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Broadening the Role of Occupational Therapists within the ICU Setting: An Occupation-Based Toolkit

Roxana Chirinos

Carly Derouin

Broadening the Role of Occupational Therapists within the ICU Setting: An Occupation-Based Toolkit

By

Roxana Chirinos, MOTS

Carly Derouin, MOTS

Advisor: Andrea Young, OTD, OTR/L

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Andrea Young, OTD, OTR/L

Signature of Faculty Advisor

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ABSTRACT

Purpose: The purpose of this project was to create a quick intervention toolkit for occupational therapists treating clients in the intensive care unit (ICU) in order to increase occupation-based services, quality of care, and improve client outcomes. Additionally, this project hopes to enlighten occupational therapists who may experience burnout while providing services within such an intensive setting.

Methods: A literature review was conducted to determine the effects of and need for occupation-based interventions within the ICU setting. It was discovered that patients receiving occupational therapy services do not receive meaningful interventions to prepare for life after hospitalization. Although intense conditions are treated within this setting, patients have the ability to participate in more occupation centered services. To increase client functioning, rehabilitation is beginning sooner within the ICU, which can diminish therapist confidence for meaning to provide holistic, personable services. The increasing number of patients treated in this area as well as the increasing opportunities occupational therapists may have contributing their efforts in the ICU, establishes the need for this product.

Results: Through the literature review and consultation with previous ICU occupational therapists, a quick intervention toolkit to guide occupational therapy within the ICU was created to provide occupational therapists with ideas about treating the person, modifying the environment and instilling occupations within the ICU. The quick intervention toolkit was designed through the guidance of the Person-Environment-Occupation model.

Conclusion: In order to provide quality and client-centered care within the ICU, it is imperative that health professionals be oriented to their abilities and unique services that may be utilized within this area of practice. Through research and personal experience, it became evident that occupational therapists including other health professionals do not feel confident treating clients in the ICU. The limitations of this project include: all interventions within this toolkit have not been piloted, client factors and functioning levels are constantly shifting within this setting requiring continuous adaptations and grading of materials provided. Another limitation is that this toolkit is not comprehensive and only targets certain functional limitations and provided protocols may become outdated over time. Further recommendations for the quick intervention toolkit include: Use by fieldwork students, utilization by working occupational therapists as well as other healthcare professionals and the adaption of the toolkit for use by families.

CHAPTER 1

INTRODUCTION

Treating clients and implementing occupation-based interventions within the intensive care unit (ICU) can be a challenge for many occupational therapists (OT). The search for a comprehensive tool or product to utilize within the ICU setting provides minimal information and resources in the evidence-based research. Throughout the search process, the noted complexity of the ICU environment, severity of diagnosis, and opportunities for occupation based interventions were identified as specific needs within this setting. With the various opportunities for advancement in the ICU setting it is imperative to implement new strategies that can ensure the satisfaction, safety and effectiveness of occupational therapy intervention. It is time for occupational therapy to implement and advocate for occupation-based services within the ICU setting.

As research of current literature for an occupation based toolbox for occupational therapists working in the ICU/Acute care was created to enhance the services of the profession. This product is intended to be utilized by therapists who are new to the ICU/Acute care setting and who are falling into a redundant implementation of services that are not based in the occupational therapy paradigm. It can be used to assist with assessment, evaluation, communication, collaboration, and intervention ideas appropriate in the ICU setting. The occupation based toolkit is intended to increase competence and confidence of the occupational therapist working in the ICU.

The utilization of the Person-Environment-Occupation (PEO) model (Law et al., 1996) to guide the development of this toolkit. The PEO model is categorized as an ecological model and

focuses on the transactive relationships between the person, environment and occupation (Hinojosa, 2017). This model assisted with organization, development, and recognition of important aspects towards development of the occupation-based toolkit. A review of the current literature findings, methodology utilized, the product, and a summary of the overall process in creating this toolkit is identified.

CHAPTER II

REVIEW OF LITERATURE

Introduction

In order to provide occupation-based services, specific consideration of the various equipment, diagnosis and availability of resources commonly seen in the intensive care unit (ICU) need to be identified. With the creation of the ICU toolkit, all aspects of a diagnosis are taken into consideration. In addition, occupational therapists are provided resources to implement occupation-based care to clients. Within this practice setting common interventions focus on biomechanical related treatment impacting the successfulness of occupational therapy (OT) practice (Poulsen, 2012). Currently no similar tool has been created at this time. As the ICU setting is a complex environment the need for developing a creative yet appropriate, safe and effective intervention plan is necessary to enhance client satisfaction as well as increase outcomes. The creation of the ICU toolkit has the potential to advance the knowledge, resources and meaningful care provided by occupational therapists in the intensive care setting.

Definition of ICU

The ICU is a specialized area in the hospital for people who need critical care due to trauma or illness (White, 2016). It can also be called the Critical Care Unit. This environment is intended for the care of seriously ill or unstable patients who commonly remain in the hospital environment with high complexity levels (Backes, Erdmann, & Büscher, 2015). Most of the patients require constant, close monitoring and support from health professionals, equipment, and medications in order to keep normal body functions.

Admittance to the ICU is determined by the severity of client illness. According to Webb, Angus, Finger, Gattinoni, and Singer (2016), there are three main guidelines to determine the appropriateness for intensive care. First, patients who require advanced respiratory support alone are seen as eligible for ICU admission. Additionally, patients requiring the support of two or more organ systems are also seen in the ICU setting. Lastly, patients with a chronic impairment of one or more organ systems that restrict daily activities and who require support from another organ system are also commonly admitted into the ICU (Lewis, Ho, & Webb, 2007). Within this setting health professionals classify patients into two categories, surgical or medical patients. Surgical ICU patients tend to be younger and have more limited or reversible diseases with the impact of therapeutic services (Berenson, 1984). Medical ICU patients tend to be older, and more commonly have multiple chronic diseases or have more concurrent illnesses (Utilization of ICUs, 1984). These differences are important to note as utilization and particular ICU outcomes can impact the delivery of occupational therapy services.

The ICU is an expensive and rare health care resource that is utilized as necessary depending on the client's specific injuries. Appropriate levels of care in the ICU increase the cost of having clients remain in this setting (Fuchs et al., 2012). Higher costs are associated with the various intervention packages that the ICU can provide to its patients. For example, specific therapies for a disease may include technologies for physiological monitoring and organ system support, invasive mechanical ventilation and integrated multidisciplinary decision making to increase the outcome for the client. In addition, each ICU specifies a Level of care that is tailored to the client's specific needs as they undergo their specific treatment course. Please see the following section for additional information regarding Levels of care within the ICU.

Levels of Care

To understand the complexity of the ICU it is important to understand basic hospital levels of care. The ranking scale includes five Levels: Level I, II, III, IV, and V. The Level I trauma center is able to provide total care for every aspect of an injury (MacKenzie, Hoyt, Sacra, Jurkovich, Carlini, & Teter, 2003). The elements of care that Level I provide includes 24 hour in house coverage from prevention through rehabilitation (MacKenzie et al., 2003). In Level II definitive care is made for each injured client by providing in this level tertiary care needs such as cardiac surgery, hemodialysis and microvascular surgery may be referred to a Level I Trauma Center (MacKenzie et al., 2003). In addition, Level III demonstrates the ability to provide prompt assessment, resuscitation, surgery, invasive care and stabilization of injured clients and emergency operations (MacKenzie et al., 2003). In Level III staff members are able to provide evaluation, stabilization, and diagnostic capabilities for injured clients (MacKenzie et al., 2003). Level IV Trauma centers have demonstrated an ability to provide advanced trauma life support (ATLS) prior to transfer of clients to a higher level trauma center. Lastly, Level V provides initial evaluation, stabilization and diagnostic capabilities and prepares clients for transfer to higher levels of care (MacKenzie et al., 2003).

Each hospital center is rated in regard to capabilities to care for trauma related injuries. These services include outpatient settings, transitional care, and rehabilitation facilities. Outpatient care consists of a person coming to the facility, receiving care and then leaving the same day (MacKenzie et al., 2003). Transitional care services are implemented immediately after the ICU (MacKenzie et al., 2003). A client can stay up to 21 days in the transitional care setting (MacKenzie et al., 2003). Rehabilitation facilities vary on the diagnosis, insurance provided and

the overall potential of the individual (MacKenzie et al., 2003). Each transitional stage will vary on the degree of recovery of the individual as the healing progresses.

The ICU and ICU Environment

The care environment in the ICU setting is intended to care for seriously ill and unstable clients, who remain in the hospital environment and are considered to have a high complexity level in accordance with their health status (Backes et al., 2015). In this setting, aggressive and invasive procedures are performed therefore, the pace is accelerated and the battle between death and life are frequently imminent (Backes et al., 2015). Most commonly, clients are restricted to their bed and/or equipment. As a result, the ICU creates a stigmatizing perception with the regard to care and attitudes of workers. When considering the typical ICU environment, practitioners must identify not only the physical environment, but rather the social and symbolic environment with respect to the client as well.

The physical environment includes the objects in a client's surroundings. In a recent study, clients treated in the ICU setting were typically found on bed rest. Bed spaces are typically separated with curtains or folding walls (Meriläinen, Kyngäs, & Ala-Kokko, 2010). The floor materials are either tile or plastic, the walls are bare, and the ceiling is typically covered by the natural structure of the building (Meriläinen, 2010). The physical environment can be divided into direct and indirect environments. The direct physical environment includes the equipment and instruments used by medical professionals, equipment connected to the client such as respirators, client monitors and intravenous cannulas (Meriläinen, 2010). In addition, the direct physical environment includes lighting, noise, and temperature. The indirect physical

environment includes the hospital, client unit and room where the client stays (Meriläinen, 2010).

The social environment refers to other individuals that make up the client's surroundings within the setting. In the ICU, the social environment includes ICU personnel, other clients in the ICU, and relatives. In a 24-hour time period, a recent study found that clients' contact with other people varied from 41 to 165 direct contacts (Meriläinen, 2010). Additionally, the social environment includes tasks that take place in contact or non-contact with the client. Tasks involving contact with the client include physical examinations, support, advice, encouragement, and rehabilitation (Meriläinen, 2010). Tasks involving non-contact with the client include conversations in the client room, service operations, and data transmission (Meriläinen, 2010).

The symbolic environment can be thought of as the ideal, normative, and institutional elements (Kim, 2000). Functions such as routines based on norms, regulations, and knowledge are also considered the symbolic environment (Meriläinen, 2010). Routine functions include staff working hours, physical examinations, tests, blood samples, X-rays, and client hygiene (Meriläinen, 2010). Physicians are also included in this environment as they plan treatments, check measurements and perform specialized procedures. Overall, clients within an ICU environment may not be able to influence every aspect in their surroundings, however it is important to note that these factors affect them in a comprehensive manner.

Competency of Occupational Therapists working in the ICU

Caring for clients in the ICU requires medical and theoretical knowledge, safety awareness, clinical reasoning, decision making, and a team approach (Smith, Whittaker, Eldridge, & Creekmore, 2020). Occupational therapy practitioners are trained to improve

functional independence, cognitive performance, and quality of life in critically ill clients within the ICU (Tobar, Alvarez, & Garrido, 2017). Specifically, OT practitioners have the knowledge to view the client in a holistic manner. Not only will OT practitioners take into consideration the severe physical symptoms, but also practitioners will focus on mental health and cognitive factors to reduce problems with adhering to health practitioners' recommendations (Smith-Gabi & Holm, 2017). Additionally, occupational therapists are educated to assess and treat biological, psychological, and sociological factors of clients (Terry & Westcott, 2012). Therefore, occupational therapists have a broad range of knowledge and skills to offer clients in the ICU setting.

Occupational therapists are able to combine a paramount skill set with focus on safety awareness to help clients improve. Specifically, occupational therapists have the skills to focus on helping clients to improve their capacity and ability through range of motion (ROM), stretching, strengthening, improving sleep and rest, communication, dressing, and more. Additionally, OT practitioners can become certified in a specialized area such as feeding and swallowing, which may also be applicable within the ICU arena. Knowing every detail of diagnoses and procedures may not be possible. However, one critical aspect for defining the value of occupational therapy in the ICU setting is OT practitioner's ability to use evidence as an element to inform interventions and become aware of the highly changing environment (Leland, Crum, Phipps, Roberts, & Gage, 2014). OT practitioners have been trained for finding the most effective, relevant, and reliable sources to guide therapy.

It is important to note that most clients in the ICU may not have the ability to communicate due to ventilation, equipment lines, or other complications. Occupational therapists

can use their knowledge of adaption of tasks and create ways to improve the communication process. For example, occupational therapy practitioners may use a dry erase board to communicate in written form, create signals for 'yes' and 'no' use assistive devices as communication boards, or adopt motivational interviewing techniques. Motivational interviewing in the ICU can be an approach to improve communication within the therapist-client relationship. For example, OT practitioners can enable open-ended questions to better understand the client within this setting. By learning more about the client the therapist may be able to identify important occupation-based milestones to facilitate the client's motivation, enhance client perspectives and better understand the client narrative. These strategies will not only improve the therapeutic and recovery process, but also can be viewed as an advantage to other healthcare providers who may not receive training on communication or interviewing techniques for clients who are unable to or have difficulty communicating verbally (Radke, Bauman, Garret, & Happ, 2011). By having an occupational therapist implement these client-centered practices all aspects of the individual are taken into consideration by the medical team.

Rehabilitation has become a more familiar word in the ICU. There is ample evidence to support the role and positive outcomes that rehabilitation and early intervention can have in the ICU (Rozeboom, Parenteau, & Carratturo, 2012). Specifically, early therapeutic services have shown to decrease hospital stays and prevent clients from experiencing generalized weakness as well as secondary complications (Bombarda, Lanza, Santos, & Joaquim, 2016). Not only can OT services benefit the clients directly, but it can also save the hospital money. For example, a bed in the ICU costs approximate $1,250.00 more than a general hospital bed per day. Therefore, by

implementing early intervention, a significant amount of money can be saved while speeding up the process of recovery for ICU clients (Lucido Hillegass, 2012).

One of the primary goals in the ICU is to stabilize the client's medical status and address any relevant life-threatening issues. A second goal is to improve the functional status and client safety to prevent secondary complications (Smith-Gabai & Holm, 2017). Occupational therapists are able to perform interventions focusing on reception, coping, communication, functionality as well as family related treatment (Smith-Gabai & Holm, 2017). These goals are utilized to increase treatment success within the ICU and are key components of occupational therapy interventions. Occupational therapy intervention is indicated as a promoter of recovery of daily life (Bombarda et al., 2016). According to Bombarda et al. (2016) occupational therapy intervention is a contribution to treatment, since it has theoretical and practical bases that help in the prevention of most of the deficits presented within the ICU, especially through intervention. In this way, OT practitioners can effectively contribute to the care provided in an ICU through task analysis. The task analysis performed can ensure appropriate grading of activities based on the client's medical status, activity tolerance, and medical restrictions. After completing the task analysis, interventions may be selected based on the client's level of capabilities. Interventions should also be chosen based on client preferences, if the client is able to adequately communicate. Through this approach, practitioners are able to grade and adjust each treatment intervention as necessary throughout treatment sessions and the entire recovery process to ensure the goal of maximal recovery (Smith et al., 2020). The use of expressive and meaningful occupations or crafts give rise to functionality. For more intense needs, activities may be performed from bed level or in a seated position (Smith et al., 2020). Interventions may include

seated activities of daily living (ADL) such as completing toothbrushing, clothing bathing and dressing in the bed. For clients with less extensive injuries, activities can progress to out-of-bed activities as long as it is safe and medically appropriate for the client (Smith et al., 2020). Interventions may include performing ADL, parts of daily routines, and light work-related exercises. Due to critical needs of clients in the ICU, it will be essential that practitioners analyze pre-hospitalization roles and safety levels for determining the client's likelihood of resuming them (Smith et al., 2020). Factors such as potential need for adaptive equipment, modifications for safety, and mobility support must also be addressed.

As value-based health care services become more sophisticated and desired, it will be important to identify and recognize the specific contributions of occupational therapists to facility and system outcomes (Lamb & Metzler, 2014). There is growing evidence of improved client outcomes and functional abilities at discharge for clients receiving OT services (Smith et al., 2020). Occupational therapy practitioners have the ability to provide therapeutic services within the ICU that reflect health care trends and current best practice. Improved client outcomes are supporting evidence of the efficacy of occupational therapy services in the ICU setting.

The above information has demonstrated the expertise, skill level, and communication skills that occupational therapists have. These are key elements to working in an ICU setting. Due to the ICU being one of the most complex, dynamic, stressful, and time pressured arenas, a team approach is essential (Rose, 2011) The skills that occupational therapists possess reflect the ability of practitioners to contribute to the interprofessional teams within this setting. Rose (2011) suggests that having shared goals, respect, and power sharing among health professionals will help to improve interprofessional performance which results in quality client care. In order

to provide clients with quality care, it is crucial for ICU team members to work together and know each other's roles and responsibilities (Rose, 2011) The expertise and particular contributions of all health care professionals will be acknowledged in this process, resulting in client safety and improved outcomes. Overall, OT's use their clinical reasoning skills and clinical knowledge to safely and effectively manage the high intensity environment of the ICU, care for critically ill clients, and provide client-centered interventions to improve quality of life and return to daily function. Lastly, occupational therapists are able to work together with other members of a healthcare team to provide the most appropriate care for their client.

Need for Meaningful OT Intervention in the ICU

Admissions into the ICU are increasing due to aging populations, rising incidence of cardiac and respiratory diseases, as well as new forming diagnosis (Rapolthy-Beck, Fleming, Turpin, Sosnowski, Dullaway, & White, 2020). As a result of the increase in demand for services, former ICU treatment is becoming questioned for effectiveness related to client outcomes. Specifically, there is a need for further client centered, purposeful interventions to assist with life after hospitalization. Therefore, an increase in needs for occupation-based services is evident for the rise in admissions within the critical care setting (Rapolthy-Beck et al., 2020). With advances in medical care, more clients are surviving an initial stay in critical care, increasing prolonged postoperative stays of clients in the ICU (Gaudino et al., 2007, Rapolthy-Beck, 2020). However, they are experiencing ongoing health and cognitive limitations that may influence return to baseline function up to a year post-admission (Rapolthy-Beck et al., 2020). Altering the approach to rehabilitation through participation in meaningful cognitive and functional tasks may lead to further long-term benefits (Rapolthy-Beck et al., 2020). There is

ongoing need for research that dives deeper into the feasibility and effectiveness of graded occupation-based activities within the ICU (Rapolthy-Beck et al., 2020). Additional current research could provide merit for attention to whether clients in the ICU are receiving not just adequate but the best care possible (Gaudina et al, 2007). The literature strongly supports task-specific training, which occupational therapists are able to provide.

Interprofessional Team Members Role in the ICU

In order to provide individuals with the best care, it is critical that healthcare professionals work together to provide the most appropriate care. Much of the ability to work as a team is based on each team members understanding of their personal roles and responsibilities when it comes to client care in the ICU. The interdisciplinary team in addition to occupational therapy is composed of several members including intensivists, physicians, nursing, physical therapy (PT), speech language pathologists (SLP) respiratory therapists, pharmacists, dieticians and other administrative support staff. An intensivist role is to be the primary care doctor for clients as they are on call for direct client care in the ICU. The nurse's role is to constantly monitor the clients and respond to their needs as necessary. PT's role in the team is to provide mobility treatment and help the client begin movements while in or out of bed as well as begin early rehabilitation. The OT role focuses on addressing activities of daily living in the functional capacity that the individual can perform as well as beginning the process of early rehabilitation. SLP's works to evaluate and treat clients with various communication disabilities and swallowing issues. Respiratory therapists work with clients to maximize lung capacity and decrease the risk of respiratory distress and ventilator related issues. The pharmacist is known to prescribe appropriate medications for the individual in the ICU. Dieticians are responsible for

making sure that the client is meeting their nutritional needs. Additional administration support staff are utilized for billing, consultations, and religious support.

General Timelines for Recovery Processes

The aim of the ICU is to support clients until the cause of their injury can be treated and resolved before transitioning them onto their next step in the recovery process (Griffiths & Jones, 1999). As no facility is the same and the diversity of client care is ever changing it is important to raise awareness that timelines most commonly seen in an ICU setting may vary depending on the type of hospital organization in which care is being provided (Griffiths & Jones, 1999). As mentioned, no hospital organization is the same but the recovery progression throughout a hospital might follow a general track. There are some clients that might have a brief ICU stay of only one to two days. These clients are often previously healthy people who are recovering from scheduled surgery or have easily treatable infections (Ewens, Hendricks, & Sundin, 2018). Longer or more complicated ICU stays happen for several reasons. Upon entering the ICU clients may require longer ICU stays if they have a severe trauma or brain injury. With the variety and difficulty of each individual's case it often becomes hard to predict when a client may leave the intensive care setting (Ewens et al., 2018). With the first admittance into the ICU to the transition back home, this process includes various steps to complete prior to getting back to a fully functioning life. Clients are transferred out of the ICU when the care team feels that it is safe for the individual. In addition, clients will leave the ICU when they have recovered to the point where they do not need intensive monitoring and when they no longer require any treatments that can only be provided in the intensive care setting (Griffiths & Jones, 1999). A case manager will work closely with the client and their family members to ensure that the care

team is implementing safe transitions from within the hospital to the next appropriate environment such as home, acute rehabilitation, outpatient services, community transitions or into a skilled nursing facility (Ewens et al., 2013).

Provided in the following section is a description of the more common diagnoses that are most likely to be seen within the ICU setting. The identified injuries include traumatic brain injury (TBI), spinal cord injury (SCI), cerebrovascular accident (CVA), and general motor vehicle accidents (MVA). These specific diagnoses were selected as they were the most commonly seen in the ICU literature. A description of the injury is provided, a brief timeline of recovery and occupational therapy's role when working with each injury. In addition, this section discusses the importance of early rehabilitation provided by occupational therapists. Depending on the specific client and their needs the early rehabilitation route can be identified as appropriate with all of the previously identified injuries.

Traumatic Brain Injury

Traumatic brain injury (TBI) is defined as a blunt and unnatural damage to the brain caused by an external mechanical force and impact to the head (Werner & Engelhard, 2007). TBI's are caused by several factors such as car accidents, physical abuse, violence, falls, and sports-related injuries. TBI can be divided into three primary mechanisms of injury including blunt, penetrating, or blast (Nolan, 2005). Blunt trauma is the most common cause of TBI and is frequently a result of motor vehicle and bicycle crashes, pedestrian versus auto impacts, sports injuries and assaults (Nolan, 2005). Penetrating TBI's can be the result of any sharp or blunt object penetrating the scalp and skull exposing and entering the brain (Nolan, 2005). Lastly, blast

TBI are the result of a combination of blunt and penetrating forces (Nolan, 2005). The types of TBI are based on level of severity. The types of TBI include primary and secondary injuries.

Primary TBI's are injuries that are sustained immediately on impact which include intracranial hematomas, skull fractures, contusions, and concussions (Nolan, 2005). Intracranial hematomas are rupturing of blood vessels in the brain which can lead to an accumulation of blood in the brain tissues or unfilled sacs in the brain (Nolan, 2005). Skull fractures include a major injury as disruption of the integrity of the skull may lead to piercing injuries or exposed brain (Nolan, 2005). Contusions including bruising of the brain tissues (Nolan, 2005). Lastly, concussions are described as rattling and unnatural movement of the brain in the skull (Nolan, 2005). Secondary TBI's are changes or injuries in the brain that occur and set in immediately after impact and may start to show days or hours after an initial injury (Werner &Engelhard, 2007). Secondary TBI's include secondary impact injury, hypoxia, and cerebral edema (Nolan, 2005). Secondary impact injuries are a result of a second concussion before the symptoms and injuries from an earlier head injury subside (Nolan, 2005). Hypoxia is an absence of oxygen in the brain tissue to sustain body functions (Nolan, 2005). Cerebral edema is used to describe a condition of increased intracranial pressure caused by the buildup of fluid around the brain (Nolan, 2005).

In the beginning of ICU treatment to manage a TBI the staff is looking into maintaining cardiopulmonary and respiratory functions through identifying and restoring the ABC's (airway, breathing, and circulation) of the client (Nolan, 2005). Members of the interdisciplinary team will implement medication management as necessary. Additionally, surgery might be appropriate for some cases of traumatic injury to the brain. Once basic needs have been addressed, then other

treatment interventions can be implemented for the individual such as early initiation of rehabilitation therapies. Client positioning, range of motion and coma stimulation promote an environment in which the client has the best opportunity for optimum outcome (Nolan, 2005). Recovery time with a severe TBI will take longer than a mild injury. The healing process is all dependent on the individual client's specific needs.

Occupational therapists' role with the TBI population comes after stabilization of the client. As an OT working with a person who has sustained initial sequelae of a TBI, therapeutic intervention includes educating the client, family and support system about what to expect from the impacts of trauma. Families of clients with TBI likely require attention as well as the client as research has shown that family members of clients with TBI experience post-traumatic stress disorder (PTSD) and depression that are comparable to those experienced by critically ill clients relative to their diagnoses (Kreitzer, Rath, Kurowski, Bakas, Hart, Lindsell, & Aseoye, 2019). In addition, occupational therapists are able to provide behavioral, cognitive and computer-based treatment or assistive technology. Behavioral therapy relies on an interdisciplinary treatment team approach and is frequently implemented in conjunction with cognitive and other psychological treatments (Kreitzer et al., 2019). Occupational therapists are one of the few members on the team that are able to provide computer-based treatment or assistive technology to a client who has experienced a TBI. The use of computer-based treatment can be used by an occupational therapist to foster insight to cognitive strengths and weaknesses, development of compensatory strategies and facilitation of transferring skills into real-life situations (American Medical Association, 2019). In addition, assistive technology can be implemented when compensation is the last step of the rehabilitation process. Assistive technology options include

providing support for language and functional problems such as a communication device or addressing mobility needs (American Medical Association, 2019). Occupational therapists are also able to provide early rehabilitation training with individuals that have experienced a TBI.

Spinal Cord Injury

Spinal cord injury (SCI) is defined as an occurrence of an acute traumatic lesion of neural elements in the spinal cord and cauda equina (Jia, Kowalski, Sciubba, & Geocadin, 2011). The degree of a SCI is dependent on the extent of mechanical damage and also on the processes occurring during the secondary phase of injury. Treatment goals for a SCI have been retention or recovery of motor and sensory function (Jia et al., 2011). Pursuit of treatments may lead to life-threatening conditions such as unstable blood pressure, difficult intubation, or respiratory failure.

Spine stabilization and immobilization are critically analyzed within the first day of ICU admission in order to make further decisions regarding critical care management. Spinal instability is common in the presence of a SCI and can be further confirmed in clients who experience mechanical pain, posterior ligamentous disruption, and subluxation or deformity (Jia et al., 2011). The purpose of immobilization is to prevent or limit secondary neurologic injury such as when in the presence of an unstable spine (Jia et al., 2011). Typically seen within the ICU setting, immobilization techniques include placement of a cervical collar, transportation on a rigid board, halo-vest orthosis and log rolling techniques. General guidelines for immobilization state that the predicted time period is recommended until secondary injuries have been ruled out by physical examination and imaging (Jia et al., 2011) Possible secondary complications include pressure sores, difficult intubation, aspiration, pain, increased intracranial pressure and respiratory failure (Jia et al., 2011).

Another component that happens within the first day of admission (specifically, 8-24 hours form time of injury) is surgery. This is considered a strategy to combat potential complications, stabilization, and intensive care management. Common surgical procedures done include surgical decompression. The benefits of surgical decompression have been shown to secure immediate postoperative stability (Jia et al., 2011). Timing of surgical decompression can directly impact the course of recovery for the client. Specifically, early surgical decompression has been suggested to be most safe, and feasible, and as a result, improves clinical and neurological outcomes which reduce health care costs (Jia et al., 2011). For example, one treatment team has found that rapid transfer to the operating room is often the most effective way of decompressing the cord and stabilizing the spinal column (Jia et al., 2011).

After spine stabilization, immobilization, and surgical procedures have been completed, treatment management can begin. This typically starts within the fourth, fifth, or sixth day of a client's ICU stay. Ventilatory insufficiency and impaired airway secretion clearance have been the most common complications SCI clients experience (Murphy, 1999). This could lead to respiratory failure, which then can result in death. Therefore, ramifications for airway and respiratory management are essential. Noninvasive treatment options include techniques for manually assisted coughing by abdominal compressions, resistive inspiratory muscle training, and electrical stimulation methods (Murphy, 1999). Invasive treatment options to improve breathing include intubation, tracheostomy, and electrophoretic respiratory techniques. Cardiovascular complications are another area that requires medical treatment attention when in the presence of SCI. Specifically, hypotension, autonomic dysreflexia, cardiac arrhythmias, and

neurogenic shock are commonly seen in clients with severe SCI at the level of T-6 or higher (Murphy, 1999).

Out of all the mentioned complications that must be assessed with a SCI client, pressure ulcers remain the most significant problem and primary concern during the acute stages. Research has shown that early rehabilitation and intervention act as key factors in the prevention of potential complications that occur, primarily due to immobility (Murphy, 1999). Early ambulation is clinically useful. According to Needham, (2008) bed rest alone has led to physical deficits. Specifically, healthy, well-nourished individuals can experience a 5% loss of muscle strength for each week of bed rest. Additionally, during bed rest, disuse atrophy occurs in skeletal muscle and fluid losses contributing to postural hypotension have been observed (Needham, 2008). Therefore, treatment with the SCI population has to include early rehabilitation and mobilization. By incorporating such activities, use of natural muscle activity can positively impact a client's recovery process. For example, muscle activity can serve an anti-inflammatory role which may reduce inflammatory diseases and processes.

The importance of vigilance and client centered treatment in the acute phases of SCI is apparent with the aforementioned positive outcomes possible. For example, one published report investigated a routine multidisciplinary, twice daily, rehabilitation therapy in the ICU that was provided to intubated clients (Needham, 2008). The results of this study demonstrated that activity, including sitting and ambulation was feasible and safe for individuals in the ICU with compromised respiratory systems (Nedham, 2008). Furthermore, minimization of sedation and changing the ICU culture to focus on recovery and rehabilitation are key for successful factors in early mobilization and improved SCI client outcomes.

Treatment with an occupational therapist may only occur after sedation is lightened, after intubation, or once a client is discharged from the ICU. However, it must be recognized that occupational therapy can benefit a client with a SCI during their stay within the ICU. With this type of care strategy perspective, early focus is to improve client recovery and outcomes. Aspects of physical medicine and rehabilitation must be introduced within days of ICU admission. According to Needham (2008), early introduction and engagement with therapeutic services can minimize the heavy sedation and improve the prolonged weakness that typical SCI clients are faced with.

Occupational therapy can serve SCI clients well. Therapeutic services that engaged in occupation-based sessions, use of real life routines, and familiar objects were seen to have the most positive impact within a client's recovery (Foy, Perrit, Thimmaiah, Heisler, Offut, Cantani, Backus, 2011). For clients more involved within their SCI prognosis, the focus of ADL is appropriate. Specifically, OT practitioners have the knowledge to conduct activity analysis. As a result, therapists can match the client's health status with the client's interests (gathered from family or medical records) to create an effective, occupation-based intervention. Occupations that focus on ADL could be initial treatment areas as they occur in private nature which commonly resemble an ICU client room (Foy et al., 2011). ADL training will be dependent on the level of SCI, however, since clients are typically at a level of bedrest, OT practitioners have to be creative in the way interventions may be completed. For example, an OT practitioner may work with a client who is at bed rest but who used to be a hairstylist manager. The client may be currently dealing with loss of ROM, poor grasp, and difficulty with fine motor coordination. An appropriate occupation-based intervention may first begin with bringing over a board on wheels

with a spray water bottle and a cloth so that the client can engage in window washing which was a part of her work routine when opening and closing her salon. This activity would work on improving grip, increasing range of motion with the height of the plastic board, and also focus on use of the client's fingers which eventually will work towards improving fine motor coordination.

On the other hand, some individuals who have a SCI may present with fewer complications or considered to be less involved. Strengthening and endurance could be important areas that OT practitioners target with this population of SCI clients. Therapeutic strengthening and endurance activities can be delivered through prior work tasks, dressing, bathing, and other occupational areas (Foy et al., 2011). For example, mobile arm supports may be attached to a SCI clients wheelchair when medically safe, to increase strength while the client is engaging in their chosen occupation (Foy et al., 2011). A mobile arm support is a type of assistive device designed to support arm movements (Atkins et al., 2008). Arm supports reduce the amount of effort required to move or use the upper limbs. Length of time or repetitions the client completes within a session can also rise to work on endurance. It is expected that through the use of occupational engagement, SCI clients may enjoy their ICU stay, give them something to look forward to, and hopefully, increase their efforts for a chance to improve functional performance.

Cerebral Vascular Accident

Stroke, also commonly known as a cerebral vascular accident (CVA), is one of the most expensive and life altering conditions that affect the ability of individuals to participate fully in occupations, and their lives (Llinas, 2008). Specifically, acute ischemic stroke (AIS) is the commonest subtype. Stroke is considered a heterogeneous disorder due to the complexity of the

organ affected (Llinas, 2008). Therefore, clients with stroke can be more involved as this is not an isolated disorder. Additionally, stroke clients have a higher risk for developing secondary complications. Examples of these complications include experiencing peripheral vascular disease, coronary artery disease, atrial fibrillation, pneumonia, and deep vein thrombosis (Llinas, 2008).

Admission happens within the first 24 hours of injury. Clients who have more severe stroke cases may also experience increased intracerebral pressure and are admitted to an intensive-directed specialty ICU (Llinas, 2008). According to Llinas (2008), these clients typically have neurological worsening, fever, intubation requirements, and a progression of deficits.

Although clients get admitted quickly into a specialized ICU unit, some clients get admitted directly to a surgical setting to be operated on (Llinas, 2008). The client will then complete fibrinolytic therapy for acute ischemic stroke (Llinas, 2008). Fibrinolytic therapy can initiate local thrombolysis as well as lower total levels of fibrinogen. However, hemorrhagic conversion is associated with worsening deficits including strong urges to sleep, new cranial nerve palsies, and/or new neurological deficits (Llinas, 2008). Therefore, it is important to closely monitor the client post fibrinolytic therapy (until the second or third day of recovery).

It is after this therapy that clients move into an ICU unit within 24 hours after intervention (second day of recovery process) (Llinas, 2008). Serious complications that the client may experience during the third and fourth day of recovery include allergies, rashes, neck edema, and life-threatening angioedema (Llinas, 2008). Angioedema can restrict airway and

make breathing difficult. As a result, clients may require intubation or tracheostomy (Llinas, 2008).

Clients who have been admitted to the ICU or have received fibrinolytic therapy begin receiving techniques for managing their stroke by their care team. The goal for stroke treatment is to address acute decompensation after the initial stroke event (Llinas, 2008). Airway evaluation is the first step for stroke management. Specifically, clients should have endotracheal intubations to protect the airway from excessive secretions, loss of protective reflexes, or absence of a gag reflex (Llinas, 2008). Intubation causes clients to be sedated for comfort and better ventilation management however, this may compromise stroke care as stroke recurrence, progression, and development of increased intracranial pressure decreases a client's mental status (Llinas, 2008).

For the remainder of a stroke client's ICU stay, the ICU team focuses on preserving the ischemic penumbra and identification of stroke worsening, recurrent hemorrhage or increased intracranial pressure (Llinas, 2008). An ischemic penumbra is the area surrounding an ischemic event such as a stroke (Hakim, 1998). This area may be at risk of progressing to infarction. One of the most common options of treatment include repercussion therapy (Kirkman, Citerio, & Smith, 2014). The goal of this treatment is to restore impaired blood flow to the ischemic penumbra before irreversible neuronal death could occur (Kirkman, Citerio, & Smith, 2014). This treatment typically starts 4.5 hours from stroke onset, preferable as soon as possible. Additionally, clients should receive cranial imagining within the first 24 hours following repercussion therapy in order to detect hemorrhage or other complications of therapy (Kirkman, Citerio, & Smith, 2014).

ICU management of AIS will also focus on monitoring and optimizing systemic physiological homeostasis, and monitoring and management of intracranial complications (Kirkman, Citerio, & Smith, 2014). Hypoxemia is common after AIS and may adversely affect the client's outcome. Additionally, hypocapnia is associated with poor outcomes for stroke clients. According to Burnum, Hickam, and Mcintosh, (1954), hypocapnia is a state of decreased levels of carbon dioxide in the blood. Clients may be intubated and use mechanical ventilation; therefore, continuous monitoring of systemic oxygenation is essential for all AIS clients within the ICU unit. Clients with stroke may also experience seizures. Typical treatment for seizures includes the use of anticonvulsants, whoever, evidence has suggested that worse long term outcomes present themselves with the use of anticonvulsants (Kirkman, Citerio, & Smith, 2014). Rather, seizures should be treated aggressively, and longer term anticonvulsants considered.

Occupational therapists must understand the various challenges stroke survivors face. These include weakness on one side of the body, a decline in cognitive and emotional functions, social disability, inability to walk or care for themselves, and decreased participation in the community (AOTA, nd). Occupational therapy practitioners are instrumental with addressing these challenges along all continuums of care including within acute settings. Focus of OT intervention is to assist clients achieve health, well-being, and increase participation in life through engagement in meaningful occupations (AOTA, nd). One key component occupational therapists can provide when assisting with stroke rehabilitation is their education and clinical expertise OT practitioners use to analyze the interactions among the person, the environment in which they need to function, and the occupation they need or want to perform (AOTA, nd).

For clients in the severe and beginning stages of recovery following a stroke, intervention ideas may include addressing ongoing deficits such as weakness, sensory loss, and cognitive impairments that limit participation within ADL and instrumental activities of daily living (IADL). Other intervention areas could be evaluating and treating swallowing difficulties or developing strategies to overcome barriers to sexual intimacy (AOTA, nd). For clients in the less severe and later rehabilitation stages of stroke, interventions may focus on further retraining in self-care skills and adapting tasks or environments including appropriate implementation of adaptive equipment to maximize the ability to engage in ADL. OT practitioner's main role includes educating the client and family about remembering to address techniques and interventions provided in rehabilitation. Additional interventions may include training in community reintegration or modifying tasks and environments, performing work-related task analysis and work site evaluations, or providing pre-driving and driving evaluations including equipment recommendations (AOTA, nd).

Motor Vehicle Accident

Motor vehicle accidents (MVA) are considered to be an unintended collision of one motor vehicle with another, a stationary object, or person, resulting in injuries, or death (Harms, & Talbot, 2007). As each MVA varies in severity, location, and impact of the injury, the need of the client will be dependent on the individual's specific complications throughout the healing process. As an occupational therapist working in the ICU with MVA clients, it is important to become aware of the different injuries that could be present. Motor vehicle accident-related trauma may include injuries throughout the physical body from head to toe, internal injuries and

psychological related injuries (Harms, & Talbot, 2007). TBI care is dependent on the level of severity as well as the main source of impact. Neck related injuries can include whiplash, neck strains or dislocation of vertebrae. Recovery from a neck related injury will vary depending on the procedures put into place but it can take several months to fully recover. Back and spinal cord injuries can be seen as muscle strains, tears, and broken bones. These related injuries may require surgery (Harms, & Talbot, 2007). With spinal injuries relating to both the vertebral column and the spinal cord the body will complete a majority of its healing within the first 6 months after the initial injury. Physical functions that are not restored in the first year after injury will likely not return (Harms, & Talbot, 2007).

Internal related injuries are caused by the impact of body weight as it is rapidly pressed against the seatbelt or during contact at a high force with another object (Harms, & Talbot, 2007). Injuries that can be sustained and cause internal issues include any organ injuries related to the torso muscles such as the heart, lungs, liver, spleen, kidneys or bowls. Internal injuries can result in internal bleeding. In that case, recovery time will depend on the extent of the injuries and the necessary treatment required. Psychological related trauma may occur as a result of an MVA. Physical injuries from crashes may cause mental health related issues which can affect both the driver and passengers of an MVA (Harms, & Talbot, 2007). Mental health related issues that could be present after an MVA accident include PTSD, anxiety, and depression (Harms, & Talbot, 2007). There is no set time for recovery of psychological trauma. As an occupational therapist working with clients that have experienced the trauma of an MVA it is important to understand the signs of necessary intervention and rehabilitation in relation to the individual's occupational needs. In the early stages of a MVA client within the critical care setting

occupational therapists are able to perform beside evaluations to determine the safety recommendations (Salvador, Lashgari, Hermann, Finnen, Frost & Alexander, 2017) for provision of best care. In addition, occupational therapists are able to provide education to family and caregivers to assist with facilitating necessary range or motion, safe transitions, mobility, and to review skin checks (Salvador et al., 2017). If necessary, occupational therapists can again provide assistive technology such as tablets for communication and other desirable activities (Salvador et al., 2017). In the ICU setting, the occupational therapist working with MVA clients will be able to evaluate the need for interventions such as orthotics and positioning devices to help preserve joint integrity and protect the skin from breakdown due to prolonged pressure in the client is immobilized (Salvador et al., 2017). Additional considerations should be attended to depending on client factors and necessary supports.

Functional Mobility in the ICU

Early intervention including mobilization is the proactive provision of occupational and physical therapy to critically ill clients in the ICU (Fraser, Spiva, Forman & Hallen, 2015). It includes interventions to foster client's ability to sit at the edge of bed or on a chair, complete functional transfers, and ambulation, as well as provision of training for ADL performance (Fraser et al., 2015, Alder & Malone, 2012). Within the ICU setting the term "early" is defined as the interval of starting with initial psychological stabilization and continuing through the ICU stay (Fraser et al., 2015). By implementing rehabilitation services earlier, the client outcome will increase. Early occupational therapy can decrease time on a ventilator, reduce the risk of acute delirium and has been associated with lower rates of complications and ventilator associated pneumonia (Fraser et al., 2015)

Early rehabilitation within critical care settings is now considered effective and feasible when carried out within a multidisciplinary approach (Rapolthy-Beck et al., 2020). Throughout the world, clients who require intensive care often are restricted to bed rest because the pieces of equipment that surround them are perceived as barriers to mobility (Perme & Chandrashekar, 2009). Bed rest can lead to rapid deconditioning and muscle atrophy (Hashem, Nelliot, & Needham, 2015). In addition, bed rest in the ICU may be an important risk factor for long-term muscle weakness (Hashem et al., 2015). In practice, early mobility programs can be difficult to implement given the complexity of safely mobilizing a client while still on a ventilator (Fraser et al., 2015). Under most circumstances, monitoring and life support equipment, including ventilators should not limit mobility (Perme & Chandrashekar, 2009). However, therapeutic interventions lacking out of bed movement have impacted the way that occupational therapists have perceived the treatment of clients with increased tubing, ventilation and bed rest. As early mobilization and rehabilitation are proving to be safe and feasible with evidence of improved client outcomes, including decreased mechanical ventilation duration and improved physical functioning (Hashem et al., 2015). It is important that occupational therapists advocate for the need of change within the ICU setting. The move to a structured quality improvement project will help to close the large gap between research and routine clinical practice (Hashem et al., 2015). Continuing to involve the multidisciplinary teams with a recognized leader can be effective to deliver early mobilization and rehabilitation (Hashem et al., 2015).

As research continues to grow on earlier rehabilitation with clients in the ICU. Specific interventions have been implemented to increase early rehabilitation within this client population. A number of technologies are being evaluated to assist with rehabilitation and

mobilization of critically ill clients (Hashem et al., 2015). One such technology is neuromuscular electrical stimulation. Neuromuscular electrical stimulation delivers a low-voltage electrical impulse through electrodes placed on the skin overlying target muscles, causing a passive contraction (Hashem et al., 2015). In the ICU setting there has been an increase in interest with utilizing neuromuscular electrical stimulation for the prevention and treatment of ICU-acquired weakness (Hashem et al., 2015).

Measures of client safety, feasibility of interventions and functional outcomes of clients in the ICU are crucial factors in determining the effectiveness of early rehabilitation provided by occupational therapy services. Outcomes of early mobilization include increased strength and range of motion (ROM), higher rates of mobility and an increased quality of life (Adler & Malone, 2012). Increased strength and range of motion will be enhanced through initiating movement patterns for both upper and lower extremities. Increases in mobility will result in higher functional independence measures (FIM), higher scores on the Barthel Index as well as an increase in performance rates for mobilization milestones (Adler & Malone, 2012). As advances in client health increase the quality of life will be enhanced. There will be an increased chance of returning to baseline functioning, decreased duration of mechanical ventilation in clients and decreased need for post-acute care services (Adler & Malone, 2012). In addition, early rehabilitation provides no serious adverse effects or medical consequences. Mobilization of critically ill but stable clients in the ICU can be done safely with minimal risk to the client (Adler & Malone, 2012).

Limitations of ICU practice

Limitations to occupational therapy practice can be factored within the ICU setting. As healthcare professionals there are many barriers that impact the ability to provide necessary treatment. Specifically, a lack of leadership, lack of staffing or equipment, lack of knowledge or training, lack of physical referrals, amount of client sedation, delirium, client tolerance of activity and overall safety (Engel, Needham, Morris, & Gropper, 2013). Other limitations and barriers could present themselves depending on the specific facility. It is unlikely that all of these barriers will be present within an organization. However, it is important to be aware of the possible holds that could interrupt or deter a client's care. As occupational therapists are a part of the care team in the ICU it is critical that the intentions of the interdisciplinary team are ethical, provide solutions to barriers and look for the best possible outcomes for their clients.

A lack of leadership is represented within interdisciplinary teams when there is one overarching leader or several leader heads that work with a specific client's case (Engel et al., 2013). This creates confusion within the staff members of who to address for specific issues. The need for a physician head that deals with critical care support and an interdisciplinary team member such as an occupational therapist who works as a case manager for the individual to make sure that appropriate care is being provided (Engel et al., 2013). Lack of staffing and equipment within the ICU can create barriers to client care as it is the members of the team that work with the client to create positive outcomes (Hashem et al., 2015). In addition, a lack of knowledge and training specific for the ICU can inhibit client-centered interventions. According to Engel et al., (2013), appropriate evidence-based literature is not being utilized. Barriers to occupational therapists being implemented more into ICU care has contributed to the limitation in physician referrals to occupational therapists (Engel et al., 2013). With a lack of referrals for

occupational therapists in the ICU the ability to provide expertise from the profession is hindered for clients who could benefit from the professional help. Over sedation and delirium in the client can be another barrier for occupational therapy to be implemented (Engel et al., 2013). Lastly, safety is a barrier to care within the ICU for occupational therapists. To provide appropriate care safety is essential when working with a critically injured individual. Safety relates to being aware of potential contraindications, maneuvering around lines or monitors and reporting incidents as necessary (Engel et al., 2013). It is essential to keep the client safe at all stages of working with a client especially within the ICU. Occupational therapists are able to provide solutions to limitations that may be present in the intensive care setting. Stopping the barriers to client care provides a better understanding of how to provide services to the individual, limits additional injuries for the client and provides a positive client outcome (Engel et al., 2013).

Need for Occupation Based Interventions in the ICU

After clients have received medical treatment within an ICU setting, most clients are offered an ICU follow up appointment after discharge to home. According to Sevin, Bloom, Jackson, Wang, Ely, and Stollings (2018), most clients are contacted after discharge to arrange a follow up session however, due to ICU complications, clients face additional barriers to allow such a process. For example, clients are often so debilitated that they are unable to return to their personal residences, therefore, home contacts are unreliable. Another example is that some clients are discharged from the hospital when in reality, they are not ready to leave (functionally).

Therefore, a time lag is created in transitions between the ICU and home. Clients are then found to be transferred to other inpatient rehabilitation or long term acute care, which increases

the costs of health services and diminishes the original ICU's ability to meet for a follow up review. Sevin et al., (2018), was also able to identify that this population of clients were weak, sick, or cognitively impaired. Family members are an essential support that ICU survivors rely on. Therefore, most clients are unable to attend meetings (including follow-ups) without their support system and often get re-admitted to a clinical facility. The last barrier identified were mortality rates. Specifically, one fifth of ICU survivors continue to have high illness post discharge (Sevin et al, 2018). Therefore, these clients do not live long enough to attend a follow up session.

Although general treatment guidelines focus on stabilizing the client in order to proceed to discharge, there is a new call for action to improve the lives of ICU survivors. The numerous effects listed above are typically the result of treatment provided within the ICU setting. Specifically, intensive care interventions often sustain life under circumstances that will not achieve an outcome that clients can meaningfully appreciate (Huynh et al., 2013). For example, treatments that cannot achieve a client's goals or that maintains a state such as ICU dependence or permanent coma contrary to professional values, inappropriately uses health care resources, and can potentially create moral distress (Huynh et al., 2013). Treatment that encompasses these features are known as futile treatments. In a recent study by Huynh et al., (2013), 1136 clients were followed during their stay in an ICU setting. Ninety-eight of those clients were found to have probably received futile treatment and one-hundred and twenty three clients did receive futile treatments (Huynh et al., 2013). As a result, the hospital and 6-month mortality rates were higher for clients perceived as receiving futile and probably futile treatment compared with clients perceived as receiving no futile treatment. In addition, eighty-four of the one-hundred and

twenty three clients who were perceived as receiving futile treatment died before their hospital discharge date (Huynh et al., 2013). Within the critical care setting, most treatments that are perceived by physicians to be futile are common (Huynh et al., 2013). Although the outcomes of clients are uniformly poor and mortality rates significantly increased, futile treatment is still being used within these settings. One reason for this treatment includes client severity (Huynh et al., 2013). For example, within an ICU setting, most clients do not respond to critical care therefore, futile treatments are typically chosen.

A number of studies have identified meaningless treatment as a problem in highlighting technological medicine, such as in an ICU. In addition, some physicians have claimed that they often agree to initiate meaningless intensive care treatment (Halvorsen et al., 2008). Not only does intensive care treatment raise hospital costs, but it directly impacts the client in a negative manner. Meaningless treatment holds no relevance to the client , therefore, their motivation and positive outlook on the future diminish (Halvorsen et al., 2008).

In a study done by Dinglas, Colantuoni, Cielsa, Mendez-Tellez, Shanholtz, & Needham (2013), the research team evaluated the association between clients . Researchers took into consideration ICU factors and the temporality for the first intervention provided by occupational therapists to clients who had acute lung injury. It was identified that only 30% of clients with acute lung injury were provided therapeutic services during their ICU stay (Dinglas et al., 2013). Results of this study found that delay in OT services were associated with co-occurring complications. Some complication examples that were identified included worsening of the organic function, continuous hemodialysis, and uninterrupted infusion of sedation. This information reflects the unnecessary services that were provided to this group of clients because

physicians did not recommend nor were aware of the positive outcomes occupational therapy services may have offered.

Occupational therapists have demonstrated positive benefits when integrated into the ICU team. More importantly, their unique services have been highlighted to provide clients with the skills needed for increased independence with activities of daily living (ADLs) (Alvarez et al., 2012). A study done by Alvarez et al., (2012), created a randomized clinical trial to compare the effects of standard non-pharmacological treatment with non-pharmacological enhanced treatment (occupational therapy with standard care) for elderly ICU clients who were experiencing incidence of delirium. The results of this study verified that the group that received occupational therapy interventions experienced lower incidence of delirium, had less hospitalization time, and a better level of motor functional independence at discharge (Alvarez et al., 2012). Occupation-based services provide better coping with hospitalization, better levels of independence, functionality, and quality of life.

These studies show the positive effects that OT practitioners can provide to ICU clients. Occupational therapy services also enhance the facilitation towards returning to daily life and the social participation of individuals (Bombarda, 2016). Occupational therapists have the expertise to enable people to perform meaningful occupations that support health, wellness, well-being, and participation in life. Given the physical, cognitive, and psychological disability experienced by many ICU clients, occupational therapists treat this client population by including occupational knowledge, task grading perspectives, and holistic approaches. Identifying and quantifying ICU treatment that is perceived as futile is the first step toward refocusing client care on treatments that will more likely benefit clients but also enhance client outcomes outside the

hospital setting. Ultimately, occupational therapists can play an important role in client recovery while attending to the importance of engagement within occupations. Within the ICU setting, practitioners may utilize theoretical foundations for service support.

Theoretical Guidance for the Occupational Therapy Process

The Person-Environment-Occupation (PEO) model provides an exceptional framework to guide the therapeutic process within the ICU. The PEO model is considered a transactional approach that assumes an interdependence of the person and environment (Law, Cooper, Strong, Stewart, Rigby, & Letts, 1996). Law et al., (1996), acknowledge that behavior is influenced and cannot be separated from contextual influences, temporal factors, and physical and psychological characteristics. Through the use of the PEO model, the therapist is able to focus on the transactive interdependent relationship between the person, environment, and occupation. Services can be guided during assessment and interventions while the therapist recognizes that a person's contexts are continually shifting and as contexts change, the behavior necessary to accomplish a goal also changes (Dunn, Brown & McGuigan, 1994). As a result, occupational therapists can integrate their knowledge regarding environmental demands to provide services that support occupational needs during challenging times. For example, with increasingly high rates of client fatigue or loss of strength, occupational therapists may offer creative therapeutic interventions that target client factors while integrating interest within therapeutic services.

Within the PEO model, the therapist is able to focus on ways to support performance rather than focus on the limitations (Strong et al., 1999). For example, rather than focus change on the person, therapists can recommend that social policy and health intervention be used to change environmental conditions to ones that foster participation of people with disabilities

(Funk, 1987; Law, 1991). In a study done by Law (1991), therapists used environmental challenges as a foundation to structure intervention planning in which knowledge about client characteristics were used to promote satisfactory engagement in occupation to increase flow experiences and skill achievement. This is critical for treating individuals in the ICU due to clients having numerous areas to focus on and being so directly impacted by their environment (Maclean, Carin-Levy, Hunter, Malcolmson, & Locke, 2012). With this positive, ecological approach, the client may feel more valued as using the guiding principles of the PEO provides therapists an opportunity to examine fit in a number of areas that are important to the client (Law et al., 1996).

According to Strong et al., (1999), each case situation must go through the PEO process such as considering each aspect of their client's situation (occupational needs, client factors, environment). The PEO model guides the therapist to gather information about the client (person), the tasks and activities which are important to them (occupation), and their environment. In a collaborative client-therapist alliance, problems are addressed. Additionally, possible support to enhance the client's performance is considered. Using the PEO model, the therapist can involve the client's family in the analysis of the transactional relationships among the PEO components across time (Strong et al., 1999). Within the ICU setting, OT's may offer distinct services that target client's in a holistic way which in turn will enhance their overall outcomes due to the ability that OT's have to tailor their interventions specifically to the individual.

Person

The person is defined as a unique being who assumes a variety of roles simultaneously (Law et al., 1996). The person is seen in a holistic manner as a composite of the mind, body and spirit (physical, affective, cognitive, and spiritual). Specifically, the person is presented as a dynamic, motivated and ever developing being, constantly interacting with the environment (Turpin & Iwama, 2011). In relation to an ICU client, physical and cognitive aspects may determine the course of treatment.

Physical traits include diagnosis, injuries, or illnesses sustained. Additionally, the physical traits may also include the impact that these events have on the client's physical abilities including movement, muscular control, stability, and strength. Such factors encourage detailed client analysis for occupational therapists to integrate their expertise towards services for chronic or disabling diseases (Hanson & Stube, 2017).

Cognitive traits include level of awareness, information processing, and understanding one's lost deficits. Specifically, the level of cognition a client has may determine the level of engagement in interventions. Within the ICU setting, cognition may vary hourly due to medical status and medications the client may be receiving. Cognition may also vary depending on the length of stay the client has acquired. If a client has a more serious cognitive deficit, the therapist may need to take on additional approaches in order to provide the most effective services for the client. Client education may be diminished as the therapist may not have the level of awareness needed to understand certain therapy protocols or directions. Therefore, it is essential that the therapist assess and monitor the cognitive levels of function with each client prior to and after providing occupational therapy services.

Affect influences the extent a client participates or wants to participate in therapy. Specifically, the way the client may feel or hold attitudes towards certain activities, will determine the participation levels during interventions. The quality of a person's experience, with regards to their level of satisfaction may lead to a better outcome in recovery (Turpin & Iwama, 2011). According to Turpin and Iwama (2011), individuals' sense of who they are and what they are capable of develops and changes as they interact with the specific environments that surround them. Occupational therapists are trained to treat the client in a holistic manner, including the psychological aspects.

Spirituality is similar to a person's inner motives. Spirituality contributes to what the person values, believes and desires (Law et al., 2017). Clients in the ICU may experience having low inner motives due to their current state of health, environment, or pain. As a result, therapy may be meaningless and have a negative impact on the recovery process. Although clients in the ICU may be in one of the more serious health status influxes, spirituality may be the only thing keeping the client fighting and in a motivated state. Each person calls upon different spiritual qualities, therefore practitioners must incorporate this trait into the therapy process for meaningful interventions and effective client results. Clients change in their attributes, characteristics, abilities, and skills which affect the way they think and feel about themselves (Turpin & Iwama, 2011). These four categories are important for the occupational therapist to identify, analyze, and understand in order to recognize the client as a person, holistically.

Environment

The PEO model defines the environment broadly, including the cultural, institutional, physical and social considerations (Law et al., 1996). In order to treat a client in a holistic

manner, the PEO model guides the therapist to recognize each of these domains from the unique perspective of the person, household, neighborhood, or community (Law et al., 1996). This provides therapists with an approach to accept the various groups when considering development, classification of environments by category and personal perspectives, and inclusion of the cultural context. As occupational therapy practitioners, we are able to collaborate with the client in a respectful manner while taking into consideration all factors in relation to their various client groups they associate with.

Barker (1968) believes that the use of the physical environment itself dictates the manner in which individuals behave. Within the ICU environment, clients are surrounded with equipment, machines, absence of daylight, limited privacy, and increased noise levels. These factors have the ability to impact the client in a negative manner. For example, certain light and noise intensities increased the risk of clients developing delirium (Zaal, Spruyt, Peelen, Eijk, Wientjes, Schneider, Slooter, 2012). The study done by Zaal et al., (2012), suggested that changes to the ICU environment could decrease the number of days with delirium during ICU admission which increases the level of responsiveness towards therapy and rehabilitation services. This shows that modifications and adaptations can impact the activity level and therapy effectiveness with clients staying in the ICU. Occupational therapists have the unique expertise to critically analyze the environment and develop options for modifications and adaptations that support performance rather than hinder the recovery process.

The social environment within the ICU includes the interactions among clients, families, health professionals, and other allied staff. Interactions for every client may be different. For example, some clients may experience invasive interactions such as day operations. Interactions

can also be less invasive such as shaking hands to meet a new health professional or greeting visitors. The social environment in the ICU may also be fast paced. This could limit the time the client has for visiting with their loved ones and increase their time spent interacting with medical professionals. However, the social environment is a key element in sustaining the individual's prior life satisfaction. Specifically, prior to the ICU individuals may have been communicating with others consciously for most of the hours in a day than not.

Life transitions into an ICU setting may cause disruption to that individual. As occupational therapists, we must recognize the client's prior life routines and social relations. Ultimately, loss of support systems can lead to feelings of dehumanization (Wilson, Beesley, & Grow, 2019). In a respectful manner, the occupational therapist must try to increase social interaction time with their loved ones as this can assist motivation levels throughout the recovery process. Occupational therapists must also focus their attention to the clients loved ones/family. Approaches such as education, empathy, and encouragement are crucial during this stressful and unknown time. As occupational therapy treatment is holistically centered, promoting a positive social environment while someone is in the ICU could be a possible therapy goal. Specifically, this may benefit persons who do not have family or friends. These approaches could assist with reassuring the client is in worthy hands.

Lastly, occupational therapists must work in a collaborative manner with members of the interprofessional team as optimal client care in the ICU is a result of a cohesive team. This particular social interaction is necessary to provide appropriate, quality services to clients .

The institutional environment within the ICU relates to the policies and guidelines followed by the hospital. Within this setting, the institutional environment consists of policies

and cultures, mostly restricted, that promote dehumanization by taking control from clients and families (Wilson et al., 2019). The institutional environment can direct client care, use of protocols and implement certain expectations that drive staff to provide services in a certain manner. Overall, the environment is not static and can have an enabling or constraining impact on occupational performance (Law et al., 1996). It is crucial that occupational therapy practitioners take into consideration all environmental aspects pertinent to the client when determining options to improve performance.

Occupation

According to the *Occupational Therapy Practice Framework: Domain and Process,* occupations are central to a client's identity and sense of competence and have particular meaning and value to that client (American Occupational Therapy Association [AOTA], 2008). Specifically, occupations refer to the daily activities in which people engage (AOTA, 2008). Occupations occur over time and have individualized purpose, meaning, and perceived utility to the client . Additionally, occupations are categorized depending on the certain clients' needs and interests as well as context (AOTA, 2008). Occupations within the ICU setting are limited due to medical/safety constraints, lack of resources, limited time, and performance skill deficits. Common occupations that clients are able to experience include ADL such as brushing their teeth, dressing, and toileting. However, occupations are more than just self-care routines. Occupations can involve the execution of multiple activities for completion and can be identified through a broad range of categories including ADL, IADLs, rest and sleep, education, work, play, leisure, and social participation (AOTA, 2008). Occupations can contribute to a well-balanced lifestyle therefore, occupational therapists must use their knowledge to consider the

more complex interactions and valued occupations beyond just self-care (Maclean et al., 2012). Rather than limiting the options for clients in the ICU, occupational therapists have the ability to conduct activity analysis to match an activity to their particular client's level of functioning. Ultimately, use of certain methods to make tasks and occupations more available to the client.

Occupational therapists who use the PEO model to guide their provision of services will be equipped to conceptualize their clients and client needs from a holistic perspective. The elements from the PEO model offer flexibility in the ICU setting regarding the extent to which occupational performance areas are targeted. Specifically, each aspect of clients in the ICU from the PEO lens offers OT's flexibility in reasoning and providing care while considering the person, the environment, and anticipated occupations. These three elements are incorporated throughout the occupation-based toolkit through the provided intervention ideas. The ICU setting is a highly growing, fast paced area of practice in which a therapist must adapt to the ever changing circumstances while maintaining the ability to offer occupation-based services. The aim of this occupation-based toolkit is to provide a quick, comprehensive resources for therapists working in an ICU setting.

CHAPTER III

METHODOLOGY

Occupational therapists have the ability and educational foundation to provide specific occupation based and client centered services to clients within the ICU setting (Bombarda et al., 2016). Occupational therapists have a broad range of knowledge and have a specific role in various practice areas specifically the ICU. The information gathered from journal articles reinforced the evidence that the toolkit provides occupational therapists an appropriate resource to utilize as it focuses on the Person, Occupation and Environment of the individual when implementing interventions while highlighting the unique role of occupational therapy. In addition, the toolkit is able to provide resources in terms of a foundation for broader interventions that can be modified and adapted to fit the needs of individuals partaking in occupational therapy services within the ICU.

In addition, occupational therapists have a wide array of skills within their repertoire to work within the ICU setting. Specifically, occupational therapists have the skills to implement interventions that educate clients, as well as create various orthotics, improve range of motion (ROM), increase strength/stretching, increase appropriate positioning, provide education for bed mobility and transfers and education for continuity of care. Occupational therapists are not limited within this setting as they have received formal education among the areas listed and have the ability to create creative manners of health service delivery. Occupational therapists are able to provide early rehabilitation to clients while they are recovering within the ICU in a holistic manner.

The authors completed an in depth-literature review and analysis of current resources utilized in the ICU for client care to determine a need for the toolkit reference for occupational therapists (OTs) or students working with clients in the intensive care setting (ICU). Journal article searches were completed through the CINAHL, EBSCOHost, and PubMed to identify the appropriate content that would be implemented within the toolkit. In addition, the use of Google Scholar was utilized to gather additional current resources. A summary was written on each article selected to organize and obtain the most pertinent information to use within the toolkit. In addition, textbooks and reference guides from the Harley French Library were used within the making of the toolkit.

Resources chosen to inform the literature review were those pertaining to traumatic brain injuries, spinal cord injuries, cerebrovascular accident, motor vehicle accidents as well as early rehabilitation in the ICU which provided content relating to areas of occupation for occupational therapists to focus on. Selected literature and evidence were used to guide the instruction of various client-centered interventions to utilize while in the ICU, assessments to be used with various client diagnosis, adaptive equipment as well as information for working with family members and the client while they stay in the ICU.

The occupation based model, Person Environment Occupation (PEO) by Law et al. (1996), provided the theoretical basis for the literature review process, and for the development of the product. Constructs of the PEO served as guides for constructing/developing the occupational toolkit. The product interventions offered were split into three sections: Person, Occupation and Environment of intervention ideas. The Person section of the intervention focuses on the specific target areas such as client factors to enhance while the client is in the

ICU. The Occupation section of interventions relates to the specific intervention ideas and how to implement them in the ICU while also focusing on the individual's specific occupation-based goals. Lastly, the Environment section includes the resources that will be required to carry out each intervention with the focus on environmental demands including accessible materials. In addition, charts are provided to identify basic directions for various activities of daily living and how to implement them within the intensive care environment.

Through the review of journal articles, textbooks, and other references, the roles of health professionals working in the ICU were analyzed in comparison to the occupational therapist's role. Through the use of the literature an emphasis was placed on the importance of occupation based and client centered care to be provided to the individuals who are in the ICU setting. Therefore, there is utmost importance towards effective communication among healthcare professionals to provide appropriate care to individuals within this setting. As there are a number of diverse roles present with the care of a client receiving services in the ICU it is important that the interprofessional team communicates effectively with one another to increase the client outcomes as well as decrease the likelihood of medical related errors. Occupational therapists receive educational training regarding communication skills and interprofessional collaboration. Occupational therapists consider these important skills in addition to practicing in a culturally competent manner which enhances health services overall.

Occupational therapists do not receive education through curricular programs regarding specialized equipment used in the ICU. In addition, occupational therapists are not provided resources for specific interventions to implement with clients that are in intensive care. The environment of the ICU is extremely technical and relies on each individual component to

function safely, and correctly to increase the successful outcomes of clients. To increase the therapist's knowledge and improve confidence with intervention approaches when with clients in the ICU, the toolkit was created. This toolkit provides informational pages (potential of adding pictures) on the various interventions, techniques, contraindications, precautions and additional content that are necessary to providing quality, client-centered services.

CHAPTER IV

PRODUCT

Treating clients within the intensive care unit (ICU) can be a challenge for many occupational therapists. The authors were motivated to search for a holistic and client-centered toolkit to utilize within the ICU setting, however none was found. Throughout the search process, the authors noted the complexity of the ICU setting and the need to provide more client centered and meaningful treatment not only to improve client satisfaction or quality of care but rather, improve client outcomes for participating fully in life after hospitalization. The use of meaningful occupations is critical in ensuring satisfaction, smoother transitions back to normal routines, and professional identity of occupational therapy intervention within a highly intensive interdisciplinary team. Thus, the authors concluded the need for an occupation-based toolkit for occupational therapists.

The authors created an occupation-based toolkit for occupational therapists working in the ICU. This product is intended to be utilized by therapists who are new to the ICU setting, have difficulty contributing towards client care, or for those practitioners who would benefit from occupation-based ideas to provide to their clients during critical recovery times. Additionally, the occupation-based toolkit may be useful to students prior to or during their fieldwork rotations in a physical disabilities or acute type setting. It can be used to assist with assessment, evaluation, communication, and intervention appropriately within the ICU. Having access to this toolkit would benefit occupational therapists towards increasing competence, confidence, evidence-based support, client satisfaction, and professional identity when working in the ICU.

Throughout this process, the authors utilized the Person-Environment-Occupation (PEO) model to guide the development of the occupation-based toolkit. The PEO model is categorized as an ecological model and focuses on the transactive relationships between the person, environment, and occupation (Strong et al, 1999). The PEO model provides therapists with a guide through a typical therapeutic process including initial evaluation, assessment, intervention, and discharge/follow up. The theory of this model also emphasizes a strong client-therapist alliance and raises awareness to a person's ever changing contexts (Dunn, Brown & McGuigan, 1994). Within the PEO model, the therapist is able to focus on ways to support performance rather than focus on the problem (Strong et al., 1999). This is an essential component when treating clients within the ICU due to the numerous areas of focus and being so directly impacted by their constantly changing environments (Maclean, Carin-Levy, Hunter, Malcolmson, & Locke, 2012).

According to Strong et al. (1999), each client situation must go through the PEO process. The PEO model guides the therapist to gather information about the client (person), the tasks and activities which are important to them (occupation), and their environment. This model assisted in the organization and development of the occupation-based toolkit which an occupational therapist can utilize to provide the highest quality of care through meaningful occupations that focus on each PEO component. Within the product, practitioners can expect to see P, E, O, concepts integrated into intervention ideas. For each of the most common ICU treatment cases, targeted areas have been described under the person (P) component. Intervention ideas including their descriptions are found under the occupation (O) component. Finally, intervention materials with addition of alternative resources have been identified within the environment (E)

component. Practitioners are advised to consider each intervention idea with respect to their client and client factors. Resources with addition to the alternative lists have been provided to further engage various client ranges into occupational therapy interventions.

CHAPTER V

SUMMARY

There is a need to explore, support and serve ICU patients through occupation-based lenses within specialized and technically demanding environments. The purpose of this project was to create a quick intervention toolkit for occupational therapists treating clients in the intensive care unit (ICU) in order to increase occupational-based services, quality of care, and improve patient outcomes. Through the use of this product, a therapist can demonstrate increased confidence and knowledge when treating patients through a holistic manner.

The exploration of current literature supported the development and creation of this product. The Person-Environment-Occupation (PEO) model (Law et al., 1996) provided guidance and organization for the product. First addressed in this product are the main conditions treated within the ICU. The quick toolkit then breaks down each condition to list typical protocol progression as well as intervention ideas following the PEO sequence. First addressed is the person, this is thoroughly explored through an assessment table including person factors: functional limitations and areas of treatment. The second aspect addressed is occupation. Occupation is covered through proceeding tables addressing activities of daily living and other leisure activities. The third area that is addressed is the environment. This includes a following list covering the physical aspect of the environment by highlighting materials and resources occupational therapists may use when carrying out interventions. The institutional, social and cultural aspects of the environment are covered through selection of intervention ideas with the addition of therapeutic use of self when grading each intervention to each client.

There are limitations to “Broadening the Role of Occupational Therapists within the ICU Setting: An Occupation-Based Toolkit ”. The first limitation is that this product has not been piloted in the ICU setting. Another limitation is that it only includes a number of intervention ideas targeting certain functional limitations. There are a number of client factors that could be included; however, the authors chose the most common and relevant treatment areas for occupational therapists. Client factors and functioning levels are also continually changing. The listed functional areas and protocols may become outdated over time, however, will still provide sufficient information for therapists. To eliminate these limitations, it is recommended that the product be piloted by therapists working in the ICU and then adapted according to feedback received as well as outcome measures provided.

The quick intervention toolkit could be integrated into fieldwork course curriculum to address purpose and potential in various areas. Specifically, students may read and analyze the literature review to identify occupational therapists’ purposes within this area of practice. Students may also review intervention ideas provided within the product to address potential and possible expansion in intervention ideas when treating patients in the ICU. This product could also be incorporated into the ICU units of hospitals and used for integrating students and entry-level therapists into the setting. Lastly, the product can be used as a motivational means to instill hope in working therapists experiencing burnout.

Through the research of this project, the authors discovered that occupational therapists lack the necessary resources and confidence to provide holistic, personable services (Leland, Crum, Phipps, Roberts, & Gage, 2014). Within this quick reference toolkit, authors included a section regarding occupational therapy competence and education to support their practice within

this setting. It is concluded that this quick intervention toolkit has the potential to increase confidence and quality of care provided by therapists treating patients in the ICU. Additionally, authors hope that the listed sections provided by this toolkit will improve the knowledge of interdisciplinary medical professionals regarding the effectiveness and unique services occupational therapists may offer.

Further recommendations for this project include, creating a version of the product for the client's family to utilize. The product could also be expanded further to include recently used interventions and should be updated every two years in order to provide the most up to date protocols for therapists. This product will be presented at Frank Low Research Day in the spring of 2021. It is possible that the authors may choose to showcase their work at the American Occupational Therapy Association Conference in the upcoming years as well.

Broadening the Role of Occupational Therapists within the ICU Setting: An Occupation-Based Toolkit

Roxy Chirinos, MOTS

Carly Derouin, MOTS

University of North Dakota

Master of Occupational Therapy Program

Table of Contents

Introduction

Treating clients within the intensive care unit (ICU) can be a challenge for many occupational therapists. The authors were motivated to search for a holistic and client centered toolkit to utilize within the ICU setting, however none was found. Throughout the search process, the authors noted the complexity of the ICU setting and the need to provide more client centered and meaningful treatment not only to improve client satisfaction or quality of care but rather, improve client's outcomes for participating fully in life after hospitalization. The use of meaningful occupations is critical in ensuring satisfaction, smoother transitions back to normal routines, and professional identity of occupational therapy intervention within a highly intensive interdisciplinary team. Thus, the authors concluded the need for an occupation-based toolkit for occupational therapists.

This occupation-based toolkit is intended to be utilized by therapists who are new to the ICU setting or for those practitioners who need true occupation based ideas for client care. Additionally, this toolkit may assist students with completing their fieldwork rotations within a physical disabilities or acute care setting. The toolkit was created to be used in various ways such as assisting with assessment, evaluation, communication, and intervention within the ICU. Having access to this toolkit would benefit occupational therapists towards increasing competence, confidence, evidence based support, client satisfaction, and professional identity when working in the ICU.

Throughout this process, the authors utilized the Person-Environment-Occupation (PEO) model by Law et al. (1996) to guide the development of the occupation based toolkit. The PEO

model is categorized as an ecological model and focuses on the transactive relationships between the person, environment, and occupation (Strong et al, 1999). The PEO model provides therapists with a guide through a typical therapeutic process including initial evaluation, assessment, intervention, and discharge/follow up. The theory of this model also emphasizes a strong client-therapist alliance and raises awareness to a person's ever changing contexts (Dunn, Brown, & McGuigan, 1994). Within the PEO model, the therapist is able to focus on ways to support performance rather than focusing on the problem (Strong et al., 1999). This is an essential component when treating clients within the ICU due to the numerous areas of focus and being so directly impacted by their constantly changing environments (Maclean, Carin-Levy, Hunter, Malcolmson, & Locke, 2012).

According to Strong et al. (1999), each client situation must go through the PEO process. The PEO model guides the therapist to gather information about the client (person), the tasks and activities which are important to them (occupation), and their environment. This model assisted in the organization and development of the occupation-based toolkit which an occupational therapist can utilize to provide the highest quality of care through meaningful occupations that focus on each PEO component. Within the product, practitioners can expect to see P, E, O, concepts integrated into intervention ideas. For each of the most common ICU treatment cases, targeted areas have been described under the person (P) component. Intervention ideas including their descriptions are found under the occupation (O) component. Finally, intervention materials with addition of alternative resources have been identified within the environment (E) component. Practitioners are advised to consider each intervention idea with respect to their

client and client factors. Resources with addition to the alternative lists have been provided to further engage various client ranges into occupational therapy interventions.

Evaluation List

Physical Assessments

Assessment	**Purpose**	**Client Population**	**Area of Person Addressed**	**Time**
Barthel Index of Activities of Daily Living (Mahoney & Barthel, 1965)	To measure activity limitations in clients with neuromuscular and musculoskeletal conditions Measures functional independence in domains of personal care and mobility	Persons with neuromuscular and musculoskeletal conditions and stroke.	Physical Cognitive	2-5 minutes Self-Report
Borg Scales (Borg, 1998)	To measure a person's perception of their effort and exertion, breathlessness, and fatigue during physical work	Stroke and Neuromuscular conditions	Motor Physical	5 minutes
Critical-Care Pain Observation Tool	Was designed to assess the pain of critically ill clients who are incapable of reporting their pain. Can be used to assess pain based on facial expressions,	Can be used to assess intubated or sedated	Pain	No specific time

(Gelinas, Fillion, Puntillo, Viens, & Fortier, 2006)	muscle tension and movement as well as compliance with ventilated breaths for intubated clients. Vocalized pain can be assessed for non-intubated clients.			
Functional Independence Measure (FIM) (Deutsch, Braun, & Granger, 1996)	Measures the level of client disability and indicates how much assistance is required for the individual to carry out activities of daily living	Spinal Cord Injury Stroke Recovery Brain Injury Pain management	Cognition Physical	30-45 minutes

Mental Status Assessments

Assessment	**Purpose**	**Client Population**	**Area of Person Addressed**	**Time**
Confusion Assessment Method for the ICU (CAM-ICU) (Ely, 2016)	To identify delirium for clients within the ICU.	All intensive care clients including medically ventilated.	Cognition Behavioral	No specific time
Rancho Los Amigos Level of Cognitive Functioning (Hagen, Malkmus, & Durham, 1979)	Used to assess the level of head trauma and response	Clients who have experience head trauma (TBI)	Cognition Behavioral	No specific time

Glasgow Coma Scale (Teasdale & Jennett, 1974).	Used to assess the level of consciousness of clients	Clients with acute brain injury	Cognition	10-15 minutes
Agitated Behavior Scale (ABS) (Corrigan, & Bogner, 1994)	Measures behavioral aspects of agitation during the acute phase of recovery from acquired brain injury	Brain injury	Cognition	30 minutes
Canadian Occupational Performance Measure (COPM) (Law, & Canadian Association of Occupational Therapists, 1991)	Measures client's perception of his or her occupational performance over time	All (ages 7+)	Cognition (self-perception)	15-30 minutes
Richmond Agitation-Sedation Scale (RASS) (Sessler, Gosnell, Grap, Brophy, O'Neal, Keane, et al., 2002)	10 point scale, with four levels of anxiety or agitation for clients who have been sedated from medications.	All intensive care clients	Cognition, alertness	5-10 minutes

Contraindications to Initiating Therapy in the ICU

The chart below provides contraindications for occupational therapists to be aware before implementing intervention plans. Normal ranges and extremes have been identified within the chart.

Contraindication (vitals)	Limits (normal ranges)
Mean Arterial pressure	<65, >110, normal MAP= 70-90 mmHg
Systolic BP	>180 mmHg, >20% decrease in SBP/DBP, orthostatic hypotension
Heart Rate	<40, >130 beats/min, >20% decrease in resting HR
Respiratory rate	<5, >40 breaths/min
Pulse Oximetry	<88%, >4% decrease
Elevated intracranial pressure	>15 mmHg (or otherwise specified by medical team)
Positive and expiratory Pressure (PEEP)	> or equal to 10
Oxygen levels	Higher than 90

Note. The suggested vitals and corresponding values are from Evangelist & Gartenber, (2016)

In addition, occupational therapists will want to be aware of possible contraindications:

- Uncontrolled seizures
- Acute change in mental status
- Hemodynamic instability
- Open chest/abdomen
- Unstable fractures
- Uncontrolled active bleeding
- Level of sedation
- Client agitation requiring increased sedative administration
- Evidence of elevated intracranial pressure
- Active gastrointestinal blood loss

- Active myocardial ischemia
- Insecure airway (device)
- Client refusal

(Adler & Malone, 2012), (Perme & Chandrashekar, 2009)

List of Precautions to be Aware of:

- Difficult/insecure airway
- Continuous dialysis
- Vasopressor medication
- Lumbar drain/external ventricular drain (need to re-calibrate with movement)
- Severe osteopenia

(Adler & Malone, 2012)

List of Possible Surgical Precautions:

- Many of these precautions might include weight bearing precautions such as:

Weight Bearing Status	**Percentage of Body Weight**
Non-weight bearing	0% of body weight
Toe-touching weight bearing	Up to 20% of body weight
Partial weight bearing	20-50% of body weight
Weight bearing as tolerated	Up to 100% if the individual can tolerate
Full weight bearing	100% of body weight

(Pierce, 2014)

The following information has been adapted from Budash (2021) and Maher & Mendonca (2021):

- Spinal Precautions (BLT)
    - No Bending forward past 90 degrees
    - No Lifting over 5 to 10 pounds
    - No twisting trunk
    - Utilize the log roll method for bed mobility tasks to avoid twisting the spine
    - Braces need to be worn at all times when out of bed
    - Braces will need to be put on while lying down in bed

    - Utilization of reachers and sock aids will be advised for lower body dressing

- Hip Precautions
    - Anterior
        - No hip extension (no stepping backwards with surgical leg)
        - No bending past 90 degrees
        - No pivoting externally (outward)
        - No crossing legs (internal rotation)
        - Sleep on surgical side when side lying
    - Posterior
        - No internal toe or leg rotation
        - No flexion past 90 degrees
    - Open Reduction Internal Fixation (ORIF)
        - Used for acute hip fractures
        - Weight bearing precautions as specified by the surgeon or partial weight bearing
        - Does not require specific hip precautions
        - Mobility and ambulation as tolerated

- Knee Replacement Surgery
    - Always use the assistive device
    - Lead with the walker, then the surgical leg, followed by non-surgical leg, make sure to keep the walker close
    - Avoid twisting the surgical leg
    - Avoid sitting in low chairs or surfaces
    - Lower body dressing will be difficult so implementing the use of a reacher and a sock aid will be advised

- Coronary Artery Bypass Graft Surgery (CABG) Precautions
    - Need to use heart hugger when completing standing, coughing or sneezing
    - No lifting over 5 pounds
    - No raising arms above the head
    - No horizontal abduction (puffing chest out)
    - No pushing or pulling

- Shoulder Surgery
    - After an arthroplasty
        - Keep sling on affected arm for at least one week even during sleeping
        - No pushing, pulling or lifting

        - Complete pendulum exercises if prescribed by doctor
        - Place a small pillow or towel rolled behind the elbow to avoid shoulder hyper-extension.
        - No external rotation beyond 30 degrees in scaption
    - Education for ADL tasks
        - No pushing up from chair, toilet or bed with the surgical arm until told to do so by a physician.
        - No hygiene tasks for reaching behind for toileting tasks with surgical arm until cleared to do so.
        - Upper body dressing will be hard for this client, education will need to be provided for:
            - Wear button ups or loose-fitting shirts
            - Do not use surgical arm during the tasks
            - Utilize hemi technique for getting it on
                - Placing the injured arm in first, taking off the non-surgical arm first and gently sliding off of the surgical.
        - Use the non-surgical arm for all other basic ADLs until cleared to do so by physician.

Signs of Intolerance:

- Oxygen saturation below established range by medical team
    - If oxygen drops below 90% rest breaks are required for that individual.
    - Vital monitoring will be important as this person may become lightheaded, dizzy or begin to fall.
    - In addition, when working with someone with lower oxygen the person may require oxygen to be supplied to the body through wall or tank O2. As the therapist working with the tubing it is important to be mindful of potential fall hazards that can present themselves due to increased tubing surrounding the client in addition to any other medical equipment already present.

- Increased work of breathing
    - Rest breaks will be important for this individual whether it be seated or standing breaks.
    - Providing respiratory breathing techniques can be beneficial for this client as it helps them center their thoughts on their breathing process
    - In addition, relaxation techniques may be beneficial with this client.

- Change in vitals deemed to be excessive as defined by medical team

    - A change in vitals means an activity is causing a rapid shift within the client. It is important to make sure that vitals are being assessed consistently with a client experiencing these symptoms.
    - It would be beneficial to slowly introduce activities as well as grading the complexity to fit the needs of the client.
        - Example: if a client is performing a dynamic standing activity and they report that they are getting dizzy. It would be appropriate to sit down, check vitals for blood pressure, oxygen saturation as well as pulse to regulate where they are at after standing. If low in any of their vitals it might be beneficial to complete a new dynamic seated balance task to help regulate the individual's body.
- Negative change/alteration in cognition, increased agitation
    - Changes in cognition will be apparent and being prepared for anything to happen is important for safety for the occupational therapist and the client.
    - Anger management techniques will be provided later within the product under the TBI section. It is important to not crowd or create additional stimulus when a person is feeling agitated. Redirection will be important to help the client calm down.
    - If overall cognition changes due to symptoms of increased ventilation it is important to help orientate the client to current surroundings. It would be beneficial to implement introductory cognition activities if essential through self-care tasks and other functional activities.
    - It is important that whatever is being addressed is what is stopping the client from moving to a new setting or transitioning home. Be aware of what the client needs to increase to gain function for independence.

Equipment Needs:

The chart below provides occupational therapists with an insider look regarding common items or tools that may benefit treatment sessions. Additionally, it is important to note that the items listed below should be general materials found in an ICU.

Ambulation Equipment	Bathroom Equipment	Self-Care Equipment
• Gait Belt • Wheelchair • Front Wheeled Walker • Four Wheeled Walker • Single-Point Cane • Quad Cane	• Tub Transfer Bench • Sliding Tub Transfer Bench • Shower chair • Shower stool • Bath board • Commode chair • Handheld Shower Hose • Grab Bars • Non-Slip mat • Long handled brush • Soap mitt • Terry-toweling bathrobe • Toilet paper tongs	• Reacher • Sock Aid • Button hook • Long handled shoehorn • Elastic Shoelaces • Suction brush • toothpaste dispenser • Electric toothbrush • A stable chair • Adjustable bedside table • Electric shaver • Adaptive handles • Long handled hairbrush or comb • A mirror

Tips for Transfers

Consider the following before performing a transfer (Pierce, 2014):

- Client's medical precautions
- Amount of assistance or the number of people needed to complete transfer
- The amount of time needed to perform the transfer safely.
- Client's ability to understand the directions.
- Any environmental barriers that may cause potential barriers.

Proper Body Mechanics:

- Keep the client close to the body.
- Have the client facing forward.
- Keep knees bent and back straight.
- Place fee shoulders width apart and keep heels firmly planted on the ground.
- Use leg muscles instead of back muscles as much as possible.
- Consider the weight of the client and utilize assistance levels as needed.
- Avoid twisting or rotating the trunk. It is better to use pivots or step rather than rotation of the body.
- Avoid combining movements such as rotating and bending at the same time.

Types of Transfers

- Using different types of mechanical lifts to transfer (Pierce, 2014):
    - A mechanical transfer is a dependent transfer that requires a device to move the client from one surface to another.
    - Mechanical lifts are used to move those who are unable to stand on their own or whose weight makes it unsafe to move or lift the client manually.
    - Portable lift device, ceiling-mounted lift device, portable compact lift will be used for:
        - These mechanical lifts will be useful to use with clients who are totally dependent, are partial or non-weight bearing, very heavy or have other physical limitations.
        - Transfer devices can be used to transfer from bed to chair from chair or floor to bed, and for toileting or bathing tasks.
        - These devices increased the client's overall safety and comfort when completing transfers.

- <u>Dependent transfer</u> (one person to as many as necessary to complete the lift)

    - A dependent transfer is used to transfer a client from one flat surface to another. The therapists carry the client in a supine position to the next surface.
    - This transfer should be completed with commands to move the client at the same time and done safely to move the client in a safe and proper way.

- Lateral transfers
    - Can be completed with
        - Gurneys, transfer cots with handles, ceiling mounted devices, free standing lateral transfer devices, boards or mats as well as air-assisted lateral sliding aids.
        - This dependent transfer requires the client to be in supine and carried from one surface to another while lying in a supine position.

- Slide board transfer
    - The client will utilize a wooden board under their bottom and thigh and use the upper extremities to push their body across the board onto the new surface.
    - Is an assisted transfer used for clients who have some sitting balance, some upper extremity strength and can adequately follow directions.

- Lateral scoot transfer
    - This transfer is completed when a client cannot stand independently but can bear weight through the arms and can bear weight through the lower extremities.
    - The client will use their upper body to scoot on a flat surface until they reach the new surface.

- Squat (bent) pivot transfer
    - This transfer is used to move a client who cannot stand independently but can bear some weight through the trunk and lower extremities.
    - The therapist should utilize momentum and raise the client or allow for as much assistance as possible to get into a squatting position then a pivot should be initiated to lower the client to the new surface.

- Stand pivot transfer
    - The client should have functional balance and the ability to pivot when standing to position the body in front of the new surface.
    - An assisted transfer is used when a client is able to stand and weight bear through one or both of the lower extremities.

- Stand step transfer

    - This transfer is similar to the stand pivot except the client actually takes a step to maneuver and reposition his or her feet in front of the new surface instead of pivoting the body.
    - An assisted transfer is used when a client who has the necessary strength and balance to weight shift and step during the transfer.

- Sit-to-stand
    - This transfer is completed when a client can go from a seated position into standing. This transfer should be completed with individuals who have adequate balance and ability to weight bear through the trunk and lower extremities.
    - Can be completed with power sit-to-stand or standing-assist devices.

Level of Assistance (Fasoli, 2014)

- Dependent (Total A): client requires total assistance for the transfer.
- Maximum Assist (Max A): client does 25%, caregiver does 75% of the transfer being completed.
- Moderate Assist (Mod A): client does 50%, caregiver does 50% of the transfer being completed.
- Minimum Assist (Min A): client does 75%, caregiver does 25% of the transfer being completed.
- Contact Guard Assist (CGA): caregiver has hands on client, gives verbal cues but does not physically assist during the transfer.
- Stand by Assist (SBA): caregiver is nearby and ready to assist by does not touch the client during the transfer. The caregiver may provide verbal cues as necessary.
- Modified Independent (Mod I): client is able to complete the transfer without the caregiver present by requiring adaptive equipment to complete the task.
- Independent: client is able to complete the transfer without a caregiver present and without the use of adaptive equipment.

Transfers

Client transfers will be common in this setting as many of the clients will be injured and possibly unable to complete normal everyday function. It will be important to have safety as the main focus of transfer training with clients. In addition, the use of proper body mechanics as the occupational therapist will be important. Gait belt needs to be placed on the individual before

moving a client for increased safety of both the client and the occupational therapist completing the transfer. Gait belts provide security in lifts and help to provide the best ergonomic lifts for healthcare staff (Pierce, 2014). Set up for a transfer is key component to completing the movement with increased awareness of safety. Keeping surfaces close and at the same height if possible (Pierce, 2014). When teaching a client how to transfer it will be important to provide clear, concise and short directions before completing the transfer with the client (Pierce, 2014). This way the individual is prepared for the move and can provide as much assistance as possible. It might be beneficial to provide a demonstration to the client of what the transfer should look like before completing the movement. In addition, it will be important to agree on timing of the transfer with the client and other professionals assisting with the lift. By counting to three before completing the transfer may be beneficial to everyone involved. Another important consideration when transferring a client is to allow the client a few seconds in a new position such as from lying to sitting before placement into a wheelchair as it will allow blood pressure to stabilize before the moving through the transfer (Pierce, 2014). When performing a transfer never allow a client to hold your neck or upper body when transferring as this can lead to injuries and possible falls (Pierce, 2014). Whenever possible have the client scoot forward and lean towards their strong side of their body. It is important to not attempt transfers that are more than a therapist can handle in terms of weighted load.

Proper Body Mechanics:

- Keep the client close to the body.
- Have the client facing forward.
- Keep knees bent and back straight.
- Place fee shoulders width apart and keep heels firmly planted on the ground.
- Use leg muscles instead of back muscles as much as possible.

- Consider the weight of the client and utilize assistance levels as needed.
- Avoid twisting or rotating the trunk. It is better to use pivots or step rather than rotation of the body.
- Avoid combining movements such as rotating and bending at the same time.

TBI

TBI Recovery Timeline:

Within the first few weeks after a moderate to severe brain injury swelling, bleeding or changes in the brain chemistry are often affecting the function of the brain and impacting the healthy brain tissue (Laureys et al., 2010). The person's eyes may remain closed and the person may not show signs of awareness. As the healing progresses the swelling in the brain will decrease, blood flow and brain chemistry will improve and overall brain function will increase (Laureys et al., 2010).

Admission---------- Discharge

Timeline Days	Client Description
1-2 days of admission	Various levels of alertness: ● Coma: ● Vegetative State (Unresponsive Wakefulness Syndrome)
3rd day of admission	Change in level of alertness to: ● Minimally Conscious State ● Emerged from Minimally Conscious State ● Client typically begins recovery from surgical procedures, will become more alert and might begin to regain some level of memory.
4-5th days of admission	● Rehabilitation treatment begins with considerations of vitals to provide appropriate safe care. ● Invasive or noninvasive treatment options if applicable.
6th day of admission	● Rehabilitation treatment will continue as necessary to increase functional performance. ● Attention to further complications will be addressed as necessary.

Note. The timelines and cognitive functional levels are from Laureys et al. (2010).

Levels of Alertness

According to Laureys et al. (2010) the different characteristics of each level of alertness will very according to the individual. A coma will have signs that a person is unconscious, eyes closed, will not respond to visual stimulation or sound as well as be unable to communicate or show emotional responses (Laureys et al., 2010). In the vegetative state (Unresponsive Wakefulness Syndrome) the person will be able to breath on their own, their eyes will open, the reflexes are functioning and the individual can make movements, but they will not be purposeful, and the person may be able to startle to noises and visual stimulation (Laureys et al., 2010). In the minimally conscious state the individual is partially conscious, may know where sounds and visual stimulation are coming from, have the potential to recognize objects and may respond to commands, utter words or show emotion by they are inconsistent (Laureys et al., 2010). The last stage is the emerged from minimally conscious state. In this state the individual has the capabilities to answer basic questions and show that they know how two use at least two different objects correctly (Laureys et al., 2010). When a client is progressing through the alertness levels there should be an expectation that there will be variability in how each individual regains consciousness.

Length of Recovery

Most improvement after a TBI will happen within the first six months after the initial injury (Laureys et al., 2010). Within the first six months the person with the injury will likely move and think better as the brain begins to recreate neuron pathways (Laureys et al., 2010). As time moves on the speed of improvement will slow down but the person can continue to gain more function for years after the injury (Laureys et al., 2010). In addition, the rate of improvement will vary from person to person. No healing process is the same for individuals.

Occupation-Based Interventions for TBI

Target Areas (Person)	**Intervention Ideas** (Occupation)	**Resources** (Environment)
Orientation	Orientation: ● Person ● Place ● Date ● Situation	Resources: whiteboard/dry erase marker, paper/pencil, additional signs in room
Range of Motion (ROM) & Strengthening	● Passive range of motion (PROM) ○ Do not stretch past the end range of the individual's capacity. This will be extremely important to be aware of when working with clients who are unaware of pain tolerance as well as unable to provide feedback for the stretch. ● Active assist range of motion (AAROM) ○ Do not stretch past the end range of the individual's capacity. ● Active range of motion (AROM) ○ Will be completed with clients as they have increased strength to do activities by themselves. ● Can be completed while participating in functional activities such as ADLs and IADL tasks. ● Exercises include: ○ Shoulder abduction/adduction ○ Shoulder horizontal abduction/adduction ○ Shoulder flexion/extension	Resources: Thera putty, foam exercises, rubber bands, free weights, weighted balls, TheraBand, towel, and additional exercise equipment if appropriate.

	○ forward/backward rowing ○ Chest press ○ Elbow flexion/extension ○ Supination/pronation ○ Wrist flexion/extension ○ Finger abduction/adduction ○ Finger joints flexion/extension ○ Pinch exercises	
Vision Activities	● Visual deficits can include: ○ Blurred vision ○ Double vision ○ Decreased peripheral vision ● Identify the need for glasses: ○ Prism glasses or patching ■ Prism glasses are opticals with a prism ground into the lens. The prism changes the way that light can come into the eye. Best used with double vision or visual field loss. ■ Patching is used to help with double vision. The patch is placed to eliminate the information that results in the double image from coming into the brain. Should be done under the supervision of a trained professional. ● Education for taking breaks can be discussed for visual fatigue. ● Increase contrast: ○ This is to allow objects or written work to stand out from the background to make it easier for a client to see. An	<u>Resources:</u> Glasses (prism, tinted or prescription), patches, paper of various colors (contrast/reduce glare), eating utensils with various colors, blinds, dimming lights, variety of light bulb options, worksheets (visual scanning/cuts) <u>Alt. Resources:</u> ● Magnify objects: ○ Magnify glasses ○ Magnify glass for in hand use ○ Electronic readers (increase print size) ● For complete vision loss various devices can be beneficial such as: ○ Talking timers ○ Various mobile phone apps ○ Mobility canes ○ Learning Braille when appropriate may also be helpful.

	example would be to use a dark tray with white plates or use dark plates with light colored food. ● Avoid light sources that are bothersome light sources. ○ Fluorescent lights can be irritating for people after a TBI. Best to use natural light or non-glare non fluorescent lighting whenever possible. ○ Limit the amount of screen time. ○ Wearing tinted sunglasses can be helpful as well. ● Reduce glare ○ Wearing tinted sunglasses can help with glare. Covering shiny surfaces that reflect light is another possibility. ● Avoid visual overload ○ Try keeping all items needed to complete a task together in one uniform place. ○ Cut down on clutter within the environment. ○ Designate one storage place for frequently used items. ○ By not having to search multiple places for items will reduce the amount of input into the visual system which can help from overwhelming the visual system. ● Visual scanning techniques ○ Scanning environment ○ Identifying if visual cuts are present (Warren, 2011)	
Anger Management	● Help with psychological adjustment to changes in functioning caused by the TBI.	<u>Resources:</u> paper/pencil, scenario cards/written, worksheets, anger

	● Identification of specific strategies to manage behavioral changes. ● Anger/frustration management ○ Learn to identify early signs of anger. ○ Learn to identify triggers that can lead to anger. ○ When the person becomes angry, talk in a soothing manner. ○ Acknowledge the persons frustrations and help the client problem-solve if appropriate. ○ Try to distract the client and help turn attention to something else if the client is to upset to problem-solve effectively. ○ Serve as a model by using effective anger management strategies ○ Be patient and persistent over time in helping the individual manage anger ○ Do not try to reason with the person when they are at their peak anger levels ○ Do not criticize the individual if their strategies for managing anger do not work at first. ○ Seek to include regular activity, hobbies and other sources of enjoyment in intervention planning.	management strategies, journaling, coping strategies, breathing techniques, provide handouts for additional education
Impulsivity Control	● Impulse control strategies should be implemented with individuals who are at Ranchos Los Amigos Scale level of a 4 and higher to address confusion, agitation and impulsivity. ● Impulse control strategies ○ Safety awareness is important with a client who presents	<u>Resources:</u> paper/pencil, worksheet for strategy development, environmental resources (triggers), pro/com lists, scenario cards, coping strategies, journaling, provide handouts as necessary

	with impulse control issues. ○ Stopping an activity and having an individual actively think about the consequences of completing a specific action. Or to stop and take a rest break with specific strategic questioning. ○ Identify triggers to impulsive behaviors such as increased emotionality, influences of peers, cognitive delay. ○ Use redirection as needed ○ Develop subtle signals to help the person remember to stop and think before acting when questionable behaviors are occurring ○ Develop strategies to reduce the likelihood of acting before considering consequences ○ Provide non-judgmental feedback regarding appropriateness of behaviors ■ Weight the positive and negative aspects of the behaviors. ■ Serve as a model by making important decisions in a thoughtful manner and including the client with the TBI in the thought process.	
Emotional Distress	● Allow and acknowledge the client to grieve changes/losses that have occurred since the TBI. ● Attend to early signs of emotions ● Be aware of factors that contribute to increased emotionality such as fatigue, pain, and time of day. ● Encourage client whenever necessary.	<u>Resources:</u> mood cards, paper/pencil, mood/goal journal, worksheets, utilize the environment (outside & inside), activities the individual enjoys (movies, sewing, coloring), relaxation training, breathing techniques,

	● Do not assume that the person is not aware. Help the individual problem-solve regarding how to address an issue.
	● Address lowered self-esteem secondary to TBI-related difficulties.
	● Help to identify sources of distress
	  ○ Categorize stressors
	● Ensure that the person has opportunities for positive experiences such as:
	  ○ Spending time in settings the person enjoys
	  ○ Gathering support from family and friends
	● Provide specific strategies for managing depressed mood or anxiety.
	● Use strategies to cope with high emotionality including
	  ○ Using words to express emotions
	  ○ Removing client from stress-inducing situations
		provide handouts as necessary

Memory recall	● Get rid of distractions before starting on activity with a client who has decreased memory recall.
	● Talk slower or repeat what is said for better understanding.
	● Allow extra time to practice, repeat or rehearse information for interventions.
	● Keep track of important information such as:
	  ○ Appointments
	  ○ To-do lists
	  ○ Telephone numbers
	● Create a "memory station"
	  ○ This is where a client can keep all items needed to take for a session such as gait belt, reading glasses, watch, and other necessary items.
		<u>Resources:</u> paper/pencil, to-do lists/checklists, planner, journal, notebooks, cellphone, calendar, apps, memory station, pill box, table, cards, can provide the individual with homework (worksheets) to complete while not in therapy session

	● Introduce a pill box to keep track of when to take medications ● Utilize checklists to keep track of what tasks have been completed. ● Complete rhythm matching with use of clapping patterns and have return demonstration from client ● Card matching activities with 2 sets of cards and have the individual match the cards.	
Problem-solving	● Problem solving safety scenarios ● Completing sequencing tasks ○ Order of daily tasks ○ Number order with cards ○ Complete math related problems for management of IADLs ■ Making change ○ Complete puzzles ● Safety awareness when completing mobility from one location to another. ○ Utilizing signage to help problem-solve directional issues. ● Complete functional scavenger hunts ○ Find specific locations ○ Complete a task once at the location apart of the individual's daily routine ○ Provide verbal cues as necessary ● Problem solving sequencing for kitchen related tasks if applicable ○ Steps of a meal ○ Creating a grocery list ○ Finding the potentially dangerous aspects of a kitchen environment off of an image.	<u>Resources:</u> paper/pencil, safety scenario cards, hallway signage, cards, jigsaw puzzle, sudokus, coins, chess, can provide the individual with homework (worksheets) to complete while not in therapy session
Self-Care tasks	● Dressing ○ Sequence of dressing ■ Hemi Technique for	<u>Resources:</u> gait belt (as necessary for ambulation), paper/pencil, laminated

	dressing ● Put the injured side first to garment. Take off the injured side first from the garment. ○ Sitting on the edge of bed or a chair when dressing, helps for safety. ○ Label drawers and cupboards ○ Identify the weather and select clothing that is appropriate to wear. ● Bathing: ○ Utilize pictures or written instructions for the necessary steps needed for washing and drying the therapist will provide this to the client for sequencing. ○ Set up shower with all necessary items so they will be there when needed. ○ Place all shower items into a toiletry bag so that items are contained. ● Grooming and Personal Hygiene ○ Setting up all the items in the bathroom in known places. ○ Labeling the cupboards ○ Everything should be kept in one place that is the same for every use. ○ Using pictures in the bathroom to remind the client of personal grooming sequencing steps. ○ Utilizing a checklist to make sure that self-care tasks are completed ○ Can us long handled brushes and combs for hair grooming	sequencing cards (dressing/grooming/bathing tasks), labels, variety of clothing options, checklists, handouts for additional equipment needs. <u>Alt. Resources:</u> shampoo, conditioner, body wash or soap, shaving cream and razor, toiletry bag, long handled sponge/brush, mirror, adaptive equipment as necessary

	○ Perform self-care tasks in front of a mirror so that the client can see what they are doing. ● Utilizing Adaptive Equipment needed ● Encourage the client to ask for help from others when needed.	
Ambulation & Balance	● Completing walking tasks ○ Safety while using adaptive equipment while walking. ● Completing weight shifts ○ Stand with feet shoulder-width apart and weight equally distributed on both feet ○ Shift weight to right foot and left foot slightly off the ground. Hold for 30 seconds or as long as the client can tolerate. ● Static balance ○ Stand in place while completing various arm movements. Can be completed while completing a therapeutic activity such as folding laundry, brushing teeth, memory recall game or whatever occupations are important to the client. ○ Feet together tasks this can be completed in a similar way. Provides variety in the activity. ● Dynamic balance ○ Completing horseshoe toss and collecting horseshoes with a reacher. ○ Completing standing with feet close together and turning left and right and back to center, increase difficulty by closing eyes	<u>Resources:</u> gait belt, dyna disk, towels, toothbrush, wall/sink/table/chair/rail for support, timer, reacher, adaptive equipment for walking

	○ Standing on one leg while completing a tasks (with support or without) ○ Staggered stance while completing a task. ○ Staggered stance with head movement while completing a task. ○ Staggering stance with eye tracking activity ○ Marching in place ○ Single step forward/backward ○ Single step side to side ○ Swing one leg forward and back ○ Swing one leg side to side ○ Walking with side to side head motion ○ Can incorporate yoga, tai chi as balance becomes safer.	
Environmental Changes	● Implement home modifications as necessary ● Home training for how to transition out of the acute setting. ● Education for transitional plan out of the ICU.	Resources: handouts for environmental changes, educational materials
Assistive Technology (AT)	● Adaptive equipment ● Applications on phones, computers and other technology	Resources: Hoyer lifts, wheelchair, front wheel walker, cane, additional AT depending on the specific individuals needs

SCI

Admission ---------- Discharge

Timeline Days	**Client Description** (Person)
1-2 days of admission	● Surgical decompression &/OR ● Spine stabilization and immobilization due to spine instability ● Use of rigid board for transportation
3rd day of admission	● Client typically begins recovery from surgical procedures, spine stabilization, and immobilization
4-5th days of admission	● Treatment begins ● Attend to changes of airway and respiratory management ● Invasive or noninvasive treatment options if applicable
6th day of admission	● Final recovery and attention to further complications such as hypotension, autonomic dysreflexia, cardiac arrhythmias, and neurogenic shock

After intubation or when patient's sedation has lightened:

Occupation-Based Interventions for SCI

Target areas (Person)	**Intervention Ideas** (Occupation)	**Resources** (Environment)
Loss of ROM	● Window or table washing ○ This intervention targets ROM in which clients are provided a white board, sliding table, or room window for cleaning. Therapists should consider client factors and precautions when choosing an object to clean. Therapists may also want to integrate intervention into daily room routine such as erasing information from	Resources: sponge, spray bottle, soap, window, side table or desk Alt. Resources: wash cloth, bar soap with bucket of water, squeeze bottle soap, board with wheels, counter space, rolling table

	the room whiteboard prior to updating it.	
	● Grooming ○ Tooth-brushing ○ Face washing ■ Clients can practice washing their face for medium ROM movements. Therapists should provide physical assistance as needed. ○ Hair brushing	Resources: brush, comb, toothbrush, toothpaste, washcloth, rag, sponge, toothette, face soap, hair spray (if applicable), face lotion
	● Horseshoes ○ This intervention may be adapted with regard to available materials. Therapists should encourage clients to participate in games similar to horseshoes to facilitate normal range of motion with regard to upper extremity reaching.	Resources: plastic or metal horseshoes, metal rod for target Alt. Resources: therapy ring hoops, metal bars or poles, back of chairs for target, or a bucket
Fine motor	● Bracelet making or craft making ○ Practitioners may choose a craft such as bracelet making to work on fine motor precision and grasping. Completion of an activity analysis is essential so that practitioners can ensure that clients areas of need will be targeted. Craft ideas may be located through online databases	Resources: yarn (various widths), pony beads or large wooden beads Alt. Resources: wires, string, pasta noodles

	or websites. Resources for each activity should be considered.	
	● Medication management ○ Practitioners must assess clients' level of safety awareness in order to minimize choking hazards. It will also be essential that no real pills are used during the activity.	Resources: Empty pill bottles, beads, medication regimen Alt. Resources: Small fruit (i.e. blueberries, craisins, raisins), empty water bottles
Early Ambulation	● Walk to gather ADL supplies ○ Purposeful strolls are better than having clients walk out of bed to their bathroom and back such as gathering self-care materials from the closet or fresh linens prior to daily shower. By adding a purposeful task, clients may ambulate more enthusiastically as they are seen as participating in other tasks.	Resources: May vary depending on ADL task chosen
	● Light Dancing ○ Utilization of light dance moves may motivate clients to ambulate early on. Practitioners may utilize music or dance along videos that encourage right and left discrimination and small step movements.	Resources: No physical materials needed. Therapist may utilize music from available appliances
Muscle activity for anti-inflammation	● Bean bag toss ○ The purpose of this intervention is to	Resources: Bean bags, bean bag target, small balloons, plastic balls, recycling bin

	simulate range of motion activities. As clients continue their stay within the ICU, their mobility may start to increase. Engagement in a bean bag toss or tossing items into a bin may simulate similar movements while also minimizing the physical consciousness of working to increase motion in clients' limbs.	
	● Painting on vertical surface ○ The purpose of this activity is to engage the client in vertical painting to mirror vertical muscle activity to assist with inflammation. As the client engages in painting, natural arm movements will be demonstrated. ○ For those who experience polytrauma, therapists may adapt intervention to encourage feedback such as finger painting on the mirror.	Resources: Paint, paint brush, paper, construction paper, tape Alt. Resources: Mirror, sandpaper
Self-Cares	● Toileting ○ Practitioners may work on multiple areas of concern while practicing client's toileting routine. Activity analysis should be completed with respect to client's level of functioning and assist	Resources: Resources needed may include but are not limited to client's bathroom, toilet paper, wet wipes, reacher (if applicable), handlebars (if applicable)

	level prior to engaging in this intervention.	
	● Bathing ○ Practitioners may work on multiple areas of concern while practicing bathing routines. Activity analysis should be completed with respect to client's level of functioning and assist level prior to engaging in this intervention.	Resources: Resources needed may include but are not limited to: Shower chair, shower wheelchair, soap, lotion ● Hair shampoo ● Hair conditioner ● Wash cloth ● Towels ● Handlebars
	● Dressing ○ Practitioners may work on multiple areas of concern while practicing dressing. Activity analysis should be completed with respect to client's level of functioning and assist level prior to engaging in this intervention.	Resources: Resources needed may include but are not limited to: Clothing articles, hospital gowns, stable chair, stable table, reacher, assistive devices, proper lighting
	● Brace don/doff ○ Practitioners must ensure clients are receiving time to practice donning and doffing braces and other therapeutic articles. This will ensure that clients are able to increase the level of independence with self-care routines. Donning and doffing can be integrated into dressing, grooming or toileting regimens.	Resources: Brace, assistive devices for increased participation, stable chair, stable table
Pressure Ulcer	Pressure ulcer prevention is essential as many clients may be spending	

Prevention	down time laying or sitting in bed. Although this area may not be addressed as occupation based, it is an important educational area within the ICU, hospital or rehab interdisciplinary team that practitioners must spend time with their clients. This area may be taught while engaging in other occupations such as when: ● Transferring in and out of bed for Self-care routine ● Adjusting in room for other health care provider visits ● While transitioning into seated position for engagement in tabletop activity

CVA

Admission ---------- Discharge

Timeline Days	**Client Description** (Person)
24 hours of admission	● Admission occurs ● Clients with severe stroke may experience increased intracerebral pressure ● Some clients will be directed into the ICU or a surgical setting to be operated on ● Neurological areas may begin to worsen, fevers present, intubation requirements
24 hrs. - 2 days of admission	● For clients who have gone directly into surgical setting- they will be moved into the ICU and spend 2 days there ● Fibrinolytic therapy can initiate to lower the levels of fibrinogen
3-4 days of admission	● Serious complications must be prevented such as allergies, rashes, neck edema ● Implementation of a number of techniques for managing stroke may begin

(Llinas, 2008)

After intubation or when client's sedation has lightened:

Occupation-Based Interventions for CVA

Target Areas (Person)	**Intervention Ideas** (Occupation)	**Resources** (Environment)
Weakness on one side of the body	● Board or Card games ○ Therapists may find it beneficial to first motivate the client by using their strong side then progress towards encouraging them to use their weak side. When selecting a board game, practitioners should take into consideration client's interests as	<u>Resources</u>: ● Practitioners should utilize available card sets or card games (UNO©, SKIP BO©, Go Fish, etc.) that clients find interest in to encourage bimanual coordination and use of weakened side. Through playing a game that clients seem interested in, their

	well as goals. Are they working on bilateral coordination? Use of the affected side? In-hand manipulation?	conscious thoughts about pain and using the other side may diminish over time.
	● Kneading bread ○ For this intervention, practitioners should provide material to clients in the best supported position. Encouragement should focus on the use of bilateral sides of the body (upper extremity) in simultaneous motions. Practitioners may grade mixture resistance to match client needs. Intervention can be integrated within hand hygiene routine.	<u>Resources:</u> bread dough, pre-made bread dough, cookie dough, pre-made cookie dough <u>Alt. Resources:</u> play doh, slime, or homemade play doh
Strengthening upper and lower extremities	● Upper extremity ○ When choosing this intervention for clients, practitioners should consider available resources for weight substitutions. For example, are there available food cans clients could use to mimic grocery unloading/loading? Is there a side table in which clients can adjust towards and away from themselves?	<u>Resources:</u> ● Dumbbell lifts ● Medicine ball lifts ● Weighted blanket folding ● 1-5 lb. weights for arm curls ● Carrying grocery bag from one location to the next ● Putting away grocery items in varied height shelves <u>Alternative resources:</u> Practitioners can substitute any item listed above with available food cans, basketballs, or water bottles

		filled with either rocks, rice, or beans.
	● Lower extremity ○ With this intervention, practitioners must decide which lower extremity strengthening activity is most applicable with their client. Depending on interests, abilities, and precautions, each activity could be modified and graded. With each provided idea, practitioners should encourage participation for efforts to improve mobility functions.	<u>Resources:</u> May include but are not limited to: ● TheraBand stretches ● Leg raises before and after getting up or while watching TV ● 3-level step staircase (if appropriate) ● Foot taps in kinetic sand or (rice or beans)
Decline in cognitive functions	● Puzzles ○ Practitioners should choose puzzles that work on cognitive skills beginning with primitive areas prior to upgrading activity towards executive functioning. Typical game/puzzle progression must follow: (initial to last) ● Attention, awareness, concentration ● Memory ● Problem solving, sequencing ● reasoning ,	Resources: Practitioners may utilize physical or virtual puzzles that clients may manipulate while focusing on the skill level that matches the client factors.

	organizing ● Judgement, insight ● Executive function	
Sensory loss (tactile)	● Sensory box dig ○ Practitioners can identify sensory areas that the client demonstrates challenges with then decide which sensory box may be most compatible. ○ Jell-O-dig: May hide items within Jell-O-O in which clients are required to retrieve and/or describe each item to practitioner ○ Shaving cream: Useful for pts to draw and make designs in. Could also utilize visual cards in which the client has to re-produce each design and could target additional client areas	<u>Resources:</u> ● Jell-O dig ● Shaving cream <u>Alt. Resources:</u> Water beads, beads hidden in Thera putty, play doh, water activities
	● Painting (for desensitization) ○ This intervention can be adapted to match various client factors. For example, practitioners may choose to paint with a brush then move towards a shorter brush, followed by introduction to finger painting.	<u>Resources:</u> Paint, paintbrush, paper, construction paper

	● Arm knitting ○ If chosen, practitioners should provide clients with simple instructions through demonstration. Intervention focus is to introduce sensory input; therefore, practitioners may grade activity by selecting tolerable textures to textures intolerable. Additionally, practitioners can grade sight with tactile input to knitting materials for additional input.	Resources: yarn, string, arm knitting step by step book, arm knitting video, or therapist demonstration if applicable
Loss of ROM	● Dressing UE or LE ○ Practitioners addressing this area of occupation must ensure they have completed an activity analysis for each clothing article the client may present with. It is vital that practitioners take into consideration the circumference needed to don and doff each clothing article including how that correlates with the goals of the pt.	Resources: Clothing articles or extra hospital gowns, socks or extra hospital socks, shoes (if applicable), jackets, sweaters, scarves, clothing articles with buttons, fasteners, or zippers
	● Hanging clothes on a clothesline with clothes pin	Resources: string for clothesline, clothing articles

	○ Practitioners may use this intervention to encourage familiar/routine patterns with respect to cognitive delay in addition to encourage ROM movements. Clotheslines may be placed close to or further away from the client for increased/decreased ROM goals.	or light towels, clothes pin Alt. Resources: bathroom shower railing, towel rail, chip bag clips
Social disability	● Practice routine conversations ○ Practitioners are encouraged to engage clients within daily conversations. Client factors and cognitive levels should be considered prior to initiating conversation. If cognitively attentive, practitioners may rehearse 3 combination conversation starters such as the example provided. Encouraging conversations across disciplines may be a way to upgrade task demands.	Resources: Practitioners should include practicing routine conversations such as: ● "Hi, how are you" ● "I enjoy ____ as well. My favorite is ____" ● Whole body listening ● Appropriate versus inappropriate responses ● How to continue a conversation
	● Grocery store simulator ○ This intervention may be initiated similar to the above intervention (routine conversations). The focus with this	Resources: Practitioners should review appropriate grocery store dialogue including: ● How to greet others when entering the store

	intervention is that clients are provided a selected setting in which to initiate and continue conversation or ask for direction.	● How to ask workers for help ● How to ask for items at the deli ● How to check out
	● Essential work questions ○ With this intervention, practitioners should provide clients with their previous or related preferred occupational job listings and a practice job interview. For clients who are less cognitively involved should be encouraged to run through simple interview questions. For clients who are more cognitively involved, practitioners may encourage participation with simple orientation questions.	Resources: Practitioners should review appropriate work dialogue that is tailored to the client. Some topic examples may include: ● Interview questions ● application /resume information ● Store operator dialogue ● How to greet customers ● Appropriate social distance when communicating with others
	● Restaurant simulator ○ In this intervention, practitioners may provide clients with a hypothetical restaurant menu or hospital menu. If cognitively available, clients should be encouraged to rehearse how to order their food with the assistance of practitioners as necessary.	Resources: Practitioners should review appropriate restaurant dialogue including: ● How to greet others ● How to order food ● How to ask for accommodations ● How to ask for additional items or condiments ● How to pay and leave ● Appropriate restaurant level of talking ● Appropriate topics to

		discuss when out to eat
Vision deficits	● Visual field ○ Visual field interventions should incorporate exercises that mimic similar processes. In a stable position, practitioners may present various activities for participation in visual deficits improvement. For additional ideas, practitioners should refer to listed resource.	Resources: Practitioners may target this area by the following activities: ● Game of ISpy ● Where's Waldo book ● Covering one eye at a time and completing scavenger hunt Alt. Resources: https://eyecanlearn.com/
	● Visual scanning ○ These interventions should incorporate tasks for visual scanning processes. Practitioners may consider included resources for additional intervention ideas.	Resources: Practitioners may target this area by the following activities: ● Following tennis ball on string vertically, horizontally, and in circles ● Spoons, the game Alt. Resources: https://eyecanlearn.com/

MVA

Types of Injuries Due to MVA

- Lacerations
    - Deep tears in the skin.
- Whiplash
    - Injury caused by an accelerated movement or jerk to the head and neck.
- Broken bones
    - Bones that are broken in various locations.
- Contusions/Severe bruising
    - This is medical terminology for a deep bruise.
- Concussions
    - Caused by a blow to the head. Can cause the individual to go temporarily unconscious.
- Headaches
    - Severe pain in the head.
- Internal damage
    - Injury involving internal organs such as bruising and bleeding. Specifically, within the abdominal and cranial cavities.

Brief Timeline of a Severe MVA

Polytrauma is defined as two or more injuries to physical regions or organ systems one of which may be life threatening resulting in physical, cognitive, psychological or psychosocial impairments and functional disability (Poorman, Sporner, Sigford, Cornis-Pop, Stephens, Zitnay, & Pramuka, 2009). Physical complications from a severe motor vehicle accident will be present within the critical care setting. The individual will receive emergency response services at the scene or later once they are admitted into the hospital. The chart below provides a brief general timeline of what to expect after a MVA.

Admission ---------- Discharge

Timeline days	Client Description

24 hours of admission	● Stabilization of injuries is crucial ● Hospital care will include surgical repairs, bandaging, intubation or other necessary life saving devices will be implemented. ● Some clients will be directed to the ICU or will be brought to surgery for necessary operations.
1-2 days of admission	● Once stabilized rehabilitative therapy services may be implemented as tolerated by the client.
3-4 days of admission	● Serious complications must be prevented such as allergic reactions, rashes, edema, and pressure sores.

Occupation-Based Interventions for MVA

Target Areas (Person)	**Intervention Ideas** (Occupation)	**Resources** (Environment)
Orthotics	● Proper splinting will need to be crafted for the client per physician's orders. ● Education on splinting care will need to be provided to the client and caregiver if the client is unable to understand at this time. ● After a period of time therapists can provide specific exercises for various fractures requiring splinting.	Resources: splinting materials, education/handout regarding care for splint, home exercise program
Orientation	Orientation to ● Person ● Place ● Time ● Situation	Resources: whiteboard/dry erase marker, paper/pencil, additional signs in room
ROM & Strengthening	● Passive range of motion (PROM) ○ Do not stretch past the end range of the individual's capacity. This will be extremely important to be aware of when working with clients who are unaware of pain tolerance as well as	Resources: Thera putty, foam exercises, rubber bands, free weights, weighted balls, TheraBand, towel, and additional exercise equipment if appropriate.

	unable to provide feedback for the stretch. ● Active assist range of motion (AAROM) ○ Do not stretch past the end range of the individual's capacity. ● Active range of motion (AROM) ○ Will be completed with clients as they have increased strength to do activities by themselves. ● Can be completed while participating in functional activities such as ADLs and IADL tasks. ● Exercises include: ○ Shoulder abduction/adduction ○ Shoulder horizontal abduction/adduction ○ Shoulder flexion/extension ○ forward/backward rowing ○ Chest press ○ Elbow flexion/extension ○ Supination/pronation ○ Wrist flexion/extension ○ Finger abduction/adduction ○ Finger joints flexion/extension ○ Pinch exercises	
Transfer Training	● Maximize safety ● Proper setup for transfer success ● Minimize physical stress ● Use proper body mechanics during transfers	<u>Resources:</u> gait belt, paper/pencil, handouts for specific transfers, various surfaces (chair, mat table, bed, wheelchair, toilet, tub), worksheets for sequencing

	● Identify what type of transfer will be completed	
Bed Mobility	● Various bed mobility motions ○ Scooting up or down while lying ○ Scooting sideways while lying ○ Rolling over ○ Twisting and reaching (if appropriate) ○ Lifting hips (bridging) ○ Moving from sitting to lying down ○ Moving from lying down to sitting ○ Completing log roll motions ○ Pushing with arms to a seated upright position ● Exercises in bed (hold for 5 seconds with 10 repetitions) ○ Gluteal squeezes ■ Lying back in bed, squeeze buttocks for 5 seconds, relax, repeat. ○ Hip Adduction Squeeze ■ Use ball or rolled up towel, lie on back with knees bent ball in between, tighten stomach muscles, squeeze ball/towel, hold the squeeze, relax. ○ Low Trunk Rotation ■ Lie on back with knees bent, roll knees	<u>Resources:</u> bed, bed rails, mechanical bed with elevation of head/legs/height of bed, blankets, gait belt, handout of exercises/mobility <u>Alt. Resources:</u> ball, rolled up towel

	to one side, bring knees back to starting position, roll to opposite side, repeat. ○ Straight Leg Raise ■ Lie on back with one knee bent and other knee straight, tighten muscles on the top of thigh in the straight leg, slowly lift leg up, hold for 2-5 seconds then lower down. Repeat with both legs. ○ Bridging ■ Lie on back with both knees bent, slowly lift buttocks off of bed, hold bridge for 2-5 seconds, slowly lower and repeat.	
Pressure Sore Positioning	● Education that a pressure sore can happen in as little as 20 minutes ● Leaning to both sides while seated in a chair to relieve pressure from one side. ● Rolling to both sides while resting in bed. ● Using pillows ○ Lying ■ Support the affected side with pillows, elbows and fingers should be straight with palm facing upwards. In addition,	<u>Resources:</u> chair, bed, cushions, pillows, elbow pads, sheep skin, handout, other people (staff, family and OT's)

	place a pillow under the knee of affected side, keep knee slightly bent. ○ Lateral position ■ Use a pillow to keep the knees from direct contact with each other, use a pillow to support the affected side with elbow straight and knee slightly bent. ○ Sitting ■ Have the client sit straight with back supported. Support the upper limb with a pillow or table, place feet on the floor or footrest with the knee flexed at 90 degrees (right angle). ○ Prone position ■ Turn head to one side, place both arms by each side of the head, support the shoulders, chest and ankles with pillows in a relaxed position.	
Increasing Endurance	● Completing walking with purposeful occupation in mind. ○ Can complete wheelchair management if applicable to clients.	<u>Resources:</u> gait belt, adaptive device, weights, TheraBand, mats, parallel bars, hallways <u>Alt. Resources:</u> hospital bed, wall railing

	● Completing weight bearing exercises ● Resistance training ○ Heavy lifting may be restricted due to various injuries. ● Balance and flexibility exercises ○ Stretching of body parts ● Practice good posture if possible ● Avoid exercises that have a high risk for falls, twisting motions and ones that are painful.	
Education	● Safety training ● Orthotic education ● Transfer education ● Polytrauma education	<u>Resources:</u> handouts, educational materials, provide environmental examples <u>Alt. Resources:</u> Provide the education to the client in their most appropriate learning styles (written, auditory, kinesthetic, etc.)
Energy Conservation	● Plan periods of rest ● Educate conserving energy with various strategies ○ Simplify tasks and set realistic goals. ○ Plan activities ahead of time. ○ Space out activities throughout the day. ○ Do not schedule too many things in one day ○ Do things that take more energy when feeling the best. ○ Rest before and after activities ○ If tired during an activity stop and rest. Can finish that activity another time. ○ Do no plan activities right after a meal	<u>Resources:</u> handouts, paper/pencil, educational materials, planner/calendar, <u>Alt Resources:</u> Create an energy bank ● This is a way to summarize a client's need to have an optimal day for meeting physical and emotional needs. Possible questions to think about: ● When is a good time to take mental breaks and physical breaks? ● What is the maximum number of minutes I can be involved in a physical

	○ Ask for help ○ Get a good night's rest ○ Complete ADL and IADL tasks while seated ○ Use adaptive equipment as needed ○ Refrain from wearing tight clothes. Wear clothing with zippers and buttons in the front eliminating reaching behind the body. ○ Wear comfortable shoes, low-heeled and slip-on shoes that are appropriate for various surfaces (tile, carpet, hard wood, etc.) ■ Avoid extreme physical activity ● Do not push, pull or lift heavy objects (more than 10 pounds). ■ Use organizers to decrease leaning and reaching ■ Use extension handles ■ Layout clothes before getting dressed	demanding task before needing a break? ● Can I take a nap? If so, how long? ● What are the things I have to get done today? What are things on my to-do list that can wait? ● How many hours of sleep is good for me a night? ● How many meals a day do I need to feel my best?
Balance & Ambulation	● Completing walking tasks ○ Safety while using adaptive equipment while walking. ● Completing weight shifts ○ Stand with feet shoulder-width apart and weight equally distributed on both feet ○ Shift weight to right foot and left foot slightly off the ground. Hold for 30 seconds or as long as the client can tolerate.	<u>Resources:</u> gait belt, dyna disk, towels, toothbrush, wall/sink/table/chair/rail for support, timer, reacher, adaptive equipment for walking

	● Static balance ○ Stand in place while completing various arm movements. ○ Feet together tasks this can be completed in a similar way. Provides variety in the activity. ● Dynamic balance ○ Dynamic standing or sitting tasks with occupation in mind for the client ● When educating the client regarding the specific movements or mobility being completed it is important to keep in mind the cognitive level this individual has and how much information they will be able to receive without being overwhelmed.	
Emotional Distress	● Allow and acknowledge the client to grieve changes/losses that have occurred since the MVA. ● Attend to early signs of emotions ● Be aware of factors that contribute to increased emotionality such as fatigue, pain, and time of day. ● Encourage clients whenever necessary. ● Address lowered self-esteem secondary to MVA-related difficulties. ● Help to identify sources of distress ○ Categorize stressors ○ Complete journaling if appropriate ● Ensure that the person has opportunities for positive experiences such as: ○ Spending time in settings the person enjoys ○ Gathering support from	<u>Resources:</u> mood cards, paper/pencil, mood/goal journal, worksheets, utilize the environment (outside & inside), activities the individual enjoys (movies, sewing, coloring), relaxation training, breathing techniques, provide handouts as necessary

	family and friends ● Provide specific strategies for managing depressed mood or anxiety. ○ Relaxation training ○ Breathing techniques ● Use strategies to cope with high emotionality including ○ Using words to express emotions ○ Removing client from stress-inducing situations	
Memory Recall (if applicable with specific client)	● Get rid of distractions before starting on activity with a client that involves specific memory related tasks. ● Talk slower or repeat what is said for better understanding. ● Allow extra time to practice, repeat or rehearse information for interventions. ● Use organizers, notebooks or cell phone calendar or various apps to keep track of important information such as: ○ Appointments ○ To-do lists ○ Telephone numbers ● Create a "memory station" ○ This is where a client can keep all items needed to take for a session such as gait belt, reading glasses, watch, and other necessary items. ● Introduce a pill box to keep track of when to take medications ● Utilize checklists to keep track of what tasks have been completed.	Resources: paper/pencil, to-do lists/checklists, planner, journal, notebooks, cellphone, calendar, apps, memory station, pill box, table, cards, can provide the individual with homework (worksheets) to complete while not in therapy session
Self-Care Tasks	● Completing everyday tasks such as: ○ Bathing	Resources: gait belt (ambulation) paper/pencil, laminated sequencing cards (dressing/grooming/bathing

	■ Completing appropriate transfer safely ■ Laminated instructions for sequencing ○ Toileting ■ Use of necessary adaptive equipment ■ Completing appropriate transfer ○ Grooming ■ Adaptive handles/equipment ○ Dressing tasks ■ Sequencing ■ Hemi technique ■ Completing dressing tasks safely ■ Labeling items	tasks), labels, variety of clothing options, checklists, handouts for additional equipment needs. Alt. Resources: shampoo, conditioner, body wash or soap, shaving cream and razor, toiletry bag, long handled sponge/brush, mirror, adaptive equipment as necessary
Environmental Changes	● Implement home modifications as necessary ● Home training for how to transition out of the acute setting. ● Modify home to maximize efficient energy use ● Education for transitional plan out of the ICU.	Resources: handouts, hospital furniture, bed, chairs, tables, rugs

Functional Mobility Occupation-Based Interventions

Outcome Measure for Functional Mobility

Measures	Interventions
● Client safety ● Feasibility ● Functional outcomes	● Functional mobility ○ Supine to sit ○ Edge of bed (EOB) sitting ○ Standing ○ Transfers ○ Ambulation ● ADL training

Note. Organization of measures and interventions is from Adler & Malone (2012)

- Outcomes of early mobilization
  - Strength/ROM
    - Increased upper extremity (UE) and lower extremity (LE)
  - Mobility
    - Higher FIM scores
    - Higher Barthel Index scores
    - Mobilization milestones reached quicker
  - Quality of Life
    - Increased chance of returning to baseline functioning
    - Decreased need for post-acute care services
    - Decreased duration of mechanical ventilation in clients with respiratory failure
  - No serious adverse medical consequences
    - Mobilization of critically ill but stable clients in the ICU can be done safely with minimal risk to the client.

Early Mobility and Walking Programs

Early mobility and walking programs have become the newest addition to ICU care. Many facilities have begun implementing early rehabilitation to help focus on specific areas of function. Specifically, the ABCDEF(+G) Bundle has been introduced with each letter representing a factor in the clients healing process. According to NYU Langone Health (n.d.) the acronym stands for awakening, breathing, coordination, delirium, early mobilization, family and goals. Each section focuses on specific attribute of the client's care. Awakening focuses on assessing the RASS score, identifying spontaneous awakening with use of trials as well as identifying the level of sedation each ICU client is under (NYU Langone Health, n.d.). The breathing section identifies spontaneous breathing with the use of trials, and weaning ventilator use (NYU Langone Health, n.d.). Coordination identifies the role of the rounding interdisciplinary team, identifies weaning, extubating protocol as well as makes sure that the ICU checklist is completed in the morning and evening (NYU Langone Health, n.d.). Delirium is a factor which the team must focus on screening, delirium should be treated first with nonpharmacological interventions and establish specific quiet time for use of ventilator (NYU Langone Health, n.d.). Early mobilization focuses on the role of the PT, PT and Recreational Therapist (RT) to collaborate with the client for exercise and ambulation purposes as well as allow the Speech Language Pathologist (SLP) to focus on identifying speech and swallow (NYU Langone Health, n.d.). Family engagement is important for the promotion of the care plan, in addition family meetings are held with the care team (NYU Langone Health, n.d.). Lastly the forms of care are discussed in daily rounds for the individual clients, short term and long term goals will be identified and client boundaries will be identified (NYU Langone Health, n.d.).

Overview of Early Mobility Charts

An early mobility and walking program were developed by Perme & Chandrashekar, (2009) to provide guidelines for early mobility that would assist clinicals who are working in the intensive care unit. This early mobility program is especially important to begin implementing with mechanically ventilated clients. Having prolonged stays in the ICU is associated with functional decline, increased morbidity, morality, cost of care and increased length of stay in the hospital (Perme & Chandrashekar, 2009). By implementing an early mobility and walking program with these clients could have an increased benefit with the overall success in outcomes. In addition by implementing an overall standard of care with ICU early mobility the likelihood of decreased time spent in the intensive setting will decrease as the program focuses on progressive mobilization and walking, along with the progression of exercise based on the client's functional capabilities to tolerate functional movement (Perme & Chandrashekar, 2009). In addition, the program is divided into four different phases. Each phase includes specific guidelines on positioning, therapeutic exercise, transfers, walking reeducation and duration as well as frequency of mobility session that each client will progress through (Perme & Chandrashekar, 2009). With the use of the program it is best to have an interdisciplinary approach in order to provide appropriate treatment for the client as well as coordinate care that provides safe mobilization of the client.

ICU Early Mobility and Walking Program Progression

When utilizing the early mobility and walking programs for clients in the ICU it is important that there is an ultimate goal to achieve. Simple goals can be created for the client such

as being able to sit on the edge of the bed unsupported, initiate standing activities as well as participate in pre-walking activities and then progressing the goals to walking specific distances with or without breaks (Perme & Chandrashekar, 2009). In addition to the goals there are general criteria for progressing to the next phase of the mobility program. Criteria includes being able to follow commands, have appropriate medical stability in status, optimal oxygen levels as well as being able to tolerate various standing postures and movements (Perme & Chandrashekar, 2009). Interventions within the early mobility and walking program include focus on education, positioning, bed mobility training, transfer training, specific walking programs, exercises, as well as duration and frequency of mobility (Perme & Chandrashekar, 2009). These interventions are all based on the four different phases for client abilities within the program. Specifically, phase one focused on clients who are critically ill with multiple medical programs, in unstable conditions (Perme & Chandrashekar, 2009). Phase two focuses on clients whose overall medical condition and strength allow standing activities with a walker or with assistance from a therapist (Perme & Chandrashekar, 2009). The third phase includes clients who are able to tolerate limited walking with a walker or with assistance (Perme & Chandrashekar, 2009). Lastly, phase four includes clients who no longer require ventilatory support and/or have been transferred out of the ICU but plan to continue with the mobility program (Perme & Chandrashekar, 2009). It is important that when implementing specific interventions that focus is on safety with activity. If physical signs present that the client needs to stop the activity do so immediately as well as provide various break in the activity to focus on increasing tolerance through sessions.

Psychosocial Aspect to the ICU

According to Chivukula, Hariharan, Rana, Thomas, & Swain (2014), clients treated in the intensive care units (ICU) though receive the best medical attention for physical ailments are also found to suffer from psychological trauma typically attributed to the ICU environment. There is a significant role of psychosocial care in minimizing ICU trauma (Chivukula et al., 2014). Having occupational therapists provide interventions that focus on psychosocial aspects will continue to enhance the potential outcomes of a client as they recover within the intensive care setting. Occupational therapists provide care that is cognitively oriented towards the client, relapse and re-hospitalization will decrease as the recovery of the client is enhanced as all aspects of the individual will be focused on occupational function.

Specifically, in the ICU applying behavioral therapy in various forms is an important method of helping critically ill clients understand what will arise after their injury. Behavioral therapy has a goal to reinforce desirable behaviors and eliminate unwanted ones (Kreitzer et al., 2019). As behavioral therapy is rooted in behaviorism the focus is on how an individual learns from their environment (Kreitzer et al., 2019). Various methods can be used within the behavioral therapy umbrella including applied behavior analysis, cognitive behavioral therapy, dialectical behavior therapy, rational emotive behavior therapy, and social learning theory (Kreitzer et al., 2019). When using behavioral therapy treatments in the ICU it will be important to include interdisciplinary team members to increase the adherence of the behavioral changes. In addition, behavioral therapy treatment can be applied with other types of psychosocial approaches (Kreitzer et al., 2019).

Applied behavior analysis uses operant conditioning to shape and modify the problematic behaviors but using this method the individual will apply the behavior principles to real-world situations to gain a better sense of the importance of the changing the initial action (Kreitzer et al., 2019). Cognitive behavioral therapy (CBT) relies on behavioral techniques but will add an additional cognitive element to increase the focus on problematic thoughts that are beneath the behaviors (Kreitzer et al., 2019). Dialectical behavioral therapy (DBT) is a form of CBT that is utilized for both behavioral and cognitive techniques to help a client learn to manage emotions, cope with stress and improve interpersonal relationships (Kreitzer et al., 2019). Rational emotive behavior therapy (REBT) focused on identifying negative or destructive thoughts and feelings. People then actively challenge those thoughts and replace them with a more rational and realistic sense of what is happening within the client's environment (Kreitzer et al., 2019). As CBT is utilized in the ICU setting it can also be used in conjunction with the PEO model to increase the likelihood of successful outcomes upon discharge from the care unit. As the Person in the PEO model has the ability to focus on self-care, leisure and productivity, CBT addressed the quality of life and how it influences the mood and choices of an individual (Kreitzer et al., 2019). While focusing on how being in the ICU setting can impact a client's emotions the use of CBT in relation to the PEO the occupational therapist can help to identify thoughts and actions to increase the quality of life for the Person factor within the PEO model by enhancing focus on self-care, leisure and productivity when in the ICU environment.

Lastly, social learning theory centers on how people learn through observation. By observing another person, the client will be rewarded or punished for actions which can lead to learning and behavior change as specific outcomes are identified (Kreitzer et al., 2019). For these

different interventions to be beneficial it is critical to have all interdisciplinary team members to be aware of how their specific role can impact a behavior. Having discussions on how to implement certain techniques with various clients as well as their medical professionals' team will benefit the outcome of the therapeutic treatment through all levels of the care team.

Occupation Based Interventions in the ICU

Interventions completed in the ICU will need to be based on the individual's specific needs. Many of the interventions that occupational therapists will provide will be low impact as the client is still recovering from their critical care. It is important to consider where the client is at and provide the just right challenge to continue to see therapeutic progress. Specific grading of activities can be beneficial to increase levels of success for the individual client.

According to Evangelist, & Gartenber, (2016) grading of interventions can include seated self-care activities such as brushing hair at the edge of bed rather than standing. In addition, bed to chair transfers with the focus on function and safety can be important occupation-based interventions to implement with an ICU client to help increase tolerance for functional opportunities. By practicing bed to chair transfers, clients are able to participate in light dancing or functional reaching tasks around their room versus in bed. With the grading of interventions, the importance of being aware of the transactions between the individual's personal needs, along with occupation and environment helps to support the best overall care. In addition, when working with a client, the occupational profile assessments provide self-reported assessments on the client's deficits as well as areas of strengths. Incorporating dynamic tasks such as grooming at the sink in standing increases the client's ability to move throughout various planes while attending to basic needs. According to Evangelist, & Gartenber, (2016) addressing level of cognition is important to assess and identify ICU acquired delirium. Specifically, if delirium is present various levels of occupational tasks will be impacted and might decrease functional abilities. Lastly, by implementing early mobilization for clients in the ICU especially those who

have been mechanically ventilated will benefit the client as it will promote the level of independence and success the client has once transitioned to their next setting (Evangelist, & Gartenber, 2016). Occupational therapists are able to provide appropriate care for clients within the ICU by assessing and grading the activity demands tailored to the specific client. More importantly, occupational therapists make sure that the relevance of specific tasks are provided to assure the client that they are receiving appropriate evidence-based care.

Overall, when working with clients in the ICU it is important to address functional limitations. Limitations such as environment or the individual factors of various clients can potentially impact occupational performance. It is valuable for an occupational therapist to initiate and plan for different limiting factors when implementing interventions in the ICU setting. As an occupational therapist it is the professional's goal to create independence in self-care related tasks and provide as much functional independence as possible to enhance the client's ability to return home and engage in valued occupations with the highest level of success. In addition, the occupational therapist has the ability to increase the level of motivation as well as opportunities for the client to increase their level of independence through their own actions.

Apps in the ICU

As the ICU continues to advance into the technological era occupational therapists (OT's) need to adapt their way of providing occupation-based interventions. The American Occupational Therapy Association has provided several apps that could be useful for OT's to implement into their practice within the intensive care setting. Below is the possible app list:

All of these apps are derived from: https://www.aota.org/Practice/Rehabilitation-Disability/RDP-apps.aspx

General

- CDC Field Triage
    - Educational app helps EMS professional and others with injury response training
- CDC Tablet App
    - App puts important health information at your fingertips with articles, popular journals, real-time updates from social media and more
- Co-Occurring Conditions Toolkit (CCT)
    - The app helps health care providers working with military clients recognize the differences between symptoms of multiple conditions
- First Aid by American Red Cross
    - Expert advice for everyday emergencies
- Health Hotlines
    - App helps the public locate health-related information and is a directory of nearly 9,000 organizations
- iMuscle
    - Identify body parts or muscles by zooming in on a 3D image of human body with musculature exposed. Access exercises associate with that muscle.
- Instant heart rate
    - Monitor vital signs with this heart rate app. Place your index finger on the camera to measure heart rate. Save and view past heart rates in a timeline.
- mTBI pocket guide
    - Health care providers to get instant and comprehensive information on mTBI care
- MyFamily

    - Users build a health plan for their families. Identify health priorities for family members, use the calendar and download health records to share with your health providers
- Neuromind
    - Contains neurological scores and a variety of anatomical images
- SymTrend
    - Electric diary that allows you to track symptoms, discover what is triggering problems, and deterring whether treatments are working for depression, cancer, women's health, chronic pain, ADHD or autism

General Therapy

- HowToDoIt Therapy
    - App allows practitioners to create customized step-by-step instruction sheets and tutorials for exercise programs, social stories, procedures and more
- TherapyGuide
    - Client education tool for therapy clients

Accessibility

- Aphasia
    - Helps people with aphasia by providing a vocabulary or pictures and videos that speak with a natural human voice

Fine Motor Apps

- Dexteria
    - Therapeutic hand exercises that improve fine motor skills and handwriting readiness
- Recognize
    - Accurately measure your client’s ability to recognize left and right body parts and movement. Train left right discrimination with a series of images

Independence & Transitions

- First Then Board
    - Easy way to communicate expectations to clients who are symbolic thinkers or use pictures to communicate. This app has a variety of photos pre-loaded or users may upload their own photos.
- iPrompts
    - Providing picture schedules, visual countdown clocks, and other choice prompts

- My Chain Widget
    - Creating a chain of small daily accomplishments to meet a goal, this widget sites on individuals' device home screen with personal goals labeled. When you follow through on the day's goal, you touch the widget and it turns green, then indicates the number of days which you followed through, if you miss a day it turns red and the counting starts again.
- Pill Time
    - Keep track of your medicines and get reminders when you need to take them with this app
- Super Better
    - Helps users achieve health goals or recover from an illness or injury. Build your personal resilience.
- Treasure of Bell Island
    - Designed for persons recovering from TBI, this game is a narrative-based adventure with characters that move across an island in search of items and their missing friend. Challenges attention, memory and executive function.

Mindfulness & Body Awareness

- Calm
    - A beginner mindfulness app that includes a variety of relaxation strategies and programs ranging from intermediate to advanced. Topics include deep sleep, calming anxiety, happiness, body scan, self-esteem, and more. Guided meditation sessions are available in lengths of 3, 5, 10, 15, 20, or 25 minutes so clients may choose experiences that fit into their daily routine.
- Headspace
    - A guide to mindfulness in which individuals learn meditation and mindfulness skills. This app may assist clients with staying resilient during life changing times. Coping strategies may benefit clients who feel angry, sad, or have resentment towards change.
- Fabulous - Daily Self Care
    - Fabulous takes a holistic approach to motivate individuals in becoming more productive, focused, and building a healthier life. Clients may benefit from topics such as managing stress, better habits, happiness, and healthier eating as well as exercise.

Additional Resources

Family Training

TBI

- Do not be discouraged if physical recovery seems to be proceeding at a more rapid pace than intellectual recovery.
- Help by completing range of motion exercises
- Bring items from home such as: family pictures, musical device and other comforting objects
- Assist with adjustment to changes in family roles that can occur after a TBI
- Provide support whenever necessary. Seek help from family, friends and others in efforts to learn and use strategies.
- Families can help by:
    - Establishing daily structure
    - Have all family members be aware of needs, understand therapy plans and reinforce as necessary.
    - Allow the person with a brain injury some choices and control.
    - Help to develop strategies for compensating for deficits
        - Watch alarms, calendar, journals, day planners, medication dispensers, etc.
    - Rehearse and role play to develop appropriate social skills

SCI

- Remember, the lower the level of injury, the less assistance is needed.
- Education for bowel, bladder, and respiratory care.
- Education regarding how to administer daily skin checks and recognize signs of pressure sores.
- Assist with identifying symptoms for autonomic dysreflexia.
- Be open to assistive technologies that assist to promote your loved one's independence.
- When people offer to help, accept the offer and suggest specific routines that have been followed.
- Ultimately, create a system of care that will work best for everyone in the team.

CVA

- Education on preventative factors/habits for your loved one to avoid.

- Learn as much as you can about your loved one's health factors.
- Remember that emotional lability is common and my last for a few minutes.
- Assist your loved one to maintain and improve learned rehabilitation skills.
- Encourage and support your loved one.
- Maintain a healthy diet with regular exercise.
- Families may receive additional help from:
    - Adult day care
    - Adult foster homes
    - Meal programs (Meals on Wheels)
    - Respite care

MVA

- Education for splinting, precautions, energy conservation and safety.
- Have family help reinforce therapeutic treatment
- Allow family to step in whenever possible while completing transfer, self-care tasks and other additional activities.
- Transfer training
    - Lifting with the legs not the back
    - Keep the center of gravity close to the body
    - To protect the back, engage core abdominal muscles before lifting.
    - Avoid any twisting in the trunk. Tell the person what they need to do to help.
    - Before completing a transfer communicate what is going to happen, when it is going to happen and any additional information.

General Family Training Section

- Have clients do as much for themselves as they can do
- When safe, allow clients to try things that may not be successful at for preservation of autonomy as well as motor learning and intrinsic satisfaction
- Remember the importance of self-care. Caregiving is only as beneficial as the caregivers are themselves.

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