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## *School of Occupational Therapy*

### Improvement of Educational Resources for Spinal Cord Injury Patients within the Acute Inpatient Rehabilitation Setting

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Under the direction of the faculty capstone advisor:

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# A Capstone Project Entitled

Improvement of Educational Resources for Spinal Cord Injury Patients within the Acute  
Inpatient Rehabilitation Setting

Submitted to the School of Occupational Therapy at University of Indianapolis in partial  
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### Abstract

The Doctoral Capstone Experience (DCE) was a 14-week long clinical rotation in which students were given the opportunity to gain advanced clinical practice skills and enhance their skills in program development, client education, and client advocacy. The purpose of this project was to gain advanced clinical skills in the Spinal Cord Injury (SCI) population and to create, and enhance educational resources for the SCI population in an inpatient acute rehabilitation setting. The SCI population has been shown to have a correlation with secondary comorbidities due to inactivity and barriers faced upon discharge home from a rehabilitation facility (Wannapakhe, Arrayawichanon, Saengsuwan, & Amatachaya 2015) The SCI population is at risk for shoulder pain, pressure sores, and other complications. These comorbidities are often influenced by the barriers faced in their daily life such as falls, obstacles to mobility in the community, or inconsistent daily routines and poor compliance to activity guidelines. A needs assessment established that educational resources related to these topics needed to be developed or updated to improve the current SCI education at Community Rehabilitation Hospital North (CRH North). By working with an established team and using the steps of Continuous Quality Improvement (CQI), resources were developed following the Health Belief Model. Exit interviews with clinicians indicated that the improved educational resources at CRH North would benefit individuals with SCI and their families. The Health Belief Model was an effective way to guide resource creation and educational programming for this population and their caregivers.

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**Theoretical Basis**

The Health Belief Model (HBM) is a psychological model, which is based on “value-expectancy outcomes” (Strecher & Rosenstock, 1997, p.113-114). Value is defined when clients have the desire to avoid illness or to get well; expectation is the belief that the specific health action they are undertaking will help them either prevent or ameliorate illness. Value is also described as a client’s belief that what they do will help them avoid a certain illness or bad health outcome (Strecher & Rosenstock, 1997). According to the HBM, individuals themselves perform an assessment of an action, and this assessment is broken in four parts which are: risk perception, perceived severity of ill-health, perceived benefit of their behavior change, and the decision of completing the action (Cockerham, Dingwall, & Quah, 2014). The model concludes that a combination of these four factors is what causes an individual to become ready for change and “health promotional messages” (Cockerhamd, Dingwall, & Quah, 2014). Health promotional messages are considered the cues which then take this individual’s readiness to change and make it an action; these messages can come from health practitioners (Cockerham, Dingwall & Wuah, 2014). The use of the HBM is relevant for the spinal cord injury (SCI) population. This paper will further delve into the connection between the model and the project that was completed by this author. Guided by the HBM, an examination of the existing literature, and a department level needs assessment, this author contributed to the SCI population at Community Rehabilitation Hospital North (CRH North), in Indianapolis, Indiana.

### **Literature Review**

This literature review was completed to determine the needs of the population of individuals living with SCI. Relevant literature was gathered pertaining to the importance of physical activity in people with SCI, exercise for people with SCI, and barriers to physical activity.

#### **Importance of Physical Activity in Persons with Spinal Cord Injury**

It is estimated that there are approximately 276,000 people in the US living with a SCI and approximately 12,500 new SCI cases each year (National Spinal Cord Injury Statistical Center, 2015). Persons with spinal cord injury are shown by research to be one of the most inactive populations, which makes them vulnerable to comorbidities due to their sedentary lifestyle (Ginis, Jörgensen, & Stapleton, 2012). These individuals are two to four times more likely to experience conditions such as obesity, cardiovascular disease, and diabetes when compared to the rest of the population (Evans, Wingo, Sasso, Hicks, Gorgey & Harness, 2015). With circulatory diseases being the most common cause of death in the SCI population (Garshick, et al., 2005), four chronic conditions are found to be significantly related to mobility/ambulatory status: diabetes, coronary artery disease, hypertension and high cholesterol (Saunders, Clarke, Tate, Forchheimer & Krause, 2015). Additionally, this population is known to have more frequent, and severe secondary health conditions such as: pain, depression, cystitis, fractures, sleep problems, and esophageal problems (Jensen, Truitt, Schomer, Yorkston, Baylor & Molton, 2013). Many of these conditions have been linked to obesity and an inactive, sedentary lifestyle post injury (Jensen, Truitt, Schomer, Yorkston, Baylor & Molton, 2013). Not only are pressure ulcers prevalent among this population, they are also linked with anxiety and depression (Kovindha, Kammauang-Lue, Prakongsai & Wongphan, 2015). Additionally, the

majority of SCI patients suffering from secondary conditions such as pressure ulcers, identified that these had negative impacts on their social participation and daily lives (Piatt, Nagata, Zahl, & Rosenbluth, 2016). Furthermore, physical activity has been linked to the overall quality of life in people with SCI (Sweet, Martin Ginnis, & Tomasone, 2013). In the same light, muscle strength, muscle endurance, flexibility, and range of motion have been identified to improve cardiovascular health and can support life enhancing activities (Evans, et al., 2015).

### **Exercise for SCI**

Physical activity guidelines have been created for the individuals with SCI that recommend adults should complete at least 20 minutes of moderate to vigorous intensity aerobic activity two times per week (Ginis et al., 2011). Additionally, it is recommended that these individuals complete three sets of 8-10 repetitions of strength training exercises two times per week which should focus on each major muscle group (Ginis, et al., 2011). For adults with SCI, following the current physical activity guidelines can improve aerobic and muscular fitness (Pelletier, Totosy de Zeptnek, MacDonald, & Hicks, 2015). For occupational therapy practitioners recommending these guidelines can improve physical capacity and overall health promotion with this population (Pelletier, et al., 2015). When examining the adherence to the physical activity guidelines for adults with SCI, it was found that only 12% of participants met the guidelines, while approximately 44% of the participants reported completing no physical activity at all (Rocchi, Routhier, Latimer-Cheung, Ginis, Noreau & Sweet, 2017). Furthermore, approximately 75% of these participants reported completing no resistance activities. Also the mode of mobility consistently correlated with the amount of physical activity participation, indicating that individuals who rely on the use of a wheelchair often completing complete little to no physical activity (Rocchi, Routhier, Latimer-Cheung, Ginis, Noreau & Sweet, 2017).

For the population of individuals with SCI, past research has linked low levels of fitness to compromised performance of patients with basic activities of daily living skills (Noreau, Shephard, Simard, & Pomerleau, 1993). More recent research has found that exercise for persons with SCI has a positive effect on performance of functional tasks such as: transfers, propelling their wheelchairs, self-care, and other ADL (Ginis, Jörgensen, & Stapleton, 2012). When compared to individuals who are inactive, individuals who have SCI and remain active and involved in sports report a higher quality of life. (Anneken, Hanssen-Doose, Hirschfeld, Scheuer & Thietje, 2009). Furthermore, higher exercise capacity in wheelchair users has been linked to a better overall quality of life when measured five years after discharge from initial inpatient rehabilitation for their SCI (van Koppenhagen, et al., 2014). Because a spinal cord injury can happen at many different levels, the clinical presentation of movement in this population depends on what muscles remain innervated. How each individual engages in their daily occupations can create a very unique set of functional capabilities. Anneken et al. (2009) concluded that it is important for physical exercise and sports to be integrated into the rehabilitation process as early as possible for individuals with SCI, with a goal of preventing the previously noted comorbidities and improving overall quality of life.

### **Barriers to Physical Activity**

Barriers to physical activity faced by this population can lead to a sedentary lifestyle which increases the risk of developing the secondary health conditions (Jaarsma, Dijkstra, Geertzen & Dekker, 2014). Barriers identified include: the actual level of disability, the health of an individual, lack of motivation, environmental barriers such as not having opportunities to participate in exercise, and lack of accessibility to resources (Jaarsma, et al., 2014). Given the various barriers faced by this population, and the life altering nature of a spinal injury,

facilitating physical activity is key to improving overall physical well-being and preventing further complications (Ginis, Jörgensen, & Stapleton, 2012).

In addition to barriers to physical activity, individuals with spinal cord injury face barriers to mobility and participation in basic ADL at home upon return from an inpatient rehabilitation site. Upon returning home, a significant portion of the SCI population experiences complications and falls; Wannapakhe, Arrayawichanon, Saengsuwan, and Amatachaya (2015) found that in the first six months following discharge from a rehabilitation program, 100% of individuals with SCI experienced medical complications of urinary tract infections, pressure ulcers, and neurogenic pain; all of these increased the re-hospitalization rates. In the same study, 36% of participants experienced at least one fall at home within these first six months. This is supported by later research which indicates people with SCI are at a high risk for falls (Forslund, et al., 2017). Poor balance and lack of exercise has been correlated to a higher fall risk within this population (Saunders, DiPiro, Krause, Brotherton & Kraft, 2013).

Shoulder pain is a common occurrence within this population as well, and can result in range of motion limitations associated with a decreased ability to transfer, and posing a barrier to activity (Eriks-Hoogland, de Groot, Snoek, Stucki, Post & Van der Woude, 2016; Mohammed & Dunn, 2014). Better biomechanical transfer techniques have shown a correlation to less shoulder pain; techniques and having an optimal body weight can reduce the incidence and pathology of shoulder pain in people with SCI (Hogaboom, Worobey, & Boninger, 2016). The existing literature supports the importance of this population maintaining a healthy active lifestyle. But also the importance of this population and their caregivers utilizing proper transfer techniques.



**Purpose of Project**

The purpose of this project was to create educational resources available at CRH North tailored to the specific levels of injury for the SCI patients and their caregivers. The resources consisted of training in exercise programs, family education regarding transfer training, and handouts of strengthening exercises, along with explanation of their relevance to function and independence in occupations. With an occupational based focus, the aim of this project was to create resources to influence client's occupational performance, health and wellness, and overall quality of life (AOTA, 2014). Occupational therapists use their skills to design interventions that create change or growth within their clients (AOTA, 2014).

Through the lens of the occupational therapy scope of practice, the aim of this project is to improve the quality and consistency of the exercise program for individuals with a spinal cord injury. Through these enhanced resources and their connection to the patient's ability to engage in functional activities, the aim was to reduce some of the barriers identified in existing literature. This will help with the prevention of secondary health risks and improvement in client factors, which has the potential to increase performance and participation in everyday occupations. This project was guided by the above mentioned Health Belief Model which is to create an enhanced exercise program that will yield the "value-expectancy" outcome and instill in these patients the belief that what they are doing will help them get better (Strecher & Rosenstock, 1997, p.113-114).

**Methods**

Following an examination of the literature, this author implemented the steps of Continuous Quality Improvement (CQI) in order to conduct a needs assessment and identify

specific objectives and goals which this project would follow. This upcoming section will further examine CQI and its relevance to the project, along with the methods process which this author completed.

### **Continuous Quality Improvement Strategy**

This project was guided by a continuous quality improvement (CQI) approach. Bonnel and Smith (2018) offer CQI as an ongoing process and a problem-solving approach aimed to address and identify outcomes to improve health in our community. CQI follows core steps which are important to the process including: creating a team to work with, defining a goal of what you are doing, defining the customer/client needs that the goal is directed towards, determining the current baseline of what you are attempting to improve, considering different approaches to reaching the goal that you set, gathering and analyzing data, using the scientific method, creating logic models, fostering a learning culture, and sustaining effort (“Guide to Continuous Quality Improvement”, 2018).

### **Needs Assessment**

The staff at CRH North was found to be open-minded with project ideas and focused on methods to improve care for the SCI population. To determine the direction for the project, a needs assessment was completed with the primary occupational therapist on the SCI rehabilitation team. The primary occupational therapist on the SCI rehabilitation team was this author’s site mentor. The program evaluation began with an interview consisting of open-ended questions regarding areas of needed improvement for the SCI population. If this were a project which took responses from a larger amount of people, a quantitative approach would have been used, allowing pre and post measurement. In addition, if this project were to contain a needs assessment which was administered to a larger amount of people or if the population were a

company or community through a consultative, indirect approach, it would have been helpful to complete a quantitative based needs assessment which could be statistically analyzed to determine patterns within the responses. Since there was only one respondent who provided rich open ended questions, it is fitting that the data be considered as a case study would and examined using a qualitative approach.

The needs assessment indicated that the educational program on site was not comprehensive, specifically in linking the importance of the resources to everyday function and caregiver education upon patients discharge home. Each patient receives a binder from the educational groups they attend during their stay in the inpatient rehab, which covers a wide variety of topics including: skin care for pressure ulcers, bladder and bowel management, general sexuality, weight management and diet, wheelchairs, home safety, depression, driving, caring for the caregiver, returning to work, and recreation and travel. However, the education was lacking an important emphasis on exercise and the reasoning behind it. Instead, existing resources contain general information about the exercise being provided. There was also a lack of educational resources for the caregivers who will hopefully review what patients learn while at the facility before discharge, participate in safety training within the home, and who assist with transfers. The reporting occupational therapist found that many patients learn safe transfers and adaptive ADL's during therapy sessions without the caregivers' presence. Instead the caregivers may only be present for occasional 30-minute family education sessions which are arranged sporadically based on their availability. These intermittent experiences result in the caregivers feeling unsure about how to safely transfer patients; as a result, patients do not feel safe. In addition, this can lead to patients becoming sedentary and inactive, and a likely factor in the report of secondary complications in previously discharged patients. The reporting occupational

therapist also indicates that the information provided in inpatient rehabilitation is not retained by the caregivers as it relates to functional importance and overall wellness. This expands on the literature reported earlier in this paper, which indicated that people with SCI are at high risk for falls upon discharge home (Forslund et al., 2017). Additionally, the results from the needs assessment interview indicate that the occupational therapist would like the resources to include why exercise, movement, and active participation in occupations (ADLs, IADLs, leisure, etc) are important after discharge from a rehabilitation hospital to prevent SCI patients from experiencing atrophy, weakness, and loss of motivation. Overall, the responder to the survey wanted the resources to be tailored to paraplegics and quadriplegics specifically

The results of this needs assessment are supported by literature reported earlier, which offers that individuals following SCI are two to four times more likely to experience conditions related to immobility such as obesity, cardiovascular disease, and diabetes when compared to the rest of the population (Evans et al., 2015), and are more prone to developing pressure ulcers (Kovindha, Kammauang-Lue, Prakongsai & Wongphan, 2015), along with many other secondary complications which are related to obesity and living an inactive, sedentary lifestyle post injury (Jensen, Truitt, Schomer, Yorkston, Baylor & Molton, 2013).

### **Service Model and Relevance to Occupational Therapy**

Utilizing a direct service delivery model approach, this project was designed with the intention to directly improve the lives of clients through the use of occupation in the inpatient rehabilitation practice setting; this approach is also seen in outpatient settings, schools, and acute care hospitals (AOTA, 2014). If this were a community-based or company based (work) setting, an indirect service delivery model approach would be more fitting because of its consultative nature (AOTA, 2014). From here, The Health Belief Model will provide the theoretical

foundation to design these educational handouts based on the needs of the patient. The implementation of this educational program will follow a CQI schedule.

The DCE was divided into two portions, one of which focused on program development and client education project and the other portion focused on the development of advanced clinical skills with the SCI population in the inpatient rehabilitation at CHR North. Advanced clinical skills, were developed under a site mentor's supervision. With these developing clinical skills, the author provided direct service delivery; working with patients and their families directly and providing treatments (AOTA, 2014). This experience supported the development of the client education resources.

### **Implementation Phase**

Using the theoretical framework and knowing what the literature has to say about this population, along with having a completed needs assessment of what is needed on site, the author of this paper was able to compile the information. Following the steps of CQI, a plan of action for resource creation was created. This next section of the paper will be further examining the implementation phase with the use of the Health Belief Model, and discuss the staff development and leadership through the process.

### **Health Belief Model**

The Health Belief Model is based on the concept that if people consider themselves susceptible to a condition (perceived susceptibility) and believe that it has possibly severe consequences (perceived severity), they will take action to prevent such condition/illness believing that these actions will help them avoid this condition, or experience positive outcomes available to them (perceived benefits) (Jones, Jensen, Scherr, Brown, Christy & Weaver, 2014). According to this model, people will be more motivated to take these actions if they perceive

fewer barriers to completing this action (perceived barriers) (Jones, Jensen, Scherr, Brown, Christy & Weaver, 2014). The combination of these four concepts prepares an individual for change and “health promotional messages”; these health promotional messages can come from health practitioners, and are considered the cues which prompt an individual’s readiness to change and make it an action (Cockerham, Dingwall & Wuah, 2014). The resources created for the CHR North site for this project followed the Health Belief Model. The resources educated clients through the steps of the Health Belief Model identified above. Each resource explained to the clients the risks that they are susceptible to due to their injury, along with an explanation to clients the possible severe consequences of these risks. The resources then educated the clients that there are things they can take action with to help prevent these risks or conditions from developing. Through then providing patient and caregiver education of safety and adaptive ways to complete activities the resources helped clients perceive fewer barriers to taking action to prevent these risks. By following the steps of the model, these resources act as tools available for clients to take their health into their own hands. The occupational therapists using these resources to educate clients will act as the health promotional messages that take client’s readiness and acceptance to change and put it into action.

### **Organizational Process of Project Implementation**

After completing the needs assessment, a weekly scheduling calendar guided the design of the DCE. The educational materials, overall health and wellness, paraplegic, quadriplegic, and family education were completed over an eight-week span. The schedule was approved by the site mentor. Educational handouts were prioritized based on the site needs.

**Resources Identified to Be Created**

Through the needs assessment, specific resources were identified to be created. This following section will run through what these resources were, along with the importance of them being created with an occupational therapy scope of practice. For the first section, the following was established as a priority outlining overall wellness: the importance of exercise and impacts on functional activity. This was a general packet of information which included current statistics demonstrating the problems and health challenges this specific population faces, benefits exercise has to health, an autonomic dysreflexia warning and personalized action plan if it occurs, explanation of the research based activity guidelines for the SCI population, and a resource explaining how important it is to continue to work on these things following discharge home from an inpatient facility in order to lower the risks of secondary health risks occurring.

The second section of resources were specific to the paraplegic population and included educational material and exercises. The following topics were prioritized: importance of stretches, the relationship of upper extremity exercises to daily activities and their functional importance, stretching, balance and core exercises, and the relationship of core strength to completion of ADL's. Designing these handouts from an OT perspective was an important part of the process. Exercises in these handouts were identified and their importance linked to being to the functional aspects of daily occupations. Exercises and stretches were described along with the rational of their connection to occupations. Additionally, a resource outlining adaptive cardio exercises and resources providing local facilities and opportunities for adaptive sports were created.

The third section of resources were specific to the quadriplegic population. The following

were prioritized: maintaining shoulder stability through strengthening, range of motion and stretching. Resources on pressure relief and pressure ulcer complications were created, these included: pressure ulcer statistics, the importance of completing effective pressure relief, maintaining proper positioning, and handouts with images on completion of pressure relief.

The fourth section of resources were family education specific. The following were prioritized: hip to head ratio explanation during transfers, and handouts teaching safety during transfers which focused on fall prevention and body mechanics for both the patient and their caregiver. Additionally, visual step by step demonstrative resources were produced for each of the following: a mat to wheelchair sliding board transfer, and a wheelchair to bedside commode transfer.

### **Development of Resources**

The following steps structured the development of resources for this program: utilization of a rehab technician, regular review of the evidence and handouts organization with my site mentor, and a scheduled draft review. A rehabilitation technician who works at the site provided assistance. Scheduled time was determined for the rehabilitation technician to assist with this project and was included in the timeline. Scheduling these blocks of time allowed the rehab technician, site mentor and the author to work as a team and create the images used in the educational handouts. The organization of each handout was consistently communicated with the site mentor via informal meetings. During these meetings, evidence-based reasoning that guided the handouts, the current research related to the topic and, the process outlined by the HBM were reinforced. Through these meetings, continuous, collaborative changes were made to the content. As each handout was completed, drafts were sent to the site mentor to edit as a whole and finalize any last-minute changes.



Because the needs assessment identified a need to help patients manage their health in relation to common secondary complications, resources helping patients understand the importance of these complications in relation to their occupations were needed. Therefore, each resource was made with the intention of taking the educational topic and providing patients with the evidence that allows them to see their perceived severity of ill health. The hope is that the through patients engaging with the resources, the educational material will clarify their risk perception by helping them identify what their specific risks. These are the first two steps of the Health Belief Model (Cockerham, Dingwall & Wuah, 2014). From there, following the third and fourths steps of the model, patients were able to learn from the evidence their susceptibility of the complication and then the resources within each handout provided information about what to change, and the ways to implement the change. This organization of each handout is what will help patients to identify and understand the benefits of behavior change and how they might minimize the perceived barriers to their change (Cockerham, Dingwall & Wuah, 2014). Because these resources were designed following the steps of the model and provide links to functional performance related to OT, the resources themselves act as the health promotional messages, which the Health Belief Model identifies as cues that can help patients turn their readiness to change into an action (Cockerham, Dingwall & Wuah, 2014).

The design this organizational process of creating resources followed was a “Plan-Do-Study-Act” process of CQI to define the problem, identify measures, and systematically test them in short, but rapid cycles which are fixes to the problem (National Learning Consortium, 2013). Following the steps listed above, an idea and layout was planned for a resource, literature applicable to the topics was gathered and studied, resources were created following the Health Belief Model, resources were then reviewed by site mentor in order to identify any fixes to be

completed. Using the “Plan-Do-Study-Act” process of CQI, steps were made to address the problem of limited educational material as identified in the needs assessment.

### **Staff Development**

The regular meetings with the site mentor focused on the creation of resources. These meetings also served as a form of education through the explanation of new evidence regarding resource topics. This author’s explanation and reasoning behind the information informed the site mentor about the newest literature, which the site mentor then utilized when treating and educating patients. The site mentor reported these meetings as very beneficial for her, since learning recent literature has helped improve her skills as a clinician. Additionally, the rehab technician on this project also reported that participating in the process of the project was beneficial for him. In creating the images for the resources, the reasoning behind the topics was reinforced, within education on proper patient care. The rehab technician reported that this process developed his knowledge in the areas of proper patient care with transfers, pressure relief, and the importance of preserving upper extremity joint integrity.

The site mentor also reported that having these resources available on the universal computer drive will be a benefit for other clinicians. The site mentor is the primary occupational therapist working with the SCI population, and many of the occupational therapists at this site have not had a chance to treat a patient with a spinal cord evaluation through discharge. These resources are available to all practitioners and will support and develop their skills in the future. The resources will be a benefit as something that the clinicians are needing at the moment for patient education, or if they wish to examine more up to date, evidence based information about these topics. Therefore, these less experienced therapists will benefit from these evidence supported resources as their skills improve.

**Leadership**

Throughout this process, leadership was demonstrated in various ways. Leadership was developed in the areas of creativity, teamwork, flexibility, active listening, ability to accept feedback, delegation of tasks, and taking initiative. Leadership creativity improved with the writing and development of resources throughout the span of the Doctoral Capstone Experience. Delegation of tasks improved through choosing who on site would assist with resource creation, and managing their performance. Teamwork skills developed through an ability to work with the team to meet and create images and in editing of the draft. Additionally, flexibility in leadership was demonstrated through adjustments to daily and weekly schedules to adapt to the changes in a fast-paced, quick to change inpatient setting. Flexibility was also needed when scheduling time for the team to meet and create images for resources. Growth in leadership also showed in an improved ability to use active listening skills and receive feedback positively throughout meetings and development of clinical skills, as the site mentor would provide constructive feedback regarding the patient care and drafts of resources. All of these leadership skills developed as the time on site continued, and will be essential traits for future occupational therapy practice.

**Outcome Phase**

Regarding the outcome phase of the project, the following section of this paper will describe the processes for quality improvement that were designed, along with the program changes that were developed as needed to guide administrative changes and ensure the ongoing quality of services for the DCE project.

**Continuous Quality Improvement Process**

Bonnel & Smith (2018) teach us that continuous quality improvement (CQI) is an

ongoing process and a problem-solving approach aimed to address and identify outcomes to improve health in our community. CQI is described as having core steps which are important to the process, these steps are: creating a team to work with, defining a goal of what you are doing, defining the customer/client needs that this goal is directed towards, determining the current baseline of what you are attempting to improve, considering different approaches to reaching the established goals, gathering and analyzing data, using the scientific method, creating logic models, fostering a learning culture, and sustaining effort (Guide to Continuous Quality Improvement, 2013). All of these steps were implemented throughout the duration of this project. By choosing the occupational therapist who is the lead of the SCI rehabilitation team as site mentor, this author decided for her to be her team leader. In an interview with the team leader, the customer's goal directed needs were identified and defined. Additionally, the team leader identified a baseline of SCI educational resources available, and with the author, brainstormed various ways of increasing access to educational resources. Throughout this process, the site mentor and author assessed the current baseline of the SCI HEP on site at Community Rehabilitation Hospital North. They both then considered different approaches of how to create the educational resources necessary.

Through the duration of the project, the author remained current in the literature regarding the following topics: SCI activity guidelines, SCI comorbidities, and SCI barriers to activity. A learning culture was fostered throughout the duration of the project by the author continuously consulting with her site mentor about current evidence-based practice. This occurred primarily when the author consulted the site mentor about justifying the information in the resources, and explaining to the site mentor the evidence that supports this reasoning. Upon preparing to leave the site, the author administered another interview with the site mentor

regarding the program. Throughout the closing interview, the author and site mentor discussed the importance of the continuation of updating resources for not only the SCI population, but for other at-risk populations that are encountered in the facility.

### **Discontinuation and Sustainability**

Once all final versions of the resources were complete, they were uploaded onto the *T* drive at the site in order to create and maintain sustainability. The *T* drive is a shared drive with resource folders that every therapist can easily access on their computer and print as needed. To ensure the resources would be easy to access in the future, each document was uploaded with a proper name and description. The naming process was completed with the site mentor to ensure accessibility and future use, in case any of the other occupational therapists were to provide coverage and treat a SCI patient upon the site mentor's absence or unavailability.

### **Needs Addressed and Outcomes**

This project addressed the societal needs for this population identified by literature above, such as: transfer training due to high fall risk (Forslund, et al., 2017; Saunders, DiPiro, Krause, Brotherton & Kraft, 2013; Wannapakhe, Arrayawichanon, Saengsuwan, & Amatachaya, 2015), secondary complications from immobility (Jensen, Truitt, Schomer, Yorkston, Baylor & Molton, 2013; Piatt, Nagata, Zahl, & Rosenbluth, 2016; Saunders, Clarke, Tate, Forchheimer & Krause, 2015; Sweet, Martin Ginnis, & Tomasone, 2013), shoulder pain causing immobility and poor transfers (Eriks-Hoogland, de Groot, Snoek, Stucki, Post & Van der Woude, 2016; Hogaboom, Worobey, & Boninger, 2016; Mohammed & Dunn, 2014). This project also focused on the development of advanced practice skills with the SCI population in the inpatient rehabilitation setting. The client for this DCE included the Community Rehabilitation Hospital North Therapy Department, patients with SCI, and their families/caregivers.

After uploading the resources onto the *T* drive, the student conducted an interview with the site mentor about the DCE. The site mentor reported that this author obtained the necessary advanced clinical skills required to work with the SCI population in this setting. Regarding the program development aspect of the DCE, the site mentor reported that the project completed at the site met the needs that were identified in the needs assessment conducted at the beginning of the project, and that the quality of available resources was improved. The site mentor also reported that in the future, she can foresee these resources being extremely helpful for patients and caregivers to take home, and continually access in support of their recovery which could help decrease some of the re-hospitalizations and complications occurring in previously discharged patients.

### **Overall Learning**

A Doctoral Capstone Experience differs from a Level 2 Fieldwork experience by the various foci and outcomes that can occur. The author of this paper chose to pursue a focus of clinical skills, with program development, advocacy, and client education as secondary pursuits. Through this unique blend of areas, this project allowed different skillsets to be enhanced which differed from knowledge obtained at a standard Level 2 Fieldwork experience. This next section will reveal the unique aspects of overall learning gained through this experience; leadership, communication, confidence and skills in patient care.

### **Leadership Skills**

The unique nature of the DCE requirements pushes students to take on leadership roles. The direction of the project lays solely in the students' hands. In a qualitative study completed to determine why occupational therapists choose the path of leadership, respondents expressed that key leadership skills for occupational therapists are: skill in interaction and building

relationships, confidence and competence, and to be visionary and practical (Heard, 2014). These skills were demonstrated throughout the DCE. Determining the objectives of the project and dividing time between those objectives meant there was a need for self-direction to take on a leadership role.

**Communication Skills.** Communication skills are identified as some of the most important skills for an occupational therapist to possess (Heard, 2014). Communication skills are defined as not only the way which an individual communicates verbally and non-verbally, but also as the ability to build relationships professionally (Heard, 2014). Throughout the DCE experience, the author developed her communication skills in both verbally and non-verbally. Communication skills were continuously needed during interactions with other health practitioners, patients, caregivers, and medical providers. The forms of professional communication developed included: letters, phone calls, direct one-on-one interactions, and interactions within a group. Through the development of professional communication skills, successful professional relationships and rapport were built and supported the quality of this project. This development of communication skills and the development of professional relationships both positively influenced the author's confidence and credibility.

**Confidence and credibility.** Through learning and practicing new clinical skills, this author was able to gain confidence in her knowledge. By spending over half of the time requirement developing clinical skills specific to SCI rehabilitation as a specialization, the author gained advanced clinical skills. Due to the constant need to advocate for many patients, proficiency in advocacy as well as confidence grew improving the author's ability to support the needs of the patients. Advocacy for patients occurred in the following ways: writing letters of necessity for medical equipment, advocating on behalf of the patient to case management,

advocating on behalf of the patient to their primary physician regarding their medical needs based on observations during treatments, advocating for the patient's needs to wheelchair and adaptive equipment vendors, advocating on behalf of the patient to caregivers and what they will need to be doing at home to ensure the patients well-being and optimal occupational success, and teaching patients to advocate for themselves.

The author perceived that the development of confidence in clinical skills established her credibility among other clinicians. Credibility has been shown to be an important trait possessed by leaders specifically in the occupational therapy field (Heard, 2014). At the start of the DCE, the author's credibility among the rest of the health care professionals on staff was minimal. This status of low credibility made the abovementioned advocacy difficult. However, as the author developed clinical skills with this population, she felt that her expertise with this population developed. Through this development of expertise, the author sensed that her credibility increased as well. This advancement of clinical skill furthered the author's advocacy efforts as well; she was able to notice changes in respect amongst staff, as well as the staff regarding her advocacy efforts on the same level that they would her site mentor.

### **Psychosocial Approach to the Spinal Cord Injury Population**

Through the clinical skill portion of the DCE, the author learned a holistic approach to treating clients. Staying true to the nature of occupational therapy's holistic approach to treating patients was important in addressing the patient's psycho-social needs as well as their physical needs. Hope plays an important role in recovery following spinal cord injury (Van Lit & Kayes, 2014). Studies report that within the spinal cord injury population, hope is associated with reduced depression, improved coping, higher self-esteem and increased life satisfaction (Van Lit & Kayes, 2014). Guided by the literature, the site mentor, and clinicians at CHR North, the



author has learned the importance of hope when treating patients with spinal cord injury. Health care providers on site offer in-services and reminders throughout the work day about the importance of keeping patient's hope in tact during the early phase of inpatient rehabilitation. This consists of never breaking news to a patient in a negative light, and instead using phrases such as: *nerves and the spinal cord heal very slowly, and we will work with what we currently have, and gain as much independence as possible*. It is taught that this is an important aspect of the psychosocial factors of working with this population. The reasoning behind it is that when patients are in this fragile stage of denial during their inpatient rehabilitation stay, clinicians do not want to crush their hope because hope is what gives patients their drive and motivation to fully participate in therapy.

### **Summary of Overall Learning**

Occupational therapists have the potential to be in leadership roles because of their skills in professional communication, relationship building, and clinical skills that they engage in daily (Heard, 2014). Additionally, the nature of the professional focus of occupational therapy makes leadership an imperative. This DCE has supported development in the abovementioned areas. The skills gained will carry over into this author's professional career, and will support an ongoing transformation as an effective leader in the field of Occupational Therapy.

### References

- American Occupational Therapy Association. (2014). Occupational therapy practice framework: Domain and process (3rd ed.). *American Journal of Occupational Therapy*, 68 (Suppl.1), S1-S48
- Anneken, V., Hanssen-Doose, A., Hirschfeld, S., Scheuer, T., & Thietje, R. (2009). Influence of physical exercise on quality of life in individuals with spinal cord injury. *Spinal Cord*, 48(5), 393-399. doi:10.1038/sc.2009.137
- Bonnel, W., & Smith, K. (2018). Proposal Writing for Clinical Nursing and DNP Projects. Springer Publishing Company.
- Cockerham, W., Dingwall, R., & Quah, S. R. (2014). *The Wiley Blackwell Encyclopedia of Health, Illness, Behavior and Society [5 vols.]*. Wiley-Blackwell.
- Cole, M. & Tufano, R. (2008). Applied theories in occupational therapy: A practical approach. Thorofare, NJ: SLACK Incorporated.
- Eriks-Hoogland, I., de Groot, S., Snoek, G., Stucki, G., Post, M., & Van der Woude, L. (2016). Association of shoulder problems in persons with spinal cord injury at discharge from inpatient rehabilitation with activities and participation 5 years later. *Archives of Physical Medicine and Rehabilitation*, 97(1), 84-91.
- Evans, N., Wingo, B., Sasso, E., Hicks, A., Gorgey, A. S., & Harness, E. (2015). Exercise recommendations and considerations for persons with spinal cord injury. *Archives of Physical Medicine and Rehabilitation*, 96(9), 1749-1750.
- Forslund, E. B., Jørgensen, V., Franzén, E., Opheim, A., Seiger, Å., Ståhle, A., ... & Wahman, K. (2017). High incidence of falls and fall-related injuries in wheelchair users with spinal cord injury: a prospective study of risk indicators. *Journal of Rehabilitation*

*Medicine*, 49(2), 144-151.

Garshick, E., Kelley, A., Cohen, S. A., Garrison, A., Tun, C. G., Gagnon, D., & Brown, R.

(2005). A prospective assessment of mortality in chronic spinal cord injury. *Spinal Cord*, 43(7), 408.

Ginis, K. M., Hicks, A. L., Latimer, A. E., Warburton, D. E. R., Bourne, C., Ditor, D. S., ... &

Pomerleau, P. (2011). The development of evidence-informed physical activity guidelines for adults with spinal cord injury. *Spinal Cord*, 49(11), 1088

Ginis, K. A. M., Jörgensen, S., & Stapleton, J. (2012). Exercise and sport for persons with spinal cord injury. *PM&R*, 4(11), 894-900.

Guide to Continuous Quality Improvement. (2018, November 19). Retrieved from

<https://www.smartsheet.com/continuous-quality-improvement>

Heard, C. P. (2014). Choosing the path of leadership in occupational therapy. *The Open Journal of Occupational Therapy*, 2(1), 2.

Hogaboom, N. S., Worobey, L. A., & Boninger, M. L. (2016). Transfer technique is associated with shoulder pain and pathology in people with spinal cord injury: a cross-sectional investigation. *Archives of Physical Medicine and Rehabilitation*, 97(10), 1770-1776.

Jaarsma, E. A., Dijkstra, P. U., Geertzen, J. H. B., & Dekker, R. (2014). Barriers to and facilitators of sports participation for people with physical disabilities: A systematic review. *Scandinavian Journal of Medicine & Science in Sports*, 24(6), 871-881.

Jensen, M. P., Truitt, A. R., Schomer, K. G., Yorkston, K. M., Baylor, C., & Molton, I. R.

(2013). Frequency and age effects of secondary health conditions in individuals with spinal cord injury: a scoping review. *Spinal Cord*, 51(12), 882.

Jones, C. L., Jensen, J. D., Scherr, C. L., Brown, N. R., Christy, K., & Weaver, J. (2014). The

- Health Belief Model as an Explanatory Framework in Communication Research: Exploring Parallel, Serial, and Moderated Mediation. *Health Communication*, 30(6), 566-576. doi:10.1080/10410236.2013.873363
- Kovindha, A., Kammuang-Lue, P., Prakongsai, P., & Wongphan, T. (2015). Prevalence of pressure ulcers in Thai wheelchair users with chronic spinal cord injuries. *Spinal Cord*, 53(10), 767.
- Mohammed, K., & Dunn, J. A. (2014). Shoulder pain in tetraplegia. *Orthopaedics and Trauma*, 28(1), 27-32.
- Nash, M. S., van de Ven, I. V., van Elk, N. V., & Johnson, B. M. (2007). Effects of Circuit Resistance Training on Fitness Attributes and Upper-Extremity Pain in Middle-Aged Men With Paraplegia. *Archives of Physical Medicine and Rehabilitation*, 88(1), 70-75. doi:10.1016/j.apmr.2006.10.003
- Hogaboom, N. S., Worobey, L. A., & Boninger, M. L. (2016). Transfer technique is associated with shoulder pain and pathology in people with spinal cord injury: a cross-sectional investigation. *Archives of Physical Medicine and Rehabilitation*, 97(10), 1770-1776.
- National Spinal Cord Injury Statistical Center. (2015). *Facts and Figures at a Glance* [Fact sheet] Retrieved from [https://msktc.org/lib/docs/Data\\_Sheets/\\_MSKTC\\_SCIMS\\_Fact\\_Fig\\_2015.pdf](https://msktc.org/lib/docs/Data_Sheets/_MSKTC_SCIMS_Fact_Fig_2015.pdf)
- Noreau, L., Shephard, R. J., Simard, C. L. E. R. M. O. N. T., Paré, G. I. L. E. S., & Pomerleau, P. (1993). Relationship of impairment and functional ability to habitual activity and fitness following spinal cord injury. *International Journal of Rehabilitation Research. Internationale Zeitschrift fur Rehabilitationsforschung. Revue internationale de recherches de readaptation*, 16(4), 265-275.
- Pelletier, C. A., De Zepetnek, J. T., MacDonald, M. J., & Hicks, A. L. (2015). A 16-week

- randomized controlled trial evaluating the physical activity guidelines for adults with spinal cord injury. *Spinal Cord*, 53(5), 363
- Piatt, J. A., Nagata, S., Zahl, M., Li, J., & Rosenbluth, J. P. (2016). Problematic secondary health conditions among adults with spinal cord injury and its impact on social participation and daily life. *The Journal of Spinal Cord Medicine*, 39(6), 693-698.
- Rocchi, M., Routhier, F., Latimer-Cheung, A. E., Ginis, K. M., Noreau, L., & Sweet, S. N. (2017). Are adults with spinal cord injury meeting the spinal cord injury-specific physical activity guidelines? A look at a sample from a Canadian province. *Spinal Cord*, 55(5), 454.
- Saunders, L. L., Clarke, A., Tate, D. G., Forchheimer, M., & Krause, J. S. (2015). Lifetime prevalence of chronic health conditions among persons with spinal cord injury. *Archives of Physical Medicine and Rehabilitation*, 96(4), 673-679
- Saunders, L., DiPiro, N., Krause, J., Brotherton, S., & Kraft, S. (2013). Risk of fall-related injuries among ambulatory participants with spinal cord injury. *Topics in Spinal Cord Injury Rehabilitation*, 19(4), 259-266.
- Strecher, V. J., & Rosenstock, I. M. (1997). The health belief model. *Cambridge Handbook of Psychology, Health and Medicine*, 113-117.
- Sweet, S. N., Martin Ginis, K. A., & Tomasone, J. R. (2013). Investigating intermediary variables in the physical activity and quality of life relationship in persons with spinal cord injury. *Health Psychology*, 32(8), 877.
- van Koppenhagen, C. F., Post, M., de Groot, S., van Leeuwen, C., van Asbeck, F., Stolwijk-Swüste, J., ... & Lindeman, E. (2014). Longitudinal relationship between

- wheelchair exercise capacity and life satisfaction in patients with spinal cord injury: A cohort study in the Netherlands. *The Journal of Spinal Cord Medicine*, 37(3), 328-337.
- Van Lit, A., & Kayes, N. (2014). A narrative review of hope after spinal cord injury: Implications for physiotherapy. *New Zealand Journal of Physiotherapy*, 42(1).
- Wannapakhe, J., Arrayawichanon, P., Saengsuwan, J., & Amatachaya, S. (2015). Medical complications and falls in patients with spinal cord injury during the immediate phase after completing a rehabilitation program. *The Journal of Spinal Cord Medicine*, 38(1), 84-90.