approval and protection of respondent confidentiality.....	46
	Sampling procedures.....	46

	Survey procedures.....	47
	Data collection.....	49
	Tools for Analysis.....	50
	Summary and Lead Into Chapter IV.....	50
IV.	Results.....	51
	Pre-Analysis Data Screening.....	51
	Research Question Analysis.....	52
	Demographic analysis.....	52
	Time and place of home program completion.....	53
	Activities affected by injury.....	54
	Therapist/client relationship and patient level of understanding.....	55
	Level of instruction provided by therapist.....	55
	Addressing and reporting pain.....	57
	Reported time to complete home program.....	59
	Respondents' adaptability to and perception of their home program.....	59
	Possible barriers and facilitators.....	60
	Adherence.....	60
	Inferential Analysis.....	61
	Spearman's <i>rho</i> Correlation Coefficients to Adherence Question.....	61
	Spearman's <i>rho</i> Correlation	

	Coefficients to Adherence Question.....	67
	Mann-Whitney <i>U</i> Test.....	69
	Summary.....	70
V.	Summary.....	71
	References.....	76
	Appendices.....	82
	Appendix A: Institutional Review Board Approval	
	Appendix B: Research Information Sheet	
	Appendix C: Request Letters to Therapist and Responses to Complete Independent study	
	Appendix D: Survey Questions as Submitted to Respondents via Qualtrics	
	Appendix E: Research Information Sheet	

LIST OF TABLES AND FIGURES

Table

1. Survey Questions with Supporting Literature.....37
2. Therapist/Client Relationship and Client Level of Understanding.....56

Figures

1. Level of Instruction Provided by Therapist.....57
2. Reported Pain Before, During, or After Home Program.....58
3. Adherence to Home Exercise Program as Reported from Respondents.....73

Acknowledgements

We wish to express our appreciation to our faculty advisor, Anne M. Haskins PhD, OTR/L, for her guidance, patience, knowledge, and commitment throughout this Independent Study. Our breath and comprehensiveness of this independent study could not have been completed without you and your dedication to our successful completion of this project. Our morning meetings were not only a great time to reflect our work, but also other facets of life vital to every occupational being. Thank you for allowing us this great opportunity to work with you.

We would also like to express our gratitude to Altru Health Systems and Travis Mackenzie, OTR/L, CHT for their time and participation in this Independent Study.

We would like to thank all of the faculty and staff at the University of North Dakota Occupational Therapy Department. Without the education we received from day one this project would not be what it is today. A special thanks to Sonia Zimmerman, PhD OTR/L, Gail Bass PhD, OTR/L, Sara Nielsen PhD, OTR/L, and Jan Stube PhD, OTR/L. Your proximity to the computer lab allowed us to pop in with quick questions and or to borrow of your texts and resources, for which you all were eager to assist us in any way possible. Thank you. Louise Detters, for always being willing to scan documents and email them to us.

Brien would like to thank:

Wife, Melissa Buckentine, for all your overwhelming support and encouragement over the last three years, even when you have been neglected you find a way to make time to help me. Without your assistance in reading and reviewing papers. Your input has definitely made me a better student and future therapist. You truly do deserve an honorary OT degree.

Family, for all the support and encouragement over the years to pursue my dreams whatever they maybe, especially Mom, Mary McLaughlin, Dad, Jim Buckentine, and Diane Buckentine, and Keishia Buckentine.

Justin Fredrickson, we made it! We are done! Thanks, for providing me with sanity when I was catastrophizing over every assignment/test the last couple of years. I have learned to be a little more relaxed...well most of the time. You also provided an outlet for someone to discuss anything other than shopping, clothes, dating, or any of the myriad of topics we endured for the last three years. You made going to OT school fun, thank you.

Justin would like to thank:

Wife, Kelsey Fredrickson, for all your support, encouragement, and understanding throughout this Independent Study as well as throughout the entire Master's of Occupational Therapy graduate program. It was a long road but we finally made it, I cannot thank you enough for all nights you spent quizzing me and reading over

my many papers and reflections. I know that you have been neglected when it comes to the time spent together but I plan on making up for that starting now.

Family, for all your support and encouragement over the last four year, as well as your time spent driving the incredibly boring 5 hours to Grand Forks to visit.

Brien Buckentine, I know that at times I was too relaxed and probably caused you to have high blood pressure at times, but thank you for the push I needed to get things done at times. Thank you for keeping me on track with your daily planner and reminders of when deadlines needed to be met. Thank you for being understanding and patient with me on completing this independent study during the life changing event of the birth of my daughter Finley. I also want to thank you for your friendship over the last four years as having another male my age in the program was instrumental in my survival.

Abstract

The purpose of this project was to explore the relationship between occupational therapy home program of clients with acute upper extremity injuries, client factors, and performance patterns that are influential in clients' adherence to their prescribed home programs. A secondary purpose was to develop an instrument intended to measure adherence in patients with an orthopedic injury of the upper extremity.

Using the Occupational Adaptation Model and Occupational Therapy Practice Framework Domain and Practice as guiding foundations, a thorough literature review of client home program adherence was completed. This led to the development of a prospective, online survey designed to capture variables that affected patient adherence to home programs after an orthopedic injury to the upper extremity. A convenience sample of 24 respondents completed the survey at a local hand therapy clinic. Following data collection, descriptive, correlational, and non-parametric analysis was completed using SPSS 21.0.

Overall, clients reported rather high adherence to completing their home program (52% to 79%). A moderate, positive relationship was found between respondents' beliefs in the importance of completing their home programs as prescribed and home program adherence. No significant relationships were found between demographic factors, pain experienced, patient satisfaction/dissatisfaction of therapist or home program, level of understanding of home program, or integration of home program into a daily routine.

These findings support the role of occupational therapists in creating home programs that patients believe are important for them to complete in order to return to previous levels of participation in occupations. These findings also suggest that further research is needed in order to explore factors that may influence client adherence to home programs including client factors and performance patterns, as greater adherence will likely result in improved function in occupations and increased quality of life.

Chapter I

Introduction

In occupational therapy, including the area of hand therapy, many patients require home programs to enhance their positive outcomes after a traumatic injury to the upper extremity. Adherence to prescribed home program has been described as the "most unpredictable, least controllable variable in a medical interventions" (Groth & Wulf, 1995, p.18). In addition, non-adherence to home programs not only affects the recovery of the patient, but also wastes health care dollars, resources, healthcare professionals times, and medication (Larrate, Taubman, & Willey, 1990). There are benefits to patient adherence with home programs. Adherence to home programs has been shown to increase strength (Magnus, Bychuk, Kim, & Fathing, 2013) and passive and active range of motion (Eng, Trommel, & Ritt, 2002).

Currently, there is a dearth of research about people with acute upper extremity injuries and their adherence to home programs. Despite the benefits of home programming, several researchers have shown there is a variable level of home program non-adherence ranging from approximately 25% to 70% (O'Brien, 2010; Paternostro-Sluga, Keilani, Posch, & Fialka-Moser, 2003; Sandford, Barlow, & Lewis, 2007). Low adherence rates are problematic for patient recovery and the aforementioned statistics provide evidence that a broad range of patient adherence is present in practice. More research is required to understand what factors influence patient adherence to home programs. Present research does not address client factors or performance patterns that

affect adherence to home programs (Sandford, Barlow, & Lewis, 2007). We found no study involving a tool used evaluate home program adherence related to client factors and performance skills.

The purpose of this independent study was to explore the relationship between occupational therapy home programs, client factors and performance patterns that are influential in patients' adherence to their prescribed home programs. This study will be the first step in developing a tool that will ultimately be useful for occupational therapists to use with patients who have had an upper extremity injury. Eventually, we hope that this tool can provide patient specific information that could provide therapists with valuable information to assist in the development of a patient-centered home program that will optimize home program adherence.

We performed a thorough review of existing literature on the topic of adherence, compliance, and/or home exercise programs with the following: home programs, acute upper extremities, performance patterns, familial support, routines, pain, equipment, perception of effectiveness, therapist interaction, and workers compensation. Next, we used Occupational Adaptation Model as a guide to develop a survey using Qualtrics to obtain information about the patient, the patient's diagnosis, other demographic information, and questions related to patient home program adherence. After completion of the survey development, Institutional Review Board (IRB) approval was obtained for this independent study from the University of North Dakota and a facility in the Upper Midwest where data collection subsequently took place. Upon IRB approval, data was collected at the facility in the Upper Midwest for a period of 20 days. Instruction was provided to the certified hand therapist at that facility about patients who were

appropriate for referral to this study. Respondents read and signed a statement of informed consent and were provide copies of the study parameters. The respondents completed the study survey on an iPad in the hand therapy clinic. The data was then analyzed using SPSS to explore potential relationships and differences that existed in home program adherence, related performance patterns and client factors.

Based on the Occupational Adaptation Model and literature review, the following variables were identified as those most relevant to home program adherence and this study: *social participation, integration of daily routines into home program, pain before, during, and after a home program, encouragement and support from family and friends, access to equipment and tools to complete home program, satisfaction with improvements, satisfaction with home program, perceived effectiveness of home program, ability to recognize improvement, expressed pain to therapist, therapist took time to integrate home program is part of daily routine, therapist took time to make sure respondent understood home program, therapist answered all of the respondents questions, therapist made sure respondent understood the need for the home program, overall health of the respondent, average hours work by the respondent, and age range of the respondent.*

Definitions

Occupational Therapy- Refers to an area of healthcare that focuses on “supporting health and participation in life through engagement in occupation” (American Occupational Therapy Association [AOTA], 2008, p. 625). Through this focus, occupational therapists work with a variety of people to improve their occupational functioning in everyday occupations. Crepeau, Cohn, and Schell (2003) defined an

occupations as "daily activities that reflect cultural values, provide structure to living, and meaning to individuals; these activities meet human needs for self-care, enjoyment, and participation in society" (p.1031). When developing the Model of Occupation Adaptation, Schkade and Schultz (1992) defined occupation as "... the means by which human beings adapt to changing needs and conditions, and the desire to participate in occupation is the intrinsic motivational force leading to adaptation" (p. 829). One specific area of the body that is vital to completion of everyday occupations is the upper extremity.

Acute Upper Extremity Injuries - Refers to injuries including the shoulder, arm, forearm, wrist, and hand that may have a slow or rapid onset and are not chronic, meaning a disease of long duration (Taber's Cyclopedic Medical Dictionary, 2009). Acute upper extremity injuries can include musculoskeletal and neuromuscular injuries. Musculoskeletal injuries include "fractures, derangements, dislocations, sprains and strains, contusions, crushing injuries, open wounds, and traumatic amputations" (American Association of Orthopedic Surgery, 2008, p. 129).

Home Program - Refers to any exercises, activities, tasks, hot or cold packs, paraffin baths, electrical stimulation, continuous passive motion machine use, splint wearing schedule or anything else assigned by a therapist for a patient to complete outside of the therapy session.

Adherence vs. Compliance - Adherence – Refers to a person deciding to support and collaborate with a medical intervention regimen or plan of care; so much so that he or she completes tasks and activities suggested by medical personnel and is included throughout the treatment process (Richards & Digger, 2011). Compliance – Refers to a

person submissively obeying orders by medical personnel. Furthermore compliance lacks a collaborative process that should occur between occupational therapists and the patient (Richards & Digger, 2011).

Delimitations

This independent study included several limitations. First, the survey was distributed within a small outpatient clinic within the Upper Midwest, limiting sample variability and generalizability of findings. Respondents were provided an iPad to complete the survey in the outpatient clinic. This may have led to the Hawthorn Effect since the therapist was in the room when the survey was completed. Additionally, even though respondents were informed of anonymity and that their individual survey results would not be shared with the therapist, they may not have recalled this point and may have answered portraying themselves in a positive manner. Finally, the survey instrument was not pilot tested prior to its use in this independent study.

Summary

This independent study is comprised of an overview of reviewed literature, theoretical basis and rationale for the development of this survey study, the research methodology, the data analysis with interpretation of data, and conclusion with limitations and recommendations for utilization in the practice of occupational therapy.

Chapter I consisted of an introduction to the literature, problem statement due to a lack of current research, the purpose of this independent study, an overview of the development of the study and survey used to identify relationships between home program adherence and client factors and performance patterns, and significantly important definitions of the study. A more detailed review of literature is provided in

Chapter II related to the following topic areas: demographics, routines/habits/roles, client factors affecting patient roles, patient interaction with the environment, meaningfulness of home programs, occupation-base, preparatory and purposeful interventions, how current occupations effect non-adherence to home programs, references available for home programs, reinforcements for completing home programs, patient satisfaction with therapist interaction, time allotted with therapists, patient understanding of exercises/mastery of home program, patient ability to recognize changes and adapt home program as necessary, and efficiency/effectiveness/satisfaction in response to changes in home programming.

Chapter II

Literature Review

Chapter II: Literature Review includes an examination of literature relating to home program adherence and adherence to home programs in people with upper extremity injuries. The focus of this examination is on how client factors affect one's ability to adhere to his or her home program. Specifically, literature will be presented focusing on the prevalence of non-adherence to home programs, education of patient in the clinic, and current tools and instruments used to increase client adherence.

Occupational therapy is an area of healthcare that focuses on supporting health and participation in life through engagement in occupation (American Occupational Therapy Association [AOTA], 2008, p. 625). Through this focus, occupational therapists work with a variety of people to improve their occupational functioning in everyday occupations. Crepeau, Cohn, and Schell (2003) defined an occupations as "daily activities that reflect cultural values, provide structure to living, and meaning to individuals; these activities meet human needs for self-care, enjoyment, and participation in society" (p.1031). When developing the Model of Occupation Adaptation, Schkade and Schultz (1992) defined occupation as "occupation defines the means by which human beings adapt to changing needs and conditions, and the desire to participate in occupation is the intrinsic motivational force leading to adaptation" (p. 829). One specific area of the body that is vital to everyday occupations is the upper extremity.

Upper extremity injuries can be so debilitating that with loss of function people may lose their ability to complete activities of daily living, such as dressing or bathing. When injuries of the upper extremity occur, healthcare is often provided by occupational therapists who specialize in hand therapy. These occupational therapists use specialized skills to “provide therapeutic interventions to prevent dysfunction, restore function and/or reverse the progression of pathology of the upper limb in order to enhance an individual’s ability to execute tasks and to participate fully in life situations”(Dimick et al., 2009, p. 374). Occupational therapists specializing in hand therapy work with clients who have acute upper extremity injuries. Acute upper extremity injuries include injuries of the shoulder, arm, forearm, wrist, and hand that may have a slow or rapid onset and are not chronic, meaning a disease of long duration (Taber’s Cyclopedic Medical Dictionary, 2009). Acute upper extremity injuries can include musculoskeletal and neuromuscular injuries. Musculoskeletal injuries include “fractures, derangements, dislocations, sprains and strains, contusions, crushing injuries, open wounds, and traumatic amputations” (American Association of Orthopedic Surgery, 2008, p. 129).

Trybus, Lorkowski, Brongel, and Hladik (2006) found that 28.6% of all injuries and 28% of injuries to the musculoskeletal system occur in the hand. Musculoskeletal injuries of the upper extremity have the potential to cause functional limitations in areas all areas of occupation. The American Association of Orthopedic Surgery (AAOS) (2008) reported that of all fractures, 38% occurred in the upper extremity. Limitations in completing activities of daily living (ADL’s) were noted in 4% of people; the number rose to 13% of in people over 65 years of age. Furthermore, 82% of people reported difficulty with instrumental activities of daily living (IADL’s) specifically in household

chores (AAOS, 2008). The United States Bureau of Labor and Statistics, Department of Labor (2011) indicated that people with upper extremity injuries were off from work an average of 10 days. Time away from work due to injury causes deficits for persons, and also creates a need for occupational therapists to assist people in adapting their ability to increase functioning and promote return to work.

In the area of hand therapy, many patients require home programs to continue to have efficacious results after a traumatic injury to the upper extremity. Adherence to prescribed home program has been described as the "most unpredictable, least controllable variable in a medical intervention" (Groth & Wulf, 1995, p.18). In addition non-adherence to home programs not only affects recovery of the patient, but also wastes health care dollars, resources, healthcare professionals times, and medication (Larrate, Taubman, & Willey, 1990). Adherence to home programs has been shown to increase strength (Magnus, Bychuk, Kim, & Fathing, 2013) and passive and active range of motion (Eng, Trommel, & Ritt, 2002). Due to the effect that home program adherence has on clients, we are interested in examining client factors and performance patterns that affect it.

Prevalence of Non-Adherence to Home Programs

Demographics

The literature revealed inconsistent evidence regarding how demographic information affects home program adherence. Chen, Neufeld, Feely, and Skinner (1999) conducted research examining factors influencing home exercise program compliance among 62 outpatients with upper-extremity impairments. They found no significant correlation between gender, marital status, and work status, and the compliance of

exercise programs among patients with upper extremity impairments. One of the major limitations in the Chen et al. (1999) study was the long length of the instruments used to measure outcomes. This may have led to participants rushing through or not completing the surveys including demographic information which may have affected results. While the research from Chen et al. (1999) did not show demographics have an effect on home program adherence, Kirwan, Tooth, and Harkin (2002) found that demographics do affect home program adherence.

Kirwan et al. (2002) used an exploratory and correlational study design to interview 41 patients and 69 therapists using a survey. They found that one reason patients reported non-adherence was due to home programs “interference with their family or social life” (Kirwan et al., 2002, p. 37). However, in this study Kirwan et al. (2002) found that therapists thought that the main reason for non-adherence was “attitudes of the patient, such as ignorance or forgetfulness” (p. 37). Based on these findings, it appears that therapists did not take into account demographics such as marital status into the home program. Due to these inconsistencies in existing evidence, it is important to consider demographic information when addressing home program adherence. Additional limitations of the Kirwan et al. (2002) research study were that the survey used was subjective and the social biases of the respondents could have influenced their responses related to demographic information when answering. Finally, future research should continue to examine subjects’ demographics to discover their influence on home program adherence.

Routines, Habits, Roles

Home program adherence can also affect a client's performance patterns, which include the habits, routines, roles, and rituals that are used when engaging in occupation (AOTA, 2008). Sanders and Oss (2013) explored how using daily routines can promote medication adherence in older adults. The researchers interviewed 149 community dwelling older adults to assess adherence to medication regimens. They found that 91% of the sample used mealtime, wake-up, and sleep routines to adhere to their medication regimen. These findings suggest that it is important that when considering increasing adherence, daily routines should be incorporated and addressed.

O'Brien and Presnell (2010) studied people who had experienced complex finger fracture dislocations using a qualitative phenomenological and grounded theory study design. Eighteen respondents were obtained and interviewed either in person or via telephone. A major limitation of this study was that it was retrospective in design and some respondents were more than five years post injury. Predictors of adherence were the level of understanding between the injury, severity, and treatment, and beliefs of how about how adherence to home programs will affect their outcome (O'Brien & Presnell, 2010). Furthermore, O'Brien and Presnell (2010) recommended that therapists provide examples of how patients can do ADL's, so that the patients do not compromise their home program adherence.

Sluijs, Kok, and van der Zee (1993) studied physical therapy patient adherence and found that one main factors affecting non-adherence were the perceived barriers to the patients. Results of this study were found from a sample of 222 therapists questionnaires, 84 therapists audio recordings of therapy sessions, which amounted to

1,837 audio recorded sessions and 1,681 patient questionnaires. The barriers that patients perceived related to habits roles and routines. For example, there was not enough time or that the client and/or therapist did not help integrate the habits and routines into the client's day (Sluijs et al., 1993). Specifically, they found that patients stated "exercising required too much extra time, that the exercises were not adjusted to their particular situation, or that exercises did not fit into their daily routine" (Sluijs et al., 1993, p. 779). Furthermore, had integration of exercises into daily routines been utilized, other barriers may have not been as prevalent such as forgetting to exercise, time to do it at work, time to do it due to caring for children, and too much fatigue after a busy day. Although the findings support the integration of interventions into habit, roles, and routines to decrease barriers to adherence, Sluijs et al. (1993) found several limitations to their study. First, they examined only short-term compliance of patients and thus results could not be generalized to long-term compliance. Second, researchers studied only patients who were either adherent or non-adherent to home programs. Patients that were partially adherent or non-adherent were removed due to the ambiguities that these characteristics in the sample data might cause and the removal resulted in 695 subjects.

The researchers have demonstrated that when habits, roles, and routines are integrated into home programs, medication adherence (Sanders & Oss, 2013) and adherence to splint wearing home programs (O'Brien and Presnell, 2010) will increase. When habits, roles, and routines are not addressed, Sluijs et al. (1993) found that many barriers that can limit home program adherence. Due to these factors it is important for occupational therapists to address habits, roles and routines when prescribing home programs to increase adherence.

Client Factors Affecting Patient Roles

Specific abilities, characteristic or beliefs a client has that affect his or her performance in activities or occupations are client factors (AOTA, 2008). Due to the impact that client factors have on home program adherence, it is important to consider them when occupational therapists are prescribing homes to clients with upper extremity injuries. There is sufficient research showing that client factors such as cognition and medical conditions (Jette et al., 1998) and interventions such as splinting and hand dominance (Paternostro-Sluga, Keilani, Posch, & Fialka-Moser, 2003; Sandford, Barlow, & Lewis, 2008), and strength and range of motion (Jette et al., 1998; Magnus, Boychuk, Kim, & Farthing, 2013), can greatly affect home program adherence.

Cognitive factors and medical conditions

Jette et al. (1998) completed a study to identify predictors of participation and adherence in 103 functionally limited, community dwelling adults. They found that a lower number of new medical conditions increased participation in home programs. While that client factor contributed to participation, “ a positive attitude and a sense of control toward exercise, lower levels of confusion and depressive moods, and the development of fewer new medical problems during the program” (Jette et al., 1998, p.419) led to increases in adherence to home programs.

Similarly, other researchers have found that the way patients thought about their illness or injury affected their level of adherence. Sluijs et al. (1993) found that the prognosis of the injury or illness and the degree of hindrance were indicators for level of adherence. These researchers found that a negative relationship present. For example,

patients who thought they would not be able to recover were less likely to be adherent with their home programs.

Splinting and hand dominance

Client factors, such as hand dominance, were also studied by Sandford et al. (2008). Sandford et al. (2008) examined adherence rate of people required to wear a thermoplastic splint for 24 hours after a forearm tendon repair. Seventy-six participants participated in the study and 67% of subjects were found to be non-adherent in their home program. Sandford et al. (2008) found no significant difference between client factors, including hand dominance or injury and adherence to home program. Sandford et al. (2008) found that the most likely reasons for non-adherence were bathing and dressing or discomfort in the splint. Paternostro-Sluga et al. (2003) studied adherence in patients with a peripheral nerve injury. Patients were approximately 85% adherent to their home program. Interestingly, and contrary to Sandford et al.'s (2008) findings, Paternostro-Sluga et al. (2003) reported higher adherence in patients who had an injury to their dominant hand. In contrast to the findings by Sandford et al. (2008), Paternostro-Sluga et al. (2003) found that patients were uncertain about how long splints should be worn and that led to non-adherence.

Strength and range of motion

Jette et al. (1998) found that increased mobility and muscle weakness improved participation in home programs, which ultimately led to increased adherence. Other study results have shown improved outcomes when client factors are addressed. Magnus et al. (2013) took into consideration the client factor of limb function and how home resistance tubing strength training program of a trained limb affected strength of the untrained limb.

They implemented a study using an experimental group (n=13) using TRAIN (an at home resistance tubing strength training program of one shoulder) and a control group (n=10) that received no intervention. Magnus et al. (2013) found that the TRAIN group had increased strength and internal rotation of both the trained and untrained limbs when compared to the control group. This study shows that when client factors, such as having one flaccid upper extremity due to stroke, are addressed by assigning a relevant home program, significant outcomes can be obtained.

When considering client factors, occupational therapists need to take into account client factors such as mobility, muscle weakness, and current medical conditions when prescribing home programs. Furthermore, client factors such as hand dominance, strength, ROM, and injury may need to be determined by the therapist on a case-by-case basis as evidenced by existing research (Magnus et al., 2013; Paternalnostro-Sluga et al., 2003; Sandford et al., 2008).

Client Interaction With the Environment (Clinic/Home)

When clients participate in the occupation of completing a home program, they do so within a specific environment. AOTA (2008) defined environment as the external physical environment, referring to “the natural and built nonhuman environment and the objects in them” (p. 642), and the social environment, which is “constructed by the presence, relationships, and expectations of persons, groups, and organizations with whom the client has contact” (p. 642). A client’s environment can affect adherence levels to home programs and was shown in a study by Deyle et al. (2005). Deyle et al. (2005) compared the outcomes of a home-based and a clinically-based physical therapy program for patients with osteoarthritis of the knee using the Western Ontario and

McMaster Universities Osteoarthritis Index (WOMAC). The WOMAC is a self-report of function stiffness and pain, in which higher scores indicate, increased client perception of their stiffness and pain (Deyle et al., 2005). Clients in the clinical group had a 52% increase in WOMAC scores, as compared to a 26% increase in the home-based exercise group (Deyle et al., 2005). These findings suggest that adding a number of clinical visits for manual therapy and supervised exercise during home programs could improve outcomes. Khalil et al. (2012) found that adding an exercise Digital Video Disc (DVD) home programs of individuals with Huntington's Disease supported engagement in the exercise programs prescribed to the clients in their home environments. The patients in the study had a 73.3% adherence rate, which may have been due to the ability of the clients to generalize what they had learned in therapy sessions to the DVD for home use. Although the aforementioned findings provide insight to environmental effects on clients with acute upper extremity injuries prescribed home programs, there is a limited amount of research available and the topic should be further addressed.

Social relationships with family and friends or affiliations with professional and community organizations shape a person's social environment. Furthermore, with each of these relationships, there are expectations and demands that individuals must meet in order to remain a member of the group (AOTA, 2008). For some individuals, these demands may be of greater importance than heeding the advice of a medical professional or following a home program. Kirwan et al. (2002) found that respondents reported non-adherence to home programs due to time constraints and the interference with social obligations. Sluijs et al. (1993) also found that social environment, revolving around the family, was one reason subjects were non-adherent in their home program. Specifically,

one patient identified that her role in caretaking for three children left little time to complete her home program. Sluijs et al. (1993) also purported that the lack of positive feedback was a factor that limited patients' completion of their home program. Patients who were in environments in which they received positive feedback were more likely to adhere to their home programs though researchers were not certain if positive feedback came after or before adherence to home programs (Sluijs et al., 1993).

Meaningfulness and Home Programs

Occupational therapists provide client-centered care to individuals in order for patients continued participation or return to meaningful activities. Ideally, occupational therapists determine goals and intervention processes, including home programs, based on what is meaningful to the client. Problematically, goals for therapy and intervention processes are often based on informal interviews in which clients do not specify meaningful occupations, leading to goals and interventions that are not meaningful to clients (Neistadt, 1995). Maitra and Erway (2006) found that while occupational therapists thought they were providing client-centered care, their clients may have had a different perception of what client-centered care was and whether or not they received it. Neistadt (1995) and Maitra and Erway's (2006) research findings showed a need for occupational therapists to inform clients of what client-center care was and then provide that client-centered care. Colaianni and Provident (2010) addressed the issue of meaningfulness of occupation-based interventions as perceived by therapists. They found that 69% of hand therapists responding to their survey indicated that occupation-based interventions promoted meaningful experiences leading to increased motivation, client satisfaction, and adherence in clients. The aforementioned research findings suggest that

meaningfulness of home programs to clients is an important variable in improving client participation and adherence; however, a dearth of evidence persists in this area of research and occupational therapy practice from the client's perspective.

Occupation-Based, Preparatory, Purposeful Interventions

“The intervention process consists of the skilled actions taken by occupational therapy practitioners in collaboration with the client to facilitate engagement in occupation... [and]...be health-promoting” (AOTA, 2008, p. 652). Interventions can be occupation-based, purposeful, or preparatory in nature. Although evidence is limited and should be further addressed, Amini (2011) found in a systematic review of evidence-based articles that occupation-based activities are effective in clients with upper extremity injuries to promote healing, and allows a client to engage in an occupation that is meaningful and purposeful. By facilitating the client's performance in occupation-based activities, interventions will be “supporting health and participation in life through engagement in occupation” (AOTA, 2008, p. 626), which is the overarching goal of occupational therapy.

Colaianne and Provident (2010) studied the benefits and barriers to using occupation-based hand therapy as perceived by hand therapists. Using surveys, Colaianne and Provident (2010) found that hand therapist overwhelmingly agreed (97%) that occupation-based interventions were beneficial to hand therapy clients. However, Colaianne and Provident (2010) also found that the therapists only used occupation-based interventions with less than half of their patients, due to barriers such as caseload demands, ill-equipped, management constraints, and financial costs. Limitations of this study included poor response rate (23%), such a low response rate may not accurately

reflect occupational therapists working in hand therapy. Another limitation is that the respondents did not understand that term “occupation as a means”, which could limit their ability to use occupation-based interventions in their practice. Furthermore, researchers cited that 75% of the respondents were certified hand therapists, which they found to have several challenges. This may have explain their lack of understanding of the concept “occupation as a means”, which could be limited due to consistent non-use of occupation-based interventions over time.

Guzelkucuk, Duman, Taskaynatan, and Dincer (2007) found that purposeful activities, such as those activities mimicking ADL’s may improve function more effectively. Possible reasons cited for the increased effectiveness was therapists motivating clients by informing them of the progress they have made, showing patients the decrease in time to complete tasks, and observed motivation when completing the activities that mimic ADL’s rather than exercises Guzelkucuk et al., 2007). Guzelkucuk et al. (2007) attributed the increase efficacy and motivation the patients’ perception that their abilities are improving. Although, Guzelkucuk et al. (2007) found these positive outcomes were due to the therapists providing the clients with information about their improvements and increase/decreased time to complete activities. Additionally, Guzelkucuk et al. (2007) also stated that they observed that patients appeared to be more motivated when performing activities mimicking ADL’s however, they indicated that these results were not statistically significant and more research was needed.

How Current Occupations Affect Non-Adherence to Home Program

Occupations, which are the everyday activities that individuals engage in, can also have an effect on adherence. Although their study did not achieve criteria for a significant

difference, Chen et al. (1999) found that participants who engaged in the current occupation of child rearing were more compliant to home programs than those who did not engage in this occupation. Similarly, Chen et al. (1999) found no significant correlation between work status and compliance of home exercise programs. Further research is needed to identify how occupations are affecting, and are affected by, home programs in order to increase and improve client therapy outcomes.

References Available for Home Program

References for home programs can include, but are not limited to, handouts, demonstration, videos/DVDs, tape recordings, and caregiver assistance. In research regarding prescribed home programs, studies have shown that with increased references, adherence increases. In one study, Khalil et al. (2012) provided patients with a DVD of their home program, had therapists demonstrate the exercises, and had patients practice their prescribed exercises in the clinic before using them at home. The results showed increased clients' adherence to their respective home program (Khalil, et al., 2012).

Additional variables that have been shown to decrease recovery time and the time it took for clients' return to function include implementation of follow-up clinical visits to allow for supervised exercise and feedback from therapists (Deyle, 2005).

Reinforcements for Completing Home Program

Patients may experience a wide variety of reinforcements that can be positive or negative, and can influence patients' adherence to their home program. Research has shown that intrinsic and extrinsic reinforcements have benefits and can increase learning in different ways. (Lei, 2010). Research has also shown the use of positive reinforcements increases wanted behaviors in children and older adults with psychosocial

disabilities (Holm, Santangelo, Fromuth, Brown, & Walter, 2000; Watling, & Schwartz, 2004; Watling, Deitz, Kanny, & McLaughlin, 1999).

Chiung-Ying et al. (1999) found a significant correlation between participants who received reinforcement of support from family, friends, or significant others and compliance with their home program. Congruently, Sluijs et al. (1993) found there to be a positive relationship between positive reinforcement and patient adherence. While the reinforcements in these two studies were positive, there are also negative reinforcements that can greatly affect adherence to home programs, which should be addressed by occupational therapists. Kirwan et al. (2002) and O'Brien and Presnell (2010) found that the negative reinforcement of pain caused a decrease in home program adherence while a decrease in pain increased adherence.

Byl, Archer, and McKenzie (2009) studied adherence to home program in patients who have focal hand dystonia. The subjects included 13 patients who were diagnosed with focal hand dystonia. Patients were divided into groups who received a home program and another group that received a home program with supervised practice (Byl et al., 2009). Byl et al. (2009) concluded that patients who were given a home program with supervised practice were more likely to be adherent to their home program. Feedback from therapists during the supervised session could have been a reinforcement for the participant and Byl et al. (2009) speculated that this was due to the feedback that was given to patients to allow them to perform the home program accurately. Furthermore, outcomes were expected to be better due to the reduction in abnormal movements that could occur with a home program if unsupervised (Byl et al., 2009). Additionally, Byl et al. (2009) found that the level of severity may be a reinforcing factor

and that patients who perceived their condition as less severe were more likely to be adherent to their home program than those who perceived their condition to be severe.

Byl et al. (2009) also found that focal hand dystonia is multifactorial in its etiology. Potential reinforcement factors affecting adherence home programs for clients with local hand dystonia were motivation, ability to modify and adapt performance techniques and demands of occupations, family support, and ability to think positively (Byl et al., 2009). Despite the usefulness of the aforementioned findings, Byl et al. (2009) reported several limitations to the study. The size of the sample limited generalizability to other populations, subjects were also allowed to receive other therapies such as occupational, physical, psychological, and musical instruction in conjunction with the study and the study did not use a control group (Byl et al., 2009). Finally, Byl et al. (2009) identified that the Hawthorne Effect could have occurred due to the increased attention, rehabilitation services, and understanding by the participant. More research is needed to confirm these findings (Byl et al, 2009).

These results from the studies related to reinforcements for completing home program demonstrate that not only did adherence play a role in the outcomes of the patient, but there were also many factors that figured into the level of adherence the patient achieved. Factors such as positive/negative reinforcement (Chiung-Ying et al., 1999; Holm, Santangelo, Fromuth, Brown, & Walter, 2000; Kirwan et al., 2002; O'Brien & Presnell, 2010; Watling, Deitz, Kanny, & McLaughlin, 1999; and Watling & Schwartz, 2004), relationship with the occupational therapist(s) specializing in hand therapy (Kirwan et al., 2002), intrinsic reinforcements (Byl et al., 2009), feedback (Byl et al., 2009), positive thought processes (O'Brien & Presnell, 2010), task demands (Byl et

al., 2009), and perception of injury (Byl et al., 2009) influence the level of adherence to home programs.

Education of Patients in the Clinic

Patient satisfaction with the therapist interaction

The model of Occupational Adaptation (OA) identifies feelings of personal satisfaction as a way to measure success in occupational performance (Cole & Tufano, 2008). The level of satisfaction a patient has with his or her occupational therapist may affect the patient's success in his or her occupational performance of home programs. The therapist who imparts education to the client has the ability to affect the client's appraisal of his or her adaptive response during a time after an injury to the upper extremity if the information provided allows for the patient generate an adaptive response to an occupational challenge. The ability of a therapist to provide education, communicate effectively, and listen to a patient's concerns may be factors that affect the patient's level of satisfaction with his/her therapist.

In a mixed method study by McKinnon (2000), 83% of participants strongly agreed that they were satisfied with the quality of occupational therapy services provided at a specific site. The qualitative findings suggested that the quality of client therapist interactions including communication, helpfulness, usefulness of information give, and sensitivity to client's needs were main themes that lead to the overall satisfaction on occupational therapy services. O'Brien and Presnell (2010) suggested therapist provided detailed, evidence-based education about the nature of the injury and the proposed treatment, and revisit information so patient understanding is not changed by outside influences in order to increase patient adherence.

Time allotted with the therapist

“Context refers to a variety of interrelated conditions that are within and surrounding a client” and “exert a strong influence on performance” (AOTA, 2008, p. 642). The temporal context includes duration, which is directly related to the amount of time that a patient has with his or her therapist, which can affect performance and outcomes including home programs. McKinnon (2000) found that while participants strongly agreed that they were satisfied with the quality of occupational therapy services provided, there was need for improvement in time to get into the facility, as well as time with the therapists. One participant reported that if she had gotten in earlier and been able to have the time needed with the therapists her improvements would have happened faster. Another participant reported the therapists having to share their time with other patients due to a high volume of patients. (McKinnon, 2000) Although this aspect of time does not relate to home programming, it demonstrates the effects time allotted with a therapist can have on patient performance as well as overall satisfaction with therapy services and thus should be considered when prescribing and teaching home programs.

Jette et al. (1998) did address the amount of time with participants when prescribing home programs, leading to increased adherence. The researchers taught the home program to the participants and then completed home visits to review the program and go over exercises the participant had difficulties with in order to perform it correctly. This strategy led to increased rates of adherence in older adults in a resistance training home program. This strategy was also supported by Khalil et al. (2012) who reported a 73.3% adherence rate to home programs in which a therapist made a home visit to spend time reviewing the exercises prescribed.

Other improvements can be made during the time with therapists as well. Sanford, Barlow, and Lewis (2008) conducted a study to look at the level of adherence in flexor tendon injuries. The level of adherence was reported to be 32.9% or 25 of 76 people in the study (Sanford et al., 2008). Researchers identified that several implications for therapists in practice. This included more improvements to the information and education that is provided to patients to ensure understanding and follow through in terms of their level of adherence (Sandford et al., 2008). Sandford et al. (2008) also noted that the main reason for non-adherence was due to the need to perform ADL's particularly dressing, bathing, and other frequently completed occupations. However, Sanford et al. (2008) noted that if therapists provided directions to clients to remove the splint to complete activities such as bathing they need to stress the importance of doing so only for this activity as it may increase the clients level of non-adherence or diminish their perception for their need to adhere. This was also supported in Amini's (2008) guest editorial where she concluded that therapists should work with their clients' to be a consultant and problem-solver through a collaborative process so that clients can overcome barriers of their injury. Furthermore, this will allow the client to participate in desired areas of occupation (Amini, 2008).

Patient understanding of exercises/mastery of home program

The process of educating patients is one of the types of occupational therapy intervention in accordance with the AOTA Framework: Domain and Process 2nd edition. The education process "involves imparting knowledge and information about occupation, health, and participation and that does not result in the actual performance of the occupation" (AOTA, 2008, p.654). One area that occupation therapists utilize the

intervention of education is in home programming to ensure patients' understanding of their home program. When educating patients on home programs, there are barriers that may arise and need to be addressed in order for patients to understand and be adherent in their prescribed home programs. One barrier to adherence related to patient education is patient confusion. Jette et al. (1998) found that participants who had some confusion as to what was expected of them in completing their home exercise program were less likely to be adherent. Chiung-Ying (1999) findings also suggest that confusion may play a role in adherence as most participants could not recall the correct home program prescribed to them leading to only 35% being 100% adherent. These findings emphasize the importance of patient education of home programs in order to reduce confusion and increase adherence especially in older adults who may be experiencing cognitive decline, or in patients with other cognitive impairments.

Although barriers exist, there are many ways in which to overcome them in order for patients to be successful and adherent in their home program. Yuen et al. (2013) found that patients prescribed a home program using the Wii accurately reported completion. Patient's recorded in a log an average of 33.3 minutes and the time measured by the Wii itself was 29.5 minutes. In another study by Khalil et al. (2012), 73.3% of participants with Huntington Disease were adherent to their home program of a DVD that was taught to them by their therapists before taking it home to use. The therapists also made a follow up home visit to make sure patients were completing the exercises appropriately, and educated them on the proper way if they were not. Other ways to overcome barriers to patient understanding include increasing their self-efficacy (Chiung-Ying, 1999) as well as creating a positive attitude.

In O'Brien and Presnell's (2010) phenomenological study, they identified the major recurring theme that client's perception was inconsistent with the severity of the injury. This theme then led to patients questioning whether or not their home program was necessary or whether there were better options for treatment. This was demonstrated with one participant in the research with a finger injury talking to a dentist, who she respected. She had not been adhered to his home program and this led to the patient being upset with all of the work that she had put in with her home program (O'Brien and Presnell, 2010). This demonstrated that therapists have a need to continue to educate clients on their home program, so that the patients understand how important adherence is to achieve positive outcomes and to minimize the effect on adherence by individuals outside of occupational hand therapists. In a guest editorial, O'Brien (2010) stated asking the patient about his or her expectations, wants, and needs, so that they can be addressed throughout treatment, could alleviate problems like this.

Another option to increase home program adherence was to provide supervised practice of the home program (Byl et al., 2009). Byl et al. (2009) found that those who received home programs were not only more adherent, but also had greater gains in performance outcomes than people who did not receive the supervised practice. Furthermore, Byl et al. (2009) speculated that better outcomes may be achieved with supervised practice due to the feedback that patients received to prevent abnormal movements during their home program. While without such feedback other patients may use abnormal movements during their home program, which could affect the outcomes of the patient (Byl et al. 2009).

Dobbe, Trommel, and Ritt (2002) studied patient adherence in patients who received a flexor tendon repair. Using a splint that had a counting device that monitored home program adherence to finger exercises, they were able to determine the actual level of adherence in their 15 subjects (Dobbe et al. 2002). The subjects in this study were all instructed by the same therapist to perform their home program once per hour with 10 repetitions. Dobbe et al. (2002) did not tell the patients of the counting device on their splint. Researchers stated that the final range of motion after flexor tendon repair in zone two of the hand is assumed in hand therapy to be influenced by exercise during rehabilitation (Dobbe et al. 2002). Dobbe et al. (2002) supported this assumption and also suggested that passive range of motion is influenced by exercise as well. Dobbe et al.,(2002) also found that the patients who participated in the study performed many more exercises than prescribed and that others were found to change intensity and vary their level of adherence to their home program throughout the day. This led Dobbe et al. (2002) to believe that there is a need for more instructions to patients, so that they may be more adherent in their home programs (Dobbe et al. 2002). With more education about the need to be consistent with exercises this may lead to decreased adhesions in patients with flexor tendon injuries.

Patient ability to recognize changes and adapt home program as necessary

After an injury to the upper extremity, patients may need to change the way they go about doing different tasks or activities that they do on a daily basis. When a person recognizes that he or she needs to find a new way to change or modify an activity to complete it this is known as adaptive capacity (Cole & Tufano, 2008). Furthermore, when a person has injuries to his or her upper extremity the need to increase his or her adaptive

capacity may be necessary due to limitations caused by the injury or new precautions to follow to allow the injured extremity to heal.

Kaskutas and Powell (2009) used a grounded theory approach and standardized interview to explore activities in which people with flexor tendon lacerations completed. When needing to complete activities, 59% of patients were non-adherent to their home program and removed a splint to complete an activity even though they understood the precaution to keep the splint on (Kaskutas & Powell, 2009). The reason for the patients need to adhere to wearing their splint was to prevent re-rupture of tendon(s). Kaskutas and Powell (2009) did not have any re-ruptures in-patient who removed the splint. Researchers found that the participants level of adherence decreased with time (Kaskutas & Powell, 2009). Furthermore, Kaskutas and Powell (2009) found that most patients did not receive education, adaptive equipment, handouts demonstrating one handed techniques, or were not supervised performing any activities one handed from their therapist. Researchers concluded that most of the people that broke their precautions did so, because they saw no alternative to perform the necessary tasks within the day (Kaskutas & Powell, 2009). Kaskutas and Powell (2009) also found that providing it was within the scope of hand therapy to provide adaptations and modifications to activities and daily demands that patients may encounter after their flexor tendon repair. Furthermore, it is within the scope of practice of occupational therapy to “support health and participation in life through engagement in occupation” (AOTA, 2008, p. 626). Researchers concluded that by offering opportunities for the client to work through everyday activities, suggest adaptive equipment, and supervise simulated activities,

clients may increase their level of adherence (Kaskutas & Powell, 2009), which would also by definition increase their adaptive capacity (Cole & Tufano, 2008).

These findings were also supported in a guest editorial by O'Brien (2010) who stated that education alone is not enough and that interventions need to be more than advice. Additionally, O'Brien stated that patients need to use resources such as family members and coworkers, that can reinforce adherence to home programs.

Kaskutas and Powell (2009) noted that of their subjects that adhered to their precautions often just asked family members to complete the tasks they could not do one handed.

Finally, O'Brien (2010) also supported Kaskutas and Powell (2009) by stating therapists should provide examples of how activities can be successfully adapted to allow patients to adhere to their home program. Another factor presented by Jette et al. (1998) found that a sense of control over exercise increased home program adherence. A sense of control is gained by the patient being able to "initiate the exercises at the appropriate level of intensity, thereby eliminating possible frustration from attempting exercises that are too difficult for a weak person to perform" (Jette et al., 1998, p. 419). The patient is also in control of recognizing differences and changing exercises accordingly leading to a sense of control and ultimately increased adherence.

Efficiency, effectiveness, and satisfaction in response to changes in home programming

As a person overcomes an occupational challenge he or she often appraise this event (Cole & Tufano, 2008). This is known as adaptive response evaluation sub process. During this process patient's measure his or her level of efficiency, effectiveness and level of satisfaction (Cole & Tufano, 2008). Occupational therapists often elicit this

response by asking the patient about his or her home program. From the information provided by the patient the therapist facilitates the patient in adapting his or her home program to increase the efficiency, effectiveness, and satisfaction of the home program.

Courneya et al. (2004) found that perceived success in an exercise program led to higher expectations of success as well as lower negative affect. These factors in turn increased motivation and adherence in cancer patients completing an exercise home program. Jette et al. (1998) found similar results in older adults completing a home-based resistance exercise program. The researchers found that participants who saw exercise had benefits on their health had greater control over their exercise program and were more likely to be adherent and meet the goals of their exercise home program. While the studies by Courneya et al. (2004) and Jette et al. (1998) found results of positive effects related to efficiency, effectiveness, and satisfaction, Janssen et al. (1994) found results of negative effects. Jensen (1994) found that patients who completed exercises that did not produce desired results thought of the exercises as tiring or boring, thus leading to decreased participation and adherence.

Problem and Purpose Statement

Currently, there is dearth research on acute upper extremity injuries and client factors affecting adherence to home programs. Several researchers have shown there is a variable level of home program non-adherence from ~25% to ~70% (O'Brien, 2010; Paternostro-sluga, Keilani, Posch, & Fialka-Moser, 2003; Sandford, Barlow, & Lewis, 2007). This indicates that more research is required in this field. Research was found on home program adherence surveys specific to splint wearing interventions, however these surveys did not address client factors or performance patterns (Sandford, Barlow,

& Lewis, 2007). Furthermore, the term adherence does not have a universal definition and thus, variability was presented in each study. We found no study involving a tool used to evaluate home program adherence related to client factors and performance skills. This study will be the first step in developing and testing a tool that will be intended for occupational therapist to utilized with patients who have had an upper extremity injury. The purpose of this independent study was to explore the relationship between occupational therapy home programs, client factors, and performance patterns that are influential in clients' adherence to their prescribed home programs. We were interested in developing and testing an instrument intended to assess adherence to home programs for clients who have upper extremity injuries.

We anticipate that this research will ultimately provide therapists with an instrument that could be used clinically to assess client compliance with home programs and provide information that could be used in therapy to improve client adherence, thereby improving client outcomes. This research will lead to a better understanding of how client factors and performance patterns influence a clients' adherence to home programming. This research will also help occupational therapists determine areas in need of improvement in order to increase clients with upper extremity injuries adherence to home programming. Through making changes to home programming to fit clients and improving their outcomes, it is anticipated that clients will return to meaningful occupations increasing their quality of life.

Chapter III

Methodology

The Institutional Review Boards at the University of North Dakota in Grand Forks, North Dakota and Altru Hospital approved this study. *Chapter III: Methodology* consists of descriptions of the procedures used to collect and analyze the survey data used in this independent research study. Included within this chapter are the design and sample, description of the practice setting and typical clientele, instrumentation, procedures, and summary paragraph.

Design

A prospective one-shot case study survey design in an online format was used to access respondents and collect data to answer the research questions. This design was appropriate as "respondents [were] identified based on one or more pre-existing criteria and [were] administered a questionnaire that [was] then measured" (Blessing & Forster, 2013, p. 121.). Respondents were asked to participate if they had an acute upper extremity injury and had been prescribed a home program. Next, respondents completed an online survey. Blessing and Forster (2013) also described one-shot case studies as "descriptive studies in which the investigator wishes to describe what currently exists" (p.122). This also made a one shot case study appropriate for this study as the current the level of respondents' adherence and factors affecting it were investigated.

Description of Setting & Typical Clientele

Locale of the study.

The surveys were completed by the respondents at an outpatient hand therapy clinic located in a rehabilitation institution in the upper Midwest, where they were receiving therapy. This geographic location was chosen due to it being in a city with an approximate size of 60,000 people, but also with rural populations in the close vicinity. These factors were important as to allow for a variety of injuries that occur in both geographic areas (such as injuries that occur in blue-collar work including farming, industrial, and road construction, as well as white collar work such as professional, managerial, or administrative work). Some of the common injuries of clients who may receive treatment at this facility would then include fractures, wrist tendonitis, tendon lacerations, finger dislocations, carpal tunnel syndrome, amputations, arthritis, burns, frostbite, and crush injuries. The research site was chosen due to the appropriateness to access respondents who would meet inclusion criteria. Additionally, the site was chosen due to the second researcher's academic responsibility to complete a level II fieldwork at the site and its proximity to the campus of the University of North Dakota. Furthermore, the volume of clientele, as well the care provided to the respondents at the facility (including home programs) was anticipated to provide a data set suitable for this research study.

Respondent characteristics.

The inclusion criteria was established to better understand client factors and performance patterns of people with acute injuries and their adherence to home programming. Acute injuries were defined as injuries that occurred to people receiving

no longer than one-year of treatment from a hand therapist. Inclusion criteria included being a current occupational therapy client who was diagnosed with an acute upper extremity injury, been prescribed a home program, and was not a member of a special population, such as children and persons who were cognitively impaired. The respondents of this study had to be 18 years of age with no comorbidities or additional injuries.

Exclusion criteria included respondents with chronic illnesses (receiving more than one-year of treatment from a hand therapist) or injuries special populations, and patients who did not receive a home program from their certified hand therapist. Respondents with chronic illnesses/injuries were excluded because they were thought to have already developed a routine level of adherence. We sought to assess the level of adherence for clients with acute injuries to determine what client factors and patterns could be modified to better allow for adherence. Special populations were avoided due to the vulnerable nature of obtained from these respondents. Lastly, respondents who were not prescribed a home program were excluded because we sought to obtain personal experience of adherence to home programs.

Instrumentation

We found no study involving a specified and tested instrument used evaluate home program adherence related to client factors and performance skills. This study was be the first step in developing and testing a tool that will be intended for occupational therapist to utilized with patients who have had an upper extremity injury, in order to evaluate the relationship between home program adherence to client factors and performance skills. Ultimately, we hope that this instrument can provide client specific

information that could provide therapists with valuable information to assist in the development of a client-centered home program that will optimize home program adherence.

The instrument used in this study included questions pertaining to demographic information and factors that may influence adherence to home programs. We designed this instrument based on the assumptions of the Occupation Adaptation Model and existing literature related to acute upper extremity orthopedic injuries, adherence, and home programs. The psychometric properties of this instrument will also be analyzed as a secondary purpose of this study. The online survey consisted of 46 items that include Likert-type questions, multiple-choice questions, and short answer open-ended questions. These questions are related to the four constructs of the Occupational Adaptation Model including: occupations, adaptive capacity, relative mastery, and the occupational adaptation process (Cole & Tufano, 2008). The survey questions pertained to the client and his or her perspective of the relationship between client factors and performance patterns and the occupational hand therapist, the respondents home program, and demographic information. This survey was written at a 6th grade reading level to make it accessible and understandable to people of lower reading levels (Bastable, 2011). The survey questions and content supporting the development of the question can be found in Table 1. For a copy of the survey as submitted to the respondents via Qualtrics, refer to appendix D.

Table 1

Survey Questions with Supporting Literature

Survey Question	Literature Support
What is your age range?	Demographic information, vulnerable populations
What is your gender?	Occupational Adaptation: Occupations: the person Chen at al. (1999)- found no significant correlation between gender and compliance of exercise programs among patients with upper extremity impairments
What is your current marital status?	Chen at al. (1999)- found no significant correlation between marital status and compliance of exercise programs among patients with upper extremity impairments Kirwan at al. (2002)- stated that patient reported non-adherence to home programs were “not enough time, discomfort or pain caused by program, the program’s interference with their family or social life and forgetting to do the program” (p.37)
How many hours a week, do you work in a average week?	Chen at al. (1999)- found no significant correlation between work status and compliance of exercise programs among patients with upper extremity impairments Kirwan et al. (2002)- stated that patient reported non-adherence to home programs were “not enough time, discomfort or pain caused by program, the program’s interference with their family or social life and forgetting to do the program” (p. 37)
Does your injury prevent you from working?	Sluijs et al. (1993)- found conditions that caused greater difficulties with functioning complied better with home exercises than did patients who had less hindrance from their condition.
Are you receiving workman's compensation due to your injury?	OA: Occupational Adaptation Process: the environment
What is your hand dominance?	OA: Occupational Adaptation Process: the person Sanford et al. (2008)- found that no significant correlation was found between hand dominance, splint side, injury type and splint removal (non-adherence). Paternostro-Sluga et al. (2003)- better effect was

	reported if dominate hand was splinted
What side is you injury on?	OA: Occupational Adaptation Process: the person Magnus (2013)- found that a home based resistance tubing program and produce increases in both limbs.
What region of the arm are you seeking treatment for?	OA: Occupational Adaptation Process: the person
In general, how would you describe your overall health at this time?	OA: Adaptive Capacity: is affected by physical disability OA: Occupational Adaptation Process: the person Jette et al. (1998)- found that physical health variables were the primary indicators of a person's participation in a home-based, resistance-training program. Sluijs et al. (1993)- found conditions that caused greater difficulties with functioning complied better with home exercises than did patients who had less hindrance from their condition. Jette et al. (1998)- fewer numbers of new medical conditions increased home program adherence.
Which of the following areas are you not completing at the same level prior to your injury? (Check all that apply). <ul style="list-style-type: none"> • Bathing (1) • Dressing (2) • Hygiene/Grooming (3) • Home Management (MANAGING FINANCES, LAUNDRY, HOUSE CLEANING, YARD WORK, ETC) (4) • Social Participation (5) • Eating (6) • Child Rearing (7) • Meal Preparation (8) • Use the Bathroom (9) • Caring for Other Adults (10) • Work (11) • Education (12) • Sexual Activity (13) • Caring for Pets (14) • Leisure Participation (15) • Social Participation (16) 	OA: Adaptive Capacity: working towards the ability to recognize the need for change in functioning Chen et al. (1999)- greater perceived physical capacity (being able to complete the activities above) may find it easier and more possible to complete and comply with home programs but this was not significant and should not be generalizable. Sluijs et al. (1993)- found conditions that caused greater difficulties with functioning complied better with home exercises than did patients who had less hindrance from their condition. O'Brien (2010)- recommended that therapist give example of how other patients have successfully adapted ADL's without compromising adherence Kaskutas and Powell (2013)- found that hand therapists can facilitate patients' ability to adhere to precautions by incorporating ADL training to allow for a more holistic approach to rehabilitation.
Do you have any other medical	OA: Occupational Adaptation Process: the person

<p>conditions that affect you ability to complete your home program?</p>	<p>Jette et al. (1998)- found that physical health variables were the primary indicators of a person's participation in a home-based resistance-training program. Jette et al. (1998)- fewer numbers of new medical conditions increased home program adherence.</p>
<p>I understand the purpose of my home program.</p>	<p>Chen et al. (1999)- found that respondents with higher self-efficacy (the belief that one can perform particular behaviors, in this case home exercises) had increase compliance. Sanford et al. (2008)- improvements should be made in the information and education, which are given to patients to ensure their understanding of the injury and the risks encountered. O'Brien and Presnell (2010)- to increase adherence in patient's, researchers suggested therapist provided detailed, evidence-based education about the nature of the injury and the proposed treatment, and revisit information so patient understanding is not changed by outside influences Jette et al. (1998)- lower confusion increased home program adherence.</p>
<p>My therapist took time to explain the reasons and the purpose of my home program to me.</p>	<p>McKinnon (2000)- found that open clear communication between therapist and patient increases satisfaction in occupational therapy services. Sanford et al. (2008)- improvements should be made in the information and education, which are given to patients to ensure their understanding of the injury and the risks encountered. O'Brien and Presnell (2010)- to increase adherence in patient's researchers suggested therapist provided detailed, evidence-based education about the nature of the injury and the proposed treatment, and revisit information so patient understanding is not changed by outside influences Amini (2008)- stated occupational therapists in hand therapy should be a consultant, problem solver, and a teacher who collaborates and offers support while their clients are maneuvering through their disrupted life. Jette et al. (1998)- decreased confusion increased home program adherence.</p>
<p>My therapist answered all my questions</p>	<p>McKinnon (2000)- found that communication and client education increases satisfaction in occupational therapy services.</p>

	<p>O'Brien and Presnell (2010)- to increase adherence in patient's researchers suggested therapist provided detailed, evidence-based education about the nature of the injury and the proposed treatment, and revisit information so patient understanding is not changed by outside influences</p> <p>Amini (2008)- stated occupational therapists in hand therapy should be a consultant, problem solver, and a teacher who collaborates and offers support while their clients are maneuvering through their disrupted life.</p> <p>Jette et al. (1998)- decreased confusion increased home program adherence.</p>
<p>My therapist took time to make sure I understood all the prescribed home program before leaving the clinic</p>	<p>Byl et al. (2009)- found that patients initiating the home program with supervised practice were more likely to be compliant with home program.</p> <p>Sluijs et al. (1993)- lack of time constraints, interference with daily routine, positive feedback was found to be a reason for non-adherence to home program</p> <p>Sanford et al. (2008)- improvements should be made in the information and education, which are given to patients to ensure their understanding of the injury and the risks encountered.</p> <p>O'Brien & Presnell (2010)- to increase adherence in patient's researchers suggested therapist provided detailed, evidence-based education about the nature of the injury and the proposed treatment, and revisit information so patient understanding is not changed by outside influences</p> <p>Khalil et al. (2012)- patients given a DVD home exercise program went through the DVD program with a therapists and the therapist made a home visit to make sure the patient was completing the program correctly. These patients had an adherence rate of 73.3%.</p> <p>Jette et al.(1998)- decreased confusion increased home program adherence.</p>
<p>My therapist helped me find ways to complete my home program as part of my daily routine</p>	<p>Sanders and Van Oss (2013)- found respondents incorporated medication regimes into daily routines/activities to increase compliance</p> <p>Sluijs et al. (1993)- lack of time constraints, interference with daily routine, and positive feedback were found to be reasons for non-adherence to home programs</p> <p>O'Brien and Presnell (2010)- to increase adherence</p>

	<p>in patients, researchers suggested therapist provided detailed, evidence-based education about the nature of the injury and the proposed treatment, and revisit information so patient understanding is not changed by outside influences</p>
<p>Do you feel your home program is part of your daily activities (IE. Household/Work tasks)</p>	<p>Sanders and Van Oss (2013)- found respondents incorporated medication regimes into daily routines/activities to increase compliance O'Brien and Presnell (2010)- to increase adherence to home programs researchers recommended therapists give examples how patients can adapt ADL's without compromising adherence or limitations after an injury Guzelkucuk and Taskaynatan (2007)- found that therapeutic activities that mimic ADL's improve the functions of the hand more effectively. Activities that mimic the ADL's may be more beneficial than the standard rehabilitation activities in the management of an injured hand. Colaianni and Provident (2010)- occupation is a central construct of occupational therapy and has been demonstrated to be a powerful treatment modality</p>
<p>It is important for me to complete my home program as prescribed.</p>	<p>Chen et al. (1999)- found that three quarters of respondents thought they were compliant but only one third actually were compliant. Dobbe et al. (2002)- indicated that patient did not adhere to patient exercise instructions indicating a need for more detailed exercise instructions. O'Brien and Presnell (2010)- to increase adherence in patient's researchers suggested therapist provided detailed, evidence-based education about the nature of the injury and the proposed treatment, and revisit information so patient understanding is not changed by outside influences Jette et al. (1998)- a positive attitude increased home program adherence. Courneya et al. (2004)- completion of home program increased post program exercise.</p>
<p>How often do you complete your home program?</p>	<p>OA: Occupations: Process Courneya et al. (2004)- completion of home program increased post program exercise.</p>
<p>Is your home program intended to be completed before/after doing a specific activity (ie eating a meal, brushing teeth, before bed, etc)?</p>	<p>OA: Relative mastery: efficiency was defined by use of time energy and resources Sanders and Van Oss (2013)- found that 91% of respondents embedded taking medication into</p>

	<p>routines to increase adherence</p> <p>Kirwan et al. (2002)- most cited reasons for non-adherence were time restriction, forgetting, and interference with family or social life</p>
<p>What times of day did you complete your prescribed home program?</p>	<p>OA: Relative Mastery: review efficiency of response as defined by use of time</p> <p>Sanders and Van Oss (2013)- found respondents incorporated medication regimes into daily routines/activities to increase compliance</p> <p>Sluijs et al. (1993)- lack of time constraints, interference with daily routine, positive feedback was found to be a reason for non-adherence to home program</p>
<p>How much time do you have available to complete your home program each day?</p>	<p>OA: Relative Mastery: review efficiency of response as defined by use of time</p> <p>Kirwan et al. (2002)- stated that patient reported non-adherence to home programs were “not enough time, discomfort or pain caused by program, the program’s interference with their family or social life and forgetting to do the program” (p. 37)</p> <p>Sluijs et al. (1993)- lack of time constraints, interference with daily routine, positive feedback was found to be a reason for non-adherence to home program</p>
<p>How long does it take to complete your home program each time you do it?</p>	<p>OA: Occupation: Process</p> <p>Kirwan et al. (2002)- stated that patient reported non-adherence to home programs were “not enough time, discomfort or pain caused by program, the program’s interference with their family or social life and forgetting to do the program” (p. 37)</p> <p>Sluijs et al. (1993)- lack of time constraints, interference with daily routine, positive feedback was found to be a reason for non-adherence to home program</p>
<p>How many times a day do you complete your home exercise program?</p>	<p>OA: Occupations: Process</p> <p>Kirwan et al. (2002)- stated that patient reported non-adherence to home programs were “not enough time, discomfort or pain caused by program, the program’s interference with their family or social life and forgetting to do the program” (p. 37)</p> <p>Sluijs et al. (1993)- lack of time constraints, interference with daily routine, positive feedback was found to be a reason for non-adherence to home program</p> <p>Yuen et al. (2013)- patients prescribed a home program using the Wii accurately reported</p>

	completion. Patients' recorded in a log an average of 33.3 minutes and the time measured by the Wii itself was 29.5 minutes.
How often is your home program prescribed?	OA: Occupations: Process Chen et al. (1999)- found that respondents could not recall the correct home program prescribed to them. Sluijs et al. (1993)- lack of time constraints, interference with daily routine, positive feedback was found to be a reason for non-adherence to home program
Rate your level of pain before a home exercise program. Rate your level of pain during a home exercise program Rate you level of pain after a home exercise program.	OA: Adaptive Capacity: recognizing the need for change or modification Byl et al. (2009)- found that subjects who viewed their injury as less severe were more compliant than those subjects who rated their injury as severe. Kirwan et al. (2002)- stated that patient reported non-adherence to home programs were "not enough time, discomfort or pain caused by program, the program's interference with their family or social life and forgetting to do the program" (p. 37) O'Brien (2010)- increase adherence to home programs researchers recommended that patients be made aware of pain that may occur, therapists ensure analgesia in the first week, and therapists assess cognitive and emotional responses to pain.
I have told my therapist about any pain I have experienced with the home program.	OA: Adaptive Capacity: recognizing the need for change or modification Byl et al. (2009)- that subjects who viewed their injury as less severe were more compliant than those subjects who rated their injury as severe. Kirwan et al. (2002)- found that clinicians did not think that pain was a main factor in non-adherence. O'Brien (2010)- increase adherence to home programs researchers recommended that patients be made aware of pain that may occur, therapists ensure analgesia in the first week, and therapists assess cognitive and emotional responses to pain.
Since beginning the home program I have recognized improvements in my ability and adapted the home program.	OA: Adaptive Capacity Jensen et al. (1994)- found that patients the exercises did not produce desired results were tiring or boring and made joints feel worse. Jette et al. (1998)- a sense of control over exercise increased home program adherence.
My home program was effective for treating my injury.	OA: Relative Mastery Jensen et al. (1994)- found that patients the exercises did not produce desired results were tiring

	<p>or boring and made joints feel worse.</p> <p>Lyngcoln et al. (2002)- found that there was a positive relationship between those who were adherent to their home program and outcomes.</p> <p>Jette et al. (1998)- a positive attitude toward the home program increased adherence.</p> <p>Courneya et al. (2004)- perceived success increased post program exercise.</p>
<p>What is your current level of satisfaction with your home program?</p>	<p>OA: Relative Mastery: successful achievement of one's goal and self-perception</p> <p>Jette et al. (1998)- a positive attitude toward the home program increased adherence.</p> <p>Courneya et al. (2004)- perceived success increased post program exercise.</p>
<p>What is your current level of satisfaction with progress since your injury?</p>	<p>OA: Relative Mastery: successful achievement of one's goal and self-perception</p> <p>Jensen et al. (1994)- found that patients the exercises did not produce desired results were tiring or boring and made joints feel worse.</p> <p>Jette et al. (1998)- a positive attitude toward the home program increased adherence.</p> <p>Courneya et al. (2004)- perceived success increased post program exercise.</p>
<p>I complete my home program at... (Check all that apply).</p> <p>Home (1)</p> <p>Work (2)</p> <p>While Commuting (3)</p> <p>Outside (4)</p> <p>Restaurant (5)</p> <p>Movie Theater (6)</p> <p>Watching a Sporting Event (7)</p> <p>Concert (8)</p> <p>Shopping (9)</p> <p>Therapy Clinic</p> <p>Others</p>	<p>OA: Occupational Adaptation Process: the environment</p> <p>Deyle et al. (2005)- patients who complete home program and had supervised exercise in the clinic frequently had higher improvement percentages in a shorter period of time than patients who had a home program that was reinforced during 2 follow up clinic visits.</p>
<p>Social activities get in the way of completing my home program</p>	<p>OA: Occupational Adaptation Process: the environment</p> <p>Kirwan et al. (2002)- stated that patient reported non-adherence to home programs were “not enough time, discomfort or pain caused by program, the program’s interference with their family or social life and forgetting to do the program” (p. 37).</p> <p>Sluijs et al. (1993)- lack of time constraints, interference with daily routine, positive feedback was found to be a reason for non-adherence to home</p>

	program.
Family members encourage me to complete my home program.	<p>OA: Occupational Adaptation Process: change in motivation, press for mastery.</p> <p>Chen et al. (1999)- found that respondents with support from family, friends, or significant others were more compliant.</p> <p>Byl et al. (2009)- retraining of home programs should be multifactorial to include family support.</p> <p>Kirwan et al. (2002)- stated that patient reported non-adherence to home programs were “not enough time, discomfort or pain caused by program, the program’s interference with their family or social life and forgetting to do the program” (p. 37).</p> <p>Sluijs et al. (1993)- lack of time constraints, interference with daily routine, positive feedback was found to be a reason for non-adherence to home program.</p>
I have all the equipment, tools, and space required to complete my home program.	<p>OA: Occupational Adaptation Process: interaction between environment and person</p> <p>Khalil et al. (2012)- patients given a DVD home exercise program went through the DVD program with a therapists and the therapist made a home visit to make sure the patient was completing the program correctly and had all of the appropriate equipment. These patients had an adherence rate of 73.3%.</p>
I have been given the follow materials to assist me in completing my home program.	<p>OA: Occupational Adaptation Process: the environment</p> <p>Khalil et al. (2012)- found that when given video instructions to watch when completing home programs resulted in an adherence percentage rate of 73.3%. Therapists also demonstrated the exercises in the home programs.</p>
If I forget or am unable to complete a home program at the usual time or place, I make time to do it later.	OA: Adaptive Capacity
Briefly tell us how can your home program be improved.	Jette et al. (1998)- a sense of control over home programs increased adherence.

Procedures

Institutional review board (IRB) approval and protection of respondent confidentiality.

Before the survey was given, ethical procedures were ensured through submitting to the University of North Dakota's IRB and gaining approval of this study on September 27, 2013 (IRB#: 201309-901) . Additionally, approval was obtained from the hospital IRB in which the hand therapy clinic is located on October 16, 2013 (IRB# ST-119). Refer to Appendix A for the official IRB approval letters. All of respondents were also provided a research information sheet prior to beginning the survey. After reading the research information sheet, respondents acknowledged they are taking part in the study voluntarily. Respondents were also informed that they could quit the study at any time and that they can decline answering questions on the survey. Refer to Appendix B to view the a copy of the research information sheet. To further protect the anonymity of the respondents, identifying information was not gathered. Additionally, researchers used the Qualtrics Research Suite, which did not allow researchers to see the time survey was completed, so there would be no way to pair a respondents to the answers they provided. With IRB approval obtained and ensuring anonymity of the respondents, the next step was inviting potential respondents to complete the survey.

Sampling procedures.

Convenience sampling methods were used to recruit respondents. No random selection was used due to the limited number of anticipated respondents in this study. The respondents in this study received information about the study, provided informed consent, and completed a structured survey via an iPad. The reason for having the

respondents complete the survey on an iPad was to make the process convenient for the respondents and to enhance the likelihood of completion of the survey by the respondent at the site.

Potential respondents for this independent study were accessed through an upper mid-western hospital hand therapy clinic. Refer to Appendix C for the request letter that was sent to the hand therapy clinic and Appendix A for IRB approval from the hospital institution. Prior to asking a potential respondents if they would like to complete a survey, the hand therapist first identified respondents who were suited for this study. To accomplish this the occupational hand therapist first identified patients that had been prescribed a home program and then determined if they meet the other inclusion criteria. If both of the prior stipulations were met, respondents were invited to complete the survey. Questions were also embedded in the survey using skip logic to ensure that inclusion and exclusion criteria were followed. For example, if a patient identified that he or she had a chronic condition (more than one year of treatment by a hand therapist), the survey used skip logic and brought him or her to the end of the survey. The survey took the respondents approximately 10-15 minutes to complete. The survey was administered through the following procedures:

Survey procedures.

1. When a potential respondent was checking in for an appointment, we asked the occupational therapist or secretary to say, "Would you be interested in learning more about participating in a research study that is being completed by UND students looking at factors that affect your home program?".

For clients who would like to learn more

2. If the potential respondent said he or she would participate and was early for his or her appointment (10-15 minutes), the occupational therapist or secretary would point the respondent in the direction of the UND students to learn more about the study. If the potential respondent indicated that he or she were willing to participate, the student ensured he or she reviewed and understood the research information sheet (refer to appendix E). The client would then complete the survey.

3. If the potential respondent did not have time before the appointment but want to learn more, the secretary said "The therapist will guide you to the UND students after your therapy session if you want to learn more about the study." Then at the end of the therapy session, the hand therapist directed the potential respondent to the UND students after completion of the therapy session. The hand therapist was also be responsible for determining if there was a 10-15 minute time period during modalities in which the potential respondent could learn more about the study. If there was time available, the hand therapist communicated this to the UND students and the students provided a study overview to the potential respondent, the research information sheet was read, and a copy was provided to the potential respondent. The survey was then given to the respondent. At no time did this study interrupt therapy services.

Furthermore, the respondents were given a sheet of paper defining home program as follows:

A home program for the purposes of this survey is defined as any exercises, activities, tasks, hot or cold packs, paraffin baths, electrical stimulation, continuous passive motion machine use, splints wear schedule, or anything else your therapist assigns you to do at home.

For Clients who choose not to learn more

4. "Thank you for your consideration. If you change your mind about participating in the study, or have more time available to participate at a later date, please let me know as the UND students will be completing the study over the next month."

Upon completion of the survey, a digital copy of survey answers were saved in the Qualtrics database.

Data collection.

University of North Dakota's Qualtrics database was only viewable to us and our research advisor. We analyzed the data using SPSS 21.0 and included descriptive statistics and inferential analysis of the variables to answer the research questions.

Research data was downloaded, and stored on a desktop computer located in the research advisors locked office for a period no more than 3 years. The data on the North Dakota's Qualtrics database was deleted at the completion of the data analysis.

We obtained 24 respondents that participated in this independent study. This number was selected to increase the rigor, validity, and reliability of the findings. Since, this was a pilot study and the instrument previously untested, a limited number of respondents as appropriate. We designed these procedures for the occupational hand therapist when approaching potential respondents. These procedures were given to the

occupational hand therapist to follow directly to increase validity and reliability. Validity and reliability was also established by us since we were the ones to administer all of the surveys and were present to answer any questions posed by respondents.

Tools for Data Analysis

Data obtained from the survey was analyzed using SPSS 21.0 using descriptive and inferential analysis in order to answer the research questions. Prior to beginning the data analysis a pre-analysis data screen was completed in order to fill in missing data with averages, look for respondents how did not complete the survey, and assign values to variables. After the pre-analysis data screen, statistical analysis of the descriptive were completed for all survey questions. Mann-Whitley *U* tests were then run to determine if differences in adherence existed between respondents related to demographic questions. Lastly, Spearman Correlation Coefficients were run in order to determine correlations between client factors and performance patterns and home program adherence.

Summary Paragraph & Lead into Chapter IV

The process gathering and analyzing data that was used in this research study is presented in this chapter, Chapter III Methodology. This chapter outlines and explains the details of the research design, description of setting and typical clientele, instrumentation, procedures, and tools for data analysis used in this study. The results and statistical analysis of the data gathered through the methodology above are presented in Chapter IV.

Chapter IV

Results

Chapter IV consists of the results of the statistical analysis of the respondents' answers of questions of a survey completed on an iPad. Chapter IV also includes the pre-analysis data screen, analysis of descriptive statistics, and inferential statistical analysis used to answer the research questions.

Respondent data was downloaded from Qualtrics Research Suite to SPSS 21.0 for data analysis. A pre-analysis data screen was completed prior to beginning data analysis. Descriptive statistical analysis of the descriptive was completed for the demographics and the survey responses. Data analysis concluded with an analysis of the inferential statistical data that was collected.

Pre-Analysis Data Screening

To ensure accuracy of results, the data was examined to determine if there was missing data and to identify those respondents that did not complete the survey or completed the survey twice. Data was collected from 28 respondents; data from 24 respondents was used in the final analysis. The data for four respondents were (numbers 4, 12, 14, and 18) was deleted. Respondent number 4 was deleted due to answering positively to having a comorbidity, which affected adherence. This was part of the exclusion criteria and, thus, the respondent should not have begun the survey. Respondent number 12 appeared to not have realized he or she received the research information sheet and his or her data was dropped from the survey. The respondent then

retook the survey to completion. Data from respondent number 14 was removed for answering positively to exclusion criteria and thus his or her data was deleted. Finally, data for respondent number 8 was removed as the respondent answered positively to having a chronic condition, which again was exclusion criteria and the respondent's data was removed from the survey. Additionally, the variables were assigned values so that statistical analysis could be completed and inferential statistics could be gathered.

Research Question Analysis

Research analysis of the data began with the analysis of the demographics and the descriptive statistics, which included frequency, percentage, mean, median, standard deviation, variance, and range. Next, correlations were completed between the respondent adherence to home programs and possible factors of adherence. The statistical tests that were completed using SPSS 21.0.; specifically, inferential analysis included Spearman's Rho and Mann-Whitney.

Demographic analysis

All 24 respondents received the research information sheet and completed the survey. Frequencies and percentages for each of the respondent's gender were calculated and revealed that 25% of the respondents were male ($n=6$) and 75% respondents were female ($n=18$). Respondents' ages ranged from 18-64 years of age, with 41% of respondents falling in the 51-61 years of age group ($n=10$), and 20.8% of respondents 18-30 years of age group ($n=5$). Descriptive statistics for Marital Status were also calculated and 76% of respondents ($n=19$) were married or married with children. Also, 91.7% of respondents ($n=22$) reported their health to be either good or very good.

Frequencies and percentages were also calculated to determine each respondent's involvement in work. We found that 48% of respondents ($n=12$) worked 41 or more hours per week and 32% of respondents ($n=8$) worked 31-40 hours per week. Of all the respondents, 33.3% ($n=8$) reported that their injuries prevented them from working and that they were receiving workman's compensation due to their injury.

The frequencies and percentages were also calculated for the area of injury and side of the body involved in the injury. Of respondents, 54.2% ($n=13$) reported that their injury was on their right upper extremity while 16.7% of respondents ($n=4$) reported that their injury was on the left side, and 29.2% of respondents ($n=7$) reported that both sides were affected. The respondents also provided the location(s) of the upper extremity that was affected by their injury. Of the respondents, 70.8% ($n=17$) reported that their injury affected their hand, 54.2% of respondents ($n=13$) indicated it affected their wrist, 33.3% of respondents ($n=8$) reported that their injury affected their forearm, 6% of respondents ($n=6$) reported that their injury affected their arm, and 8.3% of respondents ($n=2$) reported that their injury affected their shoulder.

Time and place of home program completion.

Frequencies and percentages were also calculated for the place and time home programs were completed. Of the respondents, 100% of respondents ($n=23$) stated they completed their home program at home, 54.2% of respondents ($n=13$) reported completed their home program at work, and 54.2% of respondents ($n=13$) completed their home program while watching television. Seventeen (70.8%) of the respondents reported that the most frequent time to complete their home program was after 8 pm while the other 13 (54.2%) respondents preferred 2 to 4 pm and 6 to 10 am. Eleven (48.8%) of the

respondents reported their least likely time to complete their home program was 4 to 8 pm, followed by nine (37.5%) respondents reporting 10 am to 2 pm to be the least likely time to complete their home program. Of the respondents, 45.8% ($n=11$) reported that they completed their home program 3 times per day, followed by 20.8% ($n=5$) who reported that they completed their home program 1 time per day. Equal number of respondents 12.5% ($n=3$) reported that they completed their home program either 2 times or 4 times per day.

There appeared to be inconsistency between the respondents' report of the number of times they completed their home program and their therapists' directions. Of all of the respondents, 41.7% ($n=10$) reported that their therapist told them to complete their home program 3 times per day, 25% of respondents ($n=6$) reported that their therapist told them to complete their home program 2 times per day, 12.5% of respondents ($n=3$) reported that their therapist told them to complete their home program 1 time per day, and 8.3% of respondents ($n=2$) that their therapist told them to complete their home program 4 times per day or hourly. When reporting the time required to complete the home program each time 20.8% of respondents ($n=5$) reported it took less than 5 minutes to complete their home program, 45.8% of respondents ($n=11$) reported it took 5 to 15 minutes to complete their home program, 12.5% of respondents ($n=3$) reported it to 15 to 30 minutes to complete their home program, and 16.7% of respondents ($n=4$) reported it took 30 or more minutes to complete their home program.

Activities affected by injury.

Frequencies and percentages were also calculated for respondent reported occupational activities that needed improvement, to allow respondents to function as they

did prior to injury. Of the respondents, 41.7% ($n=10$) reported that they would need to improve their ability in work tasks to be doing them as they were before their injury, 33.3% of respondents ($n=8$) reported that their ability would need to improve in home management activities, eating, and meal preparation to be doing them as they had done before their injury, and 20.8% of respondents ($n=5$) reported that they would need to improve their ability to dress themselves to complete this activity as they were before their injury.

Therapist/client relationship and patient level of understanding.

Respondents also completed questions pertaining to their relationship with their therapist and their level of understanding of their home program. Refer to Table 2.

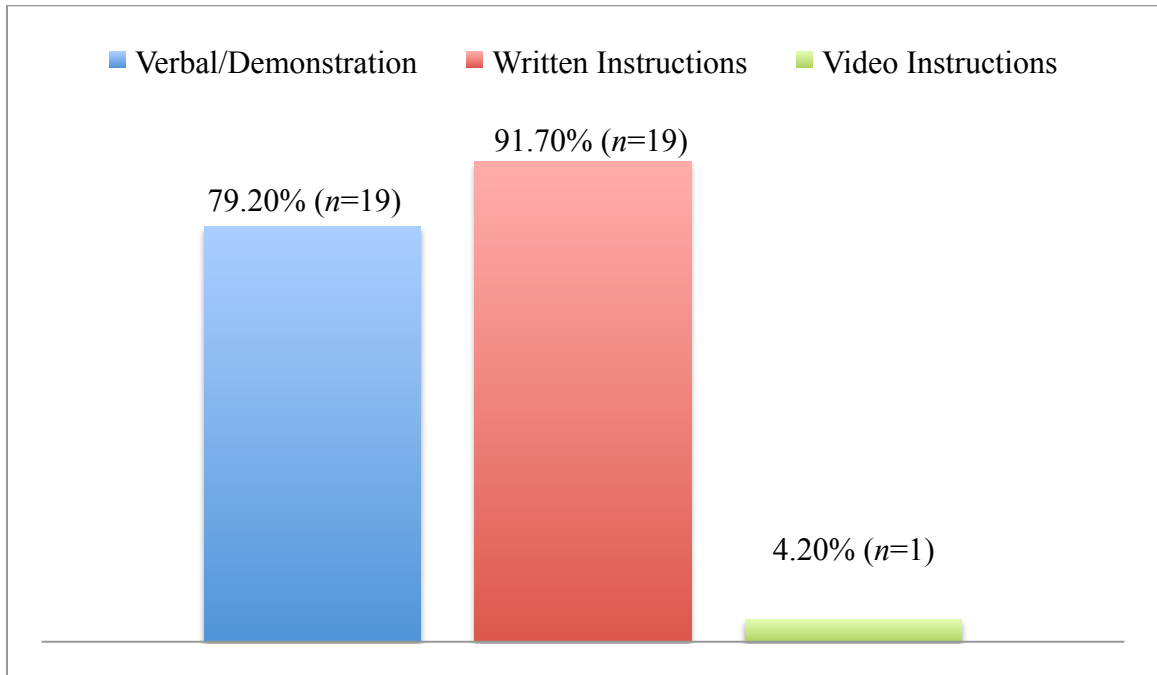
Level of instruction provided by therapist.

Respondents were asked to report what type of instruction that was provided to them by the therapist. Refer to Table 2.

Table 2
Therapist/Client Relationship and Client Level of Understanding

Instrument Statement	Completely Agree	Agree	Neutral	Disagree	Completely Disagree
My therapist took time to explain the reason for doing my home program.	100% (n=23)	-	-	-	-
My therapist answered all of my questions.	100% (n=23)	-	-	-	-
My therapist took time to make sure I understood all the prescribed home program before leaving the clinic.	95.8% (n=23)	-	-	-	4.2% (n=1)
My therapist helped me find ways to complete my home program as part of my daily routine.	86.9% (n=20)	4.2% (n=1)	8.69% (n=2)	-	-
Do you feel your home program is part of your daily activities?	73.91% (n=17)	8.69% (n=2)	17.39% (n=4)	-	-
It is important for me to complete my home program as prescribed.	91.31% (n=21)	8.69% (n=2)	-	-	-
I understand the purpose of my home program.	95.8% (n=23)	-	-	-	4.2% (n=1)

Figure 1
Level of Instruction Provided by the Therapist

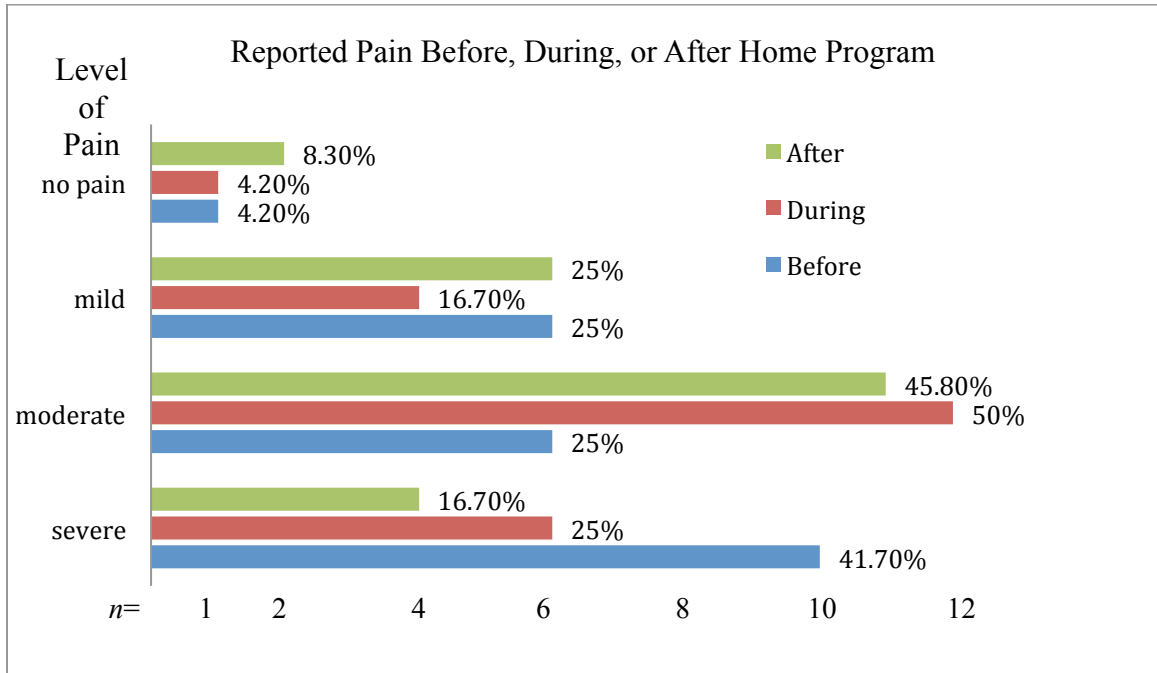


Addressing and reporting of pain.

Respondents were asked to report their level of perceived pain before, during, and after completing their home program. Pain was measured using a scale of one to 10, 0=no pain, 1-3 equaled mild pain, 4-6 equaled moderate pain, and 7-10 equaled severe pain.

Refer to Figure 2.

Figure 2
Reported Pain Before, During, or After Home Program



Before completing his or her home program, 41.7% of respondents ($n=10$) reported severe pain, 25% of respondents ($n=6$) reported moderate pain, 25% of respondents ($n=6$) reported mild pain, 4.2% of respondents ($n=1$) reported no pain. While completing the survey, respondents were asked to recall their level of pain they experienced when completing their home program. Of the respondents, 25% ($n=6$) reported severe pain, 50% of respondents ($n=12$) reported moderate pain, 16.7% of respondents ($n=4$) reported mild pain, and 4.2% of respondents ($n=1$) reported no pain. After completing their home program, 16.7% of respondents ($n=4$) reported severe pain, 45.8% of respondents ($n=11$) reported moderate pain, 25% of respondents ($n=6$) reported mild pain, and 8.3% of respondents ($n=2$) reported no pain. When presented the following statement, “I have told

my therapist about any pain I have experienced with the home program,” 83.4% of respondents ($n=20$) either strongly agreed or agreed and 12.5% of respondents ($n=3$) either strongly disagreed or disagreed.

Reported time to complete home program.

Of the respondents, 45.8% ($n=11$) reported they had less than one hour to complete their home program, 33.3% of respondents ($n=8$) reported they had 1-2 hours to complete their home program, 4.2% of respondents ($n=1$) reported they have 2-3 hours to complete their home program, and 16.7% of respondents ($n=4$) reported that they had more than 4 hours to complete their home program.

Respondents' adaptability to and perception of their home program.

Of the respondents, 70.8% ($n=17$) reported that they had adapted their home program. Respondents rated their level of agreement with the following statement, “since beginning the home program I have not recognized improvements in my ability and adapted my home program”, 33% of respondents ($n=8$) strongly disagreed with the statement, 29.2% of the respondents ($n=7$) disagreed with the statement, 20.8% of the respondents ($n=5$) neither agreed nor disagreed, 4.2% of respondents ($n=1$) agreed, and 8.3% of respondents ($n=2$) strongly agreed. When asked to respond to the following statement, “my home program was effective for treating my injury”, 16.7% of respondents ($n=4$) neither agreed nor disagreed, 37.5 of respondents ($n=9$) agreed, and 41.7% of respondents ($n=10$) strongly agreed. Of the respondents, 79.2% ($n=19$) reported they were currently satisfied or very satisfied with their home program, and 16.7% of respondents ($n=4$) reported neither satisfaction nor dissatisfaction with their home program. When reporting satisfaction level with daily improvements in daily activities,

4.2% of respondents ($n=1$) reported dissatisfaction, 25% of respondents ($n=6$) reported neither satisfaction nor dissatisfaction, 37.5% of respondents ($n=9$) reported being satisfied, and 29.2% of respondents ($n=7$) reported being very satisfied.

Possible barriers and facilitators.

Of the respondents, 53.1% ($n=13$) agreed or strongly agreed that family members encouraged them to complete their home program and 41.6% of respondents ($n=10$) disagreed that they received encouragement from family members to complete their home program. When respondents reported their level of agreement with the statement, “I have all the equipment, tools, and space required to complete my home program”, 4.2% of respondents ($n=1$) neither agreed nor disagreed, 41.7% of respondents ($n=10$) agreed, and 50% of respondents ($n=12$) strongly agreed.

Adherence.

When respondents were asked, “How often do you complete you home program?”, 4.2% of respondents ($n=1$) reported “never,” 16.7% of respondents ($n=4$) reported “sometimes,” and 79.2% of respondents ($n =19$) reported “as prescribed”. Of the respondents who responded to the statement, “If I forget or am unable to complete a home program at the usual time or place, I make time to do it”, 45.8% of respondents ($n=11$) reported sometimes and 50% of respondents ($n=12$) reported always.

Inferential Analysis

Spearman *rho* Correlation Coefficients to Adherence Question: “If I forget or am unable to complete a home program at the usual time or place, I make time to do it”.

Spearman *rho* correlations were calculated to determine relationships between the client factors and performance patterns presented below when compared to adherence question that follows: If I forget or am unable to complete my home program at the usual time or place I make time to do it later? This analysis was necessary due to respondent discrepancy in reported level of adherence to home program with two questions asking the same information, but in a different format.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between social participation/activities and the respondents' ability to adhere to their home program? No correlation was found, to be significant ($rho(21) = -.165, p > .05$). There appears to be no relationship between social participation and home program adherence.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between how the respondent felt his or her therapist helped him or her find ways to complete his or her home program as part of a daily routine and home program adherence? A low positive correlation that was not significant was found ($rho(21) = .228, p > .05$). There appears to be no relationship between whether a patient feels that his or her therapist helped him or her find ways to complete his or her home program as part of a daily routine and home program adherence.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between pain before completing a home program and home program adherence? No relationship was found ($rho(21) = .119, p > .05$). There appears to be no relationship between pain before completing a home program and home program adherence.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between pain while completing a home program and home program adherence? A low, negative, correlation that was not significant was found ($rho(21) = -.208, p > .05$). There appears to be no relationship between pain while completing a home program and home program adherence.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between pain after completing a home program and home program adherence? A low, negative, correlation that was not significant was found ($rho(21) = -.268, p > .05$). There appears to be no relationship between pain after completing a home program and home program adherence.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between family member encouragement and home program adherence? A low, positive, correlation that was not significant was found ($rho(21) = .365, p > .05$). There appears to be no relationship between family level encouragement and adherence to home program.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between having the proper equipment, tools, and space to complete a home program and home program adherence? A low, positive,

correlation that was not significant was found ($\rho (21) = .327, p > .05$). There appears to be no relationship between having the proper equipment, tools and space to complete a home program and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between satisfaction with improvements in everyday activities and home program adherence? A low, positive, correlation that was not significant was found ($\rho (21) = .243, p > .05$). There appears to be no relationship between satisfaction with improvements in everyday activities and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between level of satisfaction with the home program and home program adherence? Little, if any relationship, was found to be not significant ($\rho (21) = .114, p > .05$). There appears to be no relationship between level of satisfaction with the home program and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between respondents' belief as to whether the home program was effective for treating their injury and home program adherence? Little, if any, negative relationship was found to be not significant ($\rho (21) = .114, p > .05$). There appears to be no relationship between respondents' belief that the home program was effective for treating their injury and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between recognizing improvements in abilities and adapting home programs and home program adherence? A low, negative, correlation

that was not significant was found ($\rho (21) = -.308, p > .05$). There appears to be no relationship between recognizing improvements in abilities and adapting home programs and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between respondent communication of pain to the therapist and home program adherence? A low, negative correlation that was not significant was found ($\rho (21) = -.230, p > .05$). There appears to be no relationship between respondent communication of pain to the therapist and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between prescribed times per day to complete the home program and home program adherence? Little, if any, positive correlation was found to be not significant ($\rho (21) = .104, p > .05$). There appears to be no relationship between prescribed times per day to complete the home program and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between how long it took the respondents to complete a home program as prescribed and home program adherence? Little, if any, negative correlation was found to be not significant ($\rho (21) = -.161, p > .05$). There appears to be no relationship between how long it takes the respondents to complete a home program as prescribed and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between time available to complete a prescribed

home program by the respondents and home program adherence. Little, if any, negative correlation was found to be not significant ($\rho (21) = -.141, p > .05$). There appears to be no relationship between the amount of time available to complete a prescribed home program by the respondents and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between a respondents' belief in the importance of completing their home program as prescribed and home program adherence? A low, positive correlation that was not significant was found ($\rho (21) = .322, p > .05$). There appears to be no relationship between respondents' belief in the importance to complete their home program as prescribed and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between respondents' identification that their home program was part of their daily activities and home program adherence. Little, if any, negative correlation that was not significant was found ($\rho (21) = -.065, p > .05$). There appears to be no relationship between respondents' identification that their home program was part of their daily activities and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between respondents believing their therapist helped them find ways to complete their home program as part of their daily routine and home program adherence. A low, positive correlation that was not significant was found ($\rho (21) = .228, p > .05$). There appears to be no relationship between respondents believing their therapist helped them find ways to complete their home program as part of their daily routine and home program adherence.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between respondents believing their therapist took the time to make sure they understood their home program before leaving the clinic and home program adherence. A low, positive correlation that was not significant was found ($rho(21) = .223, p > .05$). There appears to be no relationship between respondents believing their therapist took time to make sure they understood their home program before leaving the clinic and home program adherence.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between respondents believing their therapist answered all of their questions and home program adherence. A low, positive correlation that was not significant was found ($rho(21) = .294, p > .05$). There appears to be no relationship between respondents believing their therapist answered all of their questions and home program adherence.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between respondents believing their therapist took the time to explain their reasoning for completing their home program and home program adherence? A low, positive correlation that was not significant was found ($rho(21) = .307, p > .05$). There appears to be no relationship between respondents believing their therapist took the time to explain their reasoning for completing their home program and home program adherence.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between the respondents' understanding of the purpose of the home program and home program adherence. A low, positive correlation

that was not significant was found ($\rho (21) = .223, p > .05$). There appears to be no relationship between the respondents' understanding of the purpose of the home program and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between respondents' over perceived overall health and home program adherence. Little, if any, positive correlation that was not significant was found ($\rho (21) = .117, p > .05$). There appears to be no relationship between respondents' overall perceived overall health and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between the respondents' reported hours worked in an average week and home program adherence? A low, positive correlation that was not significant was found ($\rho (21) = .226, p > .05$). There appears to be no relationship between the respondents' reported hours worked in an average week and home program adherence.

A Spearman ρ correlation coefficient was calculated to answer the following research question: Is there a relationship between respondents' age range and home program adherence? A low negative correlation that was not significant was found ($\rho (21) = -.382, p > .05$). There appears to be no relationship between respondents' age range and home program adherence.

Spearman ρ Correlation Coefficients Adherence Question: “How often do you complete you home program?”.

Spearman ρ correlations were calculated to determine relationships between the client factors and performance patterns presented below when compared to adherence

question that follows: How many times a day do you complete your home program? As stated in the previous section there was a discrepancy with reported adherence to home programs by the respondents. This analysis is of this other question and the same client factors and reported level of adherence.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between family member encouragement and home program adherence? Little, if any, positive correlation that was not significant was found ($rho (21) = .163, p > .05$). There appears to be no relationship between family member encouragement and home program adherence.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between having the proper equipment, tools, and space to complete a home program and home program adherence? Little, if any, positive correlation that was not significant was found ($rho (21) = .108, p > .05$). There appears to be no relationship between having the proper equipment, tools, and space to complete a home program and home program adherence.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between recognizing improvements in abilities and adapting home programs and home program adherence? Little, if any, correlation that was not significant was found ($rho (21) = -.027, p > .05$). There appears to be no relationship between recognizing improvements in abilities and adapting home programs and home program adherence.

A Spearman *rho* correlation coefficient was calculated to answer the following research question: Is there a relationship between a respondents' belief in the importance

of completing their home program as prescribed and home program adherence? A moderate positive correlation that was **significant** was found ($r_{ho} (21) = .490, p < .05$). There appears to be relationship between respondents' belief in the importance of completing their home program as prescribed and home program adherence.

A Spearman r_{ho} correlation coefficient was calculated to answer the following research question: Is there a relationship between respondents' age range and home program adherence? Little, if any, negative correlation that was not significant was found ($r_{ho} (21) = -.109, p > .05$). There appears to be no relationship between respondents' age and home program adherence.

Mann-Whitney U Tests

A Mann-Whitney U test was calculated examining the level of home program adherence and gender of the respondents. No significant difference in the results of adherence was found ($U = .516, p > .05$). There appears to be no difference in home program adherence between male and female respondents.

A Mann-Whitney U test was used to examine the difference in home program adherence between employment status. No significant difference in the results of adherence was found ($U = .820, p > .05$). There appears to be no significant difference in home program adherence between respondents whose injury prevents them from working and respondents whose injury does not affect their employment status.

A Mann-Whitney U test was used to examine the difference in home program adherence between hand dominance. No significant difference in the results of adherence was found ($U = p > .05$). There appears to be no significant difference in home program adherence between left-handed and right-handed respondents.

Summary

Chapter IV consisted of demographic and descriptive analysis of the survey responses after a pre-data analysis occurred. Inferential statistical analysis was also conducted on the data that was collected. These findings from this data analysis will be further examined and described in Chapter V.

Chapter V

Summary

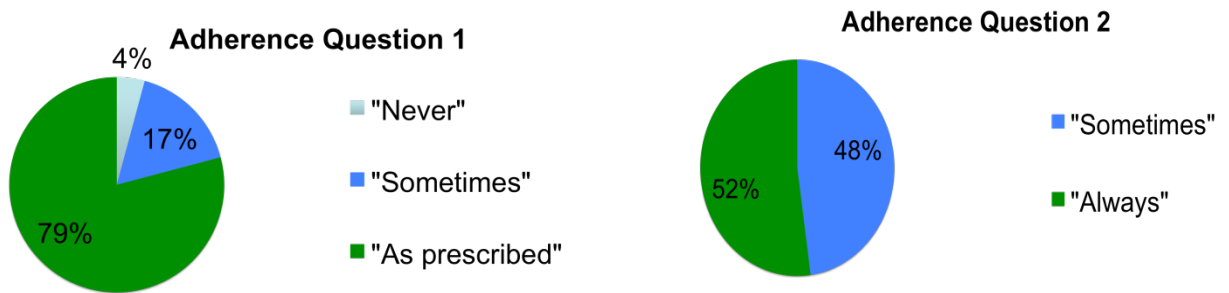
Chapter V is composed of a review of the purpose, findings, conclusions, limitations, and recommendations of this independent study. A thorough review of literature revealed a lack in current research on home program adherence in individuals with acute orthopedic injuries of the upper extremity that addressed client factors and performance patterns leading to the purpose of this independent study. The purpose of this independent study was to explore the relationship between occupational therapy home programs of patients with acute upper extremity injuries, client factors, and performance patterns that are influential in patients' adherence to their prescribed home programs, to determine the overall adherence level of patients with acute orthopedic injuries of the upper extremity, and to develop an instrument intended to measure adherence.

The instrument developed for this study was an online survey, which included 46 questions pertaining to client factors and performance patterns, the occupational hand therapist, the respondent's home program, and demographic information that may influence patient adherence to home programs. We designed this instrument based on the assumptions of the Occupation Adaptation Model and existing literature related to acute upper extremity orthopedic injuries, adherence, and home programs. The instrument items were intended to provide data that could be used to answer the following research questions: what is the relationship between client factors and adherence to home

programs?; what is the relationship between performance patterns and adherence to home programs?; and what is the level of adherence to home programs with patients who have experienced an acute orthopedic injury to the upper extremity?

Through data analysis, we found there to be a significant moderate positive relationship between respondents' feeling of the importance of complete their home program as prescribed and home program adherence .490 ($p = <.05$). Results also showed that, although not significant, increased relationships exists between patient perception of therapist assistance in developing ways to complete home programs and adherence .228 ($p = >.05$), a patient's level of family member encouragement and adherence to home program .365 ($\alpha = >.05$), proper equipment, tools, and space to complete a home program and home program adherence .327 ($p = >.05$), and number of hours worked in an average week by the patient and home program adherence .226 ($p = >.05$). In regards to level of adherence, respondents were asked to respond to two different items (one question and one statement) in order for assess current level of adherence. These items were: (1) "How often do you complete you home program?" and (2), "If I forget or am unable to complete a home program at the usual time or place, I make time to do it". The results in Figure 3 show that while 79% of respondents reported competing their home program as prescribed, 48% of respondents reported that if they were unable to complete their home program they made it up only some of the time. These results shows a confliction in the true level of respondents' adherence to their prescribed home exercise program as respondents' who did not find the time to make up their home program were not actually completing their home exercise program as prescribed.

Figure 3
Adherence to Home Exercise Program as Reported from Respondents



The findings from this independent study have implications for occupational therapists in future patient treatment. When designing and implementing home programming, occupational hand therapists should consider the following: (1) Ensure the patient understands the importance of completing home program. (2) Encourage the patient to ask for family support to complete home program. (3) Ensure the patient has all the equipment and supplies needed to complete home program. (4) Provide verbal, demonstration, written, and video instruction. (5) Address patient pain. (6) Address patients' roles, habits, and routines. (7) Address patients' ability to adapt their home program as needed. (8) Ensure questions regarding home programs and home program adherence are asked in multiple ways to ensure the patient's understanding and in order to gain true and honest patient information.

Through consideration of individual client factors and performance patterns (not limited to those listed previously), occupational therapists can create a better understanding of what and how different client factors and performance patterns are affecting home program adherence. This will allow for occupational therapists to adapt treatment to increase participation in prescribed home programs. Use of the survey

created for this independent study may allow therapists to gain a better understanding of some of the specific client factors and performance patterns that may be affecting home program adherence and, ultimately, patient outcomes.

The limitations of this independent study include: limited demographic/geographic variability within sample, the survey instrument was not appropriate for reliability and validity, and the use of a prospective one-shot case study survey method, which did not consider where in the therapeutic process respondents were at. Other limitations include some respondents' unfamiliarity with the iPad (on which surveys were completed) and limited generalizability due to the sample size. Lastly, respondents completed the survey in the clinic setting in which they were receiving therapy, which could have led to biased responses. Some respondents may have answered in a manner that portrayed them as a model patient while others may have provided biased results relating to their therapist. These limitations lead to the need for future research regarding modifications and retesting of the instrument to increase reliability and validity with other patient groups, a larger study sample size with varying demographics, increased research sites (i.e. hospital, outpatient clinics, private practice, skilled nursing facilities, and transitional care units), having paper pencil surveys, and using a retrospective experimental design.

With the increase in healthcare costs and the changes that are taking place due to the health care reform, patients are spending less time working with occupational therapists in a clinic setting and are having to take more responsibility for their outcomes after injury or disease. One of the main responsibilities that is being put on patients in the completion of home programming in order to make improvements and continue with the

next steps in treatment. Because occupational therapists are asking patients to complete and adhere to home programming, it is vital that occupational therapist take the time to address client factors and performance patterns that are both benefits and barriers to each patient. Studies have shown that adherence to home programs increase strength (Magnus, Bychuk, Kim, & Fathing, 2013) and passive and active range of motion (Eng, Trommel, & Ritt, 2002). With adherence to programs being the "most unpredictable, least controllable variable in a medical interventions" (Groth & Wulf, 1995, p.18), it is important that occupational therapist help the patients to control as many other variables relating to client factors and performance patterns. This can help patients become more adherent to home programming and ultimately increase outcomes and quality of life.

References

- American Association of Orthopedic Surgery. (2008). Chapter 6-Musculoskeletal injuries. *The burden of musculoskeletal disease in the United States: Prevalence, societal and economic cost* [Adobe Digital Editions Version] (pp. 129-179). Retrieved from http://www.boneandjointburden.org/pdfs/BMUS_chpt6_injuries.pdf
- American Occupational Therapy Association. (2008). Occupational therapy practice framework: Domain and process (2nd ed.). *American Journal of Occupational Therapy, 52*, 625-683.
- Amini, D. (2011). Occupational therapy interventions for work-related injuries and conditions of the forearm, wrist, and hand: A systematic review. *American Journal of Occupational Therapy, 65*, 29–36. doi: 10.5014/ajot.2011.09186
- Amini, D. (2008). Occupation-based hand therapy and the occupational therapy practice framework. *OT Practice Magazine, 13*(20), 17-21.
- Blessing, J.D. & Forister, J.G. (2013). *Introduction to research and medical literature for health professionals*. Burlington, MA: Jones & Bartlett Learning
- Byl, N.N., Archer, E.S., & McKenzie, A. (2009). Focal hand Dystonia: Effectiveness of a home program of fitness and learning-based sensorimotor and memory training. *Journal of Hand Therapy, 22*, 183-19

- Chen, C.-Y., Neufeld, P.S., Feely, C.A., & Skinner, C.S. (1999). Factors influencing compliance with home exercise programs among patients with upper-extremity impairment. *American Journal of Occupational Therapy*, 53, 171-180.
- Colaianni, D. & Provident, I. (2010). The benefits of and challenges to the use of occupation in hand therapy. *Occupational Therapy in Health Care*, 24(2), 130-146.
- Cole, M. B. & Tufano, R. (2008). *Applied theories in occupational therapy: A practical approach*. Thorofare, NJ: Slack Inc.
- Courneya, K.S., Friedenreich, C.M., Sela, R.A., Quinney, H.A., Rhodes, R.E., & Jones, L.W. (2004). Exercise motivation and adherence in cancer survivors after participation in a randomized controlled trial: An attribution theory perspective. *International Journal of Behavioral Medicine*, 11, 8-17.
- Crepeau, E., Cohn, E., & Schell, B. (Eds.). (2003). *Willard and Spackman's occupational therapy*. Philadelphia: Lippincott Williams & Wilkins.
- Deyle, G.D., Allison, S.C., Matekel, R.L., Ryder, M.G., Stang, J.M., Gohdes, D.D., Hutton, J.P., Henderson, N.E., & Garber, M.B. (2005). Physical therapy treatment effectiveness for osteoarthritis of the knee: A randomized comparison of supervised clinical exercise and manual therapy procedures versus a home exercise program. *Physical Therapy*, 85, 1301-1317.
- Dimick, M. P., Caro, C., M., Kasch, M. C., Muenzen, P. M., Fullenwider, L., Taylor, P. A., . . . Walsh, J. M. (2009). 2008 Practice analysis study of hand therapy. *Journal of Hand Therapy*, 22 (4), 361-376. doi:org/10.1016/j.jht.2009.06.001

- Dobbe, J. G. G., Van Trommel, N. E., & Ritt, M. J. P. F. (2002) Patient compliance with a rehabilitation program after flexor tendon repair in zone II of the hand. *Journal of Hand Therapy, 15*, 16-21.
- Groth, G. N. & Wolf M. B. (1995). Compliance with hand rehabilitation: Health beliefs and strategies. *Journal of Hand Therapy, 8*, 18-22.
- Guzelkucuk, U. & Taskaynatan, M.A. (2007). Comparison of therapeutic activities with therapeutic exercise in the rehabilitation of young adult patients with hand injuries. *The Journal of Hand Surgery, 32A(9)*, 1429-1435
- Holm, M.B., Santangelo, M.A., Fromuth, D.J., Brown, S.O. & Walter, H. (2000). Effectiveness of everyday occupations for changing client behaviors in a community living arrangement. *American Journal of Occupational Therapy, 54*, 361-371; doi:10.5014/ajot.54.4.361
- Janssen, V., Veronique De Gucht, V., Van Exel, H., & Maes, S. (2013). A self-regulation lifestyle program for post-cardiac rehabilitation patients has long-term effects on exercise adherence. *Journal of Behavioral Medicine. doi 10.1007/s10865-012-9489-y*
- Jette, A.M., Rooks, D., Lachman, M., Lin, T.H., Levenson, C., Heislein, D., Giorgetti, M.M., & Harris, B.A. (1998). Home-based resistance training: Predictors of participation and adherence. *The Gerontologist, 38*, 412-421.
- Kaskutas, V. & Powell, R. (2013). The impact of flexor tendon rehabilitation restrictions on individuals' independence with daily activities: Implications for hand therapists. *Journal of Hand Therapy, 26*, 22-29.

- Khalil, H., Quinn, L., Van Deursen, R., Martin, R., Rosser, A., & Busse, M. (2012). Adherence to use of a home-based exercise DVD in people with Huntington Disease: Participants' perspectives. *Physical Therapy, 92*(1), 69-82.
- King II, T.I. (1993). Hand strengthening with a computer for purposeful activity. *Brief-American Journal of Occupational Therapy, 47*, 635-637.
- Kirwan, T., Tooth, L., & Harkin, C. (2002). Compliance with hand therapy programs: Therapists' and patients' perceptions. *Journal of Hand Therapy, 15*, 31-40.
- Larrat, E. P., Traubman, A. H., & Willey, C. (1990). Compliance-related problems in the ambulatory population. *American Pharmacology, 30*(2), 18-23
- Lyngcoln, A., Taylor, N., Pizzari, T., & Baskus, K. (2005). The relationship between adherence to hand therapy and short-term outcome after distal radius fracture. *Journal of Hand Therapy, 18*, 2-8.
- MacDermid, J.C. & Tottenham, V. (2004). Responsiveness of the Disability of the Arm, Shoulder, and Hand (DASH) and Patient-Rated Wrist/Hand Evaluation (PRWHE) in evaluating change after hand therapy. *Journal of Hand Therapy, 17*, 18-23.
- Magnus, C. R. A., Boychuk, K., Kim, S. Y., and Farthing, J. P. (2013). At-home resistance tubing strength training increases shoulder strength in the trained and untrained limb. *Scandinavian Journal of Medicine and Sciences in Sports*. Advance online publication. doi:10.1111/sms.1207
- Maitra, K.K. & Erway, F. (2006). Perception of client-centered practice in occupational therapists and their clients. *American Journal of Occupational Therapy, 60*, 298-310; doi:10.5014/ajot.60.3.298

- McKinnon, A.L. (2000). Client values and satisfaction with occupational therapy. *Scandinavian Journal of Occupational Therapy*, 7, 99-106.
- Neistadt, M.E. (1995). Methods of assessing clients' priorities: A survey of adult physical dysfunction settings. *American Journal of Occupational Therapy*, 49, 428-436; doi:10.5014/ajot.49.5.428
- O'Brien, L. (2010). Adherence to therapeutic splint wear in adults with acute upper limb injuries: A systematic review. *Journal of Hand Therapy*, 15, 3-12.
- O'Brien, L. (2012). The evidence on ways to improve patient's adherence in hand therapy. Guest Editorial-*Journal of Hand Therapy*, 25(3), 247-250.
- O'Brien, L. & Presnell, S. (2010). Patient experience of distraction splinting for complex finger fracture dislocation. *Journal of Hand Therapy*, 23, 249-260.
- Paternostro-Sluga, T., Keilani, M., Posch, M., Fialka-Moser, V. (2003). Factors that influence the duration of splint wear in peripheral nerve lesion. *American Journal of Physical Medicine and Rehabilitation*, 82(2), 86-95.
- Richards, E. & Digger, K. (2011). Compliance, motivation, and health behaviors of the learner. In S. B. Bastable, P. Gramet, K. Jacobs, & D. L. Sopczyk (Eds.), *Health professional as educator: Principles of teaching and learning* (pp. 199-225). Sudbury, MA: Jones & Bartlett Learning.
- Sluijs, E. M., Kok, G. J., & van der Zee, J. (1993). Correlates of exercise compliance in physical therapy. *Journal of the American Physical Therapy Association*, 73(11), 771-782.

- Sanders, M.J. & Van Oss, T. (2013). Using daily routines to promote medication adherence in older adults. *American Journal of Occupational Therapy*, 67, 91-99.
<http://dx.doi.org/10.5014/ajot.2013.005033>
- Sandford, F., Barlow, N., & Lewis, J. (2008). A study to examine patient adherence to wearing 24-hour forearm thermoplastic splints after tendon repairs. *Journal of Hand Therapy*, 21, 44-53.
- Tabers cyclopedic medical dictionary*. (2009). Philadelphia: F.A. Davis.
- Trybus, M., Lorkowski, J., Brongel, L., & Hladki, W. (2006). Cause and consequences of hand injuries. *The American Journal of Surgery*, 192, 52-57.
[doi:10.1016/j.amjsurg.2005.10.055](https://doi.org/10.1016/j.amjsurg.2005.10.055)
- United States Bureau of Labor and Statistics, Department of Labor. (2011). *Survey of occupational injuries and illness in cooperation with participating state agencies* [Data file]. Retrieved from <http://www.bls.gov/news.release/osh2.t05.htm>
- Watling, R. & Schwartz, I.S. (2004). Understanding and implementing positive reinforcement as an intervention strategy for children with disabilities. *American Journal of Occupational Therapy*, 58, 113-116; [doi:10.5014/ajot.58.1.113](https://doi.org/10.5014/ajot.58.1.113)
- Watling, R., Deitz, J., Kanny, E.M., & McLaughlin, J. F. (1999). Current practice of occupational therapy for children with autism. *American Journal of Occupational Therapy*, 53, 498-505; [doi:10.5014/ajot.53.5.498](https://doi.org/10.5014/ajot.53.5.498)
- Yuen, H.K., Wang, E., Holthaus, K., Vogtle, L.K., Sword, D., Breland, H.L., & Kamen, D.L. (2013). Brief report-self-reported versus objectively assessed exercise adherence. *American Journal of Occupational Therapy*, 67, 484-489.
<http://dx.doi.org/10.5014/ajot.2013.007575>

Appendices

Appendix A
University of North Dakota and Altru Health Systems Institutional Review Board
Approval



Institutional Review Board (IRB) Human Subjects Review Form

For new projects or procedural revisions to approved projects involving human subjects.

Date: **October 4, 2013** IRB # _____
Principal Investigators: **Brien Buckentine & Justin Fredrickson** Phone # **320-493-8797/
320-583-2228**

Address to which notice of approval should be sent: **1015 N 39th St. D15**

Institution: **University of North Dakota** Department: **Occupational Therapy**

Research Coordinator(s): **Anne Haskins, PhD, OTR/L** Phone # **701-777-0229**

Proposed project dates, beginning date: **October 14, 2014** Completion Date: **May 31, 2014**

E-mail address: **brien.buckentine@my.und.edu**

Project Title: **Adherence to Home Program in Patients with Acute Othopedic Injuries of the Upper Extremity**

Funding Agencies (if applicable): **None**

Type of Project: New Project Continuation Renewal
 Student Research Project Dissertation or Thesis Research

Reports: Administrative Change Protocol Change Revised Consent Form
 Amendments or Change in Project Adverse Event Other _____

Dissertation/Thesis Advisor, or Student Advisor: **Anne Haskins, PhD, OTR/L**

Proposed Project: Involves New Drugs (IND) Involves Non-Approved Use of Drug
 Involves a Cooperating Institute None of the Above

If your project involves any human tissue, body fluids, pathological specimens, donated organs, fetal material, stem cells, discarded tissue or placental materials, check here:

If any of your subjects fall in any of the following classifications, please indicate the classification:

Minors (< 18 years) Pregnant Women Mentally Disabled Fetuses Mentally Retarded
 Prisoners Students Abortuses Control Group

Expedited Review requested under item _____ (number) of HHS Regulations (see attached explanation)

Exempt Review requested under item _____ (number) of HHS Regulations (see attached explanation)

If your project has been/will be submitted to another Institutional Review Board(s), please list name of Board(s):
If you affiliated to UND we will need a copy of your proposal.

Status of submission to another IRB: Submitted: date _____; Approved: date (9/27/2013); Pending

Any additional information should be documented on a separate sheet of paper.

Completed by: _____

1. **ABSTRACT:** *Please provide a brief explanation (limit to 200 words or less) and include justification or necessity for using human subjects Attach additional sheet if necessary.*

In the area of hand therapy, many patients require home programs to continue to have positive results after a traumatic injury to the upper extremity. Adherence to prescribed home program has been described as the "most unpredictable, least controllable variable in a medical interventions" (Groth & Wulf, 1995, p.18). In addition non-adherence to home programs not only affects recovery of the patient, but also wastes health care dollars, resources, healthcare professionals times, and medication (Larrate, Taubman, & Willey, 1990). Adherence to home programs has been shown to increase strength (Magnus, Bychuk, Kim, & Fathing, 2013), passive range of motion and active range of motion (Eng, Trommel, & Ritt, 2002). Currently, there is dearth research on persons with acute upper extremity injuries and adherence to home programs. Despite the benefits of home programming, several researchers have shown there is a variable level of home program non-adherence from ~25% to ~70% (O'Brien, 2010; Paternostro-sluga, Keilani, Posch, & Fialka-Moser, 2003; Sandford, Barlow, & Lewis, 2007). Low adherence rates are problematic for client recovery and the aforementioned statistics provide evidence that a broad range of client adherence is present in practice. More research is required in this field to understand what factors influence client adherence to home programs. Present research does not address client factors or performance patterns that affect adherence to home programs (Sandford, Barlow, & Lewis, 2007). We found no study involving a tool used evaluate home program adherence related to client factors and performance skills. This study will be the first step in developing and testing a tool that will be intended for occupational therapist to utilized with patients who have had an upper extremity injury. Ultimately, we hope that this tool can provide client specific information that could provide therapists with valuable information to assist in the development of a client-centered home program that will optimize home program adherence.

The purpose of this independent study is two fold to test an instrument intended to measure adherence and to explore the relationship between occupational therapy home programs and client factors and performance patterns that are influential in clients' adherence to their prescribed home programs.

PLEASE NOTE:

Only information pertinent to your request to utilize human subjects in your project or activity should be included on this form. Where appropriate attach sections from your proposal including data collection instruments when applicable.

2. **PROTOCOL:** *Describe procedures to which humans will be subjected (such as: recruitment procedures; subject selection procedures and criteria; estimated number of subject, where the research will be conducted and procedures to obtain informed consent)*

The surveys will be completed by the respondents at a hand therapy clinic in Grand Forks, ND where they are receiving therapy. Data collection will occur upon IRB approval from both the University of North Dakota and the Altru Hospital IRB and last for no more than 60 days. We anticipate that data collection will take place in October 17, 2014 to December 31, 2014. Respondents will be provided an I-Pad to complete a survey online. Until data analysis occurs, survey responses will be stored on the University of North Dakota Qualtrics database. We will not be identifying Altru Hand Therapy Clinic in any publication nor is this study being done to assess the clinic or therapist's quality of work, but rather to explore what factors the client perceives as influencing his or her home program adherence. The clinic will receive a copy of the final independent study in which, respondent specifics will not be shared.

Design: A prospective exploratory survey design in an online format.

Sampling Methods:

Target Population

Inclusion Criteria: Researchers will choose patients who have received an acute upper extremity injury, been prescribed a home program, and are not a member of a special population such as children and cognitively impaired. The respondents of this study must be 18 years of age with no comorbidities or additional injuries. This inclusion criteria was selected to better understand client factors and performance patterns of people with acute injuries adherence to their home programs. Acute injuries will be defined as injuries receiving no longer than one-year of treatment from a hand therapist.

Exclusion Criteria: Exclusion criteria include respondents with chronic illnesses (receiving more than one-year of treatment from a hand therapist) or injuries special populations, and patients who did not receive a home program from their certified hand therapist. Respondents with chronic illnesses/injuries were excluded because they have already developed a routine level of adherence. We wish to assess the level of adherence for acute injuries to determine what client factors and patterns could be modified to better allow for adherence. Special populations were avoided due to the vulnerable nature of obtained from these respondents. Lastly, respondents who were not prescribed a home program were excluded because we wish to obtain personal experience of adherence to home programs.

Sampling Specifics

The following is the sampling procedures, how respondents will be identified, and the responsibilities of the occupational hand therapist, secretary, and student researchers.

It is estimated that there will be 20-30 respondents participating in this independent study. This number was selected to increase the rigor, validity, and reliability of the findings. As this is a pilot study and the instrument previously untested, limiting the number of respondents is appropriate.

1. When a client is checking in for an appointment, we would like the occupational therapist or secretary to say "Would you be interested in learning more about participating in a research study that is being completed by UND students looking at factors that affect your home program?"

For clients who would like to learn more

2. If the client say yes and is early for his or her appointment (10-15 minutes), the occupational therapist or secretary will point the client in the direction of the UND students to learn more about the student including an explanation of the study and if the client wishes to participate, reviewing and understanding the research information sheet. The client would then complete the survey.

3. If the client does not have time before the appointment but want to learn more, the secretary will say "The therapist will guide you to the UND students after your therapy session if you want to learn more about the study." The hand therapist will direct the client to the UND students after completion of the therapy session. The hand therapist will also be responsible for determining if there is a 10-15 minute time period during modalities in which the client could learn more about the study. If there is this time available, the hand therapist will communicate this to the UND students and the students will provide a study overview to the client and the research information sheet will be read and a copy will be provided to the client. The survey will then be given to the client. At no time will the study interrupt therapy services.

Furthermore, the respondent will be given a sheet of paper defining home program as follows:

A home program for the purposes of this survey is defined as any exercises, activities, tasks, hot or cold packs, paraffin baths, electrical stimulation, continuous passive motion machine use, splints wear schedule, or anything else your therapist assigns you to do at home.

For Clients who choose not to learn more

4. "Thank you for your consideration. If you change your mind about participating in the study, or have more time available to participate at a later date, please let me know as the UND students will be completing the study over the next month."

Research Information sheet and Procedures

Prior to beginning the study we will be submitting a copy of the survey and research information sheet to the occupational hand therapist and occupational therapy director for preliminary approval. Prior to conducting the survey we will secure preliminary approval of the sampling specifics from the occupational hand therapist. We plan to meet with the hand therapist and receptionist to discuss the survey and how they will direct respondents to us to participate in this research study.

We will provide each respondent with a research information sheet prior to completing a survey on an I-Pad. The respondent will be given instructions on reviewing the research information sheet and then provided time read it, with the opportunity to ask us any questions he or she may have. Once the respondent has reviewed the research information sheet he or she will retain the research information sheet for their records. There will be no waiting period between informing the prospective respondents and obtaining agreement to participate in the study.

No coercion will occur. Prospective respondents will be asked to take part in this study only once. Any respondent denial of the survey will not be further persuaded by us to attempt to get the respondent to complete survey. Respondents will be reminded that this survey is voluntary and that he or she may, discontinue the survey at any time. The respondents will be given the research advisors name and contact information, as well as contact information for UND IRB, should they wish to receive information from parties other than the graduate student researchers.

The language of the research information sheet was written at a sixth grade reading level. We will be on site to provide clarification of any language that may be unknown or unclear to respondents. Before starting the research process the participants will be informed of the purpose of the study, what will be done with the data collected, and that they will be given access to the final study if they wish.

The research information sheet includes a statement of research, the purpose of the research, the potential risks, time requirements, right of the respondent to stop the survey at any time, and identification that there are no direct benefits for participating in this study. Furthermore, the specific respondent's answers will not be shared with the healthcare provider. Respondents will also be provided with information that indicates that no personal identifying data will be tracked. Potential respondents also are informed that engagement in this process is strictly voluntary and they can stop completing the survey at any time. Contact information for the

researchers and for the University of North Dakota Institutional Review Board have also been provided within the research information sheet. Refer to the actual research statement of research information sheet for full details, which is located in appendix B.

Instrumentation

The online survey consists of 46 questions that include Likert-type Scale questions, multiple-choice questions, and short answer open-ended questions. These questions are related to the four constructs of the Occupational Adaptation Model including: occupations, adaptive capacity, relative mastery, and occupational adaptation process (Cole and Tufano, 2008). The survey questions pertain to the patient and his or her perspective of the relationship between them and the occupational hand therapist, the respondents home program, and demographic information. This survey was written at a 6th grade reading level to make it accessible and understandable for most respondents. The survey will take approximately 5-10 minutes to complete.

Description of Subject Population and Estimated Number of Subjects

The respondents of this study must be 18 years of age with no comorbidities or additional injuries. This inclusion criteria was selected to better understand client factors and performance patterns of people with acute injuries adherence to their home programs. Acute injuries will be defined as injuries receiving no longer than one-year of treatment from an occupational hand therapist. Exclusion criteria include respondents with chronic illnesses (receiving more than one-year of treatment from a hand therapist) or injuries special populations, and respondents that did not receive a home program from their certified hand therapist. Respondents with chronic illnesses/injuries were excluded because they have already developed a routine level of adherence. We wish to assess the level of adherence for acute injuries to determine what client factors and patterns could be modified to better allow for adherence. Special populations were avoided due to the vulnerable nature of these respondents. Lastly, respondents who were not prescribed a home program were excluded because we wish to obtain personal experience of adherence to home programs. This inclusion criteria was selected to better understand client factors and performance patterns of people with acute injuries adherence to their home programs. It is estimated that there will be 20-30 respondents participating in this independent study.

3. BENEFITS: *(Describe the benefits to the individual or society)*

Benefits of the survey might be better feelings and emotions about doing your home program. It is also possible that you may not benefit personally from being in this study. However, we hope that, in the future, other people might benefit from this study because it will help therapists better understand why people do or do not complete home programs.

4. RISKS: *(Describe the risks to the subject and precautions that will be taken to minimize them. The concept of risk goes beyond physical risk and includes risks to the subject's dignity and self respect, as well as psychological, emotional or behavioral risk. If data are collected which could prove harmful or embarrassing to the subject if associated with him or her, then describe the methods to be used to insure the confidentiality of data obtained, including plans for final disposition or destruction, debriefing procedures, etc.)*

Risks

Participants may experience frustration that is often experienced when completing surveys. Some questions may be of a sensitive nature, and participants may therefore become upset as a result. However, such risks are not viewed as being in excess of "minimal risk". If, however, participants become upset by questions, they may stop at any time or choose not to answer a question. Due to the "minimal risk" of this study, it is not foreseen to have adverse reactions, but in the case of an adverse reaction the survey will be stopped immediately and the researchers will refer the subject to community counseling resources that are available.

Confidentiality and destruction of Data

No study procedures will begin until approval is received from the University of North Dakota IRB as well as the Altru Health Systems IRB. The identifying information of the respondent will not be obtained. Respondents will complete the survey using an online survey program that will not be linked to the person. The respondents will be given the student advisor's and our names and contact information, as well as contact information for UND IRB in the research information sheet. Through reading and agreeing to the research information sheet, respondents will be acknowledging they are taking part in the study voluntarily. Respondents will also be informed that they may quit the study at any time and can decline answering questions on the survey. Data results will be downloaded and stored on a desktop computer located in the research advisors locked office for 3 years. The research advisor and us will have access to the data. After 3 years the students' advisor will erase the data.

5. CONSENT FORM: *A copy of the CONSENT FORM to be signed by the subject (if applicable) and/or any statement to be read to the subject must be attached to this proposal. If no CONSENT FORM is to be used, document the procedures to be used to protect human subject. Please Note: All records attained must be retained for a period of time sufficient to meet federal, state, and local regulations; sponsor requirements; and organizational policies. The consent form must be written in language that can easily be read by the subject population and any use of jargon or technical language should be avoided.*

Waiver: *If you are waiving consent or its documentation, please explain how your study meets the federally mandated criteria.*

Describe who will be obtaining consent, where signed consent forms will be kept, and for what period of time.

Prior to beginning the study we will be submitting a copy of the survey and research information sheet to the occupational hand therapist and occupational therapy director for preliminary approval. Prior to conducting the survey we will secure preliminary approval of the sampling specifics from the occupational hand therapist. We plan to meet with the hand therapist and receptionist to discuss the survey and how they will direct respondents to us to participate in this research study.

We will provide each respondent with a research information sheet prior to completing a survey on an I-Pad. The respondent will be given instructions on reviewing the research information sheet and then provided time read it, with the opportunity to ask us any questions he or she may have. Once the respondent has reviewed the research information sheet he or she will retain the research information sheet for their records. There will be no waiting period between informing the prospective respondents and obtaining agreement to participate in the study.

No coercion will occur. Prospective respondents will be asked to take part in this study only once. Any respondent denial of the survey will not be further persuaded by us to attempt to get the respondent to complete survey. Respondents will be reminded that this survey is voluntary and that he or she may, discontinue the survey at any time. The respondents will be given the research advisors name and contact information, as well as contact information for UND IRB, should they wish to receive information from parties other than the graduate student researchers.

The language of the research information sheet was written at a sixth grade reading level. We will be on site to provide clarification of any language that may be unknown or unclear to respondents. Before starting the research process the participants will be informed of the purpose of the study, what will be done with the data collected, and that they will be given access to the final study if they wish.

The research information sheet includes a statement of research, the purpose of the research, the potential risks, time requirements, right of the respondent to stop the survey at any time, and identification that there are no direct benefits for participating in this study. Furthermore, the specific respondent's answers will not be shared with the healthcare provider. Respondents will also be provided with information that indicates that no personal identifying data will be tracked. Potential respondents also are informed that engagement in this process is strictly voluntary and they can stop completing the survey at any time. Contact information for the researchers and for the University of North Dakota Institutional Review Board have also been provided within the research information sheet. Refer to the actual research statement of research information sheet for full details, which is attached.

6. For **FULL IRB REVIEW**, forward the signed original and 15 copies of this completed form and, when applicable, 15 copies of the proposed consent form, survey, interview questions, etc., and any supporting documentation (such as signed student consent to release of Education Record Form (for students only) to: (see below)

For **EXEMPT or EXPEDITED REVIEW**, forward a signed original with the consent form, survey, interview questions, etc., and any supporting documentation (such as signed student consent to release of Education Record Form (for students only); to:

Marie-Laure Reese - IRB Coordinator (Telephone 701-780-6161)
Altru Psychiatry Center – Office 101
860 South Columbia Road
Grand Forks ND 58201

Prior of receiving an IRB approval, the Principal Investigator, research nurse, research coordinator and any key personnel of a research team must complete the required IRB human subjects' education. Please go to <http://phrp.nihtraining.com/users/register.php> (if already completed an IRB education, please submit a copy to the IRB Office).

The policies and procedures on Use of Human Subjects in Altru Health System Institutions apply to all activities involving use of Human Subjects performed by personnel conducting such activities. No activities are to be initiated without prior review and approval of the Altru Health System Institutional Review Board (IRB). It is the intent of the Altru Health System (IRB) to assist investigators engaged in human subject research to conduct their research along ethical guidelines reflecting professional as well as community standards.

By signing below, you are verifying that the information provided in the Human Subjects Review Form and attached information is accurate and that the project will be completed as indicated.

Signatures:

Principal Investigator:



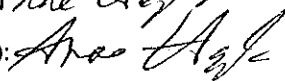
Date: 10/8/2013

Research Coordinator:



Date: 10/8/2013

Student Advisor (if applicable):



Date: 10/8/2013

**Health Insurance Portability & Accountability Act (HIPAA)
Compliance Application**

FWA-00003965/IRB-00002563

IRB Office 101 - Altru Psychiatry Center
860 S. Columbia Rd, Grand Forks, North Dakota 58201
Phone: (701) 780-6161

PROJECT TITLE & IRB NUMBER <i>Adherence to home program in patients with acute orthopedic injuries of the upper extremity</i>
PRINCIPAL INVESTIGATOR Name (First, Last) Brien Buckentine, Justin Fredrickson, Anne Haskins, PhD., OTR/L

Please complete this form if you intend to use/disclose protected health information (PHI) in your research. PHI is health information transmitted or maintained in any form or medium that: identifies or could be used to identify an individual; is created or received by a healthcare provider, health plan, employer, or healthcare clearinghouse; and relates to the past, present, or future physical or mental health or condition of an individual; the provision of healthcare to an individual; or the past, present, or future payment for the provision of healthcare to an individual

An investigator may access PHI using one or more of the following methods. Unless otherwise noted, you should complete this entire form as applicable.


A. Please check the appropriate box(es) for your specific research.

1. **De-identified Information:** De-identified Information is health information that cannot be linked to an individual. Research which involves the use of "de-identified" PHI is exempt from HIPAA requirements. The HIPAA Privacy Rule regulations [45 CFR 164.514(b)] lists 18 specific identifiers that must be removed from the health information before the researcher obtains the information for it to be considered not identifiable. The list includes: Name/initials; Street address, city, county, precinct, zip code and equivalent geocodes; All elements of dates (except year) directly related to an individual (date of birth, admission date, discharge date, date of death); Elements of date, including year, for persons 90 or older; Telephone number; Fax number; Electronic mail address; Social Security Number; Medical record numbers; Health plan identification numbers; Account numbers Certificate /license numbers; Vehicle identifiers and serial numbers, including license plate numbers; Device identifiers and serial numbers; Web addresses (URLs); Internet IP addresses; Biometric identifiers, including finger and voice prints; Full face photographic images and any comparable images; Any other unique identifying number, characteristic or code.

If the research does not include access to any of the above identifiers, sign the certification at the bottom of the page. The HIPAA privacy regulations do not apply and you are not required to complete the rest of the application.

(Sign and Date this section only if the research involves De-Identified Information)

I certify the PHI received or reviewed by research personnel for the research referenced above does not include any of the identifiers listed above.


Principal Investigator Signature



10/8/13
Date

 *10-8-2013*

STUDENT CONSENT TO RELEASE OF EDUCATIONAL RECORD¹

Pursuant to the Family Educational Rights and Privacy Act of 1974, I hereby consent to the Institutional Review Board's access to those portions of my educational record which involve research that I wish to conduct under the Board's auspices. I understand that the Board may need to review my study data based on a question from a participant or under a random audit. The study to which this release pertains _____

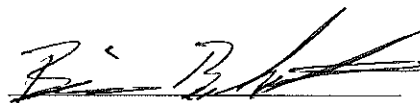
Adherence to home programs in patients with acute orthopedic injuries of the upper extremity

I understand that such information concerning my educational record will not be released except on the condition that the Institutional Review Board will not permit any other party to have access to such information without my written consent. I also understand that this policy will be explained to those persons requesting any educational information and that this release will be kept with the study documentation.

IRB Number

10/8/2014
Date

Brien Buckentine
Printed Name


Signature of Student Researcher

¹Consent required by 20 U.S.C. 1232g.

STUDENT CONSENT TO RELEASE OF EDUCATIONAL RECORD¹

Pursuant to the Family Educational Rights and Privacy Act of 1974, I hereby consent to the Institutional Review Board's access to those portions of my educational record which involve research that I wish to conduct under the Board's auspices. I understand that the Board may need to review my study data based on a question from a participant or under a random audit. The study to which this release pertains _____

Adherence to home programs in patients with acute orthopedic injuries of the upper extremity.

I understand that such information concerning my educational record will not be released except on the condition that the Institutional Review Board will not permit any other party to have access to such information without my written consent. I also understand that this policy will be explained to those persons requesting any educational information and that this release will be kept with the study documentation.

IRB Number

Justin Fredrickson
Printed Name

10/8/13
Date

Justin Fredrickson
Signature of Student Researcher

¹Consent required by 20 U.S.C. 1232g.



APPLICATION TO CONDUCT RESEARCH

Any researcher proposing to conduct research using patients, staff, or records of Altru Health System must obtain organizational approval as well as IRB approval. Complete this application form and submit it along with a brief summary of the study, including consent and instruments to: Cindy Flath, Altru Health Research Center, Building 1, 860 S. Columbia Road, Grand Forks, ND 58201

Name Brien Buckentine & Justin Fredrickson Date 10-8-2013
Address 1015 North 39th St. D15 Grand Forks, ND 58203
Telephones numbers: Work (320)-493-8797 Home (320)-493-8797
Department/College: Occupational Therapy Department, University of North Dakota
Project Title: Adherence to Home Programs in Patients with Acute Orthopedic Injuries of the Upper Extremity

Status of applicant (check all that apply):

Altru physician/staff member

Student Department Occupational Therapy Department
Advisor Anne Haskins, PhD OTR/L
Relationship to Altru, if any _____
 Coursework Thesis Dissertation Other _____

Faculty College/Department _____
Relationship to Altru, if any _____

Other Organization _____
Position _____
Relationship to Altru, if any _____

Please answer the following questions:

1. Describe the nature and extent of involvement expected of Altru staff with your project (include specific staff members by name and/or title, specific activities requested of them and an estimate of the amount of their time that would be required).

These student researchers have contacted and provided Travis MacKenzie, CHT, OTR/L and Brenda Pauley-Colter, OTR/L, Supervisor of Physical Medicine and Therapy Services with a copy of the sampling specifics listed below. These individuals reviewed the research procedures and provided written agreement to allow and participate in this research study.

Sampling Specifics

The following is the sampling procedures, how respondents will be identified, and the responsibilities of the occupational hand therapist, secretary, and student researchers.

It is estimated that there will be 20-30 respondents participating in this independent study. This number was selected to increase the rigor, validity, and

reliability of the findings. As this is a pilot study and the instrument previously untested, limiting the number of respondents is appropriate.

1. When a client is checking in for an appointment, we would like the occupational therapist or secretary to say "Would you be interested in learning more about participating in a research study that is being completed by UND students looking at factors that affect your home program?"

For clients who would like to learn more

2. If the client say yes and is early for his or her appointment (10-15 minutes), the occupational therapist or secretary will point the client in the direction of the UND students to learn more about the student including an explanation of the study and if the client wishes to participate, reviewing and understanding the research information sheet. The client would then complete the survey.

3. If the client does not have time before the appointment but want to learn more, the secretary will say "The therapist will guide you to the UND students after your therapy session if you want to learn more about the study." The hand therapist will direct the client to the UND students after completion of the therapy session. The hand therapist will also be responsible for determining if there is a 10-15 minute time period during modalities in which the client could learn more about the study. If there is this time available, the hand therapist will communicate this to the UND students and the students will provide a study overview to the client and the research information sheet will be read and a copy will be provided to the client. The survey will then be given to the client. At no time will the study interrupt therapy services.

Furthermore, the respondent will be given a sheet of paper defining home program as follows:

A home program for the purposes of this survey is defined as any exercises, activities, tasks, hot or cold packs, paraffin baths, electrical stimulation, continuous passive motion machine use, splints wear schedule, or anything else your therapist assigns you to do at home.

For Clients who choose not to learn more

4. "Thank you for your consideration. If you change your mind about participating in the study, or have more time available to participate at a later date, please let me know as the UND students will be completing the study over the next month."

2. Describe the nature of patient contact required by your project, if applicable (i.e. access to medical records, patient interviews, etc.)

We will provide each respondent with a research information sheet prior to completing a survey on an I-Pad. The respondent will be given instructions on reviewing the research information sheet and then provided time read it, with the opportunity to ask us any questions he or she may have. Once the respondent has reviewed the research information sheet he or she will retain the research information sheet for their records. There will be no waiting period between informing the prospective respondents and obtaining agreement to participate in the study. After reviewing the information sheet the respondent will be handed an I-Pad to complete a survey. Also see sampling specifics above for detailed information of the nature of patient contact required by this research project.

3. Describe how patient/subject confidentiality will be protected and how patients/subjects in the study will be assured of anonymity.

No study procedures will begin until approval is received from the University of North Dakota IRB as well as the Altru Health Systems IRB. The identifying information of the respondent will not be obtained. Respondents will complete the survey using an online survey program that will not be linked to the person. The respondents will be given the student advisor's and our names and contact information, as well as contact information for UND IRB in the research information sheet. Through reading and agreeing to the research information sheet, respondents will be acknowledging they are taking part in the study voluntarily. Respondents will also be informed that they may quit the study at any time and can decline answering questions on the survey. Data results will be downloaded and stored on a desktop computer located in the research advisors locked office for 3 years. The research advisor and us will have access to the data. After 3 years the data will be erased by the students' advisor.

4. List any supplies, equipment or other resources provided by Altru that would be required to carry out your project (i.e. photocopying, computer access, etc. Describe funding available, if any, to cover these expenses).

N/A

5. Identify any space requirements that would be needed to carry out your project.

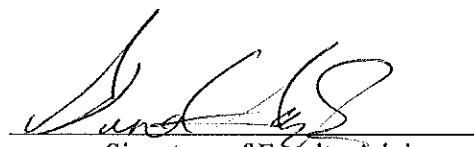
Hand therapist will determine area in which student researchers can utilize for this research survey. Space that would be adequate could include waiting room or treatment room not being utilized for therapy treatment. At no time will this student research interrupt therapy processes.

6. Projected start of project activities at Altru 10-17-2013
Projected completion of project activities at Altru 12-31-2013
Projected completion date of entire project 5-31-2014

7. Source of funding sought or received N/A

8. Other information/comments _____


Signature of Applicant


Signature of Faculty Advisor

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI)

HUMAN RESEARCH CURRICULUM COMPLETION REPORT

Printed on 08/29/2013

LEARNER Brien Buckentine (ID: 2542295)
DEPARTMENT Occupational therapy
PHONE 320-493-8797
EMAIL brien.buckentine@my.und.edu
INSTITUTION University of North Dakota
EXPIRATION DATE 10/30/2014

GROUP 2. SOCIAL / BEHAVIORAL RESEARCH INVESTIGATORS AND KEY PERSONNEL

COURSE/STAGE: Basic Course/1
PASSED ON: 10/31/2011
REFERENCE ID: 6962989

MODULE	DATE COMPLETED	SCORE
Introduction	10/31/2011	No Quiz
History and Ethical Principles - SBE	10/31/2011	4/4 (100%)
Defining Research with Human Subjects - SBE	10/31/2011	4/5 (80%)
The Regulations - SBE	10/31/2011	5/5 (100%)
Assessing Risk - SBE	10/31/2011	4/5 (80%)
Informed Consent - SBE	10/31/2011	5/5 (100%)
Privacy and Confidentiality - SBE	10/31/2011	5/5 (100%)
Research with Prisoners - SBE	10/31/2011	4/4 (100%)
Research in Public Elementary and Secondary Schools - SBE	10/31/2011	4/4 (100%)
International Research - SBE	10/31/2011	3/3 (100%)
Internet Research - SBE	10/31/2011	4/4 (100%)
University of North Dakota	10/31/2011	No Quiz

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI Program participating institution or be a paid Independent Learner. Falsified information and unauthorized use of the CITI Program course site is unethical, and may be considered research misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Program Course Coordinator

Collaborative Institutional
Training Initiative
at the University of Miami

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI)

HUMAN RESEARCH CURRICULUM COMPLETION REPORT

Printed on 10/08/2013

LEARNER justin fredrickson (ID: 2532322)
DEPARTMENT occupational therapy
PHONE 320-583-2228
EMAIL j.fredrickson@und.edu
INSTITUTION University of North Dakota
EXPIRATION DATE 10/23/2014

GROUP 2. SOCIAL / BEHAVIORAL RESEARCH INVESTIGATORS AND KEY PERSONNEL

COURSE/STAGE: Basic Course/1
PASSED ON: 10/24/2011
REFERENCE ID: 6925857

REQUIRED MODULES	DATE COMPLETED	SCORE
Introduction	10/24/11	No Quiz
History and Ethical Principles - SBE	10/24/11	4/4 (100%)
Defining Research with Human Subjects - SBE	10/24/11	4/5 (80%)
The Regulations - SBE	10/24/11	5/5 (100%)
Assessing Risk - SBE	10/24/11	4/5 (80%)
Informed Consent - SBE	10/24/11	5/5 (100%)
Privacy and Confidentiality - SBE	10/24/11	5/5 (100%)
Research with Prisoners - SBE	10/24/11	4/4 (100%)
Research in Public Elementary and Secondary Schools - SBE	10/24/11	4/4 (100%)
International Research - SBE	10/24/11	3/3 (100%)
Internet Research - SBE	10/24/11	4/4 (100%)
University of North Dakota	10/24/11	No Quiz

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI Program participating institution or be a paid Independent Learner. Falsified information and unauthorized use of the CITI Program course site is unethical, and may be considered research misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Program Course Coordinator

Collaborative Institutional
Training Initiative
at the University of Miami

INSTITUTIONAL REVIEW BOARD
c/o RESEARCH DEVELOPMENT AND COMPLIANCE
DIVISION OF RESEARCH
TWAMLEY HALL ROOM 106
264 CENTENNIAL DRIVE STOP 7134
GRAND FORKS ND 58202-7134
(701) 777-4279
FAX (701) 777-6708

September 27, 2013

Brien Buckentine and Justin Fredrickson
c/o Brien Buckentine
1015 North 39th Street D15
Grand Forks, ND 58203

Dear Ms. Buckentine and Mr. Fredrickson:

We are pleased to inform you that your project titled, "Adherence to Home Programs in Patients with Acute Orthopedic Injuries of the Upper Extremity" (IRB-201309-091) has been reviewed and approved by the University of North Dakota Institutional Review Board (IRB). The expiration date of this approval is May 31, 2014.

As principal investigator for a study involving human participants, you assume certain responsibilities to the University of North Dakota and the UND IRB. Specifically, any adverse events or departures from the protocol that occur must be reported to the IRB immediately. It is your obligation to inform the IRB in writing if you would like to change aspects of your approved project, prior to implementing such changes.

When your research, including data analysis, is completed, you must submit a Research Project Termination form to the IRB office so your file can be closed. A Termination Form has been enclosed and is also available on the IRB website.

If you have any questions or concerns, please feel free to call me at (701) 777-4279 or e-mail michelle.bowles@research.und.edu.

Sincerely,



Michelle L. Bowles, M.P.A., CIP
IRB Coordinator

MLB/jle

Enclosures

REPORT OF ACTION: EXEMPT/EXPEDITED REVIEW
University of North Dakota Institutional Review Board

Date: 9/25/2013

Project Number: IRB-201309-091

Principal Investigator: Buckentine, Brien; Fredrickson, Justin

Department: Occupational Therapy

Project Title: Adherence to Home Programs in Patients with Acute Orthopedic Injuries of the Upper Extremity

The above referenced project was reviewed by a designated member for the University's Institutional Review Board on 9/27/2013 and the following action was taken:

- Project approved. **Expedited Review** Category No. _____
Next scheduled review must be before: _____
- Copies of the attached consent form with the IRB approval stamp dated _____ must be used in obtaining consent for this study.
- Project approved. **Exempt Review** Category No. 2
- This approval is valid until MAY 31 2014 as long as approved procedures are followed. No periodic review scheduled unless so stated in the Remarks Section.
- Copies of the attached consent form with the IRB approval stamp dated Information Sheets must be used in obtaining consent for this study.
- Minor modifications required. The required corrections/additions must be submitted to RDC for review and approval. **This study may NOT be started UNTIL final IRB approval has been received.**
- Project approval deferred. **This study may not be started until final IRB approval has been received.**
(See Remarks Section for further information.)
- Disapproved claim of exemption. This project requires Expedited or Full Board review. The Human Subjects Review Form must be filled out and submitted to the IRB for review.
- Proposed project is not human subjects research as defined under Federal regulations 45 CFR 46 or 21 CFR 50 and does not require IRB review.
 - Not Research
 - Not Human Subject

PLEASE NOTE: Requested revisions for student proposals MUST include adviser's signature. All revisions MUST be highlighted and submitted to the IRB within 90 days of the above review date.

- Education Requirements Completed. (Project cannot be started until IRB education requirements are met.)

cc: Anne Haskins, Ph.D., OTR/L

Michelle L. Bredow 9/27/2013
Signature of Designated IRB Member Date
UND's Institutional Review Board

If the proposed project (clinical medical) is to be part of a research activity funded by a Federal Agency, a special assurance statement or a completed 310 Form may be required. Contact RDC to obtain the required documents.

(Revised 10/2006)

**THE UNIVERSITY OF NORTH DAKOTA
RESEARCH INFORMATION SHEET**

TITLE:

Adherence to Home Programs in Patients with Acute Orthopedic Injuries of the Upper Extremity

PROJECT DIRECTOR: Anne Haskins, *PhD, OTR/L*

PHONE # 701-777-0229

DEPARTMENT: Department of Occupational Therapy

WHAT IS THE PURPOSE OF THIS STUDY?

You are being asked to take part in a research study. This study will look at what things might help or prevent you from doing your home program.

You are invited to be in this research study about doing home programs because you have an injury to the arm, wrist or hand and have been given a home program.

The purpose of this research study is to find out why people may or may not do their home programs. Researchers hope to better understand barriers that might prevent people from doing their home programs. The information you provide will help the researchers' better understand these barriers. Researchers hope to build a survey that can be used by hand therapist to better help patients do their home program.

HOW MANY PEOPLE WILL PARTICIPATE?

Approximately 20-40 people will take part in this study at one hand therapy clinic in Grand Forks, ND.

HOW LONG WILL I BE IN THIS STUDY?

Your participation in the study will last about 5-10 minutes. You will need to simply complete this survey one time.

WHAT WILL HAPPEN DURING THIS STUDY?

If you agree to participate in this study, a survey will appear on this I-Pad to complete today. There will be several questions for you to answer. The survey will take about 5-10 minutes of your time. The survey questions will ask about your injury and ideas you have about your home program. There will be no other additional follow-up or requirements after the survey. This research project will only include people who choose to take part, and there will be no cost to you should you choose to participate. You have the right to withdraw from this study at any time with no penalties. The information you provide will not be shared with your therapist or the facility.

Approval Date:	<u>SEP 27 2013</u>
Expiration Date:	<u>MAY 31 2014</u>
University of North Dakota IRB	

WHAT ARE THE RISKS OF THE STUDY?

You may experience mild frustration that is common when completing surveys. Some questions may be of a sensitive nature, and you may therefore become upset as a result. However, such risks are not viewed as being in excess of "minimal risk". If, however, you become upset by questions, you may stop at any time or choose not to answer a question.

WHAT ARE THE BENEFITS OF THIS STUDY?

Benefits of the survey might be better feelings and emotions about doing your home program. It is also possible that you may not benefit personally from being in this study. However, we hope that, in the future, other people might benefit from this study because it will help therapists better understand why people do or do not complete home programs.

CONFIDENTIALITY

The student researchers and their advisor will be the only people to see your answers. No one will see your name or personal information. Your hand therapist will not see your survey results.

The records of this study will be kept private to the extent permitted by law. In any report about this study that might be published, you will not be identified. Your study record may be reviewed by Government agencies, the UND Research Development and Compliance office, and the University of North Dakota Institutional Review Board. Any information that is obtained in this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. If we write a report or article about this study, we will describe the study results in a summarized manner so that you cannot be identified.

IS THIS STUDY VOLUNTARY?

Your participation is voluntary. You may choose not to participate or you may discontinue your participation at any time without penalty or loss of benefits to which you are otherwise entitled. Your decision whether or not to participate will not affect your current or future relations with the University of North Dakota or the clinic where you are receiving therapy.

If you decide to leave the study early, we ask that you return the iPad the researchers. Your therapist will not view your answers and this will have no negative effect on your therapy session.

CONTACTS AND QUESTIONS?

The researchers conducting this study are Brien Buckentine, Justin Fredrickson, and their advisor Anne Haskins, PhD, OTR/L. If you later have questions, concerns, or complaints about the research please contact Brien Buckentine (320) 493-8797, Justin Fredrickson (320) 583-2228, or Dr. Anne Haskins (Advisor) at 701-777-0229.

Approval Date:	SEP 27 2013
Expiration Date:	MAY 31 2014
University of North Dakota IRB	

If you have questions regarding your rights as a research subject, you may contact The University of North Dakota Institutional Review Board at (701) 777-4279.

- You may also call this number about any problems, complaints, or concerns you have about this research study.
- You may also call this number if you cannot reach research staff, or you wish to talk with someone who is independent of the research team.
- General information about being a research subject can be found by clicking “Information for Research Respondents” on the web site:
<http://und.edu/research/resources/human-subjects/research-participants.cfm>

I agree for my written quotes in the survey to be used in the research; however I will not be identified.

Approval Date: <u>SEP 27 2013</u>
Expiration Date: <u>MAY 31 2014</u>
University of North Dakota IRB

Adherence to Home Programs in Patients with Acute

Orthopedic Injuries of the Upper Extremity

Brien Buckentine, OTS, Justin Fredrickson, OTS, & Anne M. Haskins, PhD, OTR/L

Occupational Therapy Department

The University of North Dakota

Researcher Background and Qualifications

Brien Buckentine and Justin Fredrickson are Master's Level Occupational Therapy students who have each taken and participated in course work relating to research methodology and ethics. Each researcher had also completed research projects as part of their course work. Both hold current standing for CITI supported Ethics training.

Anne Haskins, PhD, OTR/L is an associate professor in the UND Department of Occupational Therapy and has a PhD in Teaching and Learning: Educational Foundations in Research with an emphasis on quantitative research. Her CITI supported Ethics training is in current standing.

University of North Dakota Exempt Certification Form
Research Involving the Use of Survey, Interview, Observational Procedures or Educational Tests

Complete this form if you are requesting permission to use survey, interview, or observational procedures, or educational tests.

All research with human participants conducted by faculty, staff, and students associated with the University of North Dakota, must be reviewed and approved as prescribed by the University's policies and procedures governing the use of human subjects. No activities are to be initiated without prior review and approval by the Institutional Review Board.

Please answer the following questions regarding your research. Handwritten forms are not accepted – responses must be typed.

1. Are prisoners included in the research? Yes No

If you answered "Yes" to the above question, this research does not qualify as exempt. Please fill out and submit a "Human Subjects Review Form". If you answered "No", continue to question 2a.

2a. Are children included in the research? Yes No

If you answered "No" to the above question, please skip question 2b and continue to question 3. If you answered "Yes", continue to question 2b.

2b. Does the research include survey or interview procedures? Does the research involve the observation of public behavior with researcher interaction with the subjects? Yes No

If you answered "Yes" to questions 2a and 2b, this research does not qualify as exempt. Please fill out and submit a "Human Subjects Review Form". If you answered "No", continue to question 3.

3a. Will the data be documented in such a manner that subjects cannot be identified, either directly or through identifiers linked to the subjects (subject name, social security number, birth date, coding, etc.)? Yes No

If you answered "Yes" to the above question, please skip question 3b and continue with the rest of the form. If you answered "No", continue to question 3b.

3b. Will the disclosure of the subjects' responses outside of the research reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation?

Yes No

If you answered "Yes" to the above question, this research does not qualify as exempt. Please fill out and submit a "Human Subjects Review Form".

4. Will the research involve the use of audio, video, digital or image recordings of subjects? Yes No

If you answered "Yes" to the above question, this research does not qualify as exempt. Please fill out and submit a "Human Subjects Review Form". If you answered "No", provide the information requested below:

Principal Investigator: Brien Buckentine
Justin Fredrickson

Telephone: (320)-493-8797
(320)-583-2228

E-mail Address: brien.buckentine@my.und.edu
j.fredrickson@my.und.edu

Complete Mailing Address: 1015 N. 39th. St. D15, Grand Forks, ND 58203
2750 S. 38th. St. Apt. 225, Grand Forks, ND 58201

School/College: The University of North Dakota Department: Occupational Therapy

Student Adviser (if applicable): Anne Haskins, OTR/L

Telephone: 701-777-0229

E-mail Address: anne.haskins@med.und.edu

Address or Box #: 2751 2nd Ave. N. Hyslop 210/ Stop 7126
Grand Forks, ND, USA 58202

School/College: The University of North Dakota Department: Occupational Therapy

Project Title: Adherence to Home Programs in Patients with Acute Orthopedic Injuries of the Upper Extremity

Proposed Project Dates: Beginning Date: 9/1/2013 Completion Date: 5/31/2014
(Including data analysis)

Funding agencies supporting this research: None

(A copy of the funding proposal for each agency identified above MUST be attached to this proposal when submitted.)

Does any researcher associated with this project have a financial interest in the results of this project? If yes, submit on a separate piece of paper an additional explanation of the financial interest. The Principal Investigator and any researcher associated with this project should have a Financial Interests Disclosure Document on file with their department.

YES or NO

Will any research participants be obtained from another organization outside the University of North Dakota (e.g., hospitals, schools, public agencies, American Indian tribes/reservations)?

YES or NO

Will any data be collected at or obtained from another organization outside the University of North Dakota?

YES or NO

If yes to either of the previous two questions, list all institutions:

Altru Health Systems, Hand Therapy Clinic

Letters from each organization must accompany this proposal. Each letter must illustrate that the organization understands its involvement and agrees to participate in the study. Letters must include the name and title of the individual signing the letter and should be printed on organizational letterhead.

Does any external site where the research will be conducted have its own IRB? YES or NO

If yes, does the external site plan to rely on UND's IRB for approval of this study? YES or NO
(If yes, contact the UND IRB at 701 777-4279 for additional requirements)

If your project has been or will be submitted to other IRBs, list those Boards below, along with the status of each proposal.

Altru Health Systems Date submitted: Pending Status: Approved Pending
Date submitted: _____ Status: Approved Pending

(include the name and address of the IRB, a contact person at the IRB, and a phone number for that person)

Type of Project: Check "Yes" or "No" for each of the following.

YES or NO New Project YES or NO Dissertation/Thesis/Independent Study

YES or NO Continuation/Renewal YES or NO Student Research Project

YES or NO Is this a Protocol Change for previously approved project? If yes, submit a signed copy of this form with the changes bolded or highlighted.

Please provide additional information regarding your research by responding to questions 5-11 on a separate sheet of paper.

5. In non-technical language, describe the purpose of the study and state the rationale for this research.

6. In non-technical language, describe the study procedures.

How will subjects be informed of the research? If you will be having subjects sign a consent form, justify why. How will instrument(s) be distributed/collected? Will compensation be provided? What is the suspected duration of subject participation? Etc.

7. Where will the research be conducted?

8. Describe what data will be recorded.

9. How will data be recorded and stored (that is will it be coded, anonymous, etc.)?

Note: Must state that data will be stored for a minimum of three years after data analysis is complete, or for a period of time sufficient to meet federal, state, and local regulations, sponsor requirements, and organizational policies and procedures.

10. Describe procedures you will implement to protect confidentiality and privacy of participants.

11. Describe the nature of the subject population and the estimated number of subjects.

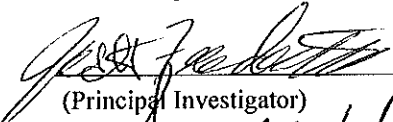

If participants who are likely to be vulnerable to coercion and undue influence are to be included in the research, define provisions to protect the privacy and interests of these participants and additional safeguards implemented to protect the rights and welfare of these participants.

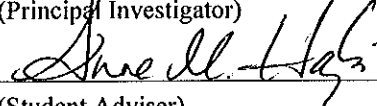
Necessary attachments:

- Signed Student Consent to Release of Educational Record Form (students only);
- Investigator Letter of Assurance of Compliance;
- Surveys, interview questions, or educational tests;
- Printed web screens (if survey is over the Internet); and
- Advertisements.

NOTE: The UND IRB requires that all key personnel involved in the research complete human subject education before IRB approval to conduct research can be granted.

By signing this form, I certify that the above information is accurate and that this research will be conducted in accordance with the statements provided above; this research does not involve prisoners, but if a subject becomes a prisoner, I will notify the IRB.



9-9-2013

 (Principal Investigator) Date:

9-5-2013

 (Student Adviser) Date:

****All students and medical residents must list a faculty member as a student adviser on the first page of the application and must have that person sign the application.****

Submit the signed application form and any necessary attachments to the Institutional Review Board, 264 Centennial Drive Stop 7134, Grand Forks, ND 58202-7134; or bring it to Twamley Hall, Room 106.

**INVESTIGATOR LETTER OF ASSURANCE OF COMPLIANCE
WITH ALL APPLICABLE FEDERAL REGULATIONS FOR THE
PROTECTION OF THE RIGHTS OF HUMAN SUBJECTS**

I Anne M. Haskins
(Name of Investigator)

agree that, in conducting research under the approval of the University of North Dakota Institutional Review Board, I will fully comply and assume responsibility for the enforcement of compliance with all applicable federal regulations and University policies for the protection of the rights of human subjects engaged in research. Specific regulations include the Federal Common Rule for Protection of the Rights of Human Subjects 45 CFR 46. I will also assure compliance to the ethical principles set forth in the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research document, The Belmont Report.

I understand the University's policies concerning research involving human subjects and agree to the following:

1. Should I wish to make changes in the approved protocol for this project, I will submit them for review PRIOR to initiating the changes. (A proposal may be changed without prior IRB approval where necessary to eliminate apparent immediate hazards to the subjects or others. However, the IRB must be notified in writing within 72 hours of any change, and IRB review is required at the next regularly scheduled meeting of the full IRB.)
2. If any problems involving human subjects occur, I will immediately notify the Chair of the IRB, or the IRB Coordinator.
3. I will cooperate with the UND IRB by submitting Research Project Review and Progress Reports in a timely manner.

I understand the failure to do so may result in the suspension or termination of proposed research and possible reporting to federal agencies.

Anne M. Haskins Ph.D., OTR/L
Investigator Signature

8-31-2013
Date

**INVESTIGATOR LETTER OF ASSURANCE OF COMPLIANCE
WITH ALL APPLICABLE FEDERAL REGULATIONS FOR THE
PROTECTION OF THE RIGHTS OF HUMAN SUBJECTS**


I Brien Buckentine
(Name of Investigator)

agree that, in conducting research under the approval of the University of North Dakota Institutional Review Board, I will fully comply and assume responsibility for the enforcement of compliance with all applicable federal regulations and University policies for the protection of the rights of human subjects engaged in research. Specific regulations include the Federal Common Rule for Protection of the Rights of Human Subjects 45 CFR 46. I will also assure compliance to the ethical principles set forth in the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research document, The Belmont Report.

I understand the University's policies concerning research involving human subjects and agree to the following:

1. Should I wish to make changes in the approved protocol for this project, I will submit them for review PRIOR to initiating the changes. (A proposal may be changed without prior IRB approval where necessary to eliminate apparent immediate hazards to the subjects or others. However, the IRB must be notified in writing within 72 hours of any change, and IRB review is required at the next regularly scheduled meeting of the full IRB.)
2. If any problems involving human subjects occur, I will immediately notify the Chair of the IRB, or the IRB Coordinator.
3. I will cooperate with the UND IRB by submitting Research Project Review and Progress Reports in a timely manner.

I understand the failure to do so may result in the suspension or termination of proposed research and possible reporting to federal agencies.


Investigator Signature

9-9-13
Date

**INVESTIGATOR LETTER OF ASSURANCE OF COMPLIANCE
WITH ALL APPLICABLE FEDERAL REGULATIONS FOR THE
PROTECTION OF THE RIGHTS OF HUMAN SUBJECTS**

I Justin Fredrickson
(Name of Investigator)

agree that, in conducting research under the approval of the University of North Dakota Institutional Review Board, I will fully comply and assume responsibility for the enforcement of compliance with all applicable federal regulations and University policies for the protection of the rights of human subjects engaged in research. Specific regulations include the Federal Common Rule for Protection of the Rights of Human Subjects 45 CFR 46. I will also assure compliance to the ethical principles set forth in the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research document, The Belmont Report.

I understand the University's policies concerning research involving human subjects and agree to the following:

1. Should I wish to make changes in the approved protocol for this project, I will submit them for review PRIOR to initiating the changes. (A proposal may be changed without prior IRB approval where necessary to eliminate apparent immediate hazards to the subjects or others. However, the IRB must be notified in writing within 72 hours of any change, and IRB review is required at the next regularly scheduled meeting of the full IRB.)
2. If any problems involving human subjects occur, I will immediately notify the Chair of the IRB, or the IRB Coordinator.
3. I will cooperate with the UND IRB by submitting Research Project Review and Progress Reports in a timely manner.

I understand the failure to do so may result in the suspension or termination of proposed research and possible reporting to federal agencies.


Investigator Signature

9-9-2013
Date

STUDENT RESEARCHERS: As of June 4, 1997 (based on the recommendation of UND Legal Counsel) the University of North Dakota IRB is unable to approve your project unless the following "Student Consent to Release of Educational Record" is signed and included with your "Human Subjects Review Form."

STUDENT CONSENT TO RELEASE OF EDUCATIONAL RECORD¹

Pursuant to the Family Educational Rights and Privacy Act of 1974, I hereby consent to the Institutional Review Board's access to those portions of my educational record which involve research that I wish to conduct under the Board's auspices. I understand that the Board may need to review my study data based on a question from a participant or under a random audit. The study to which this release pertains is Adherence to Home Programs in Patients with Acute Orthopedic Injuries of the Upper Extremity.

I understand that such information concerning my educational record will not be released except on the condition that the Institutional Review Board will not permit any other party to have access to such information without my written consent. I also understand that this policy will be explained to those persons requesting any educational information and that this release will be kept with the study documentation.

0783001
ID #

9-9-13
Date

Brien Buckentine
Printed Name


Signature of Student Researcher

¹Consent required by 20 U.S.C. 1232g.

STUDENT RESEARCHERS: As of June 4, 1997 (based on the recommendation of UND Legal Counsel) the University of North Dakota IRB is unable to approve your project unless the following "Student Consent to Release of Educational Record" is signed and included with your "Human Subjects Review Form."

STUDENT CONSENT TO RELEASE OF EDUCATIONAL RECORD¹

Pursuant to the Family Educational Rights and Privacy Act of 1974, I hereby consent to the Institutional Review Board's access to those portions of my educational record which involve research that I wish to conduct under the Board's auspices. I understand that the Board may need to review my study data based on a question from a participant or under a random audit. The study to which this release pertains is Adherence to Home Programs in Patients with Acute Orthopedic Injuries of the Upper Extremity.

I understand that such information concerning my educational record will not be released except on the condition that the Institutional Review Board will not permit any other party to have access to such information without my written consent. I also understand that this policy will be explained to those persons requesting any educational information and that this release will be kept with the study documentation.

0464601
ID #

Justin Fredrickson
Printed Name

9-9-2013
Date


Signature of Student Researcher

¹Consent required by 20 U.S.C. 1232g.

5. In non-technical language, describe the purpose of the study and state the rationale for this research.

In the area of hand therapy, many patients require home programs to continue to have positive results after a traumatic injury to the upper extremity. Adherence to prescribed home program has been described as the "most unpredictable, least controllable variable in a medical interventions" (Groth & Wulf, 1995, p.18). In addition non-adherence to home programs not only affects recovery of the patient, but also wastes health care dollars, resources, healthcare professionals times, and medication (Larrate, Taubman, & Willey, 1990). Adherence to home programs has been shown to increase strength (Magnus, Bychuk, Kim, & Fathing, 2013), passive range of motion and active range of motion (Eng, Trommel, & Ritt, 2002). Currently, there is dearth research on persons with acute upper extremity injuries and adherence to home programs. Despite the benefits of home programming, several researchers have shown there is a variable level of home program non-adherence from ~25% to ~70% (O'Brien, 2010; Paternostrosluga, Keilani, Posch, & Fialka-Moser, 2003; Sandford, Barlow, & Lewis, 2007). Low adherence rates are problematic for client recovery and the aforementioned statistics provide evidence that a broad range of client adherence is present in practice. More research is required in this field to understand what factors influence client adherence to home programs. Present research includes outcomes related to home program adherence surveys specific to splint wearing interventions, however these surveys did not address client factors or performance patterns (Sandford, Barlow, & Lewis, 2007). Furthermore, the term adherence does not have a universal definition and thus, variability was presented in each study that we reviewed. We found no study involving a tool used evaluate home program adherence related to client factors and performance skills. This study will be the first step in developing and testing a tool that will be intended for occupational therapist to utilized with patients who have had an upper extremity injury. Ultimately, we hope that this tool can provide client specific information that could provide therapists with valuable information to assist in the development of a client-centered home program that will optimize home program adherence.

The purpose of this independent study is two fold to test an instrument intended to measure adherence and to explore the relationship between occupational therapy home programs and client factors and performance patterns that are influential in clients' adherence to their prescribed home programs.

6. In non-technical language, describe the study procedures.

Primary Research Question: What client factors and performance patterns influence a person with an upper extremity orthopedic injury to adhere to a home program prescribed by an occupational therapist practicing in hand therapy?

Design: A prospective exploratory survey design in an online format.

Sampling Methods:

Target Population

Inclusion Criteria: Researchers will choose patients who have received an acute upper extremity injury, been prescribed a home program, and are not a member of a special population such as children and cognitively impaired. The respondents of this study must be 18 years of age with no comorbidities or additional injuries. This inclusion criteria was selected to better understand client factors and performance patterns of people with acute injuries adherence to their home programs. Acute injuries will be defined as injuries receiving no longer than one-year of treatment from a hand therapist.

Exclusion Criteria: Exclusion criteria include respondents with chronic illnesses (receiving more than one-year of treatment from a hand therapist) or injuries special populations, and patients who did not receive a home program from their certified hand therapist. Respondents with chronic illnesses/injuries were excluded because they have already developed a routine level of adherence. We wish to assess the level of adherence for acute injuries to determine what client factors and patterns could be modified to better allow for adherence. Special populations were avoided due to the vulnerable nature of obtained from these respondents. Lastly, respondents who were not prescribed a home program were excluded because we wish to obtain personal experience of adherence to home programs.

Sampling Specifics

The following is the sampling procedures, how respondents will be identified, and the responsibilities of the occupational hand therapist, secretary, and student researchers.

It is estimated that there will be 20-30 respondents participating in this independent study. This number was selected to increase the rigor, validity, and reliability of the findings. As this is a pilot study and the instrument previously untested, limiting the number of respondents is appropriate.

1. When a client is checking in for an appointment, we would like the occupational therapist or secretary to say "Would you be interested in learning more about participating in a research study that is being completed by UND students looking at factors that affect your home program?"

For clients who would like to learn more

2. If the client say yes and is early for his or her appointment (10-15 minutes), the occupational therapist or secretary will point the client in the direction of the UND students to learn more about the student including an explanation of the study and if the client wishes to participate, reviewing and understanding the research information sheet. The client would then complete the survey.

3. If the client does not have time before the appointment but want to learn more, the secretary will say "The therapist will guide you to the UND students after your therapy session if you want to learn more about the study." The hand therapist will direct the client to the UND students after completion of the therapy session. The hand therapist will also be responsible for determining if there is a 10-15 minute time period during modalities in which the client could learn more about the study. If there is this time available, the hand therapist will communicate this to the UND students and the students will provide a study overview to the client and the research information sheet will be read and a copy will be provided to the client. The survey will then be given to the client. At no time will the study interrupt therapy services.

Furthermore, the respondent will be given a sheet of paper defining home program as follows:

A home program for the purposes of this survey is defined as any exercises, activities, tasks, hot or cold packs, paraffin baths, electrical stimulation, continuous passive motion machine use, splints wear schedule, or anything else your therapist assigns you to do at home.

For Clients who choose not to learn more

4. "Thank you for your consideration. If you change your mind about participating in the study, or have more time available to participate at a later date, please let me know as the UND students will be completing the study over the next month."

Research Information sheet and Procedures

Prior to beginning the study we will be submitting a copy of the survey and research information sheet to the occupational hand therapist and occupational therapy director for preliminary approval. Prior to conducting the survey we will secure preliminary approval of the sampling specifics from the occupational hand therapist. We plan to meet with the hand therapist and receptionist to discuss the survey and how they will direct respondents to us to participate in this research study.

We will provide each respondent with a research information sheet prior to completing a survey on an I-Pad. The respondent will be given instructions on reviewing the research information sheet and then provided time read it, with the opportunity to ask us any questions he or she may have. Once the respondent has reviewed the research information sheet he or she will retain the research information sheet for their records. There will be no waiting period between informing the prospective respondents and obtaining agreement to participate in the study.

No coercion will occur. Prospective respondents will be asked to take part in this study only once. Any respondent denial of the survey will not be further persuaded by us to attempt to get the respondent to complete survey. Respondents will be reminded that this survey is voluntary and that he or she may, discontinue the survey at any time. The respondents will be given the research advisors name and contact information, as well as contact information for UND IRB, should they wish to receive information from parties other than the graduate student researchers.

The language of the research information sheet was written at a sixth grade reading level. We will be on site to provide clarification of any language that may be unknown or unclear to respondents. Before starting the research process the participants will be informed of the purpose of the study, what will be done with the data collected, and that they will be given access to the final study if they wish.

The research information sheet includes a statement of research, the purpose of the research, the potential risks, time requirements, right of the respondent to stop the survey at any time, and identification that there are no direct benefits for participating in this study. Furthermore, the specific respondent's answers will not be shared with the healthcare provider. Respondents will also be provided with information that indicates that no personal identifying data will be tracked. Potential respondents also are informed that engagement in this process is strictly voluntary and they can stop completing the survey at any time. Contact information for the researchers and for the University of North Dakota Institutional Review Board have also been provided within the research information sheet. Refer to the actual research statement of research information sheet for full details, which is located in appendix B.

Researcher Background and Qualifications

Brien Buckentine and Justin Fredrickson are Master's Level Occupational Therapy graduate students who have each taken and participated in course work relating to research methodology and ethics. They also completed research projects as part of their course work. Both hold current standing for CITI supported Ethics training.

Anne Haskins, PhD, OTR/L is an associate professor in the UND Department of Occupational Therapy and has a PhD in Teaching and Learning: Educational Foundations in Research with an emphasis on quantitative research. Her area of specialty is in orthopedic practice and she is responsible for teaching both orthopedic and quantitative research coursework. Her CITI supported Ethics training is in current standing.

Instrumentation

The online survey consists of 46 questions that include Likert-type Scale questions, multiple-choice questions, and short answer open-ended questions. These questions are related to the four constructs of the Occupational Adaptation Model including: occupations, adaptive capacity, relative mastery, and occupational adaptation process (Cole and Tufano, 2008). The survey questions pertain to the patient and his or her perspective of the relationship between them and the occupational hand therapist, the respondents home program, and demographic information. This survey was written at a 6th grade reading level to make it accessible and understandable for most respondents. The survey will take approximately 5-10 minutes to complete.

Upon completion of the survey, a digital copy of survey answers will be saved in the University of North Dakota's Qualtrics database and viewable to only to us and our research advisor. Upon completion of the study, data will be downloaded, and stored on a desktop computer located in the research advisors locked office for a period no more than 3 years. The data on the North Dakota's Qualtrics database will then be deleted at the completion on the data analysis. This survey was designed by the researchers of this study and is based on the Occupation Adaptation Model relative to occupational therapy, and existing literature related to acute upper extremity orthopedic injuries, adherence, and home programs. The psychometric properties of this instrument will also be analyzed as a secondary purpose of this study.

Data Analysis

We will analyze data using SPSS 19.0 and will include descriptive statistics and inferential analysis of the variables to answer the research questions.

7. Where will the research be conducted?

The surveys will be completed by the respondents at a hand therapy clinic in Grand Forks, ND where they are receiving therapy. Data collection will occur upon IRB approval from both the University of North Dakota and the Altru Hopsital IRB and last for no more than 60 days. We anticipate that data collection will take place in September and October of 2013. Respondents will be provided an I-Pad to complete a survey online. Until data analysis occurs, survey responses will be stored on the University of North Dakota Qualtrics database. We will not be identifying Altru Hand Therapy Clinic in any publication nor is this study being done to assess the clinic or therapist's quality of work, but rather to explore what factors the client perceives as influencing his or her home program adherence. The clinic will receive a copy of the final independent study in which, respondent specifics will not be shared.

8. Describe what data will be recorded.

Survey questions related to the four constructs of the Occupational Adaptation Model including: occupations, adaptive capacity, relative mastery, and occupational adaptation process will be collected (Cole & Tufano, 2008). Furthermore, survey questions pertain specifically to the respondent and his or her perspective of the relationship between him or her and the occupational hand therapist, his or her home program, and demographic information. Upon completion of the survey, a digital copy of survey answers will be saved in the University of North Dakota's Qualtrics database and viewable to the researchers and research advisor. Upon completion of the study, data will be downloaded and stored on a desktop computer located in the research advisors locked office for a period no more than 3 years. The data on the North Dakota's Qualtrics database will be deleted upon completion on the data analysis.

9. How will data be recorded and stored (that is, will it be coded, anonymous, ect.)

Upon completion of the survey a digital copy of survey answers will be saved in the University of North Dakota's Qualtrics database and viewable to the researchers and research advisor. The respondent's names and other identifying information, such as date of birth will not be recorded. Upon completion of the study, data will be downloaded and stored on a desktop computer located in the research advisors locked office for a period no more than 3 years. After 3 years, the research advisor will erase the data.

10. Describe procedures you will implement to protect confidentiality and privacy of participants.

No study procedures will begin until approval is received from the University of North Dakota IRB as well as the Altru Health Systems IRB. The identifying information of the respondent will not be obtained. Respondents will complete the survey using an online survey program that will not be linked to the person. The respondents will be given the student advisor's and our names and contact information, as well as contact information for UND IRB in the research information sheet. Through reading and agreeing to the research information sheet, respondents will be acknowledging they are taking part in the study voluntarily. Respondents will also be informed that they may quit the study at any time and can decline answering questions on the survey. Data results will be downloaded and stored on a desktop computer located in the research advisors locked office for 3 years. The research advisor and us will have access to the data. After 3 years the data will be erased by the students' advisor.

11. Describe the nature of the subject population and the estimated number of subjects.

The respondents of this study must be 18 years of age with no comorbidities or additional injuries. This inclusion criteria was selected to better understand client factors and performance patterns of people with acute injuries adherence to their home programs. Acute injuries will be defined as injuries receiving no longer than one-year of treatment from a occupational hand therapist. Exclusion criteria include respondents with chronic illnesses (receiving more than

one-year of treatment from a hand therapist) or injuries special populations, and respondents that did not receive a home program from their certified hand therapist. Respondents with chronic illnesses/injuries were excluded because they have already developed a routine level of adherence. We wish to assess the level of adherence for acute injuries to determine what client factors and patterns could be modified to better allow for adherence. Special populations were avoided due to the vulnerable nature of these respondents. Lastly, respondents who were not prescribed a home program were excluded because we wish to obtain personal experience of adherence to home programs. This inclusion criteria was selected to better understand client factors and performance patterns of people with acute injuries adherence to their home programs. It is estimated that there will be 20-30 respondents participating in this independent study.

References

- Cole M. B., & Tufano, R. (2008). Occupational Adaptation. *Applied theories in occupational therapy: A practical approach* (pp. 107-115). Thorofare, NJ: Slack Incorporated,
- Dobbe, J. G. G., Van Trommel, N. E., & Ritt, M. J. P. F. (2002) Patient compliance with a rehabilitation program after flexor tendon repair in zone II of the hand. *Journal of Hand Therapy, 15*, 16-21.
- Groth, G. N. & Wolf M. B. (1995). Compliance with hand rehabilitation: Health beliefs and strategies. *Journal of Hand Therapy, 8*, 18-22.
- Larrat, E. P., Traubman, A. H., & Willey, C. (1990). Compliance-related problems in the ambulatory population. *American Pharmacology, 30*(2), 18-23
- Magnus, C. R. A., Boychuk, K., Kim, S. Y., and Farthing, J. P. (2013). At-home resistance tubing strength training increases shoulder strength in the trained and untrained limb. *Scandinavian Journal of Medicine and Sciences in Sports*. Advance online publication. doi:10.1111/sms.1207
- O'Brien, L. (2010). Adherence to therapeutic splint wear in adults with acute upper limb injuries: A systematic review. *Journal of Hand Therapy, 15*, 3-12.
- Paternostro-Sluga, T., Keilani, M., Posch, M., & Fialka-Moser, V. (2003). Factors that influence the duration of splint wear in peripheral nerve lesion. *American Journal of Physical Medicine and Rehabilitation, 82*(2), 86-95.
- Sandford, F., Barlow, N., & Lewis, J. (2008). A study to examine patient adherence to wearing 24-hour forearm thermoplastic splints after tendon repairs. *Journal of Hand Therapy, 21*, 44-53.

Appendix B
Research Information Sheet

INFORMED CONSENT DOCUMENT TEMPLATE: NON-MEDICAL PROJECTS

IC 701-B

04/18/2013

**THE UNIVERSITY of NORTH DAKOTA
INSTRUCTIONS FOR WRITING AN INFORMED CONSENT DOCUMENT
NON-MEDICAL CONSENT TEMPLATE****INSTRUCTIONS:**

- This consent document template is recommended for non-medical studies because it contains all required elements of consent.
- The text in bold throughout this document offers suggestions and guidance. It should be deleted and replaced with information specific to your study. The headers and footers are not meant to be edited and should remain on your consent document.

CONSENT DOCUMENT INSTRUCTIONS:

- Consent documents should be written in the second person (e.g., “You are invited to participate”). Use of the first person (e.g., “I understand that...”) can be interpreted as suggestive and can constitute coercive influence over a subject.
- The consent form should be written at about an eighth grade reading level. Clearly define complicated terms and put technical jargon in lay terms.
- The consent form must be signed and dated by the subject or the subject’s legally authorized representative. The signed consent from each subject must be retained by the investigator and a copy of the consent form must be provided to the subject.

CONSENT DOCUMENT FORMAT:

- To facilitate the IRB review process, the sample format below is recommended for consent forms.
- Prepare the entire document in 12 point type, with no blank pages or large blank spaces/paragraphs, except for a 2 inch by 2 ½ inch blank space on the bottom of each page of the consent form for the IRB approval stamp.
- Multiple page consent documents should contain page numbers and a place for the subject to initial each page.

ASSISTANCE

- If you have questions about or need assistance with writing an informed consent please call the Institutional Review Board office at 701 777-4279.

**THE UNIVERSITY OF NORTH DAKOTA
RESEARCH INFORMATION SHEET**

TITLE:

Adherence to Home Programs in Patients with Acute Orthopedic Injuries of the Upper Extremity

PROJECT DIRECTOR: Anne Haskins, *PhD, OTR/L*

PHONE # 701-777-0229

DEPARTMENT: Department of Occupational Therapy

WHAT IS THE PURPOSE OF THIS STUDY?

You are being asked to take part in a research study. This study will look at what things might help or prevent you from doing your home program.

You are invited to be in this research study about doing home programs because you have an injury to the arm, wrist or hand and have been given a home program.

The purpose of this research study is to find out why people may or may not do their home programs. Researchers hope to better understand barriers that might prevent people from doing their home programs. The information you provide will help the researchers' better understand these barriers. Researchers hope to build a survey that can be used by hand therapist to better help patients do their home program.

HOW MANY PEOPLE WILL PARTICIPATE?

Approximately 20-40 people will take part in this study at one hand therapy clinic in Grand Forks, ND.

HOW LONG WILL I BE IN THIS STUDY?

Your participation in the study will last about 5-10 minutes. You will need to simply complete this survey one time.

WHAT WILL HAPPEN DURING THIS STUDY?

If you agree to participate in this study, a survey will appear on this I-Pad to complete today. There will be several questions for you to answer. The survey will take about 5-10 minutes of your time. The survey questions will ask about your injury and ideas you have about your home program. There will be no other additional follow-up or requirements after the survey. This research project will only include people who choose to take part, and there will be no cost to you should you choose to participate. You have the right to withdraw from this study at any time with no penalties. The information you provide will not be shared with your therapist or the facility.

WHAT ARE THE RISKS OF THE STUDY?

You may experience mild frustration that is common when completing surveys. Some questions may be of a sensitive nature, and you may therefore become upset as a result. However, such risks are not viewed as being in excess of “minimal risk”. If, however, you become upset by questions, you may stop at any time or choose not to answer a question.

WHAT ARE THE BENEFITS OF THIS STUDY?

Benefits of the survey might be better feelings and emotions about doing your home program. It is also possible that you may not benefit personally from being in this study. However, we hope that, in the future, other people might benefit from this study because it will help therapists better understand why people do or do not complete home programs.

CONFIDENTIALITY

The student researchers and their advisor will be the only people to see your answers. No one will see your name or personal information. Your hand therapist will not see your survey results.

The records of this study will be kept private to the extent permitted by law. In any report about this study that might be published, you will not be identified. Your study record may be reviewed by Government agencies, the UND Research Development and Compliance office, and the University of North Dakota Institutional Review Board. Any information that is obtained in this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. If we write a report or article about this study, we will describe the study results in a summarized manner so that you cannot be identified.

IS THIS STUDY VOLUNTARY?

Your participation is voluntary. You may choose not to participate or you may discontinue your participation at any time without penalty or loss of benefits to which you are otherwise entitled. Your decision whether or not to participate will not affect your current or future relations with the University of North Dakota or the clinic where you are receiving therapy.

If you decide to leave the study early, we ask that you return the iPad the researchers. Your therapist will not view your answers and this will have no negative effect on your therapy session.

CONTACTS AND QUESTIONS?

The researchers conducting this study are Brien Buckentine, Justin Fredrickson, and their advisor Anne Haskins, PhD, OTR/L. If you later have questions, concerns, or complaints about the research please contact Brien Buckentine (320) 493-8797, Justin Fredrickson (320) 583-2228, or Dr. Anne Haskins (Advisor) at 701-777-0229.

If you have questions regarding your rights as a research subject, you may contact The University of North Dakota Institutional Review Board at **(701) 777-4279**.

- You may also call this number about any problems, complaints, or concerns you have about this research study.
- You may also call this number if you cannot reach research staff, or you wish to talk with someone who is independent of the research team.
- General information about being a research subject can be found by clicking “Information for Research Respondents” on the web site:
<http://und.edu/research/resources/human-subjects/research-participants.cfm>

I agree for my written quotes in the survey to be used in the research; however I will not be identified.

Appendix C
Letters of Request to Therapists

Re: UND Independent Study Procedures

TRAVIS MACKENZIE <tmackenzie@altru.org>

Mon 9/23/2013 7:16 AM

To: Fredrickson, Justin <j.fredrickson@my.und.edu>;

Sorry for the delay. I approve the process and agreement to the procedures. Thank you.
Travis MacKenzie OTR/L CHT

>>> "Fredrickson, Justin" <j.fredrickson@my.und.edu> 09/12/13 9:12 AM >>>

Travis MacKenzie,

Hello. I hope you are doing well. In order to submit to the UND IRB, we need an email of agreement on the procedures we are asking of you and the secretary at the Altru Hand Therapy Clinic.

Here is what we propose:

1. When a client is checking in for an appointment, we would like the occupational therapist or secretary to say "Would you be interested in learning more about participating in a research study that is being completed by UND students looking at factors that affect your home program?"

For clients who would like to learn more

2. If the client say yes and is early for his or her appointment (10-15 minutes), the occupational therapist or secretary will point the client in the direction of the UND students to learn more about the student including an explanation of the study and if the client wishes to participate, reviewing and signing a statement of informed consent. The client would then complete the survey.

3. If the client does not have time before the appointment but want to learn more, the secretary will say "The therapist will guide you to the UND students after your therapy session if you want to learn more about the study." The hand therapist will direct the client to the UND students after completion of the therapy session. The hand therapist will also be responsible for determining if there is a 10-15 minute time period during modalities in which the client could learn more about the study. If there is this time available, the hand therapist will communicate this to the UND students and a study overview will be provided by the students to the client and informed consent will be read and signed if the client wishes to participate. The survey will then be given to the client. At no time will the study interrupt therapy services. If you agree to these procedures reply back I agree, if not please identify changes in procedures.

For Clients who choose not to learn more

4. "Thank you for your consideration. If you change your mind about participating in the study, or have more time available to participate at a later date, please let me know as the UND students will be completing the study over the next month."

All of the above, will of course be dependent approval from the UND Institutional Review Board.

Thank you for taking the time to review this and respond. Have a wonderful day and we look forward to hearing from you.

Justin Fredrickson

j.fredrickson@my.und.edu

(320)-583-2228

CONFIDENTIAL & PRIVILEGED COMMUNICATION

This email and any files transmitted with it are confidential, may contain privileged or copyright information, and are intended solely for the use of the intended recipient. If you are not the intended recipient of this email, you are required to notify the sender immediately and delete this email from your system. You may not copy, distribute or use this email or the information contained in it for any purpose other than to notify the sender.

We do not guarantee that this material is free from viruses or any other defects although due care has been taken to minimize the risk.

Any views expressed in this message are those of the individual sender, except where the sender specifically states them to be the views of Altru Health System.

Hyslop 210

2751 2nd Ave. No Stop 7126

Grand Forks, ND 58202-7126

Altru Health System

1000 S Columbia Rd

Grand Forks, ND 58201

Dear Travis Mackenzie,

I hope the day is finding your well. As you know, I am scheduled to complete a level II fieldwork with you during the spring of 2014; I am looking forward to working with you and have already grown a passion for occupational therapy practice in the area of upper extremity orthopedics.

In order to fulfill my academic work prior to my elective fieldwork with you, I am writing to request your assistance. Presently, I am developing a graduate research study and seeking to examine hand therapy clients' adherence to home programs that are prescribed by their occupational therapist or physical therapist. With the guidance of our faculty advisor, Dr. Anne Haskins, my classmate, Brien Buckentine, and I will be developing a survey intended to assess client factors and performance patterns that are influential in clients' adherence to their prescribed home programs. It is our hope that this research will ultimately provide therapists with an instrument that could be used clinically to assess client compliance with home programs and provide information that could be used in therapy to improve client adherence, thereby improving client outcomes. I am writing to inquire about your willingness to take part in this study. Specifically, would you be willing to invite clients to complete this survey at your facility for one month beginning shortly after Labor Day?

To assist you in choosing whether or not you would be willing to assist me in this study, here is more study specific information. We will be developing a survey/assessment to gather information about the client, the client's diagnosis, and other demographics and additional questions related to client home program adherence based on an occupational therapy model. Once the survey has been developed fully, I will, of course, send a copy for your review. Once the survey fully developed and the University of North Dakota Institutional Review Board has approved the study itself, we will make the survey available in an online format through a secure server supported by the University of North Dakota. During the course of the study, we will provide an iPad to your facility to allow clients to complete the survey. The survey should take no more than 15-20 minutes to complete and no client supervision will be required after the client is invited to take part in the study.

With your approval to assist us in this research and the approval from the University of North Dakota Institutional Review Board we will continue the process of approving it through your facility. We are incredibly excited about this project and hope that you find it to be beneficial to occupational therapy practice as well. If you have any questions or concerns please contact me or my advisor at the contact information provided below.

In order to move forward with this study, we do need to secure initial approval from you. If you would please reply to this email by Monday July 15th, I would be most grateful. Thank you in advance for your time and consideration.

Sincerely,

Justin Fredrickson, MOTS

J.fredrickson@my.und.edu

320-583-2228

Fredrickson, Justin
Thu 8/29/2013 9:55 AM

To:

Buckentine, Brien;

From: TRAVIS MACKENZIE <tmackenzie@altru.org>

Sent: Monday, July 15, 2013 7:15 AM

To: Fredrickson, Justin

Subject: Re: UND Independent Study

Good morning. I would be willing to assist with the study. As you know, the study must be approved by UND IRB. It must then be approved by Altru. Please contact me with questions or updates on the approval process.

Have a good day.
Travis

Travis MacKenzie OTR/L CHT
Certified Hand Therapist
Rehab Outpatient Therapy Department
Altru Health System
Grand Forks, ND 58206
Phone: 701.780.5973
Fax 701.780.1851

>>> "Fredrickson, Justin" 07/09/13 10:55 PM >>>

University of North Dakota

Occupational Therapy Department

School of Medicine and Health Sciences

Anne Haskins, PhD, OTR/L

anne.haskins@med.und.edu

701-777-0229

CONFIDENTIAL & PRIVILEGED COMMUNICATION

This email and any files transmitted with it are confidential, may contain privileged or copyright information, and are intended solely for the use of the intended recipient. If you are not the intended recipient of this email, you are required to notify the sender immediately and delete this email from your system. You may not copy, distribute or use this email or the information contained in it for any purpose other than to notify the sender.

We do not guarantee that this material is free from viruses or any other defects although due care has been taken to minimize the risk.

Any views expressed in this message are those of the individual sender, except where the sender specifically states them to be the views of Altru Health System.

|

FW: Letter

Fredrickson, Justin <j.fredrickson@my.und.edu>

Thu 9/12/2013 1:33 PM

To: Buckentine, Brien <brien.buckentine@my.und.edu>;

1 attachment

Justin Letter.docx;

From: BRENDA PAULEY-COLTER <BPAULEY-COLTER@altru.org>
Sent: Thursday, September 12, 2013 8:53 AM
To: Fredrickson, Justin
Subject: Letter

Justin - here is the letter of support let me know if you need anything else. Brenda

Brenda Pauley-Colter, OTR/L
Supervisor | Rehab Outpatient Therapy Department
Altru Health System | Grand Forks, ND
701.780.2396 phone | 701.780.2328 fax | bpauley-colter@altru.org

CONFIDENTIAL & PRIVILEGED COMMUNICATION

This email and any files transmitted with it are confidential, may contain privileged or copyright information, and are intended solely for the use of the intended recipient. If you are not the intended recipient of this email, you are required to notify the sender immediately and delete this email from your system. You may not copy, distribute or use this email or the information contained in it for any purpose other than to notify the sender.

We do not guarantee that this material is free from viruses or any other defects although due care has been taken to minimize the risk.

Any views expressed in this message are those of the individual sender, except where the sender specifically states them to be the views of Altru Health System.



9/12/2013

Ann Haskins, PhD, OTR/L,
Brien Buckentine, OTS
Justin Fredrickson, OTS
Department of Occupational Therapy
University of North Dakota
Grand Forks, ND 58202-7126

Dear University of North Dakota Institutional Review Board Members:

It is my pleasure to write a letter in support of the clinical research proposal being submitted to the Institutional Review Board at the University of North Dakota and also at this facility by the UND Occupational Therapy researcher, Dr. Ann Haskins, and her graduate student advisees, Brien Buckentine and Justin Fredrickson. The proposed research study will look at patient adherence to prescribed home programs/client compliance. The researchers will work with Travis Mackenzie, Certified Hand Therapist to recruit volunteer subjects to complete a survey.

As the supervisor of the occupational therapy rehabilitation area at Altru Health System in Grand Forks, North Dakota, I fully support the efforts of the OT researcher and OT graduate student researchers as they seek approval from the University of North Dakota Institutional Review Board and this facility's research board to conduct clinical research of this important topic.

Sincerely,

Brenda Pauley-Colter, OTR/L
Supervisor, Physical Medicine and Therapy Services
Altru Health System

Appendix D
Survey Questions as Submitted to Respondents via Qualtrics

How many hours do you work in an average week?

(retired, unemployed)

<20 hours

21-30 hours

31-40 hours

41+ hours

Are you receiving workman's compensation due to your injury?

Yes

No

Don't know

What hand do you use to do most tasks?

Right

Left

What side is your injury on?

Right

Left

Both

What part or parts of your arm are involved in your treatment? (Check all that apply)

Shoulder

Arm

Forearm

Wrist

Hand

In general, how would you describe your overall health at this time?

Very Poor

Poor

Fair

Good

Very Good

Do you have any other medical conditions that effect you ability to complete your home program?

Yes

No

Unsure/Don't Know

In order to be doing things as you did before your injury, which areas need improvement? (Check all that apply).

Bathing

Dressing

Hygiene/Grooming

Home Management (i.e. managing finances, laundry, house cleaning, yard work, etc.)

Social Participation (i.e. being social active with friends, family, or community organizations).

Eating

- Child Rearing
- Meal Preparation
- Use the Bathroom
- Caring for other adults
- Work
- Education
- Sexual Activity
- Caring for Pets
- Leisure Participation

Rate the following Questions

Please slide bar to the number that the matches your level of agreement.

1= completely disagree, 2= disagree, 3=neutral, 4= Agree, 5=completely agree

	1	2	3	4	5
I understand the purpose of my home program.					
My therapist took time to explain the reason for doing my home program.					
My therapist answered all my questions					
My therapist took time to make sure I understood all the prescribed home program before leaving the clinic.					
My therapist helped me find ways to complete my home program as part of my daily routine.					
Do you feel your home program is part of your					

daily activities (IE. Household/Work tasks).	
It is important for me to complete my home program as prescribed.	

Is your home program intended to be completed before or after doing a specific activity (i.e.. eating a meal, brushing teeth, before bed, etc.)?

- Yes
 No
 Unsure/Don't Know

What time(s) of day do you complete your prescribed home program? (Check all that apply)

- Before 6 am
 6-10 am
 10 am-2 pm
 2-4 pm
 4-8 pm
 After 8 pm
 Never

How much time do you have available to complete your home program each day?

- None
 <1 hrs
 1-2 hrs
 2-3 hrs
 4 + hrs

How often do you complete your home program? (For example: wearing a splint as directed, daily exercises, daily stretches, using hot/cold packs, etc.).

- Never
 Sometimes
 As prescribed

How long does it take to complete your home program EACH TIME you do it?

- < 5 minutes
 5-15 minutes
 15-30 mins
 30 + minutes

How many times a day do you complete your home program?

- Never
 1 time a day
 2 times a day
 3 times a day
 4 times a day
 Hourly

How many times per day did your therapist suggest you do your home program?

- Never
 1 time a day
 2 times a day
 3 times a day
 4 times a day
 Hourly

Rate your average level of pain BEFORE doing your home program.

Please slide the bar to the appropriate number that matches your level of pain.

	No Pain			Moderate Pain				Severe Pain			
	0	1	2	3	4	5	6	7	8	9	10
Slide to write Choice											

Rate your average level of pain while you are DOING your home program.

Please slide the bar to the appropriate number that matches your level of pain.

	No Pain			Moderate Pain				Severe Pain			
	0	1	2	3	4	5	6	7	8	9	10
Slide to write Choice											

Rate your average level of pain AFTER completing your home program.

Please slide the bar to the appropriate number that matches your level of pain.

	No pain			Moderate Pain				Severe Pain			
	0	1	2	3	4	5	6	7	8	9	10
Slide to write Choice											

I have told my therapist about any pain I have experienced with the home program.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Since beginning the home program I have recognized improvements in my ability.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I have adapted my home program

Yes

No

Since beginning the home program I have not recognized improvements in my ability and adapted the home program.

Strongly Disagree Disagree Neither Agree nor Disagree Agree Strongly Agree

My home program was effective for treating my injury.

Strongly Disagree Disagree Neither Agree nor Disagree Agree Strongly Agree

What is your current level of satisfaction with your home program?

Very Dissatisfied Dissatisfied Neutral Satisfied Very Satisfied

How satisfied are you with your improvements in everyday activities since your injury?

Very Dissatisfied Dissatisfied Neutral Satisfied Very Satisfied

The following locations are where I usually complete my home program (Check all that apply).

- Home
- Work
- School
- Gym
- While Commuting
- Outside
- Restaurant
- Watching television
- Movie Theater
- Watching a Sporting Event
- Concert
- Shopping
- Therapy Clinic
- Other

Social activities get in the way of completing my home program.

- Never

 Rarely

 Sometimes

 Often

 Very Often

Family members encourage me to complete my home program.

- Strongly Disagree

 Disagree

 Neither Agree nor Disagree

 Agree

 Strongly Agree

I have all the equipment, tools, and space required to complete my home program.

- Strongly Disagree

 Disagree

 Neither Agree nor Disagree

 Agree

 Strongly Agree

I have been given the following materials to assist me in completing my home program. (Check all that apply).

- Verbal Instructions

 Demonstration

 Written Instructions

 Video Instructions

If I forget or am unable to complete a home program at the usual time or place, I make time to do it later.

- Never

 Sometimes

 Always

Briefly tell us how your home program can be improved.

Why have you been successful with your home program?

What do you find is your main reason for not completing your home program?

Thank you for taking the time to complete this survey. Your input is greatly appreciated by the student researchers. Please click "finish survey" and turn the iPad back in.

- Finish Survey

Appendix E
Research Information Sheet

INFORMED CONSENT DOCUMENT TEMPLATE: NON-MEDICAL PROJECTS

IC 701-B

04/18/2013

**THE UNIVERSITY of NORTH DAKOTA
INSTRUCTIONS FOR WRITING AN INFORMED CONSENT DOCUMENT
NON-MEDICAL CONSENT TEMPLATE****INSTRUCTIONS:**

- This consent document template is recommended for non-medical studies because it contains all required elements of consent.
- The text in bold throughout this document offers suggestions and guidance. It should be deleted and replaced with information specific to your study. The headers and footers are not meant to be edited and should remain on your consent document.

CONSENT DOCUMENT INSTRUCTIONS:

- Consent documents should be written in the second person (e.g., “You are invited to participate”). Use of the first person (e.g., “I understand that...”) can be interpreted as suggestive and can constitute coercive influence over a subject.
- The consent form should be written at about an eighth grade reading level. Clearly define complicated terms and put technical jargon in lay terms.
- The consent form must be signed and dated by the subject or the subject’s legally authorized representative. The signed consent from each subject must be retained by the investigator and a copy of the consent form must be provided to the subject.

CONSENT DOCUMENT FORMAT:

- To facilitate the IRB review process, the sample format below is recommended for consent forms.
- Prepare the entire document in 12 point type, with no blank pages or large blank spaces/paragraphs, except for a 2 inch by 2 ½ inch blank space on the bottom of each page of the consent form for the IRB approval stamp.
- Multiple page consent documents should contain page numbers and a place for the subject to initial each page.

ASSISTANCE

- If you have questions about or need assistance with writing an informed consent please call the Institutional Review Board office at 701 777-4279.

**THE UNIVERSITY OF NORTH DAKOTA
RESEARCH INFORMATION SHEET**

TITLE:

Adherence to Home Programs in Patients with Acute Orthopedic Injuries of the Upper Extremity

PROJECT DIRECTOR: Anne Haskins, *PhD, OTR/L*

PHONE # 701-777-0229

DEPARTMENT: Department of Occupational Therapy

WHAT IS THE PURPOSE OF THIS STUDY?

You are being asked to take part in a research study. This study will look at what things might help or prevent you from doing your home program.

You are invited to be in this research study about doing home programs because you have an injury to the arm, wrist or hand and have been given a home program.

The purpose of this research study is to find out why people may or may not do their home programs. Researchers hope to better understand barriers that might prevent people from doing their home programs. The information you provide will help the researchers' better understand these barriers. Researchers hope to build a survey that can be used by hand therapist to better help patients do their home program.

HOW MANY PEOPLE WILL PARTICIPATE?

Approximately 20-40 people will take part in this study at one hand therapy clinic in Grand Forks, ND.

HOW LONG WILL I BE IN THIS STUDY?

Your participation in the study will last about 5-10 minutes. You will need to simply complete this survey one time.

WHAT WILL HAPPEN DURING THIS STUDY?

If you agree to participate in this study, a survey will appear on this I-Pad to complete today. There will be several questions for you to answer. The survey will take about 5-10 minutes of your time. The survey questions will ask about your injury and ideas you have about your home program. There will be no other additional follow-up or requirements after the survey. This research project will only include people who choose to take part, and there will be no cost to you should you choose to participate. You have the right to withdraw from this study at any time with no penalties. The information you provide will not be shared with your therapist or the facility.

WHAT ARE THE RISKS OF THE STUDY?

You may experience mild frustration that is common when completing surveys. Some questions may be of a sensitive nature, and you may therefore become upset as a result. However, such risks are not viewed as being in excess of “minimal risk”. If, however, you become upset by questions, you may stop at any time or choose not to answer a question.

WHAT ARE THE BENEFITS OF THIS STUDY?

Benefits of the survey might be better feelings and emotions about doing your home program. It is also possible that you may not benefit personally from being in this study. However, we hope that, in the future, other people might benefit from this study because it will help therapists better understand why people do or do not complete home programs.

CONFIDENTIALITY

The student researchers and their advisor will be the only people to see your answers. No one will see your name or personal information. Your hand therapist will not see your survey results.

The records of this study will be kept private to the extent permitted by law. In any report about this study that might be published, you will not be identified. Your study record may be reviewed by Government agencies, the UND Research Development and Compliance office, and the University of North Dakota Institutional Review Board. Any information that is obtained in this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. If we write a report or article about this study, we will describe the study results in a summarized manner so that you cannot be identified.

IS THIS STUDY VOLUNTARY?

Your participation is voluntary. You may choose not to participate or you may discontinue your participation at any time without penalty or loss of benefits to which you are otherwise entitled. Your decision whether or not to participate will not affect your current or future relations with the University of North Dakota or the clinic where you are receiving therapy.

If you decide to leave the study early, we ask that you return the iPad the researchers. Your therapist will not view your answers and this will have no negative effect on your therapy session.

CONTACTS AND QUESTIONS?

The researchers conducting this study are Brien Buckentine, Justin Fredrickson, and their advisor Anne Haskins, PhD, OTR/L. If you later have questions, concerns, or complaints about the research please contact Brien Buckentine (320) 493-8797, Justin Fredrickson (320) 583-2228, or Dr. Anne Haskins (Advisor) at 701-777-0229.

If you have questions regarding your rights as a research subject, you may contact The University of North Dakota Institutional Review Board at **(701) 777-4279**.

- You may also call this number about any problems, complaints, or concerns you have about this research study.
- You may also call this number if you cannot reach research staff, or you wish to talk with someone who is independent of the research team.
- General information about being a research subject can be found by clicking “Information for Research Respondents” on the web site:
<http://und.edu/research/resources/human-subjects/research-participants.cfm>

I agree for my written quotes in the survey to be used in the research; however I will not be identified.