

2014

# Increasing Collaborative Communication Regarding Proper Positioning: A Photographic Guide

Kyle Donner
*University of North Dakota*

Rachel Newman
*University of North Dakota*

# INCREASING COLLABORATIVE COMMUNICATION REGARDING PROPER POSITIONING: A PHOTOGRAPHIC GUIDE

By

Kyle Donner MOT/S and Rachel Newman MOT/S

Advisor: Sclinda Janssen PhD, OTR/L

A Scholarly Project

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 2014

This Scholarly Project, submitted by Kyle Donner and Rachel Newman in partial fulfillment of the requirement 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 completed and is hereby approved.

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Faculty Advisor

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| Department: | Occupational Therapy |
| Degree: | Master's of Occupational Therapy |

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ACKNOWLEDGEMENT

The authors would like to thank their advisor Sclinda Janssen for her unwavering support and guidance as well as her extensive knowledge to aide in the development of scholarly project. The authors would also like extend their gratitude to their friends, family, and fellow classmates for their support and encouragement throughout this process.

## ABSTRACT

Approximately 98,000 people die annually in the United States due to medical errors (Institute of medicine, 2013). These medical errors are most often due to miscommunication between healthcare providers (Sutcliffe, Lewton, & Rosenthal, 2004). Impaired positioning is one type of medical error, which leads to severe complications such as contractures, pressure ulcers, and occupational deficits (Amidei, 2012; de Jong, Nieuwboer, & Aufdemkampe, 2006; Gordon, Gottschlich, Helvig, Marvin, & Richard, 2004). The purpose of this scholarly project is to provide a communication tool that will increase interprofessional communication and collaboration in regards to client positioning needs in healthcare settings. A literature review was conducted on positioning guidelines, communication strategies and barriers, and teaching strategies. The five target diagnoses of this scholarly project were traumatic brain injury (TBI), cerebral vascular accident (CVA), spinal cord injury, burn, and orthopedic injury. The goal of this program is to decrease secondary complications related to improper positioning that will impede occupational performance by providing consistent and evidence-based positioning strategies. The Model of Human Occupation (MOHO), Social Learning Theory, and Dynamical Systems Theory were utilized to guide the creation of this scholarly project. The resulting product was an adaptable interdisciplinary communication tool to guide positioning of clients with the aforementioned diagnoses as well as other individuals with limited mobility. Through implementation of this communication tool, clinicians can provide consistent and evidence-based positioning to their clients, increase interdisciplinary communication and carryover of care, and assist in prevention of

secondary medical complications related to improper positioning.

# CHAPTER I

## INTRODUCTION

Approximately 98,000 people die annually in the U.S. due to medical errors (Institute of medicine, 2013). Most often these medical errors are attributed to miscommunication between healthcare providers (Sutcliffe, Lewton, & Rosenthal, 2004). Improper positioning was found to be one type of medical error leading to secondary complications such as increased risk of infection, deformity, contractures, and pressure ulcers. *(*Amidei, 2012; de Jong, Nieuwboer, & Aufdemkampe, 2006; Gordon et. al., 2004). These secondary complications can lead to longer hospital stays and occupational performance deficits which may affect a patient's quality of life and ability to participate in meaningful occupations.

Specifically, it was found that little time is spent determining how to incorporate meaningful occupation based activities into medical settings (Rogers, 2007). The ability to participate in meaningful activities can be an indicator of an individual's quality of life. Thus the authors assert that incorporation of these activities that are unique to each individual patient is of the utmost importance to improve functional outcomes and minimize occupational performance deficits. This can also support healthcare workers to provide unique client centered care and potentially increase patient satisfaction with the care provided within these settings.

The purpose of the scholarly project was to create a communication tool that will increase interprofessional communication and collaboration in regards to client

positioning and incorporate engagement in meaningful activities to promote occupational performance in healthcare settings for individuals with limited mobility. The population chosen for the project includes traumatic brain injury (TBI), cerebrovascular accident (CVA), spinal cord injury (SCI), burn and certain orthopedic conditions that impede functional mobility; however, it may be adapted to meet the needs of any individual with limited mobility.

Using evidence obtained through the literature review completed for this scholarly project, the authors created simple, multimodal positioning guideline templates to be used within individual client's rooms, which will provide a guideline for all healthcare personnel when positioning that client. The communication tool will include each individual client's goals and interests to promote unique client centered care within healthcare settings. The goal of this tool is to decrease secondary complications related to improper positioning that will impede occupational performance by providing consistent and evidence based positioning.

The authors determined the information and formatting to be used for the positioning program through extensive research about common communication barriers and strategies, the influence of participating in meaningful activities, and specific positioning strategies that facilitate improved patient outcomes. With this knowledge, the authors designed a functional positioning program to be utilized within hospital settings to improve occupational performance of patients and facilitate improved communication between healthcare workers.

The positioning program is structured into three sections; evaluation, intervention, and implementation. As previously stated, each template is designed to be changed and

adapted to meet the facility and individual patient's needs, with the exception of using the MOHO Interest checklist during the evaluation section of the program. The evaluation section was designed to include assessment recommendations that are specific to the person and their diagnosis as well as facility used assessments. For example, with traumatic brain injury, an evaluation template may include range of motion, Ranchos Los Amigos Scale, and Braden Scale as recommended assessments. These assessments will help to determine potential risks for secondary complications as well as describe current abilities or deficits caused from the individual's brain injury. Using the evaluation template can help a facility standardize clinical pathways to be utilized with their patients.

The intervention section uses a multimodal learning strategy to portray specific patient positioning through the use of digital photographs and written communication. This includes the purpose of the specific position, what to assess, precautions, and how often the person needs positioned. This section also includes a section to be filled out with each patient describing their individual interests and activities as well as their identified treatment goals.

The implementation section includes guidelines for how the program should be properly utilized. This details necessary staff education, signatures required for accountability and increasing the feedback loop, boundaries and confidentiality concerns, how to adapt the templates to meet individual needs, and the promotion of engagement in occupation throughout the recovery process to increase independence. The positioning program can be found in appendix A and reviewed literature applied to specific positioning needs of the population identified can be found in chapter II.

Many factors could influence the application of the communication tool within healthcare settings. Administrative personnel will need to support the introduction of this program, as the program is essentially a change in positioning procedures within the current structure of the facility. It is difficult to implement change within any facility because there is often resistance to any change in normal operations. Once administration has approved the program, each healthcare professional will need to become invested in the implementation of the program. This program will only achieve the expected results if all members of the healthcare team understand and act accordingly to the positioning program. To achieve this, it is recommended education on the program is provided through training seminars or in-services. Even after education is provided, it is not guaranteed that all healthcare professionals will support the program. If these obstacles are overcome, there should be an individual or committee in charge of overseeing and evaluating the program. This committee would have the ability to change the program to meet the unique needs of that facility. Although there are a variety of factors that may influence the application of this program, implementation is feasible and has the potential to have a significant positive impact on client outcomes.

**Theory**

Multiple theories were used to inform the creation of this scholarly project, including the Model of Human Occupation (Kielhofner, 2009), Social Learning Theory (Bandura, 1971), and Dynamical Systems Theory (Royeen, 2011). These theories have been researched and found appropriate to provide a theoretical basis for this scholarly project. Concepts from the Model of Human Occupation, Social Learning Theory, and Dynamical Systems are integrated throughout the entirety of the positioning program.

The authors of this scholarly project used MOHO in a variety of ways. It provided the framework to complete this scholarly project in an organized step by step manner. An illustration that demonstrates this concept is located within Chapter III. MOHO also guided the goals for this project. It was important to incorporate each individual client's volition, habituation, and performance capacity when creating this program (Kielhofner, 2009). For that reason, client goals and interests were included in the intervention section of the product. The product is a template; it is encouraged for the program to be adapted to meet the specific needs of the client. When adapting the template, the occupational therapist should consider the client's performance capacity and his or her goals for therapy.

The Social Learning Theory was also used to guide the implementation of this positioning program. It will specifically guide the communication between healthcare providers when developing this program. For example, in-service presentations should be given to all disciplines involved in the care of client's with positioning needs. This will insure that all members of the healthcare team are well informed and invested in the implementation of the program. Role-modeling is a key concept of this product, which is derived from Social Learning Theory (Bandura, 1971). Several pictures are inserted on the positioning program for each client to provide an example of the correct positioning for that client. Healthcare personnel performing positioning may refer to this pictures and role-model the positioning shown. By having illustrations of proper positioning, it is hoped that consistency of positioning between all healthcare workers will increase.

The Dynamical Systems Theory was also used throughout the development of this project. This theory uses a holistic approach that considers all aspects of care (Royeen,

2011), which is important when implementing change of procedures. This positioning program will change the communication of healthcare workers, so it was important to consider the structure of the system as an entity when developing this product. The Dynamical Systems Theory also guided the creation of boundaries between systems. For example, confidential information is not included in the product to remain compliant with healthcare regulations. A feedback loop is a key concept of this theory and was developed within this scholarly project (Royeen, 2011). This program will be placed within the client's chart with a section for staff to write comments regarding the positioning program. Changes to the program may be made in accordance with the feedback received. This allows all members of the team to have input on the system, which promotes investment in the continued implementation of the program. It was important to have evidence-based guidance when making decisions regarding the development of this scholarly project and the above theories provided that guidance.

**Key Terms**

The authors of this scholarly project recognize that there may be multiple definitions for some of the following terms. The definitions listed below are the ones used to guide the development of this project.

- Brain Injury: may be caused by a variety of factors including trauma, stroke, and degenerative discords (Book, 2009). Depending on the cause of the brain injury, client symptoms will vary greatly.
- Spinal Cord Injury: can be broken into a complete or incomplete injury to the spinal cord which causes disruption in the motor and sensory pathways at the site of the lesion/injury (Atkins, 2008). An incomplete spinal cord injury occurs when

there is “partial preservation of sensory and/or motor function below the neurological level and including the lowest sacral segment” (ASIA, 2000 p.7). A complete spinal cord injury occurs when there is “an absence of sensory and motor function in the lowest sacral segment” (ASIA, 2000 p.7)

- Burn Injury: a thermal injury to the skin and underlying tissues. A burn injury may be broken into three types of burn including; superficial burn which involves only the cells of the most superficial layer of skin; superficial partial thickness burn which includes the both the superficial layer of the skin as well as the upper layer of the dermis including blood vessels, nerve endings, hair follicles, and sweat and oil glands; and full thickness burn which includes both the dermis and epidermis (Pessina & Orrotch, 2008)
- Orthopedic Injury: an injury to the bone or joint and related structures including muscles, tendons, ligaments and nerves (Maher & Bear-Lehman, 2008).
- Multimodal Learning: application of various presentations of information, such as visual representations, auditory, and written and verbal communication to address individual learning needs (Breckler, Joun & Ngo, 2009; Sankey, Birch, & Gardiner 2010)
- Ischemic Stroke: a blockage of a cerebral vessel resulting in insufficient blood flow and oxygen to brain tissue (Bartels, 2004).
- Hemorrhagic Stroke: bleeding resulting from a rupture of the cerebral blood vessels, where the blood is released outside of the vascular space causing a pressure injury to the brain tissue (Bartels, 2004).

- Intracranial Pressure: pressure placed within the skull by brain tissue and cerebrospinal fluid (Book, 2009)
- Cerebral Perfusion Pressure: the pressure gradient of blood flow to the brain (Book, 2009)
- Systemic Oxygenation: the capability of the body to maintain appropriate oxygen levels to all body parts, especially the brain after a traumatic brain injury or cerebral vascular accident (CVA) (Book, 2009)
- Cerebral Vasospasm: sustained arterial constriction, which prevents oxygenation of the brain following a CVA (Blissitt, Mitchell, Newell, Woods, & Belza, 2006).
- Spasticity: also known as hypertonicity; muscle tone that is higher than normal and resists movement and stretching (Levit, 2008)
- Flaccidity: also known as hypotonicity, muscle tone that is lower than normal (Levit, 2008)

**Conclusion**

This chapter provided an introduction to the purpose of this project and some of the key concepts researched when creating the positioning program. The following chapters will provide an increased depth of detail regarding the development of the project. Chapter II will describe the evidence-based justification for the creation of this scholarly project. It will summarize and compare the literature findings regarding the important concepts of this scholarly project, including proper positioning guidelines. Chapter III describes the methodology the authors used in regard to gathering relevant information and development of the communication tool. Chapter IV is an overview of the product. The full communication tool may be found in appendix A. Finally, Chapter

V is a summary of the main concepts of this scholarly project. This chapter provides recommendations for implementation, limitations of the product, and recommendations for future research.

# CHAPTER II

# LITERATURE REVIEW

Client safety and quality of care is of utmost importance to health care professionals. In order to provide the best care possible, collaboration and communication must occur between all health disciplines. Conversely, lack of collaboration and communication often results in serious medical errors in hospital settings. The Institute of Medicine reported that approximately 98,000 people die each year in the United States as a result of medical errors (Institute of Medicine, 2013). Medical errors related to bed positioning are of particular concern. Proper bed positioning of clients with traumatic brain injuries (TBI), cerebral vascular accidents (CVA), spinal cord injuries (SCI), burns, and orthopedic conditions has been researched and a variety of standards of care has been established for these clients (Christie, 2008; Messerole, Peine, Wittkopp, Marini, & Albert, 2002; Sullivan, 2000). The standard of care, however, is not often followed, understood, and can differ in application across different facilities or context according to the recent evidence base (Helman, Sherner, Fitzpatrick, Callender, & Shorr, 2003). The following literature review explores the current evidence base in regards to the problems with improper positioning, communication barriers, communication strategies, and positioning guidelines for clients with a TBI, CVA, SCI, burns, and orthopedic conditions.

## Identified Problems

Complications from immobility or disuse are common in individuals who have sustained a brain injury including cerebrovascular accident and traumatic brain injury, severe burn, spinal cord injury, and orthopedic conditions. These complications may lead to compromised functional outcomes (Moseley, 2008; Proctor, 2010; Singer, Gnanaletchumy, Singer, Allison & Duane 2004; Simandl, 2009; Singer, Gnanaletchumy, Singer, Allison, 2003; Summers et al., 2009). Specifically, the most concerning complications that impair functional performance include contractures and pressure ulcers. Body and bed positioning may be related to other complications such as aspiration and nosocomial pneumonia, intracranial pressure, cerebral perfusion pressure, and systematic oxygenation (Book, 2009; Drakulovic et al.1999; Fan, 2004; Feldman et. al., 1992). The researchers acknowledged that several resources used may be older; however, more recent research has not been conducted. As a result, these studies are still relevant.

Contracture is one complication that results in the loss of joint mobility, which affects the patient's ability to function and carry out activities of daily living. Contractures can occur from the absence of stretch or movement of the affected spastic or hypertonic muscles as seen in spinal cord injury, cerebrovascular accident, and traumatic brain injury, or prolonged bed rest, positioning or disuse of extremities with tissue damage such as burn or orthopedic conditions (Singer et al., 2003; Singer et al., 2004)

Also affecting a patient's functional outcomes is the development of pressure ulcers (Amidei, 2012; Simandl, 2009). Once a pressure ulcer has developed, the patient's length of stay in the hospital may increase and requires costly medical interventions (Gordon, Gottschlich, Helvig, Marvin, & Richard, 2004). Researchers have indicated that pressure ulcers are a preventable condition and when an individual develops a pressure

ulcer, the quality of care the patient received comes into question (Simandl, 2009). Factors that contribute to pressure ulcer formation include sustained pressure, shearing forces, friction and moisture (Arnold, 2003; Gordon et. al., 2004; Simandl, 2009). The following section will describe communication barriers in healthcare, which are a contributing factor to the development of secondary positioning complications.

**Communication Barriers**

To understand the causes of ineffective communication that contribute to medical problems, it is important to examine barriers to communication. The following section will describe the following communication issues; a hierarchical structure, lack of funding, scope of practice issues, lack of education, faulty communication, evaluation of communication, and consistency.

Several authors asserted that the hierarchical structure of the health care system contributes to communication failures (Jansen, 2008; Sinclair, Lingard, & Mohabeer, 2009; Sutcliffe, Lewton, & Rosenthal, 2004). A hierarchical structure is defined as a system in which certain professions are viewed as more powerful and influential (Sutcliffe et. al., 2004). For example, residents may view their supervising physician as having power over them, which may limit the communication between the two parties. Sinclair et. al., (2009) reported that hierarchies were present within health care teams. Clinicians with more experience and higher expertise made the medical decisions within the facility and the other disciplines acted according to their decision. The team members in this study reported that there is a balance between shared decision-making and a top-down approach, acknowledging the need for authority figures. Sutcliffe et. al., (2004) conducted a qualitative study on the communication of a single hospital and found that

medical professions were hesitant to communicate to their superiors. There were several reasons for this hesitancy including not wanting to appear incompetent and not wanting to offend their superiors. In conjunction with these results, Jansen (2008) stated that a hierarchical structure in health care leads to service fragmentation and poor team communication.

While a hierarchical structure has been identified as a barrier to communication, a lack of funding and resources also has been reported to limit effective communication within health care settings (Atwal, Tattersall, Caldwell, & Craik, 2006; Jansen, 2008; Long, Kneafsey, & Ryan, 2003). Education of staff members in regards to effective communication strategies within the workplace is important in developing collaborative health care, but funding is often not available to implement and develop communication programs (Jansen, 2008). Thus, many health care settings go without formal education procedures and often have ineffective communication strategies. A shortage of staff due to financial constraints also affects the ability of staff to collaborate and communicate (Atwal et. al., 2006; Long et. al., 2003). Long et. al. (2003) reported that when nurses are understaffed, they don't participate in multi-professional team meetings because they are busy performing their essential job functions. This shortage of staff had a significant impact on the transfer of client information from one discipline to another and increased the risk for medical mistakes.

Another communication barrier includes the traditional roles and scope of practice guidelines of each health care discipline (Atwal et. al., 2006; Jansen, 2008; Long et. al., 2003). Jansen (2008) reported that political agendas involving scope of practice discrepancies had a negative impact on the collaboration of health care members. The

scope of practice of each discipline promotes professional protectionism, which is not conducive to a transdisciplinary or interdisciplinary environment. In other facilities, role confusion was present and each health care discipline was not sure as to what their role on the team was (Atwal et. at., 2006; Long et. al., 2003). An example of role confusion in Atwal's (2006) study is that nursing was perceived as performing a therapist's role if they continued therapy techniques after the conclusion of a client's therapy for the day. The physician at this facility emphasized the need for nursing to carry over therapy skills throughout the day to promote client improvement. As Long et. al., (2003) stated, "Where nurses lacked awareness of their contribution to rehabilitation, many opportunities to promote client well-being were missed" (p. 667). It was also noted that a lack of clarity in health care led to oversights, disorganization, and duplication of work. These examples emphasize that health care worker roles need to have some guidance but cannot be too strict in order to provide optimal care to clients and to promote a collaborative environment.

While role discrepancies contribute to communication barriers, a lack of formal education on team collaboration also is a contributing factor (Jansen, 2008; Paul & Peterson, 2001). Jansen (2008) reported that many health care members are not educated on collaborative techniques during their educational career. It is not a requirement in many of the curriculums and is thus not addressed by many educational programs. There is a need for a paradigm shift in the educational sector to address this increasingly important issue of communication within the workplace. Paul and Peterson (2001) reported further on the need to implicate interprofessional education into health care curriculums. They stated that traditional education promotes separation of disciplines and

are a precursor for lack of collaboration in the workplace. They further asserted that it is more difficult for educational programs to implement interprofessional education because of the increased time needed to coordinate with other educational program. It is often not feasible to find a time frame that fits the schedule of multiple health care programs, which is a reason why there is hesitancy to incorporate interprofessional education (Paul & Peterson, 2001). These barriers must be overcome before educational programs emphasize collaboration in their curriculum. It is unrealistic to expect practicing professionals to have collaboration and communication skills if they are not taught those skills at some point in their educational careers.

Sutcliffe, Lewton, and Rosenthal (2004) reported that an additional communication barrier is faulty communication strategies when transferring clients from one setting to another. During their study, residents reported that information is often missing from reports when they are transferred to their in-patient facility. As one resident in the study states "God, we get patients, we're lucky if we get any information when the patients come into the hospital. About half the time we don't even know they're coming. They'll just show up on the floor." (p. 190). The information that is received is often in written documents, which is impersonal in nature and not the most effective way of communicating. Through written documents, nonverbal cues are not expressed and the needs of the client are often vague. Due to the fast paced nature of many health care facilities, written documents are often not reviewed in a timely manner. The data from this report suggests that information is often not available, not timely, or not communicated in an effective way when patients are transferred from one facility to another.

While communication when transferring patients may be faulty, another barrier is that there is not an accurate measurement for evaluating collaboration within health care facilities (Boon, Mior, Barnsley, Ashbury, & Haig, 2009; Jeffcott & Mackenzie, 2008; Paul & Peterson, 2001). Communication errors are established as a major source of mistakes within the healthcare system, but it will be difficult to improve communication without a method of accurately measuring communication and collaboration within healthcare (Jeffcott & Mackenzie, 2008). Currently there is not a measurement that has been proven valid or reliable to evaluate communication and collaboration. Without proper evaluation, it is difficult to determine what measures need to be taken to improve interprofessional communication and collaboration. Boon et. al., (2009) reported that there is a lack of clarity within the health field as to what constitutes collaboration. When healthcare professionals were interviewed, there was not one definition for collaboration and several participants used collaboration and integration interchangeably. Without a clear definition of collaboration, it will be impossible to accurately measure collaboration within the healthcare system. Paul and Peterson (2001) explained that effective collaboration will lead to a health care system that is accountable and cost effective. It is essential to develop a measurement tool that has the ability to provide evidence base to the concept of communication within healthcare.

Consistency within the health care system has also been identified as a barrier to communication (Atwal et. al., 2006; Sinclair et. al., 2009; Xyrichis & Lowton, 2008). Atwal et. al., (2006) conducted a series of interviews with a variety of health care professionals. Several nurses reported that they attempt to follow through with therapy recommendations but it is difficult with all their other job responsibilities. They reported

that consistency is not always present within that particular health care setting. Sinclair et. al., (2009) reported that consistency with therapy carry over is not always feasible because nurses have more direct contact with clients. It was reported that nurses were hesitant to enforce therapy recommendations if the client resisted because they had to interact with the client on an hourly basis. Communication standards between health professions were also found to be inconsistent. Xyrichis and Lowton (2008) reported that consistency in communication is dependent upon the experience of the staff with each other. The researchers found that teams who have worked together for longer periods have established communication techniques that are effective within the team. Health care teams that experience a lot of turnover or are understaffed tend to have inefficient and inconsistent communication techniques that may lead to medical mistakes.

Researchers identified multiple communication barriers in healthcare settings that can compromise the quality of healthcare services. It is important to develop interprofessional communication systems to neutralize the influence of communication barriers.

**Communication Strategies**

Due to the substantial risks associated with communication barriers and subsequent medical error, many hospitals have implemented varying protocols and strategies in an attempt to improve patient outcomes and the quality of care provided (Kilday, Spiva, Barnett, Parker, & Hart, 2013). An abundance of research has been conducted on these strategies to gain insight into possible ways to effectively and efficiently manage these barriers to communication to improve quality of care and patient outcomes.

Effective interdisciplinary communication has been associated with decreased medical errors and the promotion of optimal patient outcomes (Kilday, Spiva, Barnett, Parker, & Hart, 2013). Because an individual's stay within a hospital setting requires a multidisciplinary team and their expertise, the importance of communication and the carryover of care are of the utmost importance. Effective communication is vital to the success of the team and to provide collaborative healthcare (Kilday, Spiva, Barnett, Parker, & Hart, 2013). Thus, providing education to other disciplines, implementing appropriate communication strategies, and following the patient's plan of care, requires mutual support and communication from the interdisciplinary team.

According to Deering, Johnston, and Colacchio (2011), traditionally, the approach used to improve patient outcomes and decrease medical error has been to address an individual's skills by providing further education; however, more recently, these researchers have found complications and medical error generally result from the team rather than individual team members. Furthermore, individual competency in clinical skills relevant to their discipline is not enough to improve patient outcomes. Coordination, collaboration, education and communication are the essential components of improved quality of care and patient outcomes (Rosen et al., 2008)

Although individual professionals possess expertise in their specific area of practice, it is essential to understand the roles and competency of other healthcare professionals that are working with these clients to provide inclusive and superior care (Proctor, 2010). Interdisciplinary education is an important component of collaborative care. Multimodal teaching strategies apply various presentations of information, such as visual representations, auditory, and written and verbal communication to address

individual learning needs (Breckler, Joun & Ngo, 2009; Sankey, Birch, & Gardiner 2010). To provide education effectively, Sankey, Birch, and Gardiner (2010) found incorporating multiple representations of educational materials can directly assist comprehension because it caters to these different learning styles. Although this study was conducted within an education system context, the information can be generalized to hospital settings where learning occurs. Members of an interdisciplinary team are unique, therefore they have different learning styles, skills, knowledge, and preferred communication styles. This is why it is important to use a multimodal approach because it attempts to meet the diverse needs of all team members.

Van et el. (2004) found evidence to support the use of a multimodal strategy to increase communication through the use of technology. The authors found that verbal and written communication alone were not effective to accurately portray specific positioning programs. They implemented the use of digital photographs of splinting and positioning guidelines along with written and verbal instructions to enhance comprehension and interdisciplinary carryover of care. The results of the study demonstrated 73 percent of nurses felt that this method was the most effective way to communicate positioning needs. Tipmongkol, Thepkamnoet, and Tangtrakulwanich, (2009), found similar results using digital photography to portray characteristics of open wounds in orthopedic patients. Using these visual representations provided more clarity and detail than using verbal communication alone to describe open fractures, pressure ulcers, and infections between staff members.

Another use of technology to increase interdisciplinary communication that was found to be effective was the use of communication boards. Wong, Caesar, Bandali,

Agnew and Abrams (2009), developed, implemented and evaluated the utility of electronic whiteboards to portray pertinent patient information within a hospital setting. These boards were strategically placed and provided accurate, timely, and integrated patient information. The authors found that 71 percent of participants found the communication tool to be useful. Specifically, participants indicated that the tool allowed them to save time and was a standardized formal structure of communication.

Formal structuring of communication through the use of rounds has also been found to increase interdisciplinary communication (Deering, Johnston, & Colacchio, 2011; Lown & Manning, 2010). Rounds, which are structured in a formal interdisciplinary meeting about specific patient plans of care, are typically led by the attending physician. Lown and Manning (2010), conducted a study to assess the impact of attending rounds on interprofessional communication. The authors found rounds improved teamwork and increased understanding of the roles and responsibilities of their colleagues. The authors also stated that changes in institutional culture occurred with a greater emphasis on client-centered care (Lown & Manning, 2010). Similarly, Deering, Johnston, and Colacchio, (2011) found interdisciplinary meetings improved coordination of care by ensuring patient's plans of care are understood. Communication about pertinent changes in patient information and resources were also provided.

Another approach to increase awareness of professional roles and responsibilities is to implement specific training and communication protocols. Rice et al. (2010) implemented a communication intervention that consisted of introducing oneself to the other profession by name, stating professional role, sharing unique training and professional knowledge about the topic, and eliciting feedback by asking if the other

professional had questions or concerns. Although the researchers concluded this strategy was ineffective by the end of the study, participants and stakeholders initially supported its implementation but lacked commitment to the protocol. Participants attributed this to lack of time due to the fast-paced medical environment. The researchers asserted that because time is finite within a medical setting, a less intrusive, simple intervention would be more effective.

Authors Phipps and Thomas (2007), assessed the effectiveness of a less intrusive intervention by implementing daily goal sheets as a form of communication between physicians and nursing staff. These goal sheets outlined safety risks, daily goals, and the pulmonary, cardiovascular, nutrition and hematology status of the patient. The authors found through pre and post intervention surveys, the daily goal sheets led to improvements in perception of communication. Thus, concrete and less time consuming interventions such as communication boards, digital photography and daily goal sheets to assert timely and effective communication may be more plausible and efficient strategies within a medical setting.

These communication strategies, such as, multimodal interdisciplinary education, formal communication meetings such as rounds, technology, digital photography, daily goal sheets and simulations are effective strategies to improve communication among healthcare professionals. Proper positioning has been well researched and can aide in decreasing or preventing secondary complications of illness or injury (Amidei, 2012; Gordon et. al., 2004; de Jong, Nieuwboer and Aufdemkampe, 2006). Patient positioning is completed by multiple healthcare disciplines, though the application of positioning strategies may differ depending on the profession. Interdisciplinary communication is a

key factor to increase the quality of care a patient receives, the reduction of medical errors, as well as follow through of care between healthcare disciplines. The implications from these studies provide rationale for this scholarly project to increase interdisciplinary communication and comprehension of positioning strategies. It is postulated that utilizing a simple and concrete multimodal approach of written instruction paired with digital photographs of proper positioning will be beneficial to decrease these medical errors, therefore increasing patient outcomes.

## Positioning Guidelines

The following sections will highlight the evidence-base for positioning the target diagnoses. There are unique considerations to consider when positioning each client and it is important for consistency in positioning to exist between health disciplines.

### Positioning for Brain Injury

There are many client factors to consider when positioning a patient who has sustained a brain injury. A brain injury may be caused by a variety of factors including trauma, stroke, and degenerative discords (Book, 2009). Depending on the cause of the brain injury, client symptoms will vary greatly (Book, 2009). The following section will discuss the head of bed, supine and prone, and hemiplegic arm positioning guidelines for a client following a brain injury.

#### *Head of bed.*

It is important for health care professionals to be aware of the benefits and contraindications of adjusting a patient's head of bed. Changing the angle of the head of the bed affects a patient's intracranial pressure (ICP), cerebral perfusion pressure (CPP), and systemic oxygenation (Fan, 2004; Feldman et. al., 1992). It is common for those

measures to be monitored if a patient has sustained a brain injury. ICP is pressure placed within the skull by brain tissue and cerebrospinal fluid (Book, 2009). CPP is defined as the pressure gradient of blood flow to the brain (Book, 2009). Systemic oxygenation refers to the capability of the body to maintain appropriate oxygen levels to all body parts, especially the brain after a traumatic brain injury or cerebral vascular accident (Book, 2009).

Fan (2004) conducted a systematic review to determine the appropriate head of bed position for patients that have suffered a brain injury. The theoretical basis for raising the head position of a patient is to place the head above the heart to encourage decreased ICP. When the head is above the heart, cerebrospinal fluid will descend down the spinal column and venous draining from the brain will occur. Of the eleven studies that Fan (2004) evaluated, nine studies demonstrated a significant decrease in ICP when the patient with a brain injury was placed with his/her head elevated as compared to lying flat in supine. The degrees of head positioning varied from 30 to 60 degrees but 30 degrees was the most common head elevation with six studies conducting measurements at that angle. Feldman et. al. (1992) conducted one of the first studies on patients with brain injuries in regards to ICP values. Twenty-two patients' ICP measurements were compared while lying supine and with a head of bed angle of 30 degrees. Half of the participants began the study in supine and the other half began with an elevated head. The two groups would then switch positions and measurements were again taken. It was found that ICP decreased significantly with this population while their head was elevated at 30 degrees and the starting position was found to not affect the results. Research has supported the elevation of a patient's head following a brain injury.

While it is important to monitor patients' ICP once they have sustained a brain injury, including traumatic brain injuries (TBI) or CVAs, CPP should also be monitored. Past research on CPP has yielded inconsistent results as to the effect of elevating the head (Fan, 2004). Fan (2004) evaluated nine studies that measured CPP when raising the head of bed. Only two articles found a decrease in CPP when raising the head of bed, while another two studies indicated an increase in CPP with an elevated head position. The other studies did not yield significant results for the measurement of CPP. These results are consistent with the results of the study by Feldman et. al. (1992), in which there wasn't a statistical difference in CPP when the patients were at a 30 degree angle of the head of the bed or lying flat in supine. The effect of head positioning on CPP was unique to each individual with some participants' CPP increasing at 30 degrees, others remaining close to the same, and others decreasing. The results of the two studies suggest that CPP measurements change unpredictably when changing head positioning.

Researchers have examined how ICP and CPP measurements change with changes in head positioning but how does this information guide clinical application? Researchers found that secondary brain injuries such as a decreased CPP, which results in decreased systemic oxygenation, are the main determinants for prognosis (Fan, 2004). These secondary injuries can be affected by body positioning. Fan (2004) and Feldman (1992) suggested that all any patient with a brain injury be placed at 30 degrees of head elevation with constant monitoring of CPP. If CPP begins to decrease, the patient should be returned to lying flat in supine.

While 30 degrees of head elevation was found to be appropriate for brain injuries in general, there are specialized cases in which this approach is not appropriate

(Hargroves, Tallis, Pomeroy, & Bhalla, 2008; Hunter, Snodgrass, Quain, Parsons, & Levi, 2011). Hunter et. al. (2011) conducted a study on eight participants that were in the acute stages following an ischemic stroke. The results of the study indicate that following an ischemic stroke, the body is not able to adapt to orthostatic stress. Orthostatic stress is created by changing the body position of the patient, which changes the blood flow to the brain (Hunter, et. al., 2011). Under normal circumstances, the body is capable of maintaining a static blood flow regardless of body position. The participants of Hunter et. al. (2011) study were found to be at risk of decreased oxygenation to the brain from a decreased blood flow when at 30 degrees head elevation. The results of a study by Hargroves et. al. (2008) supports these findings as well. Seven participants with an ischemic stroke were placed in various head of bed positions. Maximal oxygenation to the brain was achieved in the supine position in six of the seven participants. These researchers support lying patients flat in supine during the acute stages following an ischemic stroke.

While it may not be appropriate to elevate a patient's head following an ischemic stroke, researchers recommend elevating the head following a subarachnoid hemorrhage (Blissitt, Mitchell, Newell, Woods, & Belza, 2006). Researchers focused on cerebral vasospasm, although they did collect data regarding ICP and CPP. Cerebral vasospasm is defined in the article as sustained arterial constriction, which prevents oxygenation of the brain following a CVA. The 20 participants in the study went through a series of head of bed changes from 0-20-45-0 degrees. There was not a significant increase or decrease in vasospasm at any of the head positions. The ICP and CPP data is, again, consistent with the findings of Fan (2004) and Feldman et. al. (1992). The researchers concluded that

following a subarachnoid hemorrhage, patients should be placed in an elevated head position from 20 degrees to 45 degrees but should be monitored closely.

Head of bed positioning not only has an effect on internal processes but also has implications regarding prevention of pressure ulcers and pneumonia (Drakulovic et. al., 1999; Harada, Shigematsu, & Hagisawa, 2002). Harada et. al. (2002) conducted a study on ten participants to determine sacral pressure in two different positions. Participants were placed in 30 degrees of head elevation with no leg elevation, and then later positioned in 30 degrees of head elevation with 10 degrees of leg elevation. The researchers noted that in their clinical experience, patients at 30 degrees of head elevation and no leg elevation tend to slip down the bed. This causes shear stress to the sacral area. The results of the study were that less body displacement occurred when leg elevation of 10 degrees was incorporated into positioning guidelines. This study provides justification for not only having patients in 30 degrees of head elevation but also 10 degrees of leg elevation to decrease the frequency of pressure ulcers in patients. The bed position of elevating both the head and legs was studied by Drakulovic et. al. (1999) to evaluate the relationship between the onset of pneumonia in patients who were mechanically ventilated and bed positioning. Researchers concluded that the incidence of pneumonia increased in patients who were lying flat in supine as compared with elevated head and leg positioning. The researchers suggested that this position be implemented in clinical settings to reduce unnecessary medical costs and deaths related to pneumonia. When positioning a patient with head elevation, it would also be important to conduct frequent assessments of pressure ulcer formation on the sacrum or coccyx. These assessments may need to be done four times a day if the patient is continually in supine with head of bed

elevation.

***Supine and prone.***

While head positioning is important to consider, there should also be consideration of whether to place a patient in supine or prone. The prone position is seldom used in the clinical setting, but there are benefits to placing the patient in the prone position (Defloor, 2000; Messerole, Peine, Wittkopp, Marini, & Albert, 2002; Nekludov, Bellander, & Mure, 2006). Nekludov et. al. (2006) conducted a study on patients following a TBI or CVA and found that the prone position improved systemic oxygenation. They hypothesized that this was due to anatomical structure in the prone position, which allows for more efficient pulmonary output. It should be noted that the patients in the study did not exhibit a high ICP prior to positioning because the prone position has been shown to increase ICP. The authors suggested using the prone position for patients with a TBI or CVA with careful monitoring of ICP and CPP values. Messerole et. al. (2002) reported personal observations regarding the benefits of the prone position in patients with acute respiratory distress syndrome or acute lung position. These conditions are common when an individual has suffered a TBI, CVA, burn, or spinal cord injury. Messerole et. al. (2002) reported that the prone position not only improves oxygenation but decreases the risk of ventilator-induced lung injury.

Defloor (2000) conducted a study on a person's body pressure in various positions, including the prone position. The results of the study were that the prone position produced lower pressure on the body than most supine positions. The semi-fowler position, which is 30 degrees of head elevation and 30 degrees of leg elevation, was the only position that produced less pressure than lying in prone. The researcher

suggested that the prone position should be used more frequently in the clinical setting for patients at risk of pressure ulcers. The prone position is appropriate for many patient populations, so it should be implemented in the clinical setting.

Proper bed positioning is important, but health care professionals should also consider the appropriateness of bed mattresses (Defloor, 2000). Defloor (2000) conducted a study on the body pressure with different positions and different mattresses. A standard hospital mattress was compared to a polyethylene-urethane mattress. The results of the study show that the participants' body pressure was lower on the polyethylene-urethane mattress than the hospital mattress for all ten positions studied by the researcher. The polyethylene-urethane mattress would be appropriate to use with patients that are at risk for pressure ulcers. These results suggest that both correct positioning and the correct mattress choice can reduce the prevalence of pressure ulcers in a clinical setting.

***Positioning precautions.***

When making any body position related decision, health professionals should consider contraindications. The benefits of the prone position have been discussed, but there are also situations in which the prone position would be not be appropriate (Messerole et. al., 2002). According to Messerole et. al. (2002) the prone position should be avoided if the patient has burns or wounds on the ventral side of the body, if there is spinal or pelvic instability, or if the patient has hypotension. It should also not be used with patients that have increased ICP because it is known to further increase ICP. The medical professionals should be aware of any tubes that might become bent in the prone position and use clinical reasoning to determine proper positioning. Positioning of patients is often not simple because of the frequency of multiply-injured patients

(Christie, 2008). Christie (2008) advised that medical facilities have guidelines in place for complex positioning decisions to be made as a team. The team, consisting of all disciplines involved in the care, would consider the contraindications of the patient's condition and use the evidence base to place the patient in the position that best accommodates recovery. The value of correct positioning should not be underestimated in the care of patients (Christie, 2008).

***Hemiplegic arm.***

Painful hemiplegic arm (PHA) is a common secondary condition resulting from a cerebral vascular accident (CVA). Proper management and positioning of PHA is essential to limit further injury and increase functional outcomes during stroke recovery (Ada, Goddard, McCully, Starvinos, & Bampton, 2005; de Jong, Nieuwboer, & Aufdemkampe, 2006). Positioning strategies vary depending on whether the arm is flaccid or spastic. Spasticity has been defined as an increase in muscle tone that is associated with a hyperactive stretch reflex, conversely flaccid or hypotonicity is decreased muscle tone (Murie-Fernandez et al, 2012).

If the arm is flaccid, supportive positioning strategies are utilized due to the risk of injury and further complications such as shoulder subluxation (Gillen, 2011; Murie-Fernandez, 2012). According to Gillen (2011), the weight of the arm and positions that cause traction and mechanical stretch place the individual at high risk for shoulder subluxation. This can occur from improper bed or wheel chair positioning, or lack of support when the body is in an upright vertical position. It is, therefore, important to position the joint using shoulder support devices such as bed positioning devices, adapted seating systems and slings. These devices are used to align, protect, or support the

affected limb (Gillen, 2011; Murie-Fernandez, 2012). The use of slings should only be implemented when the patient is in upright positions due to the reduction of gravitational pull on the arm. The use of slings has become controversial because the device promotes internal rotation and a flexed position, which can lead to an increased prevalence of contracture with this population (Gillen, 2011; Murie-Fernandez, 2012). Therefore, the use of slings and other supportive devices should be used with caution and for short durations of time when the shoulder is not supported due to the increased risk of subluxation.

Specific arm positions during the spastic stage of PHA have also been researched. Much of the research conducted has been centered on reducing the risk of contracture. Ada et al. (2005) conducted a randomized control trial and concluded that positioning the affected arm in maximal external rotation and 90 degrees of shoulder flexion for thirty minutes a day decreased the risk of contracture and helped to maintain range of motion. Similarly, researchers de Jong, Nieuwboer and Aufdemkampe (2006), conducted a randomized control trial in which patients in the experimental group were positioned in shoulder abduction, external rotation, elbow extension, and supination of the forearm for thirty minutes, twice a day. The authors found additional contracture preventative positioning slows down the development of contracture.

Furthermore, a review of literature conducted by Paci, Nannetti, and Rinaldi (2005), emphasized functional positioning of the affected arm included proper alignment between the humeral head and the scapula This functional positioning of the humeral head, as asserted in the study conducted by de Jong et al. (2006) emphasizes positioning the arm in abduction, external rotation, and elbow extension help to maintain tissue and

muscle length. Biomechanical alignment of the scapula and trunk as well as maintaining scapular mobility through positioning are important factors to address with the hemiplegic shoulder to improve patient's functional outcomes (Gillen, 2011). The abovementioned positioning strategies support the use of muscle lengthening positions for contracture management of the hemiplegic arm.

**Positioning for Spinal Cord Injury**

A spinal cord injury is defined as damage to neural components of the spinal cord and may vary in severity (Carroll & Curtis, 2009). According to Carroll and Curtis (2009), these injuries are most common in individuals from 16 to 30 years of age and are often the result of motor vehicle accidents, falls, violence, and sporting activities. Patients who have sustained a spinal cord injury often have altered physiologic responses, such as changed heart rate, that may be managed through proper positioning (Claydon, Steeves, & Krassioukov, 2006). Positioning and movement also plays a key role in preventing contractures with this population (Harvey, Glinsky, Katalinic, & Ben, 2011).

Patients with a spinal cord injury are most often placed in a flat supine position following injury because patients often maintain cardiovascular homeostasis in this position (Houtman, Oeseburg, Hughson, & Hopman, 2000). It is important for patients to gradually be exposed to positions other than supine through the use of tilt testing (Claydon et. al., 2006). Tilt testing is a procedure that passively moves the patient from supine to an upright position between 60 and 90 degrees of head elevation. The purpose of this test is to evaluate the patient's ability to tolerate the change of position. Patients, especially in the acute stages following injury, will often exhibit orthostatic hypotension when placed in a more upright position. Orthostatic hypotension is defined as significant

drop in systolic blood pressure, which may result from inadequate circulation or changes in the nervous system (Pikna, 2009, p. 41). Orthostatic hypotension often clinically presents as dizziness or fainting (Claydon et. al., 2006). If those symptoms are present, the patient should be returned to the supine position. The patient should never be left alone in an upright position during the acute stages following a spinal cord injury.

***Precautions for spinal cord injury.***

In contrast to supine, the prone position is contraindicated for patients with a spinal cord injury (Messerole et. al., 2002). The prone position places pressure throughout the patient's spinal column and often requires neck rotation, which is not feasible for patients with a cervical injury. It is suggested that this population be placed in a position that provides a flat, straight body alignment (Christie, 2008). The supine position is best capable of maintaining appropriate body alignment. It should be noted that a firm mattress is required for these patients to maintain a stable, flat back arch.

It is common for patients with spinal cord injuries to develop contractures in their limbs and proper limb positioning and movement acts to prevent the onset of contractures (Diong et. al., 2012). Patients with spinal cord injuries should avoid direct pressure on the shoulders when in bed or in a wheelchair (Boninger & Koontz, 2006). All upper extremity joints should be supported and all times. For example, it is unacceptable to have a patient's arm hanging off the bed. It is also important to avoid positions that place distraction on the joints (Boninger & Koontz, 2006). Boninger and Koontz (2006) recommended that patients with a spinal cord injury should be placed on their back with both shoulders externally rotated and placed away from the body but supported.

Positioning of a person with a spinal cord injury is complex, requiring

professional consideration of several factors. Spinal cord injuries are often the result of a traumatic event, so patients often present with other injuries that should be considered when evaluating the proper positioning technique for the client. The elevation of the head of the bed, firmness of the mattress, and limb positioning should all be considered when treating this patient population.

**Positioning for Burns**

Approximately 1.2 million people require medical care for burn injuries each year with 51,000 of these people requiring hospitalization (Behrman, Kliegman, & Jensen, 2004). Severe burn injuries are associated with lengthy hospital stays with an estimated one day per percentage of the total body surface that is burned. The primary goals of burn rehabilitation are to limit the loss of range of motion, prevent contracture and deformity, and reduce pain and edema. It is further asserted that proper positioning can improve these goals (Kamolz & Jeschke, 2012; Godleski et al., 2013; Whitehead & Serghiou, 2009)

Increased hospital stays, bed rest and the complexity of treatment required for burn patients can attribute to hospital acquired complications such as pressure ulcers (Fitsch, Coffee, & Yowler, 2001; Gordon et al., 2004; Lewis et al., 2012). The prevalence of pressure sores in the burn population represents a significant challenge for healthcare providers (Gordon et al., 2004). Researchers suggested that with burns patients may be at a higher risk for development of pressure ulcers due to general as well as factors unique to the burn population (Gordon et al., 2004). Risk factors that are unique to burn patients are complications such as hemodynamic instability, impaired respiratory function, and a hypermetabolic response. These complications paired with edema, decreased mobility,

nutrition, and skin integrity can lead to pressure ulcers, contracture, and deformity if appropriate care is not provided (Lewis et al., 2012; Simandl, 2009).

Proper positioning can minimize shortening of tendons and ligaments to reduce the prevalence of contracture. Several researchers support positioning patient extremities in elevation to decrease edema, which is an essential component of treatment that starts on the first day in the hospital (Kamolz & Jeschke, 2012; Smith, Munster, & Spence, 1998). Positioning strategies reflected in the literature were mainly applied to partial and full thickness burns because of the extensive tissue damage, which will more likely lead to complications such as contracture or pressure ulcers.

Pain management is an integral part of treatment with clients who have sustained a burn injury. Partial thickness burn injuries are very painful due to damaged tissue and intact nerve endings. Full thickness burns are less painful due to the extensive damage to nerve endings, however most full thickness burns are present in conjunction with partial thickness burns. Pharmaceutical intervention such as morphine and other long acting opiates are typically used to treat pain (Esselman, Thombs, Magyar-Russell, & Fauerbach, 2006). The use of pharmaceutical intervention adds to the complexity of treatment required to prevent contracture and pressure ulcers because they decrease the body's natural tendency to change positions; therefore, positioning becomes even more important (Gordon et al., 2004; Simandl, 2009).

Additionally, many times patients with full thickness burns require skin grafts. Post operatively, immobilization of the graft site is recommended, which decreases the frequency of repositioning to prevent sheering or disruption with the adherence of the graft. This decrease in repositioning, while necessary, poses an increased risk for pressure

ulcer development because it occurs less frequently than needed to prevent pressure sores (Gordon et al., 2004).

The prevalence of contracture in burn patients is also a significant area of concern that warrants considerable attention. Godleski et al.(2013) conducted a study and found that nine participants who sustained a burn injury had a total of eighty-eight joint contractures. This study demonstrates the significance of joint contracture among the burn population. Facilitating normal posture and joint alignment, and avoiding positioning patients in flexion due to the body's natural tendency to contract in these positions are essential when treating burns.

Serghiou, Holmes, and McCauley (2004), conducted survey research regarding management of face and neck burns. The author's research supported positioning patients with neck burns in neutral or extension. This will assist in prevention of abnormalities such as neck flexion contractures, which are common among individuals who have sustained partial or deep thickness burns to the neck region and promote increased function.

Other common contracture and deformities with the burn population are of the upper limb and hands. These include contracture at the axilla, claw hand deformity, boutonniere or mallet finger deformity. Increased edema and decreased range of motion make the hand more susceptible to these deformities. Another predisposing factor is the anatomical structure of the hand. Tendons and joints are more superficial than other parts of the body, thus increasing the risk of tissue damage and incidence of contracture and deformity in this area (Esselman, Thombs, Magyar-Russell, & Fauerbach, 2006; Smith, Munster, & Spence, 1998).

Manual positioning, pressure garments, range of motion, and splinting were identified as conservative treatment approaches that can be utilized in prevention of the complications secondary to burn injury. Functional positioning strategies identified were positioning the metacarpophalangeal joints of the hand in 70-90 degrees of flexion and extending the interphalangeal joints as well as utilizing elevation to manage edema (Esselman, Thombs, Magyar-Russell, & Fauerbach, 2006). To prevent shoulder flexion contracture, it is recommended to position the arm in abduction and extension (Ada et al., 2005; de Jong, Nieuwboer & Aufdemkampe, 2006). Avoiding placement of joints in flexion to prevent contracture, frequently repositioning patients to prevent pressure ulcers and following standard positioning guidelines is necessary when positioning burn patients to facilitate the best patient outcomes.

**Orthopedic Positioning**

Proper positioning is an important aspect of care with individuals whom have orthopedic conditions requiring surgical intervention. When considering the orthopedic population, it is important to evaluate the patients risk factors associated with the development of pressure ulcers. For example, limited mobility post-surgery and client factors such as age may have an impact on the skin integrity, thus increasing the risk for pressure ulcer development (Simandl, 2009). Other elements to be considered with this population are the increased use of pharmaceutical intervention such as narcotics as well as decreased tissue perfusion around the incision post-surgery. Pharmaceutical side effects have the potential to reduce the body's natural tendency to change positions. (Gordon et al, 2004).

Positioning strategies for this population can be generalized to follow positioning

guidelines applied within a hospital setting. When positioning these clients, the following guidelines should be followed; repositioning schedule every two hours to reduce pressure over bony prominences, maintaining less than thirty degrees of elevation in the patient's head of bead, and avoiding prolonged pressure over surgical sites (Gordon et al., 2004).

**Repositioning Schedule**

Manual repositioning of patients has long been common practice in hospital settings to relieve pressure and prevent ulcer formation. Traditionally, repositioning patients every two hours with small intermittent shifts to the body has been utilized to decrease the incidence of pressure ulcer formation (Young, 2004). According to authors Defloor, Bacquer, and Grypdonck (2004), repositioning schedules decrease the length of time tissue is under sustained pressure and therefore is considered to be a factor in preventing pressure ulcer formation. According to research conducted by Gordon et al. (2004), the amount of pressure different types of tissue can sustain varies before breakdown occurs. Muscle tissue has been identified as the most sensitive tissue with a maximum tolerance of two hours of sustained pressure. If pressure is not redistributed or relieved through positioning at a minimum of every two hours the likelihood of a pressure ulcers developing is high (Simandl, 2009; Young, 2004)).

Although a two hour repositioning or turn schedule is a widely accepted in clinical practice settings such as a hospital, no single method or protocol has been determined to prevent pressure ulcer formation (Gordon et al, 2004; Hagisawa & Ferguson-Pell, 2008; Young, 2004). Because no single repositioning protocol has proven one hundred percent effective, an abundance of research has been conducted on the topic. Much of the research varies in the duration of time that patient should be

repositioned as well as the surface in which bed positioning occurs for best outcomes (Defloor et al., 2005; Gordon et al.). For example, Defloor et al. (2005) examined the effect of varied two, three, four, and six hour repositioning schedules and found that a four hour repositioning schedule on a specialized mattress decreased the likelihood of pressure ulcer formation.

Due to the variance in surfaces, unique patient diagnoses and assessment of risk factors for contracture and pressure ulcer formation, the standard turn every two hours does not apply to all populations (Defloor et al., 2005). Utilizing clinical judgment and completing a thorough integumentary assessment is essential to provide appropriate repositioning schedules that are individualized the patient for best outcomes (Gordon et al, 2004; Simandl, 2009).

**Therapeutic Positioning**

When working with patients that are immobile for long durations, bed positioning is an essential portion of the treatment plan developed by the occupational therapist (Gillen, 2011). According to Gillen (2011), the goal of positioning from the perspective of an occupational therapist is to prevent skin breakdown and contractures, have joint alignment, and provide a comfortable position for the client. It is the responsibility of the occupational therapist to develop a positioning schedule for each client but all members of the healthcare team are responsible for implementing the schedule. The occupational therapist should anticipate how positioning of a patient will affect occupational performance and apply positioning principles that will minimize a decrease in occupational performance (Flinn, Jackson, Gary, & Zemke, 2008). For example, if a patient's hand is to be immobilized, it should be placed in the intrinsic plus position if not

contraindicated. In that position, the client has some ability to hold objects while immobilized. Occupational therapists have the knowledge and skills necessary to make proper positioning decisions to prevent and minimize decreases in occupational performance for their clientele.

**Occupational Performance**

Progression from disease-oriented focus on the body to enablement in meaningful occupations through the participation in life activities is essential (Hemmingsson & Jonsson, 2005). Positioning strategies that reduce secondary complications that have been described throughout the literature review are important to reduce functional limitations; however, it is pertinent to introduce and facilitate participation in meaningful activities through these positions. Participation in daily activities is how individuals find purpose and meaning in their lives (Law, 2002). The return to participation in daily activities has the ability to improve health and wellbeing of the client (Law, 2002). Decreased occupational performance is often times an issue in acute care settings due to inactivity, bed rest, and lack of autonomy. It is important to provide opportunities for clients to engage in meaningful activities to promote self-determination and autonomy to minimize occupational performance deficits throughout the recovery process (Eyres & Unsworth, 2005). Clients with limited mobility should be encouraged to participate in meaningful activities while in the acute phases of rehabilitation to facilitate improved health and wellbeing. Providing opportunities for these clients to engage in activities will be essential to increase self-efficacy thus enhancing occupational performance.

**Conclusion**

Research indicates that medical mistakes are occurring within healthcare facilities

and this product is aimed at reducing the mistakes made regarding bed positioning of patients. Barriers to communication within healthcare facilities include a hierarchical structure, lack of funding, role discrepancies, lack of education, and lack of consistency. Strategies have been developed to improve healthcare communication including the use of multimodal materials. Standard positioning guidelines have been developed for patients with burn, spinal cord, TBI, CVA, and orthopedic injuries. This scholarly product presents the standard bed positions for each diagnosis in a multimodal picture and text format, with the intent of placing the product in a patient's room for improved interdisciplinary communication. Chapter three will discuss the methods used in developing this scholarly product.

# CHAPTER III

## *Methodology*

This scholarly project, *Increasing Collaborative Communication Regarding Proper Positioning: A Photographic Guide*, arose after the authors conducted research on rehabilitation for people with burns. The authors found an article regarding communication barriers and positioning of patients whom had sustained a burn injury, which sparked their interest in positioning needs of these clients. During their initial research about the prominence and effects of medical communication errors, the authors found an alarming statistic about medical errors within the United States. According to the institute of medicine in 2013, 98,000 people die each year as a result of medical error. With the seriousness of medical error, the authors reviewed research about interdisciplinary communication strategies that have been successful within healthcare settings. These topics of interest were combined to develop a communication tool that could be utilized by multiple healthcare professionals working in hospital settings. This chapter describes the methodology used to develop a communication tool for this scholarly project.

During occupational therapy fieldwork experiences, the authors of this scholarly project witnessed times where more efficient interdisciplinary communication could have enhanced patient outcomes in regard to patient positioning. The authors chose to expand the list of diagnoses to include not only burns but also traumatic brain injuries, spinal

cord injuries, cerebrovascular accidents, and orthopedic injuries due to the immobility associated with these diagnoses. A summary of this communication tool can be found in chapter four, with the complete product located in appendix A.

A literature review was conducted on topics related to proper positioning of individuals who have sustained traumatic brain injuries, spinal cord injuries, cerebrovascular accidents, burns, and orthopedic injuries. The effectiveness of a multimodal educational approach using visual imagery and/or digital photography as a tool to enhance education and collaborative communication to increase positioning compliance was also reviewed. A variety of resources were used during the literature review including University of North Dakota's Harley French Library databases (PubMEd, CINAHL), Google Scholar, American Journal of Occupational Therapy, and review of occupational therapy textbooks. The advisor of the scholarly project, Sclinda Janssen, PhD, OTR/L, also provided the authors with resources she has accumulated through her past experiences as a therapist and educator.

**Literature**

While conducting the literature review, the authors noticed a theme that healthcare errors are often attributed to communication breakdowns between healthcare professionals. Jansen (2008) reported that political agendas involving scope of practice discrepancies had a negative impact on the collaboration of health care members. In some facilities, role confusion was present and each health care discipline was not sure as to their role on the team (Atwal et. at., 2006; Long et. al., 2003). Sutcliffe, Lewton, and Rosenthal (2004) reported that an additional communication barrier is faulty communication strategies when transferring clients. For example, information is often not

translated from one professional to another during transfer of patients. These literature findings provided the authors with the inspiration to create a product that will enhance communication between interdisciplinary professions, hopefully leading to fewer communication errors in healthcare.

Another theme identified while conducting the literature review was that participation in meaningful activities leads to an increased quality of life (Law, 2002). For example, proper positioning has been found to minimize occupational performance deficits (Flinn et. al., 2008, p. 580). These literature findings demonstrate the profound benefits of proper positioning; however, proper positioning guidelines are not always followed in healthcare settings as demonstrated by the authors' personal experiences. The inconsistencies in implementing positioning guidelines provide the justification for the creation of this product. This product has the potential to increase clients' quality of life and occupational performance by using evidence-based positioning.

As evidenced throughout the literature review and personal experience of the authors, positioning guidelines are often not followed. By providing a positioning educational tool within sight in the patients' rooms that includes a multimodal presentation of information, interdisciplinary communication, and follow through of care; functional patient outcomes will improve.

Several studies were conducted to assess a variety of communication strategies that have been successful within healthcare settings. It was found that formal communication strategies that are concrete and less time consuming such as communication boards, digital photography, and daily goal sheets may assert more timely and effective interdisciplinary communication in fast paced medical settings. For

example, Phipps and Thomas (2007) found daily goal sheets to be an effective way for doctors and nurses to effectively communicate patient goals; therefore, goal sheets were created for the positioning guide presented in this scholarly project.

The authors found using this communication strategy led to improvements in perception of communication. Wong, Caesar, Bandali, Agnew and Abrams (2009) found the use of strategically placed communication boards to portray pertinent patient information within a hospital setting to be effective. The boards provided accurate, timely, and integrated patient information. Determining effective communication strategies was highly important to demonstrate the potential effectiveness of this communication tool and successfully implement it within hospital settings. These findings helped the authors of this scholarly project design the product in a manner that incorporated effective communication strategies.

Following the literature review, the authors concluded that a communication tool outlining positioning guidelines would be beneficial to utilize in healthcare settings to increase patient functional outcomes. The findings of the literature review are located in chapter II and were used to create the final product. The final product is separated into three sections: evaluation, intervention, and implementation. This was necessary to organize information in a logical manner to increase the viability of the product being implemented within healthcare settings.

**Theory**

Several theories were chosen to inform and guide the creation of the scholarly project. These theories were applied in an integrative way, as each theory overlaps throughout the three sections of the positioning guidelines. The Model of Human

Occupation (MOHO) guided the process in creating this scholarly project. It was also implemented in the evaluation and intervention sections of the product. The Dynamical Systems Theory and Social Learning Theory were applied in the intervention and implementation sections of the product.

MOHO was utilized to guide the development of the evaluation and implementation sections of this scholarly project. It is important to gain a thorough understanding of client needs and interests to increase therapeutic benefit and client outcomes (Kielhofner, 2009). MOHO seeks to assess a client's volition, habituation, and performance capacity (Kielhofner, 2009). These components of the model will assist health care workers to remain client centered and focused on each unique client needs.

The authors chose an assessment specific to this model called the *interest checklist* to be utilized with every patient (Asher, 2007). This assessment will allow healthcare workers to foster volition and assess personal causation to promote effective occupation based interventions that are meaningful to the client. Due to the nature of the diagnoses chosen for this project, many times the patients have to undergo substantial changes in the way they lead their daily lives, requiring occupational adaptation of their roles, routines, due to their changed mental or physical capabilities.

The Dynamical Systems Theory was utilized in this scholarly project because it is based on the premise that as one component of the system changes; the system as a whole will change (Royeen, 2011). The purpose of this project is to change the interdisciplinary communication in regards to positioning, although it is hoped that this change will encourage the implementation of occupation-based interventions and improve overall collaboration between the different healthcare disciplines.

Several components of the Dynamical Systems Theory were directly implemented into the design of this scholarly project including holism, boundaries, a transforming feedback loop, and adaptive systems (Royeen, 2011). Holism was incorporated into the intervention section of the project by including the client's goals and interests. Boundaries were created by considering healthcare policies and procedures and adhering to those guidelines. For example, personal client information is not shown on the positioning guides in adherence with the Health Insurance Portability and Accountability Act of 1996 (HIPPA) regulations. A transforming feedback loop was created with the implementation of a comments section that is to be included within the positioning guidelines in each client's chart. This allows healthcare personnel to suggest improvements for this program and encourages all personnel to be proactive in the implementation of this program.

Within this scholarly project, there is also an emphasis on the product being adaptive. It is encouraged for the positioning templates to be adjusted to meet the specific needs of each individual client. As demonstrated, the Dynamical Systems Theory has guided the production of this scholarly product.

Social Learning Theory guided the creation of the intervention and implementation sections of the positioning program. It is important for role modeling and vicarious reinforcement to occur to increase competency and buy in from all healthcare disciplines (Bandura, 1971). One of the overarching goals of the positioning guide is to promote consistency of care, thus learning and teaching strategies were important to assess. The use of visual and written demonstration will facilitate increased comprehension. Occupational therapist will model the use of the positioning program to

other professionals.

Social Learning Theory postulates learning can be acquired through direct experiences as well as observation (Bandura, 1971). By increasing comprehension, healthcare workers will likely experience the four phases of learning. These phases are attention, retention, reproduction, and motivation (Bandura, 1971). The healthcare worker must attend to what is being taught or observed, be able to retain the information, reproduce what has been learned, and finally be motivated throughout the process (Bandura, 1971). By decreasing the likelihood of medical errors in regard to positioning and facilitating a positive learning environment, the authors aim to increase competency and interdisciplinary communication.

3.1 MOHO Therapeutic Reasoning

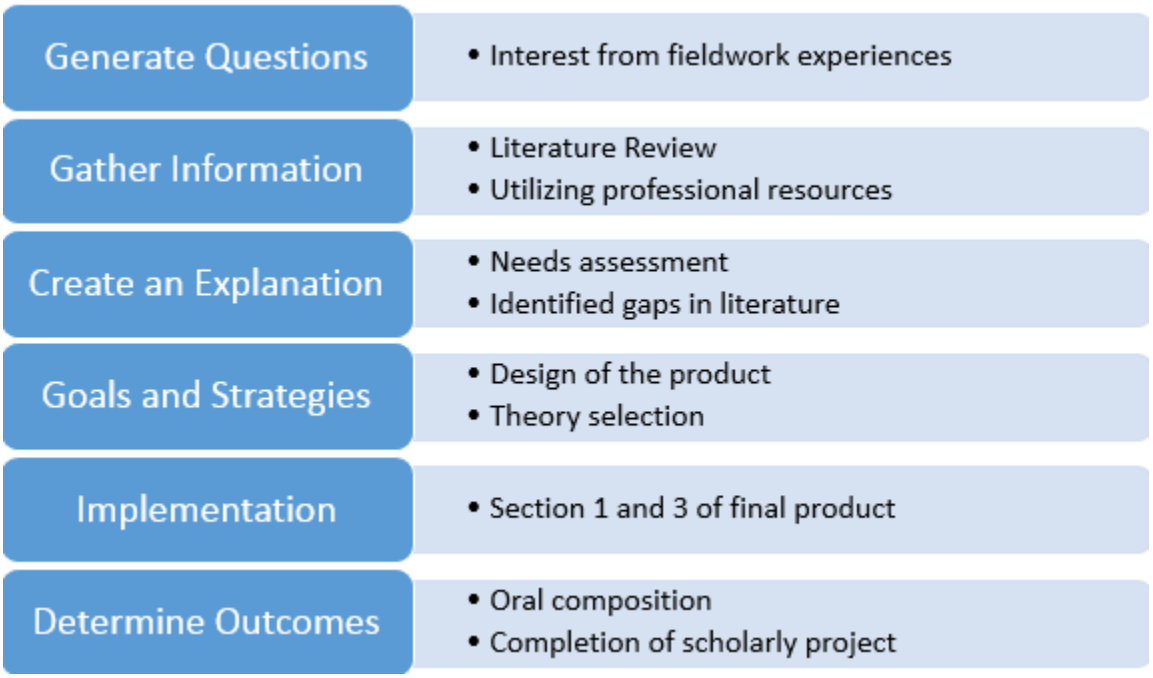


*Figure 3.1.* Demonstrates how the MOHO therapeutic reasoning process was imbedded throughout the scholarly project. The left portion of this figure demonstrates the six therapeutic reasoning steps of MOHO. The right portion of the figure represents the specific processes the authors performed during each of the therapeutic reasoning steps. Adapted from Keilhofner, G., Forsyth, K., Kramer, J.M., Melton, J., & Dobson, E. (2009) The Model of Human Occupation. In Crepeau, E.B., Cohn, E.S., & Boyt-Schell, B.A. (11th Eds.)Willard and Spackman's occupational therapy (p.446-461). Philledelphia, PA: Lippincott Williams and Wilkins

Figure 3.2 MOHO Conceptual Framework

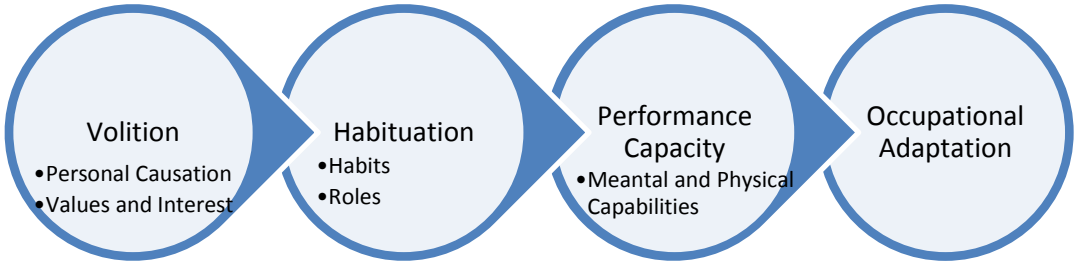


*Figure 3.2.* Demonstrates how occupational adaptation occurs within the framework of MOHO. The patient's volition, habituation, and performance capacity all have an impact on their ability to perform occupations. This model was used in the creation of the evaluation section of the product. It is important to choose assessments that will evaluate all aspects of the person. This model should be applied in conjunction with the positioning guidelines to provide client-centered and occupation based interventions. The authors chose to include functional activities within the positioning photographs to emphasize the importance of performing meaningful occupations within a hospital setting.

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Figure 3.3 Dynamical Systems Theory


*Figure 3.3.* The Dynamical Systems Theory demonstrates how change occurs within an organizational structure, such as a hospital setting. The client is central to the array of professionals whom interact with and impact functional outcomes of the client. When implementing this scholarly project, it is imperative that all disciplines position the client appropriately to facilitate improved occupational performance.

Figure 3.4 Social Learning Theory

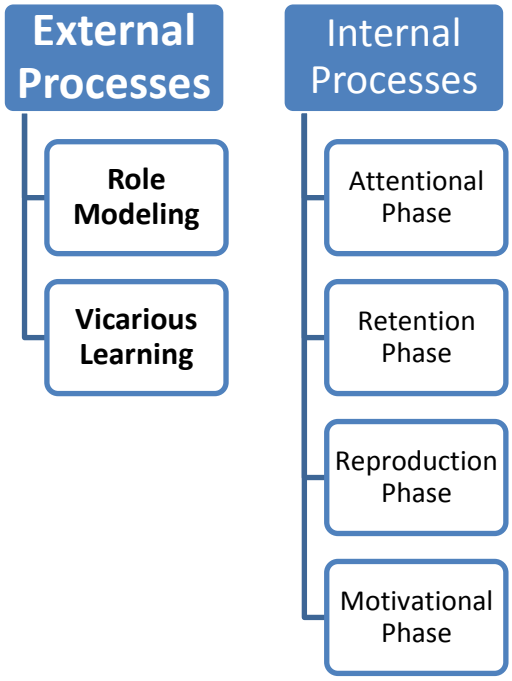


*Figure 3.4.* Illustrates how Social Learning Theory was applied to this scholarly project, specifically the implementation section of the product. In preparation for educational sessions describing the implementation of the product it is important to consider external and internal processes of the healthcare providers (Bandura, 1971). Addressing both the internal and external processes promotes a vested interest in the learning process thus increasing follow through of patient care. Please refer to Chapter one for further description of the Social Learning Theory.

This chapter was an overview of the methodology utilized in creating this scholarly project. The themes that emerged throughout the literature review were described, as well as a description of how the models guided this project. The following chapter will describe the product created and how it is to be used in a clinical setting as well as further detail on the three sections; evaluation, intervention and implementation. The product was created from the research conducted and therefore is an evidence-based communication tool on proper patient positioning.

# CHAPTER IV

Improper client positioning is one type of medical error and medical errors as a whole account for approximately 98,000 deaths annually in the United States (Institute of medicine, 2013). This scholarly project was created with the purpose of providing a communication tool that will increase communication between health professionals regarding client positioning. The communication tool includes evidence-based positioning strategies to be utilized with clients whom have sustained a cerebrovascular accident, traumatic brain injury, spinal cord injury, burn injury, or orthopedic conditions, which often limit functional mobility. The positioning program is separated into three sections; evaluation, intervention, and implementation. Each section is designed as a template that should be adapted to meet the requirements of specific facility and client needs.

The evaluation section was designed with recommended assessments for each of the five diagnosis listed above. It needs to be noted that these assessments are recommended based on current best practices and evaluations available within hospital settings. This portion of the communication tool was developed to increase clinical pathways and communication between healthcare workers on which assessments are standard and need to be completed to provide holistic and client centered care. The MOHO *interest checklist*, Braden scale, and range of motion are components of each of the five diagnosis due to the prominence of pressure ulcers and contracture with these

populations. The MOHO *interest checklist* (Asher, 2007) is utilized to provide insight into the client's volition to increase participation in meaningful activities, which is often neglected in hospital settings.

The intervention section of this product consists of evidence-based templates that demonstrate proper positioning guidelines for the five target diagnoses. The templates include several pictures taken from different angles, which are intended to model the correct positioning for that particular client. Precautions and turn schedule are also included on the templates as a reminder to all healthcare personnel in an attempt to safeguard against secondary complications or symptoms. A patient goal section was devised in order to ensure healthcare workers are aware of occupational goals and interests to promote the engagement in meaningful activities within this setting. It should be noted again that these positioning templates may be adapted and modified to meet the specific goals of the facility and client.

The implementation section of the product provides details about how to appropriately utilize the communication tool within hospital settings. An overview of specific procedures such as staff education, signatures required, placement of the positioning guide, boundaries and confidentiality, adaptability, and the promotion of occupation are included within this section. This ensures the intended purpose and procedures of the product will be adhered to.

Each section was developed using the literature reviewed as well as theory to provide an evidence based product. The Model of Human Occupation (MOHO), Social Learning Theory, and Dynamical Systems Theory were implemented throughout the creation of this positioning program.

The authors of this scholarly project used concepts from MOHO in a variety of ways, especially in the creation of the evaluation section of the program. The authors suggest that at least one MOHO assessment be utilized in the evaluation section. This will ensure that the main concepts of MOHO; volition, habituation, and performance capacity, are embedded within this section. MOHO was also used in the intervention section as client goals and interests were included to promote a more holistic view of the client. When adapting this template, the occupational therapist should remain in accordance with MOHO concepts, as this theory has been instrumental in the design of the program. Theory should be used to guide the implementation of this program.

The Social Learning Theory was also used when creating this product. It specifically guided the implementation section of the product. It provides guidance to healthcare providers to become competent in using this positioning program. For example, in-service presentations should be given to all disciplines involved in the care of client's with positioning needs. This will ensure that all members of the healthcare team are well informed and invested in the implementation of the program. Role-modeling is a key concept of this product, which is derived from Social Learning Theory (Bandura, 1971). Digital photography was used to provide examples of correct positioning for each client. Healthcare personnel performing positioning may refer to these pictures and role-model the positions shown. By having visual representation of proper positioning, it is hoped that consistency of positioning between all healthcare workers will increase.

The Dynamical Systems Theory was also used throughout the development of this project. This theory uses a holistic approach that considers all aspects of care (Royeen, 2011), which is important when implementing change of procedures. This positioning

program will change the communication of healthcare workers, therefore it is important to consider the structure of the system as an entirety when developing this product. The Dynamical Systems Theory also guided the creation of boundaries between systems. For example, confidential information is not included in the product to remain compliant with healthcare regulations. A feedback loop is a key concept of this theory and was developed within this scholarly project (Royeen, 2011). This program will be placed within the client's chart with a section for staff to write comments regarding the positioning program. Changes to the program may be made in accordance with the feedback received. This allows all members of the team to have input on the system, which promotes investment in the continued implementation of the program. It was important to have evidence-based guidance when making decisions regarding the development of this scholarly project and the above theories provided that guidance.

This chapter has provided a description of the product created with the full product located in appendix A. Each section of the product provides an evidence-based and theoretically driven template that is intended to be utilized within hospital settings. Although in the current form, this product is targeted at the five diagnosis, the authors encourage adaptations be made to meet the individual needs of their facility or client. The following section will provide a summary of this scholarly project, including limitations and recommendations of the project.

# CHAPTER V

The purpose of this scholarly project was to provide a communication tool that will increase interprofessional communication and collaboration in regards to client positioning needs in healthcare settings. The individualized positioning program will be posted within the client's room, which will provide a guideline for all healthcare personnel when positioning that client. The program will also include the client's goals and interests to promote client-centered care within healthcare settings. A goal of this program is to decrease secondary complications related to improper positioning that will impede occupational performance by providing consistent and evidence-based positioning.

This scholarly product is separated into three sections; evaluation, intervention, and implementation. The evaluation section highlights the assessments that may be used with the separate diagnoses. As with all the sections, these evaluation templates may be adapted to meet the needs of the therapist, client, and facility. Each therapist has specific training that may affect the evaluations used and each client presents with unique characteristics that effect the appropriateness of certain assessments. The evaluation section for all diagnoses includes the MOHO *interest checklist* to promote client centered care and interventions that meet the goals of the client.

The intervention section consists of templates that include the positioning guidelines for each diagnosis. This section will be posted within the client's room and

includes digital photographs showing the desired position for that client. This will allow all healthcare personnel to position the client according to the posted photographs, creating consistency within positioning. Other positioning considerations may be posted within the intervention section, such as the frequency in which the client should be turned. This section was created by using the evidence gathered through the literature review to provide positioning guidelines that are evidence-based and effective to decrease secondary positioning complications.

The implementation section of this scholarly product describes how the product may be incorporated into a healthcare setting. All healthcare staff involved in client care will need to be educated and found competent in using the positioning program. Staff will have an opportunity to evaluate the program with the creation of a feedback loop. There will be a section in the client's chart that staff may make suggestions for better implementation, thus encouraging all staff to become proactive in this program. This section of the product also creates boundaries, such as following all national and state legislation. For example, personal information should not be allowed to be posted within the client's room. Before placing the positioning guideline within the client's room, consent should be received from the client. As with each of the sections, implementation will be different in each setting and adjustments may be made as necessary.

There are several limitations to this scholarly project, which have impacted the creation of the positioning program. Some of the research regarding proper positioning within the literature review is dated, although the authors of this project attempted to locate newer research. More recent research was not present, which meant that the older studies were still relevant to guiding the positioning of clients. This does suggest that

further research should be conducted in the positioning of clients to increase the evidence-base of positioning interventions. Another limitation was that manikins were used when designing the positioning program templates. Manikins lack the range of motion of a typical human, thus making it difficult to replicate an accurate position. This product was also limited by only including clients with five different diagnoses, when many more clients will have positioning needs. Due to time restrictions, it was not realistic to include additional diagnoses, although this does limit the usefulness of the scholarly product.

The authors of this scholarly project have several recommendations for further action. Upon implementation of this positioning program, an evaluation of the effectiveness should be conducted. To assist in doing so, an evaluation tool that measures healthcare collaboration should be developed. There is a need for further research to be conducted on proper positioning and also the role of occupational therapy in client positioning. It is also recommended that this product be adapted to meet the unique needs of each situation. The product is strictly a template and changing it to fit the client will promote client-centered care.

In conclusion, this scholarly project provides an evidence-based positioning program that is intended to be utilized within healthcare settings. It is hypothesized that this program will increase interprofessional collaboration among healthcare providers and provide the client with more consistent care. The three sections of the product are designed to guide the process of implementing and regulating this program. It is of utmost importance that the client's interests and goals are considered when implementing this program. It is hoped that by creating a holistic view of the client, this program will

assist in transitioning from a medical-based approach to a more client-centered approach.

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# APPENDIX A