2016

Resource guide for secondary complications of individuals aging with a spinal cord injury

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RESOURCE GUIDE FOR SECONDARY COMPLICATIONS OF INDIVIDUALS
AGING WITH A SPINAL CORD INJURY

by

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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 2016
This Scholarly Project Paper submitted by Allison Laska, MOTS and Emily Proctor, MOTS in partial fulfillment of the requirement for the Degree of Master of Occupational Therapy from the University of North Dakota, has been read by the Faculty Advisor under whom the work has been done and is hereby approved.

[Signature of Faculty Advisor]

[April 25, 2016]

Date
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Title Resource Guide for Secondary Complications of Individuals Aging with a Spinal Cord Injury
Department Occupational Therapy
Degree Master of Occupational Therapy

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Allison Laska, MOTS
November 30, 2015

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November 30, 2015
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ACKNOWLEDGMENTS

The authors wish to thank Dr. Mandy Meyer for her support, guidance, and encouragement throughout the process of completing our scholarly project. The authors would also like to thank their classmates, friends, and family for their support and understanding throughout this process.
ABSTRACT

**Purpose:** The purpose of this scholarly project was to develop an easy to use resource guide to aid occupational therapists in working with those aging with a spinal cord injury (SCI) that have endured a secondary complication and advocating to other healthcare professionals the usefulness of occupational therapy in treatment of these individuals.

**Method:** An extensive literature review was conducted using Cinahl, OT Search, PubMed, PsycInfo, various medical journals, OT course textbooks, and documents obtained from the American Occupational Therapy Association (AOTA) website. Information was gathered about aging with SCI, common secondary complications in SCI, OT’s role in SCI, OT’s role in pressure ulcer care, OT’s role in bladder and bowel dysfunction, and OT treatment for cardiovascular complications.

**Results:** The Model of Human Occupation assisted in creating *An Occupational Therapist's Guide: Aging with a Spinal Cord Injury: Secondary Complications*. The role of the occupational therapist was incorporated along with the Model of Human Occupation’s core components of volition, habituation, performance capacity and lived body, environment, dimensions of doing, and lifespan perspective as well as important findings from the literature review.

**Conclusions:** The document created includes a thorough review of the three most common secondary complications in individuals aging with a SCI. The document addresses occupational therapy’s role in all areas of occupation for individuals aging with a SCI that have endured a secondary complication for both the occupational therapist as well as the ability to advocate to other healthcare professionals about the profession.
CHAPTER 1
INTRODUCTION

Rationale

As of 2011, there were more than 253,000 individuals living with spinal cord injuries (SCIs), and with an incidence of 11,000 cases annually, the population impacted by SCIs continues to rise (D’Hondt & Everaert, 2011). In 2003, 85% of individuals with SCIs reported enduring one or more secondary medical complications; these secondary complications strongly contribute to the individuals’ functional declines. Secondary complications for individuals with SCIs often lead to an increased rate of rehospitalization, loss of employment and decreased quality of life (Sezer, Akkus, & Ugurlu, 2015). The most common secondary complications for individuals with a SCI include pressure ulcers, frequent urinary tract infections (UTIs) or changes in bladder and bowel function, weight gain, and cardiovascular disease (Liem, McColl, King, & Smith, 2003). Advances in preventing the occurrence of secondary medical complications and improved treatment efficiency have been attributed to a decline in the annual rehospitalization rate and length of stay (McKinley et al., 1999). Healthcare providers being aware of common secondary complications may reduce the development and/or severity of such complications. Currently, there is little data to guide healthcare providers who deal with changes related to those aging with SCIs (Friedman, 2007). An easy to navigate resource guide that provides occupational therapists with the role of OT for an individual aging with a SCI would be beneficial in the treatment of these individuals.
**Theoretical Framework**

The Model of Human Occupation (MOHO) was used to develop a resource guide to aid occupational therapists in working with those aging with a spinal cord injury (SCI) that have endured a secondary complication and advocating to other healthcare professionals the usefulness of OT in treatment of these individuals.

The core concepts of this model include volition, habituation, performance capacity and lived body, environment, dimensions of doing, and lifespan perspective along with the areas of occupation identified in the Occupational Therapy Practice Framework: Domain and Process, 3rd edition (2014).

Within our product, the occupational therapist’s role is developed using the core concepts of MOHO (Kielhofner, as cited in Turpin & Iwama, 2008):

- **Volition**- “a pattern of thoughts and feelings about oneself…which occurs as one anticipates, chooses, experiences, and interprets what one does.”

- **Habituation**- “an internalized readiness to exhibit consistent patterns of behaviour guided by habits and roles and fitted to the characteristics of routine temporal, physical and social environments.”

- **Performance Capacity and the Lived Body**- “the ability to do things” and a person’s embodied experience

- **Environment**- “the particular physical and social, cultural, economic, and political features of one’s contexts that impact upon the motivation, organization, and performance of occupation.”

- **Dimensions of Doing**- consists of three dimensions: occupational participation, occupational performance, and skill. This encompasses a person’s engagement in
occupations that are necessary to one’s well-being, how the person completes the occupation, as well as what skills are required to perform the occupation.

- **Lifespan Perspective**- acknowledges that human occupation changes over time as age and circumstances change and the need for full understanding of the entire lifespan. The patient’s life has a temporal dimension which shapes his or her interpretations and behaviors in the present time, which are also impacted by future goals and aspirations.

The areas of occupation stated in the Occupational Therapy Practice Framework: Domain and Process, 3rd edition (2014) are also incorporated to ensure the individual is evaluated and treated in a holistic manner.

- **Activities of Daily Living**- activities focusing on taking care of one’s own body and vital to one’s survival and well-being

- **Instrumental Activities of Daily Living**- activities that support one’s daily life within their homes and community while interacting with someone other than one’s self

- **Rest and Sleep**- occupations completed for restorative rest and sleep to remain healthy and able to engage in other occupations.

- **Education**- occupations needed in order to learn and participate in the school environment

- **Work**- committed occupations that are completed with or without financial reward

- **Play**- spontaneous or organized activity that brings entertainment to the individual
Leisure- non-obligatory activity that is intrinsically motivating and completed when not doing an obligatory task

Social Participation- engagement with community, friends, family, and peers

Statement of the Problem

Current literature has limited research on occupational therapy’s role in providing treatment for individuals aging with a SCI. The rising cost of SCI care along with the personal, vocational, and social impact on an individual increases the importance of understanding secondary medical conditions while aging with a SCI (McKinley, Jackson, Cardenas, & DeVivo, 1999). Occupational therapists can play a large role in assisting professionals with treatment of the secondary complications as well as assist patients in experiencing an increased quality of life as they age with a SCI. Knowledge of the most common secondary complications of individuals aging with SCI and the corresponding services that OT provides can promote the overall health of these individuals. This knowledge in turn will assist primary healthcare providers in preventing further secondary complications as they age.

Scope and Delimitation

An occupational therapist is qualified to work with individuals that have endured a secondary complication while aging with a SCI due to their unique education and practice domains. Occupational therapists can assist with secondary complications by addressing environmental modifications and evaluate the patient environment for safety and possible hazards. An occupational therapist considers the person’s physical, cognitive, and psychosocial status along with possible deficits due to the secondary complication. In addition, occupational therapists can educate on the use of adaptive
equipment to account for loss of strength or mobility restrictions related to one’s treatment. OT can provide functional strengthening exercises related to endurance, coordination, and balance to complete or maintain independence throughout the healing process. Prevention of further secondary complications is also a primary component of treatment for OT intervention.

**Importance of the Study**

This scholarly project provides a resource guide for occupational therapists to use when working with those aging with a SCI while also advocating to other healthcare professionals the usefulness of OT in the treatment of these individuals. This document also provides a detailed list of items that an occupational therapist can address within each area of occupation to ensure the holistic person is evaluated and treated. In addition the document provides the occupational therapists with a handout for other healthcare professionals in order to advocate for the occupational therapy profession.
CHAPTER II
A REVIEW OF THE LITERATURE

This literature review covers three of the most common secondary complications experienced by clients with spinal cord injuries and the impact a spinal cord injury (SCI) has on a person’s occupational performance during the years following this paralyzing injury. It also gives an overview of how occupational therapy (OT) plays a role in treatment, management, and prevention of further secondary complications while an individual ages with a SCI. Based on the Model of Human Occupation, we will focus on how these secondary complications impact a person’s motivation, habituation, and values to allow an occupational therapist to provide the most client-centered care, therefore improving a client’s quality of life and ability to age with a SCI.

The rising cost of SCI care along with the personal, vocational, and social impact on an individual increases the importance of understanding secondary medical conditions while aging with a SCI (McKinley, Jackson, Cardenas, & DeVivo, 1999). While it remains important for rehabilitation professions to be familiar with skills and conditions regarding initial rehabilitation for those with SCIs, they must also be aware of additional challenges and complications in order to help the clients at every stage of their lives. In addition to their own services, occupational therapists can play a large role in assisting professionals with treatment of the secondary complications as well as assist clients in experiencing an increased quality of life as they age with a SCI.
An Overview of SCIs

At this moment in the United States of America approximately 297,000 individuals are living with a SCI. As of 2011, there were more than 253,000 individuals living with SCIs, and with an incidence of 11,000 cases annually, the population impacted by SCIs continues to rise. More than 80% of those living with a SCI are male and the majority of them sustained their injury at a young age with the leading cause of SCIs being trauma (D’Hondt & Everaert, 2011). SCI is more than just a physical disorder; it also affects an individual psychologically, functionally, and financially (Sezer, Akkus, & Ugurlu, 2015). SCI is no longer a “fixed” disability, but instead a condition that adjusts function throughout the lifespan as well as affixes challenges to health (Friedman, 2007). SCI has a large impact on a person’s daily life and requires additional assistance and modifications to simple activities of daily living such as bathing, toileting, transferring, and dressing. OT has the unique role of assisting individuals with SCIs in remaining as independent as possible as they age despite experiencing secondary complications. Occupational therapists are able to do this through the participation in the individual’s desired occupations.

Secondary complications in individuals with SCIs often are a frequent cause of morbidity and mortality. Secondary complications for individuals with SCIs often lead to an increased rate of rehospitalization, loss of employment and decreased quality of life (Sezer, Akkus, & Ugurlu, 2015). In 2003, 85% of individuals with SCIs reported enduring one or more secondary medical complications; these secondary complications strongly contribute to the individual’s functional decline. According to Liem, McColl,
King, and Smith (2003), the most common secondary complications in those with SCI include pressure ulcers (22%), frequent urinary tract infections (UTIs) or changes in bladder and bowel function (22%), weight gain (17%), and cardiovascular disease (14%). According to Friedman (2007), the most frequently reported problems by clients were fatigue, pain, new muscle weakness, pressure ulcers, urinary tract infections, changes in bowel and/or bladder function, and weight gain. Advances in preventing the occurrence of secondary medical complications and improved treatment efficiency have been attributed to a decline in the annual re-hospitalization rate and length of stay (McKinley et al., 1999).

In order to improve survival, community participation and overall health-related quality of life in those with SCI, healthcare providers must be educated on prevention, early diagnosis, and treatment of chronic secondary complications during routine office appointments. In comparing those aging with SCI to the general population, there is a quicker functional decline in those with SCI than persons without (Friedman, 2007). Thus, it is also important for families, caregivers, and clients to be aware of the secondary complications that come along with SCIs. Currently, there is little data to guide healthcare providers who deal with changes related to those aging with SCIs (Friedman, 2007).

When the client first experiences the SCI, there is usually a large team involved that consists of doctors, nurses, physical therapists, and occupational therapists, among others. This multidisciplinary team assists the individual in maintaining their immediate health needs as well as to begin to assist them in relearning their day-to-day activities with their new limitations. The disciplines work together in order to assist the client in
regaining function until he or she is well and safe enough to leave the hospital. Individuals also continue with therapies and care in an outpatient setting. Depending on the severity of the SCI, the team may work with the individual for months after discharge from the hospital. Once the client is able to perform tasks independently or with modified independence, outpatient therapies are discontinued and the client is left with his or her primary healthcare provider.

As the primary point of contact, the medical professional, most often the primary healthcare provider, is responsible for promoting health and wellness of those with SCIs following completion of the acute phase of the injury. Current literature discusses that clients with SCI visit their primary healthcare provider frequently, and the primary healthcare provider plays a crucial role in their health care. Primary healthcare providers must have knowledge of common conditions affecting individuals with SCIs (Milligan, Lee, McMillan, & Klassen, 2012). Additionally, while the client may keep in contact with his or her primary healthcare provider, the healthcare provider is not always aware of how other professions involved in the first treatment team may assist with secondary complications later on. Healthcare providers being aware of common secondary complications may reduce the development and/or severity of such complications. An easy to navigate resource guide that provides occupational therapists with the role of OT for an individual aging with a SCI would be beneficial in the treatment of these individuals.

Occupational therapists serve an important role in the acute stages of treatment after SCIs, but the primary healthcare providers are responsible for the health of the individual in years thereafter. The primary healthcare provider serve as the gatekeepers
for individuals with SCI to receive OT services as they age and as secondary complications arise. Additionally, while the client may keep in contact with his or her primary healthcare provider, the healthcare provider is not always aware of how other professions involved in the first treatment team may assist with secondary complications later on. Knowledge of the most common secondary complications of individuals aging with SCI and the corresponding services that OT provides can promote the overall health of these individuals and assist primary healthcare providers in preventing further secondary complications as they age.

**Pressure Ulcers**

*Overview*

Pressure ulcers are defined as an injury of the skin or underlying tissue, typically over a bony area, caused by unrelieved pressure or shear that results in decreased blood and lymph flow to a specific area (Sezer, Akkus, & Ugurlu, 2015; Simandl, 2009). Individuals with a SCI have decreased circulation to their lower limbs which places these individuals at a greater risk for developing pressure ulcers as it takes less pressure to interrupt circulation (Simandl, 2009). Pressure ulcers occur in about 85% of individuals with SCIs and are a potentially life threatening secondary complication leading to the second most common reason for re-hospitalization in individuals with SCIs (Lala, Dumont, Leblond, Houghton, & Noreau, 2014; Sezer, Akkus, & Ugurlu, 2015). As individuals with SCIs begin to age, their skin becomes thinner. The thinning of one’s skin increases their risk of developing a pressure ulcer by 30%, making recognition and treatment of pressure ulcers imperative to both the individual with a SCI and the medical team.
Pressure ulcers also often take a toll on one’s psychological health in addition to the physical complications and symptoms. Lala et al. (2014) found that pressure ulcers have a significant impact on quality of life and one’s social interactions in individuals with SCIs. One’s day-to-day activities are directly impacted during the healing process of a pressure ulcer as they spend much of their time in a pressure relieving position. This leads to decreased social interaction, engagement in meaningful activities and completion of one’s habits, roles, and routines. Not engaging in these meaningful activities can cause an individual to have decreased self-efficacy, confidence, and even lead to depression.

The number of individuals with SCIs that experience pressure ulcers throughout their lifetime places a large financial burden on the health care system each year. It is estimated that $4,800 a month or $57,000 annually are spent on pressure ulcer care for individuals with SCIs living in the community (Lala et al., 2014). This statistic leads to a need for occupational therapists and other healthcare providers to be aware of the risk factors of secondary complications in order to assist in prevention and care of these individuals in order to help decrease these physical, emotional, and financial burdens.

**Signs and Symptoms**

Pressure ulcers can occur in five stages, each with their own unique signs and symptoms. Stage one pressure ulcers, also called nonblanchable erythema, are characterized as observable areas of the skin that are red in color and remain this way even after pressure is removed. Stage one pressure ulcers may also present with a difference in temperature than surrounding areas, as harder or softer than adjacent skin, painful, and/or itchy. If these symptoms are present, an individual should to seek medical treatment for further investigation of the area. Stage two pressure ulcers include partial
skin loss involving the epidermis and/or dermis. The pressure ulcer is superficial in nature and appears similar to a blister or abrasion. Stage three pressure ulcers involve damage or necrosis of subcutaneous tissue but do not impact the underlying fascia. Stage three pressure ulcers are full thickness skin loss that present as a deep crater. Minimal tunneling also may be present at this stage. Stage four pressure ulcers are classified as skin loss with extensive destruction, damage to muscle or bone, and damage to surrounding tissue and/or tissue necrosis. The final stage of pressure ulcers is called unstageable. This stage is characterized as a wound that is covered with eschar, or necrotic, devitalized tissue. The eschar blocks drainage of the wound leading to a high risk for infection. This stage may also not be visible at the skin surface thus increasing the individual’s risk of complications (Janssen, 2014). Individuals with signs or symptoms listed for stage two through four should seek treatment immediately.

Risk Factors

There are a variety of risk factors that can contribute to pressure ulcers in individuals with SCIs. Duration of time with SCI, urinary or fecal incontinence, lack of sensation, reduced physical activity, immobility, and smoking are factors that increase the risk of developing a pressure ulcer in individuals with SCIs. Sociodemographic factors that lead to a pressure ulcer include aging, reduced level of education, being unemployed, or being single. Medical factors that increase one’s risk of developing a pressure ulcer include poor nutrition, depression, muscle atrophy, pulmonary and/or cardiovascular disease, severe spasticity, history of pressure ulcers, and diabetes mellitus (Lala et al., 2014; Sezer, Akkus, & Ugrulu, 2015).
As stated previously, pressure ulcers generally occur over bony prominences. The areas at most risk for development of pressure ulcers in individuals with SCIs are the ischium, trochanters, sacrum, and bony prominences of the feet (Sezer, Akkus, & Ugurlu, 2015). These areas should be assessed frequently by the patient and the multidisciplinary team in order to minimize the severity of the pressure ulcer and reduce its impact on one’s quality of life and engagement in occupations.

Current Treatments

Management of pressure ulcers includes inspecting the skin daily for sores, keeping the skin clean and dry, as well as avoiding excessive pressure or shearing to the area affected. Pressure relief techniques, proper nutrition, and early recognition of the sores can also greatly assist with the management and treatment of pressure ulcers. Equipment prescribed to an individual such as a proper wheelchair cushion can also greatly impact the effectiveness of pressure ulcer management (Sezer, Akkus, & Ugurlu, 2015; Simandl, 2009). OT can play a role in the assistance and management of pressure ulcers in individuals aging with a SCI. OT can assist with the initial management of the wound site along application and use of pressure garments for scar management. Following the initial wound management, body positioning can be implemented by the occupational therapist to ensure postural alignment and stability. Additional treatments occupational therapists can provide include recommendations of support surfaces such as customized wheelchair cushions, seating systems or specialized beds. Prevention is a key component in the treatment of pressure ulcers. Occupational therapists can help to educate the client on pressure relief techniques, daily skin inspection schedules, early recognition of signs and symptoms, and proper transfer techniques that minimize
shearing and excessive pressure. Modification or adaptation to the individual’s environment may also be needed to ensure safety and prevent further pressure ulcers (Amini, 2013).

**Bladder and Bowel Complications**

Even though medical care and technology have progressed over the years, persons with SCIs are at increased risk of urinary tract infections, bladder stones, as well as bowel dysfunction (Friedman, 2007). Urological dysfunctions after SCIs not only increase the risk of long-term complications, but also decrease the social and psychological well-being of the client (Sezer, Akkus, Ugurlu, 2015). Inability to manage the bladder and bowel may deter clients from engaging in occupations outside of his or her own home due to the level of difficulty and added precautions related to maintaining bowel and bladder hygiene in restrooms in unfamiliar environments.

**Urinary Tract Infections**

*Overview*

Often those with SCIs require the use of bladder drainage with catheters. With the use of catheters also comes greater risk of urinary tract infections (UTI). Due to the conditions and methods utilized to drain the bladder, UTI are one of the leading secondary complications seen in those with spinal cord injuries (D’Hondt & Everaert, 2011). As those with SCIs begin to reach the age of 60 and beyond, abnormal renal test results are more common.
**Signs and Symptoms**

As listed by the National Institute on Disability and Rehabilitation Research (NIDRR) consensus statement (1992), signs and symptoms of UTI include pyuria, fever, discomfort of kidney or bladder tenderness, painful or difficult urination, urinary incontinence, increased spasticity, autonomic dysreflexia, cloudy urine with increased odor, malaise, lethargy, and sense of unease. Diagnosing UTI in persons with SCIs is often difficult and can be complicated due to the lack of sensitivity from the sustained injury; persons often lack the ability to identify symptoms and signs without the ability to feel the discomfort. Signs and symptoms may be delayed or missed as they are not always recognized as being related to UTI and are subtle and have gradual onset (D’Hondt & Everaert, 2011). Because of this, diagnosis is often discovered or confirmed after blood or urine tests, typically completed by the person’s primary healthcare provider (Cardenas & Hooton, 1999).

**Risk Factors**

Following a SCI, bladder pressure elevates, which often leads to damage to the upper urinary tract and the development of urinary infection symptoms. This initial damage along with the use of catheters, elevated intravesical pressures, and post-void residuals all contribute to an increased risk and elevated severity of UTI. Structural risk factors for UTI include detrusor sphincter dyssnergy, bladder overdistention, voiding under high pressure, stones in the urinary tract, and vesicoureteral reflux (D’Hondt & Everaert, 2011).

The method of urinary drainage also contributes to the risk of developing UTI. Methods that are most likely to lead to development of UTI are indwelling catheterization
and urinary diversion (Cardenas & Hooton, 1995). Methods such as intermittent catheterization that do not involve catheters or other equipment to be in place for more than 30 days have been proven to reduce the incidence of UTI. Also, individuals with neurogenic bladders, or bladder dysfunction, are at an increased risk of developing UTI, as emptying the bladder involves bypassing the mucosal defense mechanisms (Cardenas & Hooton, 1999). The client’s cooperation and level of adherence to a catheterization program also impacts the risk of bacterial growth, which often leads to UTI.

Additionally, after enduring a SCI, clients often struggle during the adjustment period of learning to care for themselves. Failing to adjust to his or her change in ability and poor self-care increases the client’s risk for developing a UTI (D’Hondt & Everaert, 2011). In addition, behavioral and socioeconomic factors that have been loosely linked to the incidence of UTI include the person’s knowledge of the urinary system, self-esteem, work or productivity, age, gender, access to services, and support systems (Cardenas & Hooton, 1999).

Treatment

Currently, the best method to treat a UTI in persons with SCIs is with medication, specifically antibiotics. Typically after diagnosis and starting medication for the infection, improvement is seen within 24 to 48 hours and the duration of treatment is 7 to 14 days, based on the severity of the infection. If improvements are not seen during this time period, an additional urine or blood test is done along with imaging, such as ultrasound, to rule out urinary tract pathology and the presence of stones in the bladder or kidneys. If symptoms persist despite the use of antibiotics, then healthcare providers may resort to more invasive procedures such as excretory urogram or cystogram to treat the
UTI (Cardenas & Hooton, 1999). The treatment best suited for each client as well as the duration of treatment is based on the severity of UTI, presence of fever, and overall health status in regard to the person’s functional capacities (D’Hondt & Everaert, 2011).

Clients who experience recurrent UTI may require revision of his or her bladder management program, more frequent bladder emptying as well as additional hygiene precautions while participating in bladder hygiene in order to reduce the risk. Occupational therapists can assist with implementation of a schedule to manage catheterization throughout the day to prevent further infection. In addition, occupational therapists can work to increase the person’s independence despite the limitations that come along with the UTI. The primary goals in managing UTI are to improve the client’s quality of life and prevent loss of renal function. In managing UTI through a bladder management program, practitioners should take careful consideration of the impact the change may have on the patient’s lifestyle and ability to complete the technique. The program must be individualized to the patient’s preferred type of voiding dysfunction, extent of disability, level of SCI, as well as the level of care that the client has available (Sezer, Akkus, & Ugurlu, 2015).

**Prevention**

As mentioned previously, many signs and symptoms are missed or overlooked as they are not always recognized as being related to UTI. Preventing the incidence of UTI is important because many complications can be foreseen. In order to prevent the occurrence of UTI firsthand, the optimal bladder drainage technique must be chosen and agreed upon by the client and the practitioner (D’Hondt & Everaert, 2011). The client and/or caregiver must also be educated on proper techniques of catheterization as well as
hand hygiene (D’Hondt & Everaert, 2011). Although there are many precautions to take in order to avoid developing UTI, they are not always effective and UTIs may be inevitable for some clients.

**Other Urinary Complications**

*Bladder Stones*

Bladder stones are potentially dangerous in clients with no renal sensation since the client is unlikely to experience continuous pain associated with severe obstruction (McKinley et al., 1999). Generally speaking, the likelihood to develop bladder stones is increased due to recurrent UTIs along with incomplete bladder emptying. If not removed or passed, bladder stones can also cause recurrent UTIs in an individual aging with a SCI (Bartel et al., 2014). According to the Mayo Clinic, bladder stones consist of masses of minerals in the bladder and develop when urine becomes too concentrated or remains in the bladder for a prolonged period of time. Symptoms include pain in the abdomen, blood in the urine, and painful or frequent urination. If the stones are small, they are able to pass on their own; often time’s stones require removal through closed or open surgeries (Mayo Clinic, 2013).

OT can play a role in treatment of bladder stones during as well as after treatment. Occupational therapists can work with the client to create an individualized bladder management program to ensure complete emptying of the bladder frequently. In addition, if a client requires surgery to remove the stones, occupational therapists can fit the person with appropriate adaptive devices to remain independent in self-cares while on surgical precautions related to bending and reaching. OT can also work with the client to
incorporate more fluids, especially water, into his or her diet on a daily basis to prevent the development of additional bladder stones in the future.

**Bowel Dysfunction**

Following a SCI, clients often experience changes in bowel functions. Those changes can include problems moving waste through the colon, loss of control when passing stool, as well as stool that is hard to pass. Not only can bowel problems contribute to physical and anatomical problems for individuals, but can also contribute to depression or anxiety. With the uncertainty of passing stool, clients may struggle with control of bowels in public places, therefore hindering his or her independence when outside the home. In order to gain control and confidence of the uncertainty of bowel function, many use a bowel program. A bowel program works as a plan to retrain the body in order to have regular, sometimes scheduled, bowel movements (Rodriguez, 2015). Without regular bowel movements, a client is at high risk for constipation which can later lead to bowel obstructions.

In these situations, occupational therapists play a role in the management of bowel function through implementation of a bowel schedule which can involve a variety of methods completed by the individual or a caregiver. Occupational therapists can also determine which assistive devices could assist the individual in maintaining as much independence as possible while managing their bowel functions. As the severity of bowel dysfunctions can vary, occupational therapists can evaluate the individual’s ability to remain safe in his or her environment as he or she progresses through recovery from the complication while continuing to age with the SCI (AOTA Inc., 2002). In terms of bowel incontinence, the occupational therapist can work with a client to take precautions or
incorporate additional garments for when incontinence does occur to reduce the physical impact on the client.

**Cardiovascular Complications**

Cardiovascular complications and disorders in both the chronic and acute phases of SCIs are one of the most common causes of death in individuals with SCIs (Claydon, Steeves, & Krassiouskov, 2006). Immediately after an individual sustains a SCI, there is a sudden loss of autonomic effect in the smooth muscle walls of the blood vessels (Claydon, Steeves, & Krassiouskov, 2006; Hagen, Rekand, Gronning, & Faerestrand, 2012). This loss of autonomic effect can lead to complications as an individual with a SCI ages as there may be scar tissue in and/or possible weakened areas throughout the vascular system. Sympathetic overactivity, hypertension, and vasoconstriction are additional complications that may be present in individuals with SCIs (Sezer, Akkus, & Ugurlu, 2015). Other common cardiovascular complications for individuals with SCIs include orthostatic hypotension (OH), autonomic dysreflexia (AD), decreased conduction of cardiac pain, damaged or weakened cardiovascular reflexes, pseudo-myocardial infarction, and impaired or loss of reflex cardiac acceleration (Sezer, Akkus, & Ugurlu, 2015). Of these complications, AD and OH are the most commonly seen complications that have the greatest impact on individuals that are aging with a SCI.
**Orthostatic Hypotension**

*Overview*

OH is defined as “a decrease in systolic blood pressure of 20 mmHg or more, or a reduction in diastolic blood pressure of 10 mmHg or more, when the body position changes from supine to upright, regardless of whether symptoms occur” (Claydon, Steeves, & Krassioukov, 2006; Sezer, Akkus, & Ugurlu, 2015; The Consensus Committee of the American Autonomic Society and the American Academy of Neurology, 1996). OH is common in individuals with high thoracic spinal cord injuries and can severely impact the quality of life in individuals with SCIs. Individuals with OH spend much of their time managing their unstable blood pressure which impacts their quality of life as they are not able to engage in many meaningful activities due to feeling fatigued and weak much of their day (Sezer, Akkus, & Ugurlu, 2015). OH is also often associated with fatigue which directly impacts an individual’s ability to complete meaningful activities, again impacting one’s quality of life (Claydon, Steeves, & Krassioukov, 2006).

*Signs and Symptoms*

One common symptom of OH includes a sudden drop in blood pressure when changing body positions, such as sitting up in bed or following long periods of sitting. Fatigue and weakness are also common symptoms of OH due to the decrease in blood pressure. This decrease in blood pressure makes doing even simple activities additionally tiring. Additional signs and symptoms include dizziness, head and/or neck pain, upper body flushing, blurred vision, lightheadedness, and fainting (Claydon, Steeves, & Krassioukov, 2006; Gillis, Wouda, & Hjeltnes, 2008).
Risk Factors

It is advised that individuals that are experiencing OH avoid activities that may elicit falls in blood pressure. This may have a direct effect on the individual’s ability to participate in daily activities, may impact abilities to complete specific rehabilitation interventions, and greatly impact one’s quality of life (Claydon, Steeves, & Krassioukov, 2006). The consumption of alcohol and caffeine may also provoke OH symptoms as it causes vasodilation and an increase in plasma volume which also alters one’s blood pressure.

Current Treatments

Current treatment of OH includes both pharmacological and nonpharmacological interventions. Non-pharmacological treatments include application of compression to the abdomen and/or legs, avoidance of activities that can cause falls in blood pressure, increasing fluid intake, raising head of bed 10 to 20 degrees, upper body exercise, increasing salt intake, functional electrical stimulation applied to the legs, and biofeedback (Claydon, Steeves, & Krassioukov, 2006; Gillis, Wouda, & Hjeltnes, 2008).

If non-pharmacological treatment is not effective, medications may be appropriate for an individual to manage OH. Fludrocortisone is a common medication used for OH and helps increase the plasma volume in the body to help counter the drop in blood pressure. Midodrine is another common medication that increases peripheral vasoconstriction with an α-adrenergic (Claydon, Steeves, & Krassioukov, 2006).
Autonomic dysreflexia

Overview

AD results when a somatic or visceral stimulus occurs below the level of a spinal cord lesion and activates unopposed, sympathetic activity (Caruso, Gater, & Harnish, 2015; Milligan, Lee, McMillian, & Klassen, 2012). AD can occur in individuals with a T6 SCIs and above (Hagen et al., 2012; Milligan et al., 2012). AD occurs in up to 70 percent of individuals with SCIs throughout their lifetime (Hagen et al., 2012). The most common cause of AD is bladder distension (Sezer, Akkus, & Ugurlu, 2015). If left untreated, AD can lead to seizures, loss of consciousness, cardiac complications, stroke, and even death (Hung, 2009; Milligan et al., 2012).

Signs and Symptoms

An increase in systolic pressure of 20 to 40 mmHg over the normal level at rest can be a sign of AD (Hagen, 2012; Milligan et al., 2012). Additional signs and symptoms of AD include nausea, blurred vision, shortness of breath, pulsing headache, anxiety, and bradycardia (Hagen, 2012; Milligan et al., 2012). Hot flushes or flushing of the face, cold or clammy skin, sporadic sweating above the lesion, goose bumps, and vasocongestion are also symptoms that may be present in individuals with AD (Hagen et al., 2012; Milligan et al., 2012).

Risk Factors

AD is commonly caused by bladder distension due to a full urinary bladder in 85 percent of individuals with SCIs (Hagen et al., 2012). Catheter blockage or kinking leading to urine retention are common causes for bladder distension in individuals with SCIs. Additional risk factors for AD include pressure ulcers, ingrown toenails, urinary
tract infections, kidney stones, pregnancy, childbirth, tight clothing, sexual activity or stimulation, wound dressing changes, and stimulation of pain receptors (Hagen et al., 2012; Hung, 2009; Milligan et al., 2012).

Current Treatments

Treatment for AD should be immediate and can help to prevent further complications of stroke, seizures, and death. Immediate treatment includes removal or loosening of tight clothing, elevating the individual's head, and lowering legs to decrease intracranial pressure. Blood pressure should also be measured and treated as appropriate (Hagen et al., 2012; Hung, 2009). An important aspect of treatment in AD is prevention. AD can greatly impact one’s quality of life and prevention of further complications and/or symptoms can assist in maintaining one’s quality of life (Milligan et al., 2012). If the stimuli causing the increase in blood pressure cannot be removed or identified, pharmacological treatment can be administered to block autonomic function (Hung, 2009).

Other Cardiovascular Complications

Additional cardiovascular complications for individuals aging with a SCI include cardiovascular disease and temperature regulation. Individuals with SCIs are at an increased risk of developing cardiovascular disease due to their decreased muscle mass, reduced physical activity, and development of metabolic syndromes (Hagen et al., 2012). Difficulties with temperature regulation are also common in individuals with SCIs as they display decreased thermo-regulating sensory input centers and lack of sympathetic temperature control below their level of injury, thus creating difficulties with sweat regulation below the level of injury. (Hagen et al., 2012). Excessive sweating and the
inability to self-regulate body temperature may also have a strong impact on the person and the occupations he or she engages in on daily basis.

**Model**

In examining the impact of SCIs on individuals and the incidence of secondary complications as they age, one must consider the person’s own values, habits, roles, personal insight, motivations and environment. These concepts are conducive to the Model of Human Occupation (MOHO). A person’s habits and roles as he or she ages with SCIs are largely affected by the presence of secondary complications. When a person ages with a SCI, he or she may have to change the way simple things are done, especially the everyday occupations they enjoy. With that, the individual may struggle with motivation, or volition which is defined by Kielhofner (as cited in Turpin & Iwama, 2008), as “a pattern of thoughts and feelings about oneself…which occurs as one anticipates, chooses, experiences, and interprets what one does”. As secondary complications can impose unwanted change in a person’s functional status, their motivation for doing those occupations may also change. Without the drive to complete tasks and engage in meaningful occupations, they may struggle with their perceived ability to complete tasks. When faced with hospitalization from secondary complications, a client may not be able to express and sense what they are capable of and what outcomes are possible due to the stress and medical acuity of the condition. A person’s self-efficacy can be strongly affected by the secondary complications that occur with SCIs. There may also be a change in one’s sense of what they can achieve and how effective they are in changing the outcomes they are responsible for; this is known as personal capacity.
While aging with a SCI, a person’s perspective of the life span changes over time. This concept is also addressed by MOHO. Their personal insight into life and how the SCI has impacted achievements, relationships, and other factors of their life are often considered. Many can experience a lack of control and insight into life when secondary complications reduce a person’s independence and functional status. Secondary complications can cause clients to re-think the severity of the SCI they have been living with and lead them to struggle with the SCI’s impact on their life as a whole.

When considering an individual’s environment, secondary complications also have a strong impact on how and where occupations can take place. If a person is hospitalized for a secondary complication, their entire context and environment is changed. Not only does their physical environment change, their social environments could change as well. Being in the hospital or when bedridden while recovering from secondary complications, a person may lack the social interactions of their everyday life, such as meeting up with friends for coffee or a meal. If they are hospitalized, others may be hesitant to visit them and spend time with them based on the perceived effects of the complication and medical acuity.

In examining the impact that secondary complications have on those aging with SCIs, it is important to consider how the condition is impacting a person’s motivation, habituation, values, personal causation, and lifespan perspective. Depending on the severity of the complications, all or some of these areas can be changed, therefore creating additional difficulties for the individual. Considering how the secondary complications impact a person’s motivation, habituation, and values allows an
occupational therapist to provide the most client-centered care, therefore improving a client’s quality of life and ability to age with a SCI.

**Role of Occupational Therapy**

Occupational therapists play a major role in the education and treatment of individuals with SCIs. Occupational therapists not only aim to amplify occupational performance in meaningful occupations and activities but also to prevent debilitating and costly secondary complications (Antcliff & Turner, 2014). Immediately after a SCI, a patient often works with a treatment team of professionals to assist them to regain functions and their optimal level of occupational independence. A key component of the treatment team is OT. When clients are discharged from OT, they often possess the skills to complete everyday occupations and maintain some degree of independence. As clients age with SCIs and complete their daily occupations, many individuals often face challenges and/or secondary complications that occur years after their initial injury. When the complication impacts their daily life and ability to function, OT can again be there to assist in adaptations to their activities of daily living (ADLs) that are most affected, such as bathing, transfers, and dressing. In addition, instrumental activities of daily living (IADLs) that were most affected include chores, shopping, and meal preparation. Most participants also reported a decline in social activities that occurred as they aged as well as an increased need for adaptive equipment (Friedman, 2007).

Sexual activity is also greatly impacted in individuals experiencing secondary complications of SCIs. These effects may be both physical and psychological in nature. Occupational therapists can assist by providing resources for health promotion such as support groups and providing modifications to one’s environment or routine to allow one
to participate in sexual activity. An occupational therapist may also provide remediation techniques such as endurance, strength, and/or range of motion so they may continue or return to participating in this occupation (MacRae, 2013). OT also plays a role in providing clients with adaptive equipment in order to promote the person’s independence in ADLs along with other occupations (Liem, McColl, King, & Smith, 2013). If equipment is no longer appropriate for the client’s current condition, OT plays a strong role in provision of new assistive technology such as wheelchair positioning systems, ADL equipment, home and work modifications, and computer technology (Friedman, 2007).

As occupational therapists are familiar with managing and educating clients on basic ADLs and IADLs, they also play a role in prevention of secondary complications. Occupational therapists educate clients on the importance of maintaining overall personal hygiene while completing ADLs as well as safety while completing IADLs. Maintaining safety, hygiene, and functional independence is important, as Liem et al. (2003) noted that those needing more assistance with ADLs were significantly more likely to experience bowel problems and more likely to develop skin problems, specifically pressure ulcers.

OT interventions may vary when working with those with SCIs that have experienced a secondary complication due to one’s current, previous, or changing independence as well as the need for education and prevention of future complications. Interventions include safe exercise for health benefits, hygiene, education about prevention and available treatments that could promote functional change, as well as effective mobility methods for clients and caregivers for protecting musculoskeletal
systems. Additional interventions for those aging with SCIs include skin inspection, seating and positioning, assistance with psychological or social issues, housing, and transportation assistance (Friedman, 2007).

The educational background of OT supports care of those aging with SCIs and their encounters with secondary complications. Occupational therapists can support other professions through sharing this knowledge and additional resources about preventative care for secondary complications with SCIs while also considering all aspects of a client. The OT knowledge not only looks at the physical complications associated with SCIs but also addresses the psychological needs of an individual to ensure quality of life as they age with SCIs and endure secondary complications. The role of OT is unique in this way and supports the idea of client-centered care across the lifespan.

**Product**

It is important for occupational therapists as well as other healthcare providers to be aware of secondary complications associated with SCIs. Many of the individuals with SCIs are seen after their initial injury and only seek medical treatment when secondary complications arise. Occupational therapists and other healthcare providers should be aware of these special challenges in order to help these individuals in all stages of their life and not just following their initial injury (Friedman, 2007). In addition to being knowledgeable of secondary complications, it is also important to understand how these complications impact one’s quality of life as they age with the SCI (Sezer, Akkus, & Ugurlu, 2015). This product serves as a resource guide for occupational therapists to address the various needs of these individuals as well as provide healthcare providers with information regarding how OT can assist these individuals in their recovery. This
product includes a handout of the areas that OT can assist with in order to assure that all areas of occupation are addressed in these individuals. This handout serves to further advocate for the OT profession and allows occupational therapists to further serve the needs of individuals in their community.

Just as each individual with a SCI is unique, so are the secondary complications that can occur. Due to the lack of literature available regarding OT’s role in the treatment of secondary complications in those aging with SCIs, the resource guide and handouts were created to meet the need of occupational therapists and provide an introduction of information about each condition and possible treatments based on the MOHO in correlation with the OT Practice Framework: Domain and Process (2014). This user-friendly guide was intended for fellow OT practitioners to reference and implement in treatment.
CHAPTER III
METHODOLOGY

The product *An Occupational Therapist’s Guide-Aging with a Spinal Cord Injury: Secondary Complications* is designed to aid occupational therapists in working with those aging with a SCI and advocating to other health care professionals, the usefulness of occupational therapy in the treatment of these individuals. This document is used as a resource guide for occupational therapists in order to address the various needs of these individuals as well as provide physicians with information regarding how occupational therapy (OT) can assist these individuals in their recovery.

The Model of Human Occupation (MOHO) was chosen to guide this document as it encompasses a person’s own values, habits, roles, personal insight, lifespan perspective, motivations, and environment. While considering a person aging with a spinal cord injury (SCI), it is important to consider a person’s past experiences and significant value of how routines and roles are impacted by secondary complications. Along with the mission of occupational therapy as a profession, this model reiterates the importance of a person to return to his or her valued occupations, roles, and meaningful environment.

The process of developing this product began with an extensive review of the current literature of aging with SCI, common secondary complications in SCI, OT’s role in SCI, OT’s role in pressure ulcer care, OT’s role in bladder and bowel dysfunction, and OT treatment for cardiovascular complications. The literature included an abundant selection of both qualitative and quantitative research studies. Through the use of many search engines that included Cinahl, OT Search, PubMed, PsycInfo, and various medical
journals, the literature review was created. Additional data was gathered through national databases, OT course textbooks, and documents obtained from the American Occupational Therapy Association (AOTA) website.

With the extensive amount of literature acquired on this topic, the authors narrowed down the information to be organized into the literature review and resource guide. The authors found a lack of information and resources for OT’s role in the treatment of individuals aging with a SCI. The authors used the areas of occupation defined in the Occupational Therapy Practice Framework: Domain and Process, 3rd edition (2014) as an outline for the development of the resource guide. Through the use of these areas of occupation, a resource guide for occupational therapists was created to use when working with individuals who have a secondary complication related to aging with a SCI.

The authors integrated the MOHO into the most common secondary complications found in the literature. The three most common secondary complications for individuals aging with SCI included pressure ulcers, bowel and bladder complications, and cardiovascular complications. The occupational therapist's role was addressed through evaluating each area of occupation defined in the Occupational Therapy Practice Framework: Domain and Process, 3rd edition (2014) impacted for the three most commonly identified secondary complications. In addition, this resource guide is beneficial as it can serve as a tool for occupational therapists to utilize when working with an individual aging with a SCI. This also allows for a holistic approach to occupational therapy as it involves all areas of occupation impacted by secondary complications of SCI. The resource guide also assists the occupational therapist in
advocating for the profession and need for services through the physician’s guide component included.

A bound and indexed document in both physical and electronic formats demonstrated to be the most suitable choice for production of this manual as it allows for the information to be easily accessed and referenced by an occupational therapist in a variety of treatment facilities. The bound document also provides an opportunity for physical or electronic distribution through mail or email to many occupational therapists on a national or international level. This document provides an additional handout for the occupational therapist to provide to primary physicians in order to advocate for the occupational therapy profession. The product provides the occupational therapist with an organized and user-friendly document that emphasizes the importance of OT services when applied to secondary complications of SCI with the ease of being shared across professions in order to promote the profession of OT and advocate for services.
An Occupational Therapist’s Guide

Aging with a Spinal Cord Injury: Secondary Complications

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Appendix


Appendix C - Healthcare Provider’s Guide for Individuals Aging with a Spinal Cord Injury: Cardiovascular Complications
Aging with a Spinal Cord Injury
Aging with a Spinal Cord Injury

At this moment in the United States of America approximately 297,000 individuals are living with a spinal cord injury (SCI). With an incidence of 11,000 cases annually, the population impacted by SCIs continues to rise. SCI is more than just a physical disorder; it also affects an individual psychologically, functionally, and financially (Sezer, Akkus, & Ugurlu, 2015). SCI is no longer a “fixed” disability, but instead a condition that adjusts function throughout the lifespan as well as affixes challenges to health (Friedman, 2007). Occupational therapy (OT) has the unique role of assisting individuals with SCIs in remaining as independent as possible as they age despite experiencing secondary complications. Occupational therapists are able to do this through the participation in the individual’s desired occupations.

Secondary complications for individuals with SCIs often lead to an increased rate of rehospitalization, loss of employment, and decreased quality of life. Although there are many secondary complications associated with SCI, the three most common secondary complications include pressure ulcers, bladder and bowel dysfunction, and cardiovascular complications. The secondary complications were chosen as they coincide with the aging process of individuals with SCI, making these complications appropriate for inclusion into this product. Additionally, these complications directly affect an individual's ability to engage in multiple areas of occupation, thus increasing the need for occupational therapy services.

In 2003, 85% of individuals with SCIs reported enduring one or more secondary medical complications; these secondary complications strongly contribute to the individual’s functional decline (Sezer, Akkus, & Ugurlu, 2015). In order to improve
survival, community participation and overall health-related quality of life in those with SCI, healthcare providers must be educated on prevention, early diagnosis, and treatment of chronic secondary complications during routine office appointments. Currently, there is little data to guide healthcare providers who deal with the changes related to those aging with SCIs (Friedman, 2007).

As the primary point of contact, the medical professional, most often the primary healthcare professionals, is responsible for promoting health and wellness of those with SCIs following completion of the acute phase of the injury (Milligan, Lee, McMillan, & Klassen, 2012). Additionally, while the patient may keep in contact with his or her primary healthcare provider, the healthcare provider is not always aware of how other professions involved in the first treatment team may assist with secondary complications later on. Healthcare providers being aware of common secondary complications may reduce the development and/or severity of such complications.

This easy to navigate resource guide will serve as a tool to provide occupational therapists with the role of OT for an individual aging with a SCI. When a therapist encounters an individual requiring services to treat secondary complications of a SCI, he or she can locate the complication and then make decisions regarding the appropriate occupations to address and guide goals and interventions. This product also assist the therapist in ensuring that interventions are client-centered and address all aspects of the person’s life. A practitioner can quickly reference the guide without needing to complete additional research prior to assessment. The guide also assists occupational therapists in advocating to health care practitioners for inclusion of occupational therapy services to better meet the needs of these individuals.
Justification for

Occupational Therapy

Services
Justification for Occupational Therapy Services

The rising cost of SCI care along with the personal, vocational, and social impact on an individual increases the importance of understanding secondary medical conditions while aging with a SCI (McKinley, Jackson, Cardenas, & DeVivo, 1999). While it remains important for rehabilitation professionals to be familiar with skills and conditions regarding initial rehabilitation for those with SCIs, they must also be aware of additional challenges and complications in order to help the patients at every stage of their lives. Occupational therapists can play a large role in assisting professionals with treatment of the secondary complications as well as assist patients in experiencing an increased quality of life as they age with a SCI.

Occupational therapists serve an important role in the acute stages of treatment after SCIs, but the primary healthcare providers are responsible for the health of the individual in years thereafter. The primary healthcare providers serve as the gatekeepers for individuals with SCI to receive OT services as they age and as secondary complications arise. Knowledge of the most common secondary complications of individuals aging with SCI and the corresponding services that OT provides can promote the overall health of these individuals. This knowledge in turn will assist primary healthcare providers in preventing further secondary complications as they age.

Occupational therapists can assist with secondary complications by addressing environmental modifications and evaluate the patient environment for safety and possible hazards. An occupational therapist considers the person’s physical, cognitive, and psychosocial status along with possible deficits due to the secondary complication. In addition, occupational therapists can educate on the use of adaptive equipment to account
for loss of strength or mobility restrictions related to one’s treatment. OT can provide functional strengthening exercises related to endurance, coordination, and balance to complete or maintain independence throughout the healing process. Prevention of further secondary complications is also a primary component of treatment for OT intervention. Therapists can also collaborate with patients to create schedules in managing medications, routines, bowel/bladder, and/or pressure relief while in turn increasing self-efficacy in managing one’s condition. Evaluation and assessment of adaptive equipment can also be completed by an occupational therapist to facilitate recovery as well as provide education and training to the individual about how modifications can be implemented.

With the addition of OT services into treatment of secondary complications, patients can be better educated and less likely to reduce additional secondary complications of increased severity. These individuals will also be better able to advocate for themselves as they will have additional resources and knowledge which allows them to adapt to changes in ability as they age. OT provides a holistic approach to therapeutic intervention with a patient by focusing more on the person’s abilities, rather than disabilities.
Methodology
Methodology

This product is designed to aid occupational therapists in working with those aging with a SCI and advocating to other health care professionals the usefulness of OT in the treatment of these individuals. This document is used as a resource guide for occupational therapists in order to address the various needs of these individuals as well as provide physicians with information regarding how OT can assist these individuals in their recovery.

The process of developing this product began with an extensive review of the current literature of aging with SCI, common secondary complications in SCI, OT’s role in SCI, OT’s role in pressure ulcer care, OT’s role in bladder and bowel dysfunction, and OT treatment for cardiovascular complications. The literature included an abundant selection of both qualitative and quantitative research studies. Through the use of many search engines that included Cinahl, OT Search, PubMed, PsycInfo, and various medical journals, a literature review was created. Additional data was gathered through national databases, OT course textbooks, and documents obtained from the American Occupational Therapy Association (AOTA) website.

The authors found a lack of information and resources regarding OT’s role in the treatment of individuals aging with a SCI. The authors used the areas of occupation defined in the Occupational Therapy Practice Framework: Domain and Process, 3rd edition (2014) as an outline for the development of the resource guide. Through the use of these areas of occupation, this resource guide for occupational therapists was created to use when working with individuals who have a secondary complication related to aging with a SCI.
The Model of Human Occupation (MOHO) was chosen to guide this document as it encompasses a person’s own values, habits, roles, personal insight, lifespan perspective, motivations, and environment. While considering a person aging with a SCI, it is important to consider a person’s past experiences and significant value of how routines and roles are impacted by secondary complications. Along with the mission of OT as a profession, this model reiterates the importance of a person to return to his or her valued occupations, roles, and meaningful environment.
Use of the Model of Human Occupation as a Treatment Guide
Use of the Model of Human Occupation as a Treatment Guide

The MOHO was used when designing this treatment guide to be used with individuals aging with a SCI. Based on the MOHO, the authors focused on how these secondary complications impact a person’s motivation, habituation, and values to allow an occupational therapist to provide the most patient-centered care, therefore improving a patient’s quality of life and ability to age with a SCI. The overall focus of the MOHO is occupational adaptation, which involves a patient possessing the ability to intrinsically adapt themselves and their environment to be most successful in desired occupations. The main components of the MOHO include (Turpin & Iwama, 2008):

- **Volition**—“a pattern of thoughts and feelings about oneself…which occurs as one anticipates, chooses, experiences, and interprets what one does” Kielhofner (as cited in Turpin & Iwama, 2008).
  - Volition is addressed in this product as it considers one’s decreased motivation when suffering with secondary complications. The limitations and accessibility to activities one enjoys also impacts one’s volition to complete these activities.

- **Habituation**—“an internalized readiness to exhibit consistent patterns of behaviour guided by habits and roles and fitted to the characteristics of routine temporal, physical and social environments” Kielhofner (as cited in Turpin & Iwama, 2008).
- Habituation is addressed in this product as one’s routine is significantly disrupted when suffering with secondary complications related to SCI. One’s habits may also be affected due to medical appointments, required treatment such as laying down for pressure relief, or added medications. Habituation may also be impacted for this population as one may need additional help in completing their daily routine, limiting one’s ability to complete their habits and roles.

- **Performance Capacity and the Lived Body**—“the ability to do things” and a person’s embodied experience
  - Performance capacity is reflected in this product as it directly assesses one’s participation and performance in all areas of occupation defined in the OT Practice Framework: Domain and Process (2014). The patient’s previous experience and knowledge base is also considered when providing OT services as each individual’s signs, symptoms, risk factors, and treatment will vary.

- **Environment**—“the particular physical and social, cultural, economic, and political features of one’s contexts that impact upon the motivation, organization, and performance of occupation” Kielhofner (as cited in Turpin & Iwama, 2008).
  - Environment is addressed as secondary complications have a strong impact on how and where occupations can take place. If a person is hospitalized for a secondary complication, not only does their physical environment change, their social environments could change as well. For those that are recovering at home there may be added restrictions to their
home environment such as community mobility and ability to work. These areas are discussed in this product as they are often areas that occupational therapists address.

- **Dimensions of Doing** - consists of three dimensions: occupational participation, occupational performance, and skill. This encompasses a person’s engagement in occupations that are necessary to one’s well-being, how the person completes the occupation, as well as what skills are required to perform the occupation (Turpin & Iwama, 2008).
  
  o The person’s three dimensions of doing are reflected in this product by consideration of the occupations he or she engages in and how well they are performed, as well as the skills necessary to complete the desired occupations. This product reflects the three dimensions of doing through breakdown of factors for each secondary complication in all areas of occupation.

- **Lifespan Perspective** - acknowledges that human occupation changes over time as age and circumstances change and the need for full understanding of the entire lifespan. The patient’s life has a temporal dimension which shapes his or her interpretations and behaviors in the present time, which are also impacted by future goals and aspirations (Turpin & Iwama, 2008).
  
  o The lifespan perspective is addressed in this product as it encompasses the individual's experiences throughout their lifetime and how their experiences have impacted them as they age. The person’s occupational
narrative serves as a guide for implementation of OT services and their reason for seeking treatment.

The MOHO considers how secondary complications of individuals aging with a SCI impact a person’s volition, habituation, performance capacity and lived body, environment, dimensions of doing, and lifespan perspective. The OT Practice Framework: Domain and Process (2014) was used to categorize the impact on a person aging with a SCI and address each area of occupation in order to connect the MOHO with the framework used throughout OT practice. A healthcare provider must consider the person and his or her occupations in order to provide occupation-focused, patient-centered, and evidence-based practice care. The MOHO also focuses on occupational adaptation as an overall focus, which is the main goal while working with those aging with a SCI. Occupational adaptation involves adapting occupations in order to employ as much independence as possible. The holistic approach to OT and the use of the MOHO allows a healthcare provider to assist a patient in being as independent and successful as possible while aging with a SCI.
Secondary Complications
Pressure Ulcers
Pressure Ulcers

Overview

Pressure ulcers are defined as an injury of the skin or underlying tissue, typically over a bony area, caused by unrelieved pressure or shear that results in decreased blood and lymph flow to and from a specific area. Individuals with a SCI have decreased circulation to their lower limbs which places these individuals at a greater risk for developing pressure ulcers as it takes less pressure to interrupt circulation. Pressure ulcers occur in about 85% of individuals with SCI and are a potentially life threatening secondary complication leading to the second most common reason for re-hospitalization in individuals with SCI. As individuals with SCI begin to age, their skin becomes thinner. The thinning of one’s skin increases their risk of developing a pressure ulcer by 30%, making recognition and treatment of pressure ulcers imperative to both the individual with a SCI and the medical team.

Pressure ulcers also often take a toll on one’s psychological health in addition to the physical complications and symptoms. Pressure ulcers have a significant impact on quality of life and one’s social interactions in individuals with SCI. One’s day-to-day activities are directly impacted during the healing process of a pressure ulcer as they spend much of their time in a pressure relieving position. This leads to decreased social interaction, engagement in meaningful activities and completion of one’s habits, roles, and routines. Not engaging in these meaningful activities can cause an individual to have decreased self-efficacy, confidence, and even lead to depression.

(Sezer, Akkus, & Ugurlu, 2015; Simandl, 2009; Lala, Dumont, Leblond, Houghton, & Noreau, 2014)
Signs and Symptoms

Pressure ulcers can occur in five stages, each with their own unique signs and symptoms. Each individual’s presentation of a pressure ulcer will vary, and they may present with all or some of the listed signs and symptoms.

- **Stage 1 or Unblachable Erythema:**
  - Skin may remain red after pressure is removed
  - Adjacent skin may present with: difference in temperature, be harder or softer, be painful, be itchy

- **Stage 2:**
  - Partial skin loss involving epidermis and/or dermis
  - Superficial in nature
  - Appears similar to blister or abrasion

- **Stage 3:**
  - Full thickness skin loss
  - Damage or necrosis of subcutaneous tissue but does not impact the underlying fascia
  - Present as a deep crater
  - Minimal tunneling may also be present at this stage

- **Stage 4:**
  - Skin loss with extensive destruction
  - Damage to skin or bone
  - Damage to surrounding tissue
  - Tissue necrosis

- **Unstageable**
  - Covered with eschar, or necrotic, devitalized tissue
  - The eschar blocks drainage of the wound leading to high risk for infection
  - May not be visible at skin surface increasing risk of complications

(Janssen, 2014)
**Risk Factors**

There are a variety of risk factors that contribute to a patient’s risk of developing a pressure ulcer including personal, sociodemographic, and medical factors. In addition to the listed risk factors, pressure ulcers generally occur over bony prominences. The areas at most risk for development of pressure ulcers in individuals with SCI are the ischium, trochanters, sacrum, and bony prominences of the feet. These areas should be assessed frequently by the patient and the multidisciplinary team in order to minimize the severity of the pressure ulcer and reduce its impact on one’s quality of life and engagement in occupations.

**Personal:**
- Duration of time with SCI
- Urinary/Fecal incontinence
- Lack of sensation
- Reduced physical activity
- Immobility
- Smoking

**Sociodemographic:**
- Aging
- Reduced level of education
- Unemployment
- Single status

**Medical**
- Poor nutrition
- Depression
- Muscle atrophy
- Pulmonary &/or cardiovascular disease
- Severe spasticity
- History of pressure ulcers
- Diabetes Mellitus

http://www.esteeklar.com/
**Treatment**
Occupational therapists can play a role in the assistance and management of pressure ulcers.

- Inspecting skin daily for sores
- Keeping skin clean and dry
- Avoiding excessive pressure or shear
- Pressure relief techniques
- Proper nutrition
- Early recognition of sores
- Body positioning
- Management of the wound site
- Scar management
- Proper fitting equipment such as a wheelchair cushion

http://dump.fm/jeronimo/2012-10-25/8866416
Occupational Therapy’s Role in Pressure Ulcer Care

Activities of Daily Living

- Position individual to alleviate areas of pressure ensuring postural alignment, stability, balance, and weight distribution
- Education on alternative techniques or modifications for bathing, showering, dressing, personal hygiene, sexual activity, and grooming due to much of time being spent in pressure relieving position
- Maintain/increase strength, range of motion, and endurance in pressure relieving position in order to maintain level of independence with transfers for bathing/showering, toileting, dressing, functional mobility, and sexual activity following healing of pressure ulcer
- Assess patient’s motivation to complete habits and routines and provide resources to facilitate occupational participation and performance

http://www.suzimorris.biz/62/how-to-discover-your-strengths/
Instrumental Activities of Daily Living

- Compensating for inability to care for others, children, and pets, such as through additional resources or adaptive equipment
- Providing additional resources for inability to drive due to medication prescribed for pain and/or infection
- Due to financial burden of pressure ulcers, provide home program and prevention ideas along with additional resources for financial management
- Compensating for deceased endurance and ability to care for home and complete home management through adaptive equipment or additional resources
- Evaluation of individual’s ability to remain safe in home environment during healing process
- Education on alternative methods of meal preparation such as microwave meals, healthy food choices, shopping assistance, and additional resources for food delivery
- Assist with completion of patient’s tasks related to their roles within their current environment

http://www.lepawroyalepetgrooming.com/services.html
Rest and Sleep

- Engaging in restful sleep despite pain
- Provide additional resources for sleep participation and preparation as these areas may be impacted and engagement in this area may be increased due to much of time being spent in bed
- Determining and implementing ample amount of rest needed for restored energy and to facilitate proper healing of pressure ulcer

Education

- Educating patient about condition including signs and symptoms as well as preventative measures for future occurrence of pressure ulcers
- Assisting with adapting to changes in function due to aging and secondary complications through providing education and resources on methods of doing so

Work

- If patient is working, collaborating with employer to adapt or modify job tasks once he or she returns to incorporate pressure relieving techniques
- Managing missed work and assistance with advocating for self upon returning to work

http://anyimages.info/galleryzdnw-zzz-icon.htm
Leisure

- Continued participation in desired leisure activities or exploration of activities that are conducive to the patient’s abilities and interests
- Provide resources for meaningful and enjoyable activities that can be completed in pressure relieving position including the use of occupation-based kits

Social Participation

- Encourage individual to maintain contact with friends and loved ones despite physical limitations through technology or visitors in the home or hospital

Please refer to Appendix A for the *Healthcare Provider’s Guide for Individuals Aging with a Spinal Cord Injury: Pressure Ulcers*
Bladder Dysfunction
Urinary Tract Infections

Overview

Often those with SCI require the use of bladder drainage with catheters. With the use of catheters also comes greater risk of urinary tract infections (UTIs). Due to the condition and methods to drain the bladder, UTIs are one of the leading secondary complications seen in those with spinal cord injuries. As those with SCI begin to reach the age of 60 and beyond, abnormal renal test results are more common. Long-term medical complications after a traumatic SCI assessed between year 1 and 15 in individuals at least 60 years or older, had a significantly increased probability of abnormal renal testing results.

(D’Hondt & Everaert, 2011; McKinley, Jackson, Cardenas, & DeVivo, 1999)
**Signs and Symptoms**

Signs and symptoms are often delayed or missed due to the lack of sensitivity from the sustained injury or the subtle gradual onset. Diagnosis is often discovered or confirmed with use of blood and/or urine tests.

Here are a list of common signs and symptoms of UTI:

- Pyuria (pus in urine)
- Fever
- Discomfort
- Kidney or bladder tenderness
- Painful or difficult urination
- Urinary incontinence
- Increased spasticity
- Autonomic dysreflexia
- Cloudy urine with increased color
- Malaise
- Lethargy
- Sense of unease

**Risk Factors**

A patient’s risk of developing a UTI stems from both structural and lifestyle factors.

Structural factors refer to body structures of a person with SCI, and lifestyle factors refer to a patient’s catheterization method as well as personal attributes contributing to his or her risk.

**Structural:**
- Detrusor sphincter dyssnergia
- Bladder over-distention
- Voiding under high pressure
- Stones in the urinary tract
- Vesicoureteral reflex
- Neurogenic bladder
- Bladder dysfunction

**Lifestyle:**
- Indwelling catheterization
- Urinary diversion
- Decreased cooperation and adherence to catheterization program
- Low knowledge of urinary system
- Lack of access to services
- Lacking support system
Treatment

- Medications
  - Antibiotics
  - Analgesics
  - Medications take three days up to one week to treat completely
  - If UTIs are recurrent, low-dose antibiotics can be taken for six months or more

- Revision of bladder management program
  - Increasing frequency of emptying of bladder
  - Utilization of a different type of catheterization
  - Considers lifestyle of patient including routines, habits, and roles

- Increased hygiene while completing bladder management
  - Hand-washing
  - Additional disinfection of equipment associated with catheterization and bladder management
**Occupational Therapy’s Role in Bladder Dysfunction**

Activities of Daily Living

- Increase strength and balance to optimize level of independence while bathing/showering, toileting, and dressing.
- Counteract medication side effects from treatment
- Increase endurance in order to complete personal daily grooming, such as styling hair or brushing teeth
- Education about adherence to medications and precautions
- Education about precautions in regards to sexual activity
- Assess patient’s motivation to complete habits and routines and provide resources to facilitate occupational participation and performance
Instrumental Activities of Daily Living

- Compensating for inability to care for others and pets, such as through outside assistance or adaptive equipment
- Compensating for deceased endurance and ability to care for home and complete home management through adaptive equipment or outside assistance
- Community mobility while adhering to driving restrictions and mobility precautions of medications and other treatment modalities of UTIs
- Education about management of finances due to changes in ability to work or financial burden related to UTIs
- Allowing individual independence or educating on compensatory strategies for preparation of meals while adhering to diet restrictions of condition or medication
- Evaluation of individual’s ability to remain safe in home environment and handle emergency situations
- Assist with completion of patient’s tasks related to their roles within their current environment
Rest and Sleep

- Participation in enough sleep per night while recovering, despite discomfort through positioning to promote comfort and pain relief
- Increased amount of time daily to rest in order to facilitate recovery

Education

- If patient is in school, working with missed classes or assignments while recovering
- Educating patient about condition and preventing further occurrence of urinary and bladder dysfunction
- Assisting with adapting to changes in function due to aging and secondary complications through providing education and resources on methods of doing so

Work

- If patient is working, collaborating with employer to adapt or modify job tasks once he or she returns
- Managing missed work and incorporating level of productivity to add meaning into patient’s life while recovering
Leisure

- Continued participation in desired leisure activities or exploration of activities that are conducive to the patient’s abilities and interests

Social Participation

- Encourage individual to maintain contact with friends and loved ones despite physical limitations from the UTI through technology or visitors in the home if community mobility is restricted
- Increase self-esteem despite urinary incontinence in order to maintain and promote engagement with friends and family
- Increase self-efficacy to counteract the impact that urinary incontinence can have on one’s perceived ability to engage with others

http://cliparts.co/free-clip-art-great-job
Please refer to Appendix B for the *Healthcare Provider's Guide for Individuals Aging with a Spinal Cord Injury: Urinary Tract Infections*
Cardiovascular Complications
Orthostatic Hypotension

Overview

Orthostatic hypotension (OH) is defined as “a decrease in systolic blood pressure of 20 mmHg or more, or a reduction in diastolic blood pressure of 10 mmHg or more, when the body position changes from supine to upright, regardless of whether symptoms occur.” OH is common in individuals with high thoracic spinal cord injuries and can severely impact the quality of life in individuals with SCI. Individuals with OH spend much of their time managing their unstable blood pressure which impacts their quality of life in numerous ways. OH is also often associated with fatigue which directly impacts an individual’s ability to complete meaningful activities, again impacting one’s quality of life.

**Signs and Symptoms**

The most common symptom of OH includes a sudden drop in blood pressure when changing body positions, such as sitting up in bed or following long periods of sitting. Additional signs and symptoms are as follows.

- Fatigue
- Weakness
- Dizziness
- Head and/or neck pain
- Upper body flushing
- Blurred vision
- Light headedness
- Fainting
Risk Factors

It is advised that individuals that are experiencing orthostatic hypotension avoid activities that may elicit falls in blood pressure. This may have a direct effect on the individual’s ability to participate in daily activities, may impact abilities to complete specific rehabilitation interventions, and greatly impact one’s quality of life.

Activities that may cause a fall in blood pressure:

- Changing in positions after laying down for long periods of time
- Sitting up in bed quickly
- Dressing
- Raising hands above head during bathing or grooming

Additional factors:

- Alcohol consumption increases blood pressure
- Caffeine consumption can spike blood pressure

(Claydon, Steeves, & Krassioukov, 2006).
Treatment

Current treatment of OH includes both nonpharmacological and pharmacological interventions.

Nonpharmacological:

- Application of compression to the abdomen and/or legs
- Avoidance of activities that can cause falls in blood pressure
- Raising head of bed 10 to 20 degrees
- Upper body exercise
- Functional electrical stimulation applied to the legs
- Biofeedback

Pharmacological:

- Fludrocortisone: helps increase the plasma volume in the body to help counter the drop in blood pressure
- Midodrine: increases peripheral vasoconstriction with an α-adrenergic
Autonomic Dysreflexia

Overview

Autonomic dysreflexia (AD) results when a somatic or visceral stimulus occurs below the level of a spinal cord lesion and activates unopposed, sympathetic activity. AD can occur in individuals with a T6 SCI and above. AD occurs in up to 70 percent of individuals with SCI throughout their lifetime. The most common cause of AD is bladder distension. If left untreated, AD can lead to seizures, loss of consciousness, cardiac complications, stroke, and even death.

http://www.fotosearch.com/CSP328/k19066265/

Signs and Symptoms

An increase in systolic pressure of 20 to 40 mmHg over the normal level at rest is the most common symptom of AD. Additional signs and symptoms of AD include:

- Nausea
- Blurred vision
- Shortness of breath
- Pulsing headache
- Anxiety
- Bradycardia
- Hot flushes/flushing of face
- Cold or clammy skin
- Sporadic sweating above lesion
- Goose bumps
- Vasocongestion
Risk Factors

AD is caused by bladder distension due to a full urinary bladder in 85% of individuals with SCI. Catheter blockage or kinking leading to urine retention are common causes for bladder distension in individuals with SCI. Additional risk factors include:

- Pressure ulcers
- Ingrown toenails
- Urinary tract infections
- Kidney stones
- Pregnancy
- Childbirth
- Tight clothing
- Sexual activity or stimulation
- Wound dressing changes
- Stimulation of pain receptors

http://www.people-clipart.com/people_clipart_images/
Treatment

Treatment for AD should be immediate and can help to prevent further complications of stroke, seizures, and death. Blood pressure should also be measured and treated as appropriate. An important aspect of treatment in AD is prevention. AD can greatly impact one’s quality of life and prevention of further complications and/or symptoms can assist in maintaining one’s quality of life. If the stimuli causing the increase in blood pressure cannot be removed or identified, pharmacological treatment can be administered to block autonomic function.

Immediate treatment includes:

- Removal/loosening of tight clothing
- Elevating the individual’s head
- Lowering legs to decrease intracranial pressure

(Hagen et al., 2012; Hung, 2009; Milligan et al., 2012)
Occupational Therapy’s Role in Cardiovascular Complications

Activities of Daily Living

- Educate on risk factors, alternative techniques and/or modifications for bathing, showering, dressing, personal hygiene, sexual activity, and grooming due to changes in blood pressure
- Position individual to assist with maintenance of blood pressure
- Counteracting symptoms and/or medication side effects from treatment
- Provide additional resources or modifications for functional mobility due to changes in blood pressure
- Maintain/increase strength and endurance in order to maintain level of independence with transfers, functional mobility, grooming, and bathing
- Assess patient’s motivation to complete habits and routines and provide resources to facilitate occupational participation and performance

Instrumental Activities of Daily Living

- Provide resources for assistance or adaptive equipment to care for others and pets
- Education about management of finances due to inability to work due to symptoms and/or financial burden related to cardiovascular complications
- Compensating for decreased endurance and ability to care for home and complete home management through adaptive equipment or outside assistance
- Providing additional resources for inability to drive due to decreased blood pressure
- Evaluation of individual’s ability to remain safe in home environment despite symptoms
- Educate on risk factors and how to avoid these while completing home management and meal preparation tasks
- Provide additional resources for shopping assistance, appropriate food choices, and if needed alternative methods of meal preparation such as food delivery or microwave meals
- Assist with completion of patient’s tasks related to their roles within their current environment

http://baltimoretimes-online.com/
Rest and Sleep

- Provide modifications and ensure proper positioning on sleep surface to assist with maintenance of blood pressure
- Determining and implementing appropriate amount of rest/sleep needed to facilitate recovery and restore energy
- Engaging in restful sleep despite signs and symptoms

Education

- Educating patient about condition including signs, symptoms, and risk factors to avoid provoking of symptoms
- Assisting with adapting to changes in function due to aging and secondary complications through providing education and resources on methods of doing so

Work

- If patient is working, collaborating with employer to adapt or modify job tasks once he or she returns to avoid drops in blood pressure
- Managing missed work and assistance in advocating for self upon return to work
Leisure

- Continued participation in desired leisure activities and exploration of activities that are conducive to the patient’s abilities and interests
- Provide resources for meaningful and enjoyable activities that can be completed while avoiding potential risk factors

Social Participation

- Encourage individual to maintain contact with friends and family despite symptomology through technology or visitors in the home or hospital
Please refer to Appendix C for the *Healthcare Provider's Guide for Individuals Aging with a Spinal Cord Injury: Cardiovascular Complications*
Resources

http://dx.doi.org/10.5014/ajot.2014.682006


Janssen, S. (January, 2014). *Pressure Ulcers*. Powerpoint presentation during OT 432 at University of North Dakota, Grand Forks, ND.


Appendix
Appendix A

Healthcare Provider’s Guide for Individuals Aging with a Spinal Cord Injury: Pressure Ulcers

Occupational Therapy can help with:

- Maintaining independence in everyday occupations
  - Suggest adaptations to allow patient to complete dressing, showering/bathing, toileting, grooming, and personal hygiene tasks
  - Provide modifications to environment or adaptive equipment in order to complete daily routine and self-cares
  - Teach ways to position body to alleviate areas of pressure while maintaining alignment, stability, balance, and weight distribution
  - Provide patient with functional strengthening exercise to complete or maintain independence following healing process
  - Evaluate patient’s environment for safety and possible hazards
  - Assess patient’s motivation to complete habits and routines and provide resources to facilitate occupational participation and performance

http://www.clipartpanda.com/categories/fitness-clip-art-cartoon
Occupational Therapy can help with:

- Preventing future pressure ulcers
  - Educate patient on pressure relief techniques, daily skin inspection schedules, early recognition of signs and symptoms
  - Educate patient on transfer techniques that minimize shearing and excessive pressures
  - Collaborate to create schedule for skin inspection and/or pressure relieving
  - Recommend prevention measures to incorporate pressure relieving into their daily routine such as tilt-in-space chairs and proper seating cushions
  - Assisting with adapting to changes in function due to aging and secondary complications through providing education and resources on methods of doing so
Occupational Therapy can help with:

- Evaluation of proper pressure relieving strategies
  - Evaluation of properly fitted equipment such as wheelchair cushion
  - Assessment of commonly used surfaces to implement additional pressure relief strategies or alternative surfaces
  - Recommendations for customized wheelchairs, specialized bed, or additional adaptive equipment to relieve pressure
  - Assist with completion of patient’s tasks related to their roles within their current environment

http://www.rehabmart.com/category/Pediatric_Wheelchairs.htm
Appendix B


Occupational Therapy can help with:

- Managing bladder schedules
  - Make modifications to new medication regimens
  - Incorporate new or modified schedule into patient’s typical daily routine
  - Evaluate home for potential inhibitors to current schedule and provide additional recommendations for bladder schedule
  - Assess patient’s motivation to complete habits and routines and provide resources to facilitate occupational participation and performance

http://www.clipartpanda.com/categories/daily-schedule-clipart
Occupational Therapy can help with:

- Increasing independence through functional strengthening while completing everyday occupations
  - Improved coordination and balance while getting dressed, showering, bathing
  - Suggest adaptations to environment to allow patient to cook for self and/or others
  - Instruct on use of adaptive equipment to account for loss of strength or mobility restrictions while navigating around the home and community
  - Assist with completion of patient’s tasks related to their roles within their current environment
Occupational Therapy can help with:

- Preventing further urinary tract infections
  - Educate patients on better hygiene techniques during catheterization
  - Collaborate to create new bladder management plan
  - Increase strength through upper body exercise in order to maintain or increase ability to complete bladder management tasks such as transfers, positioning, toileting, and adaptive equipment use
  - Assisting with adapting to changes in function due to aging and secondary complications through providing education and resources on methods of doing so
Occupational Therapy can help with:

- Evaluation of patient environment for safety and possible hazards
  - Eliminate of hazards in the bathroom to complete all catheterization tasks
  - Educate on adaptive equipment to use in order to remain safe while participating in desired occupations
  - Modify to current environment to reduce symptoms and risk factors

Appendix C

Healthcare Provider’s Guide for Individuals Aging with a Spinal Cord Injury: Cardiovascular Complications

Occupational Therapy can help with:

- Maintaining independence in everyday occupations
  - Provide modifications and ensure proper positioning of sleep surface to assist with maintenance of blood pressure
  - Suggest adaptations to allow patient to complete dressing, showering/bathing, toileting, grooming, and personal hygiene tasks despite symptoms
  - Provide modifications to environment or adaptive equipment in order to complete daily routine and self-cares
  - Evaluate of patient’s environment for safety and possible hazards
  - Assist with completion of self-cares and daily activities despite side effects of medications/treatment

http://www.atitesting.com/ati_next_gen/skillsmodules/content/ambulation/equipment/positioning.html
Occupational Therapy can help with:

- Increasing independence through functional strengthening while completing everyday occupations
  - Improve strength, endurance, and range of motion through upper body exercise
  - Adapt environment to allow patient to care for self, others, and/or home
  - Instruct on use of adaptive equipment to account for mobility restrictions of symptoms while navigating around home and community
  - Assist with completion of patient’s tasks related to their roles within their current environment
  - Assess patient’s motivation to complete habits and routines and provide resources to facilitate occupational participation and performance

http://www.suzimorris.biz/62/how-to-discover-your-strengths/
Occupational Therapy can help with:

- Preventing future symptomology
  - Educate patient on risk factors and alternative methods of completing daily routine to decrease changes in blood pressure
  - Recommend prevention measures to incorporate blood pressure maintenance into their daily routine such as a self-assessment of symptoms to know when to seek treatment
  - Modify current environment to reduce symptoms and risk factors
  - Evaluate current symptom maintenance strategies
  - Assist with adaptations to changes in function due to aging and secondary complications through providing education and resources on methods of doing so

http://www.fotosearch.com/clip-art/blood-pressure.html
CHAPTER V

SUMMARY

The product in the previous chapter is an all-inclusive resource guide detailing the role of an occupational therapist working with an individual aging with a SCI that has endured a secondary complication. This document was created due to the lack of occupational therapy literature and resources available for occupational therapists working with individuals that endure secondary complications while aging with a SCI. In addition, throughout the literature review a gap in information was found indicating OT’s role in the chronic stages of SCI as one ages as many of the articles addressed OT’s role in the acute stages of a SCI. The product created utilized the MOHO core concepts of volition, habituation, performance capacity and the lived body, environment, dimensions of doing, and the lifespan perspective. In addition, the areas of occupations outlined in the OT Practice Framework: Domain and Process (2014) were utilized to ensure consistency of occupational therapy terminology and ensure that all areas were addressed by the therapist when providing therapy.

The product was designed to be implemented in order to guide occupational therapists when working with individuals aging with a SCI that have endured a secondary complication. It was designed to provide the therapist with general information of the common secondary complications, provide areas of occupation that may be affected due to these secondary complications, while also incorporating a handout for the therapist to provide other healthcare professionals in order to advocate for the need of occupational therapy with these individuals.
The authors believe this product could easily be transitioned into use with primary care however research is needed in order to better understand this relationship. In addition, specific intervention and treatment ideas for each area of occupation may also be beneficial for therapists. The inclusion of additional research for other secondary complications may be beneficial as well as this product only addresses the top three complications for individuals aging with a SCI.

This product is in the early stages and research, additional student projects, and a pilot study of use may be beneficial to better understand the product’s effectiveness in the clinical setting. Ideas for expanding its effectiveness and content include additional complications and the document’s implementation in primary care. Although the document is a resource guide for occupational therapists working with individuals aging with a SCI that have endured a secondary complication, the material and format may also be beneficial for individuals with additional traumatic life changing injuries or diseases in order to ensure the holistic person is addressed throughout the therapist’s treatment.
Resources


http://dx.doi.org/10.5014/ajot.2014.682006


Janssen, S. (January, 2014). *Pressure Ulcers*. Powerpoint presentation during OT 432 at University of North Dakota, Grand Forks, ND.


