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SARGENT COLLEGE OF HEALTH AND REHABILITATION SCIENCES

Doctoral Project

**THE OCCUPATIONAL THERAPY INTENSIVE CARE UNIT GUIDE:
A PRACTICAL GUIDE FOR IMPLEMENTING OCCUPATIONAL THERAPY
SERVICES WITH PEOPLE WHO ARE CRITICALLY ILL**

by

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Master of Occupational Therapy, University of North Dakota, 2012

Submitted in partial fulfillment of the
requirements for the degree of
Doctor of Occupational Therapy

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DEDICATION

I would like to dedicate my doctoral project to my family. I am grateful to my husband, Josh, who gave me encouragement, support, and motivation every single day during this program. Without his support I would not have been able to pursue and complete this degree. I also dedicate my doctoral project to my daughters, Audrey and Amelia. They gave me hugs and smiles at just the right times.

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ABSTRACT

Patients who are critically ill in the intensive care unit (ICU) or critical care unit are at risk for cognitive, psychosocial, and physical impairments as a result of their admitting diagnosis or secondary diagnoses acquired during their hospital stay. Occupational therapy is a profession that facilitates patients' recovery through holistic evaluation and treatment. Occupational therapy in the ICU improves patients' strength, cognition, functional independence in activities of daily living and walking, decreases the duration and incidence of delirium, decreases time spent on mechanical ventilation, decreases the length of time patients spend in the hospital, and saves the hospital money (Alvarez et al., 2017; Lord et al., 2013; Schweickert et al., 2009; Weinreich, Herman, Dickason & Mayo, 2017).

However, the problem is that a small number of patients are receiving occupational therapy when they are in the ICU. Due to the complexity of the medical environment, severity of patients' illness, limited education on ICU care in entry-level occupational therapy and occupational therapy assistant programs, and limited research on the efficacy of occupational therapy evaluations and treatments, many occupational

therapy practitioners do not have the knowledge and confidence to work in the critical care setting (Accreditation Council for Occupational Therapy Education (ACOTE) 2018; Foreman, 2005). In addition, many critical care team members are not aware of the benefits of early intervention occupational therapy in the ICU, impacting the number of referrals placed for patients while they are in the ICU setting (Zanni et al., 2010).

The *Occupational Therapy Intensive Care Unit Guide (OT ICU Guide)* was created to improve the knowledge, confidence, and competency of occupational therapy practitioners working in the ICU in order to increase the presence of occupational therapy practitioners in the ICU. Increasing the presence of occupational therapy practitioners in the ICU will lead to an increase in the number of patients receiving occupational therapy during their stay in the ICU. The *OT ICU Guide* is a “one-stop shop” to guide occupational therapy practitioners on providing safe and evidence-based evaluations and treatments to patients in the ICU. The *OT ICU Guide* includes handouts, resources, guides, and brochures highlighting the role and benefits of occupational therapy in the ICU, safety and medical information for working with medically complex patients, and examples of occupational therapy assessments and treatment interventions for patients in the ICU. The *OT ICU Guide* is a steppingstone for increasing the presence and frequency of occupational therapy services in the ICU.

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CHAPTER ONE - Introduction

Nature of the Problem

The intensive care unit (ICU) is a fast-paced environment where professionals implement life sustaining measures, provide specialized care, and monitor patients who are critically ill (Marshall et al., 2017). Throughout this document, the ICU and critical care are terms that will be used interchangeably. Patients in the ICU are at risk for mortality, ICU acquired weakness, cognitive impairments, delirium, anxiety, depression, sensory deprivation, and decreased functional independence (Affleck, Liberman, Polon, & Rohrkemper, 1986; Girard, et al., 2010; Hashem, Nelliott, & Needham, 2016; Jackson, Mitchell & Hopkins, 2015). Occupational therapy can prevent and rehabilitate deficits patients acquire during their ICU stay. Occupational therapy practitioners offer a holistic perspective when interacting with patients and families; evaluating how the environment impacts occupational engagement and facilitating patient recovery through creative interventions (Foreman, 2005). This skill set enables occupational therapy practitioners to provide services to patients who have complex and critical needs.

Unfortunately, many patients do not receive occupational therapy when they are in the ICU. A study completed in 2013 revealed that less than half of patients in 11 ICUs received occupational therapy during their ICU stay (Dinglas et al., 2013). Currently, occupational therapy practitioners in the United States are not a consistent member of critical care teams. A 2015 survey revealed that only 35% of 500 United States ICUs surveyed had a dedicated occupational and physical therapy team (Bakhru, Wiebe, McWilliams, Spuhler, & Schweickert, 2015). Working in the ICU poses challenges for

occupational therapy practitioners. Some challenges expressed by occupational therapists include: the medical and technical environment of the ICU, the culture and attitude of ICU team members towards early rehabilitation and delayed or inappropriate occupational therapy referrals (Dinglas et al., 2013; Foreman, 2005).

Resources for occupational therapy in the ICU and studies focusing on the effectiveness of occupational therapy interventions in the ICU are limited, leaving occupational therapy practitioners without a standard of care to guide their clinical practice. A systematic review of literature by Weinreich et al. (2017) revealed only one study focused exclusively on occupational therapy in the ICU, whereas the remainder of the studies focused on patient outcomes as a result of occupational therapy and physical therapy combined (Weinreich et al., 2017). Only one article highlighted specific occupational therapy interventions used in the ICU and one article assessed the efficacy of occupational therapy intervention with patients in the ICU (Weinreich et al., 2017). Literature on the efficacy of occupational therapy treatment for patients who have delirium is an emerging area of research. In 2017, a pilot randomized control trial was conducted assessing the efficacy of intensive occupational therapy interventions for delirium management with patients in the ICU (Alvarez et al., 2017; Tobar, Alvarez, Garrido, 2017). However, most of the professional literature assesses the effects of occupational therapy and physical therapy intervention combined. Studies focusing on efficacy of detailed occupational therapy evaluation and a standard of treatment for patients in the ICU are limited.

Not only is research limited on occupational therapy in the ICU, but occupational therapy and occupational therapy assistant programs are not required to provide education to students on ICU specific topics (ACOTE, 2018). Therefore, occupational therapy practitioners may graduate with limited to no knowledge on what to chart review, what precautions to take with patients who have invasive lines and tubes, how to manage complex medical lines, and what assessments and treatments are appropriate and effective for patients who are critically ill requiring complex medical intervention and monitoring. Having limited education, training, and resources on occupational therapy in the ICU can impact occupational therapists' self-efficacy and competency to work in an ICU setting. Therefore, occupational therapists may avoid a career in the ICU. Those working in the ICU may feel unskilled providing safe and effective care to patients with complex medical needs, resulting in a small percentage of patients actually receiving occupational therapy during their ICU stay.

It is a clear disservice to patients, hospital settings, and the profession to not provide occupational therapy to patients in the ICU. In order to optimize patient functioning and improve hospital outcomes it is essential for the profession of occupational therapy to increase the presence and frequency of services in the ICU and to promote the role and value of occupational therapy in the ICU to critical care team members. To reach these goals, there is a need for improved resources to support occupational therapy practitioners with providing care in the ICU.

Approach to Address the Problem

To provide support and guidance for occupational therapists working in the ICU, the *Occupational Therapy Intensive Care Unit Guide (OT ICU Guide)* was created. This guide serves as a comprehensive resource for occupational therapy practitioners in evaluating and treating patients who are critically ill and medically complex. Additionally, the resource guide includes resources for promoting the profession of occupational therapy amongst critical care team members in order to increase the number of orders occupational therapists receive to evaluate and treat patients in the ICU. The *OT ICU Guide* can be used as an educational tool or as a daily resource for occupational therapy practitioners. The *OT ICU Guide* includes medical review and safety information, occupational therapy evaluations and treatments for patients in the ICU, and educational handouts on the role and benefits of occupational therapy in the ICU for patients, family members and hospital staff.

The intended outcome of the *OT ICU Guide* is to increase the confidence, competency, and knowledge of occupational therapy practitioners working with critically ill patients in the ICU. The initial version of the *OT ICU Guide* was created using resources from professional literature in the medical community, professional networking with critical care professionals, and the program designer's clinical experience.

Target Population

The *OT ICU Guide* targets occupational therapists and occupational therapy assistants who are new to working in the ICU and occupational therapy practitioners who are seeking support and resources for providing therapy in the ICU or long-term acute

care hospital. The *OT ICU Guide* also targets occupational therapy students and occupational therapy assistant students. The *OT ICU Guide* is beneficial for occupational therapy students who are preparing for fieldwork in an acute care or long-term acute care hospital setting and students who want to pursue a career in the intensive care or long-term acute care hospital setting.

CHAPTER TWO - Project Theoretical and Evidence Base

Introduction

Intensive Care Units (ICUs) in the United States treat over 5.7 million patients annually (Society of Critical Care Medicine (SCCM), n.d.). The ICU is “an organized system for the provision of care to critically ill patients that provides intensive and specialized medical and nursing care, an enhanced capacity for monitoring, and multiple modalities of physiologic organ support to sustain life during a period of life-threatening organ system insufficiency” (Marshall et al., 2017, p.270). The most frequent admitting diagnoses into the ICU between 2009 and 2013 were the following: “sepsis, respiratory failure, acute coronary syndrome, cardiac arrest, cerebral vascular accident, GI [gastrointestinal] bleeding, pneumonia, trauma, congestive heart failure and coronary artery bypass graft procedure” (Lilly, Swami, Liu, Riker, & Badawi, 2017, p.725). Lilly et al. (2017) assessed ICU practice trends and outcomes through an analysis of data from 160 ICUs in the United States. This analysis revealed that the average length of stay in the ICU between 2009 to 2013 was three days (Lilly et al., 2017). See Table 2.1 for the average length of time patients’ stay in the ICU based on specific diagnoses. Length of stay for each patient and diagnosis varies depending on factors such as the patients’ medical history, secondary medical conditions, and if they received rehabilitation during their hospital stay. Table 2.2 illustrates the variation in length of stay that can occur among diagnoses.

Diagnosis	Average Length of Stay
Trauma	4
Hepatic	4
Shock	4
Gastro-intestinal	4
Infection	4
Respiratory	4
Neurosurgical	3
Renal	3
Neoplastic	3
Vascular	3
Cardiac	3
Bleeding	2
All other diagnoses	2
Median LOS for 34 ICUs	3

Table 2.1: Average Length of Stay in ICU by Diagnostic Group (1998)
Adapted from table in Higgins et al. (2003)

Diagnosis	Year	ICU LOS
Congestive Heart Failure	2002	With acute coronary syndrome: 5.2 days Without acute coronary syndrome: 3.2 days
Medical intensive care unit patients who were mechanically ventilated (with and without cognitive impairments)	2003	10 days
Severe sepsis requiring mechanical ventilation >7 days	2005	With critical illness polyneuropathy (CIP): 46.5 days Without CIP: 22.5days
Acute Respiratory Failure	2016	With Rehabilitation: 7.5 days With Standard hospital care: 8 days

Table 2.2: Variations in Average Length of Stay for Common ICU Diagnoses
(Garnacho-Montero, Amaya-Villar, Garcia-Garmendia, Madrazo-Osuna, & Ortiz-Leyba, 2005; Jackson et al., 2003; Lettman, Sites, Shofer, & Hollander, 2012; Morris et al., 2016)

Impacts of an ICU Stay

Cognitive and Psychosocial Impairments

Patients who are critically ill requiring ICU care are at risk for cognitive, psychosocial, and physical impairments. “New or worsening impairments in physical, cognitive, and/or mental health [are] referred to as post-intensive care syndrome. Such impairments can be long-lasting and negatively impact survivors’ quality of life.” (Parker, Sricharoenchai, & Needham, 2013, p. 307). These impairments can be a result of “medications, physiologic changes, pain, altered sensory inputs...unfamiliar environment”, stress, critical illness, bed rest, and immobility (Jackson et al., 2015, p. 96; Hashem et al., 2016). Patients in the ICU often experience long and short-term cognitive impairments, with more than half of ICU survivors experiencing long-term cognitive impairments (Jackson et al., 2015).

Delirium is the most prevalent cognitive impairment among patients who are critically ill and occurs in 45-87% of ICU patients (Alvarez et al., 2017). Delirium is an acute brain disorder defined as “a disturbance of consciousness with accompanying change in cognition” (Cavallazzi, Saad, & Marik, 2012, p.1). Someone who has delirium may experience fluctuating cognition, impaired short-term memory, impaired attention span, and/or disorientation, all of which develop over a short period of time (Cavallazzi, Saad, & Marik, 2012). Delirium risk factors include patient characteristics (e.g. age, comorbidities, dementia), sleep deprivation, invasive lines and tubes, and an unfamiliar hospital environment that is without natural daylight or a clock. (Pitrowsky, Shinotsuka, & Salluh, 2010). These delirium risk factors are likely to be present in all ICU’s, placing

many patients at risk. Patients with delirium are at risk for experiencing worse outcomes. Delirium is associated with higher mortality rates, longer hospital stays, cognitive decline, and functional decline (Ely et al., 2004; Tomasi et al., 2012). Delirium can lead to both short-term and long-term cognitive deficits. Ely et al. (2004) completed a prospective cohort study of 275 adult patients, who required mechanical ventilation during their stay in medical and coronary ICUs. Of these patients 81.7% developed delirium during their ICU stay. The patients with delirium had a higher prevalence of cognitive impairment when they discharged from the hospital. Those who developed delirium had a longer stay in the hospital by an average of 10 days and a higher mortality rate compared to those without delirium (Ely et al., 2004).

A stay in the ICU can impact patients' sensory systems which can lead to behavioral, cognitive, and physical changes. Sensory deprivation in the ICU can be caused by social isolation in the hospital room, decreased ability to communicate due to mechanical ventilation, and being connected to multiple lines and tubes limiting independent movement (Howell, 1999). On the other hand, sensory overload can occur due to the constant beeping of monitors and frequent staff members entering patients' rooms. Imbalanced sensory input can lead to behavioral changes, hallucinations, and motor impairments (Howell, 1999). Patients in the ICU who exhibit hallucinations or delusions may become agitated and attempt to pull out their lines and tubes, therefore requiring restraining of their arms and/or their legs for their safety. Being in restraints impacts a patient's ability to move independently, which can then again impact their sensory input.

Depression and anxiety are psychological impairments many patients experience during and after their stay in the ICU. Depression occurs in 25-50% of individuals who survive a critical illness (Jackson et al., 2015). Symptoms of depression can be present even after patients return home from the hospital. ICU survivors report symptoms of depression and anxiety that last four months after they are discharged from the hospital (Choi, Tate, Rogers, Donahoe, & Hoffman, 2016). In a study conducted by Choi et al. (2016), patients experienced worse symptoms of depression if they were unable to discharge home after their ICU stay and if they required moderate to high levels of assistance with their activities of daily living (ADLs) and instrumental activities of daily living (IADLs). Jackson et al. (2003) assessed neuropsychological function, depression and quality life among patients who required mechanical ventilation during their stay in the ICU. One third of the ICU survivors had neuropsychological impairments six months after they discharged from the hospital. The primary neuropsychological impairments were in the areas of “psychomotor speed, visual and working memory, verbal fluency, and visuo-construction” (Jackson, et al., 2003, p. 1226). Thirty-six percent of the patients had clinically significant depression six months after their hospital discharge (Jackson, et al., 2003). Depression among patients after a stay in the ICU is a world wide concern. A study with patients in Jordan revealed that 93.3% of patients who underwent a coronary artery bypass graft experienced depression (Hweidi, Gharaibeh, Al-Obeisat & Samadi, 2018).

Perpina-Galvan and Richart-Martinez (2009) completed a review of literature using English and Spanish literature databases to examine experiences of anxiety in

patients who are critically ill. Eighteen articles were reviewed and assessed by the researchers. Overall patients in the ICU experience moderate levels of anxiety (Perpina-Galvan & Richart-Martinez, 2009). Patients in the ICU are often not in control of their environment and daily routine, which can contribute anxiety and symptoms of anxiety.

Physical Impairments

Immobility and bed rest are risk factors for the development of physical weakness and functional impairments. Immobility from bed rest and critical illness leads to “substantial muscle wasting during an ICU stay”, causing significant muscle weakness and functional deficits (Hashem et al., 2016, p. 981). A person can lose 1–1.5% muscle strength each day they spend on bed rest (Hopkins & Spuhler, 2009). Weakness in ICU patients “with no possible etiology other than critical illness” is known as ICU acquired weakness (Hashem et al., 2016, p. 972). ICU acquired weakness has a reciprocal relationship with time spent on the mechanical ventilator. ICU acquired weakness is associated with more time spent on the ventilator and 25% of patients who are on mechanical ventilation for a week or more have ICU acquired weakness (Hashem et al., 2016; Schweickert et al., 2009). Historically patients who required mechanical ventilation were treated by immobility and bed rest (Hopkins & Spuhler, 2009). However, current research shows that immobility and bed rest negatively impact patients’, leading to significant weakness and functional decline.

Patients admitted to the ICU experience impairments that can be complicated by immobility/inactivity, sedation, and mechanical ventilation, all which impact functional independence. Currently occupational therapy services in the ICU are insufficient with

only a small fraction of patients in the ICU receiving occupational therapy services to address these impairments and functional limitations. Not providing occupational therapy services to patients in the ICU is a disservice to patients, families, hospitals, and the profession of occupational therapy. Figure 2.1 provides a visual representation of factors impacting patients in the ICU. It highlights the problem of insufficient availability of occupational therapy services in the ICU, which must be addressed by occupational therapy practitioners for the betterment of ICU patients, hospitals, and the profession.

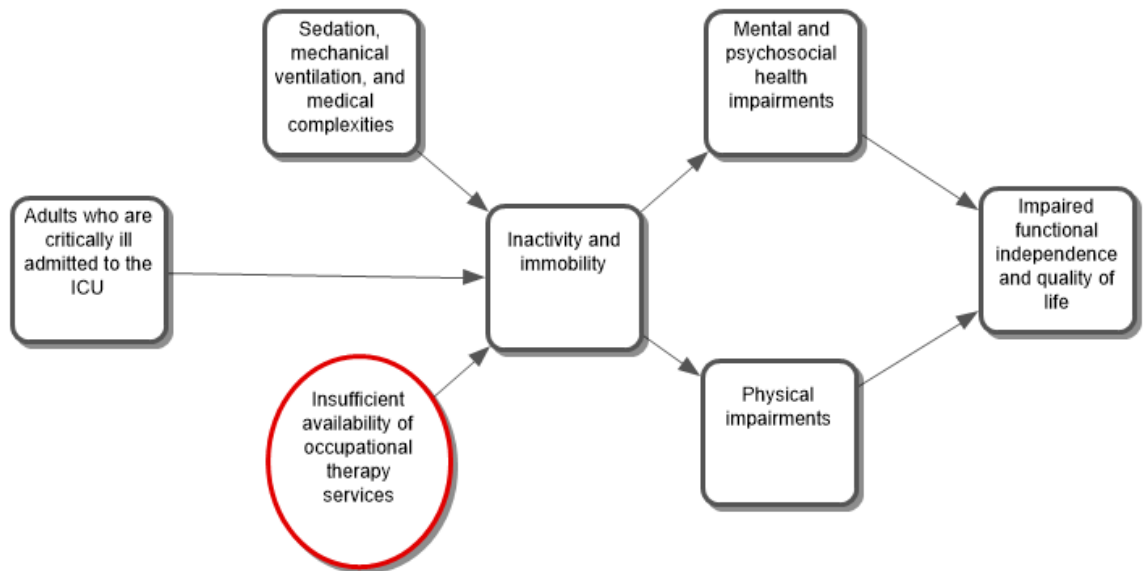


Figure 2.1 Map of the Problem

Occupational Therapy in the ICU

According to the American Occupational Therapy Association (AOTA) (2017), “the primary goal of acute care is to stabilize the patient’s medical status and address life-threatening issues. An essential second goal is to improve functional status and safety to prevent physical and cognitive complications- which are also key components of occupational therapy intervention (para. 1).” Occupational therapy practitioners are

trained in providing holistic evaluation and treatment focusing on the whole person, including their physical health, psychosocial health, mental health, sensory needs, environment, and communication ability. Using a holistic viewpoint, occupational therapists can prevent and treat the multitude of impairments patients experience when in the ICU.

During the evaluation process occupational therapists assess a patient's functional independence and any factors impacting their participation in ADLs and functional mobility. For example; in the ICU occupational therapists assess patients' strength, activity tolerance, balance, fine and gross motor coordination, independence in activities of daily living and mobility, and cognition including orientation, short- and long-term memory, single and multi-step command following (Campbell, 2014; Zanni et al., 2010). Completing a holistic evaluation assists occupational therapists with creating a patient centered plan of care.

Occupational therapy should be implemented as early as medically possible, starting while patients are in the ICU setting (Schweickert et al., 2009). "Early" can be defined as when the patient is physiologically stable (Bailey et al., 2007; Thomsen, Snow, Rodriguez, & Hopkins, 2008). However, research on the efficacy of specific occupational therapy interventions in the ICU is currently limited. In regards to mobility, early therapy activities that have yielded positive outcomes are sitting at the edge of the bed without back support, transferring from the bed to a chair, sitting up in a chair, and functional ambulation (Bailey et al., 2007; Thomsen et al., 2008). Costigan, Duffett, Harris, Baptiste and Kho (2019) completed a scoping review of 221 documents to

“determine the state of knowledge of interventions delivered by occupational therapists in adult ICU patients” (p.1). Common occupational therapy interventions were in the categories of physical, environmental, cognitive, social or emotional, sensory, and other. Examples of reported occupational therapy interventions in the ICU were the following;

mobility, physical rehabilitation, activities of daily living, feeding/eating swallowing, splinting, skin care, augmentative and alternative communication, seating and wheelchair, environmental modifications/adaptations, assistive devices, delirium prevention and care, cognitive assessment and intervention, mental health/psychosocial/coping, family support/goal setting, sensory stimulation, music therapy, discharge planning, sleep, education, other (ICU diary, pet therapy, imagery, aromatherapy, therapeutic touch) (Costigan et al., 2019, p.6).

Occupational therapy practitioners working in the ICU are implementing a variety of interventions but understanding the optimal treatment interventions for patients’ in this setting still needs to be explored.

Delirium occupational therapy interventions with patients in the ICU is a developing area of research. Alvarez et al. (2017) assessed the efficacy of detailed delirium interventions with patients in the ICU, who were not on mechanical ventilation, through a pilot randomized control trial. Patients in the control group received standard nonpharmacological delirium prevention, whereas the intervention group received intensive occupational therapy in addition to standard nonpharmacological delirium prevention. Patients in the intervention group received occupational therapy twice a day

for 40-minute sessions. The participants cognition and functional independence were assessed within 24 hours of being admitted to the ICU and again 48 hours before they were discharged from the hospital. The patients who received occupational therapy in the intervention group had greater strength, cognition, and function with less delirium at time of discharge compared to the control group who did not receive occupational therapy (Alvarez et al., 2017). A summary of the occupational therapy interventions used in this study are provided in Table 2.3 and Table 2.4.

Occupational Therapy Intervention	Description
Polysensory stimulation	<ul style="list-style-type: none"> • Used with patients who had scores of 2 and 3 on Sedation-Agitation Scale. • Therapist provides intense multi modal stimulation to increase patient alertness.
Positioning	<ul style="list-style-type: none"> • Therapist provides adaptations and issues adaptive equipment to prevent edema, prevent pressure sores and optimize range of motion.
Cognitive Stimulation	<ul style="list-style-type: none"> • Patients are given a notebook and tools needed for participation in cognitive activities focused on “alertness, visual perception, memory, calculus, problem solving, praxis and language” (Alvarez et al., 2017, p. 86).
Basic Activities of Daily Living (BADLs)	<ul style="list-style-type: none"> • Therapist engages patients in activities focused on progressing their independence in BADLs.
Family Participation	<ul style="list-style-type: none"> • Occupational therapy practitioner meets with family members to provide training on ways to optimize their interactions with their loved one and provides “strategies for cognitive stimulation” (Tobar et al., 2017, p.250).

Table 2.3 Morning Occupational Therapy Delirium Treatment Session

Information adapted from Alvarez et al., 2017; Tobar et al., 2017

Occupational Therapy Intervention	Description of Intervention
Polysensory stimulation	<ul style="list-style-type: none"> • Used with patients who had scores of 2 and 3 on Sedation-Agitation Scale. • Provide intense multi modal stimulation to increase patient alertness.
Positioning	<ul style="list-style-type: none"> • Therapist provides adaptations and issues adaptive equipment to prevent edema, prevent pressure sores and optimize range of motion.
Cognitive Stimulation	<ul style="list-style-type: none"> • Patients are given a notebook and tools needed for participation in cognitive activities that were created with focus on “alertness, visual perception, memory, calculus, problem solving, praxis and language” (Alvarez et al., 2017, p. 86).
Stimulation of Upper Extremity Motor Function	<ul style="list-style-type: none"> • Upper extremity exercises to maintain upper body strength and coordination to prevent ICU acquired weakness.
Family Participation	<ul style="list-style-type: none"> • Occupational therapy practitioner meets with family members to provide training on ways to optimize their interactions with their loved one and “strategies for cognitive stimulation” (Tobar et al., 2017, p.250).

Table 2.4 Evening Occupational Therapy Delirium Treatment Session

Information adapted from Alvarez et al., 2017; Tobar et al., 2017

Another occupational therapy treatment intervention is the use of an ICU diary. Occupational therapy practitioners can provide education and intervention on the use of an ICU diary to help patient’s in their recovery. An ICU diary “is a diary that is written for ICU patients during their time of sedation and ventilation. It is written by relatives, nurses and others.” (ICU-DIARY.ORG, 2012^a, para. 1). An ICU diary can include information about procedures and tests the patient undergoes in the hospital and even medical, physical, and self-care milestones. An ICU diary can also include photos and notes from visitors. The ICU diary helps patients understand what went on during their

hospital stay when they were too sick or sedated to understand. It assists patients with understanding what they may have dreamed versus the reality of what occurred during their hospital stay (ICU-DIARY.ORG^b, 2012). According to ICU-DIARY.ORG^b (2012), an ICU Diary reduces “the incidence of depression, anxiety, and PTSD for patients and relatives” (para.5).

A randomized control trial by Schweickert et al. (2009) assessed the impact of early occupational and physical therapy on the outcomes of adult patients mechanically ventilated in the ICU. Patients included in the study were functionally independent prior to their hospitalization. The control group received standard hospital care with occupational and physical therapy as routinely ordered from the physician, and the intervention group received daily occupational and physical therapy services daily during an interruption in their sedation (Schweickert et al., 2009). Occupational therapy and physical therapy included a gradual progression of activities dependent on patient physical abilities and medical tolerance. Sessions progressed through the following activities: active assistive range of motion and active range of motion in supine, bed mobility, sitting edge of bed, sitting balance activities, engagement in ADLs, exercises, transfer training, pre-gait, and ambulation. At discharge, 59% of the patients in the intervention group returned to being independent with six activities of daily living and walking compared to 35% of patients in the control group (Schweickert et al., 2009). Patients who received therapy in the intervention group “had shorter duration of delirium...and more ventilator-free days” (Schweickert et al., 2009, p.1874). Early

occupational and physical therapy positively impacts patients cognitive and physical function.

In addition to positive patient outcomes, occupational therapy can also impact hospital outcomes. Rogers, Bai, Lavin and Anderson (2017) found occupational therapy to be the only spending category in the hospital where increased spending was associated with decreased hospital re-admission rates for patients with pneumonia, acute myocardial infarction and heart failure. Occupational therapy in the ICU, as part of an interdisciplinary team, is projected to decrease the length of time patients are in the hospital and save the hospital money. Lord et al. (2013) completed financial modeling of a new rehabilitation program in a medical ICU to assess potential cost savings associated with implementation of the program. The rehabilitation team consisted of physical therapy, occupational therapy, rehabilitation aide/technician, program coordinator, and ICU physician leader. Results of this financial modeling projected a decreased ICU length of stay by 22% and a predicted net savings of \$817,836 annually (Lord et al., 2013).

Overview of the Problem

Cognitive, psychological, and physical impairments acquired during an ICU stay can lead to impaired functional independence, impaired quality of life, and mortality. Occupational therapy can combat the impairments associated with an ICU stay and positively impact patient outcomes. However, despite the positive impacts of occupational therapy with patients in the ICU, only a small percentage of patients in United States ICUs are receiving occupational therapy. In a prospective cohort study with

11 ICUs and 514 patients who had an acute lung injury, only 30% of patients received occupational therapy while in the ICU (Dinglas et al., 2013). None of the hospitals involved in this study had early rehabilitation programs (Dinglas et al., 2013). A survey of 500 ICUs revealed only 34% had a dedicated occupational therapy and physical therapy team (Bakhru et al., 2015). Similarly, Foreman (2005) completed a survey of Canadian hospitals to determine the role of occupational therapists' in the ICU. The survey results revealed 27% of occupational therapists worked full-time in the ICU, while another 27% reported that ICU care was split among multiple therapists. Sixty percent of the respondents' reported that less than 10% of the ICU patients receive occupational therapy (Foreman, 2005).

Challenges exist for occupational therapy practitioners when working in a complex environment with patients who are critically ill. These challenges are visually displayed in Figure 2.2

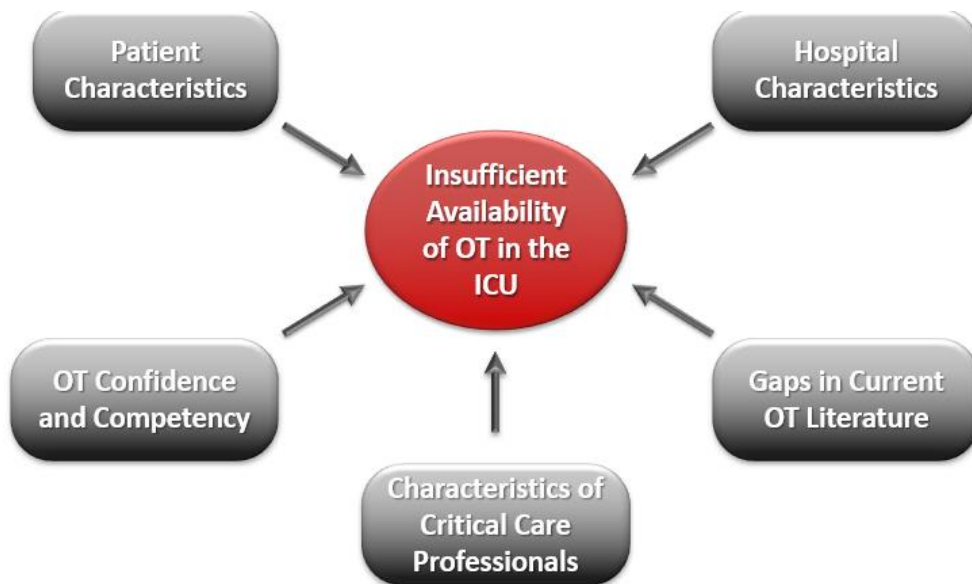


Figure 2.2 Factors Contributing to the Problem

Patient characteristics, hospital characteristics, characteristics of critical care professionals, gaps in current occupational therapy literature, occupational therapist confidence and occupational therapist competency are all categories of factors that contribute to the insufficient availability of occupational therapy services in the ICU. More specifically, occupational therapy practitioners report the following challenges impacting occupational therapy services in the ICU: limited staffing, lack of full time rehabilitation staff in the ICU, lack of physician referrals/underutilization of occupational therapy, deep patient sedation, severity of patient illness, impaired knowledge of the role of occupational therapy in critical care by health care professionals, poor carryover of therapists' recommendations by ICU staff, the ICU environment complexity, the type of ICU, hospital characteristics, and the occupational therapists' ability to develop goals and interventions for complex patients (Dinglas et al., 2013, Foreman, 2005; Zanni et al., 2010). In addition, historically, patients who were critically ill requiring mechanical ventilation were treated by bed rest (Hopkins & Spuhler, 2009). Therefore, medical professionals may have the mindset that it is unsafe or inadvisable for patients to get out of bed. However, early activity and rehabilitation has been found to be beneficial, feasible and safe for patients who are in the ICU, even for those who are on mechanical ventilation (Hashem, et al., 2016). These challenges impacting the implementation of occupational therapy in the ICU can be overcome with proper education, training, and research.

Contributing to the problem of a small percentage of patients receiving occupational therapy in the ICU; current occupational therapy curriculum in the United

States does not adequately prepare entry-level occupational therapists and occupational therapy assistants to work with patients who are medically complex and critically ill. ACOTE requires occupational therapy practitioners have “broad exposure to current practice settings...and emerging practice areas defined by the program” (ACOTE, 2018, p.19). This broad exposure provides entry-level occupational therapy practitioners with a broad knowledge on practice settings, but occupational therapy training and education standards do not adequately address specialty areas such as the ICU. This leads to occupational therapy practitioners having minimal knowledge on the scope of practice for occupational therapy in the ICU, ICU lines and precautions, evidence-based assessments, and interventions for patients who are medically complex.

Resources and evidence on detailed occupational therapy interventions are limited. Much of the literature focuses on early mobility protocols and studies assessing the benefits of occupational therapy and physical therapy interventions and outcomes together; with minimal differentiation of the specific assessments, treatments, and therapy outcomes as a result of occupational therapy intervention alone. Studies incorporating occupational therapy in the ICU confirm that occupational therapy in the ICU yields positive outcomes. However, currently there is no comprehensive standard of care for occupational therapy in the ICU. Weinreich et al. (2017), highlights the need for future research on the role of occupational therapy in the ICU, detailed interventions, and the efficacy of occupational therapy interventions in the ICU. The scoping review of occupational therapy literature by Costigan et al. (2019) reveals that occupational therapy practitioners in the ICU are primarily performing mobility and physical rehabilitation

treatments with an evolution of treatments focused on delirium and communication. Overall, the profession of occupational therapy would benefit from developing a standard of care for working in the ICU. The occupational therapy profession would benefit from conducting studies on the efficacy of holistic occupational therapy interventions addressing patients' performance in ADLs and IADLs while addressing the physical, cognitive, psychosocial, and mental health of patients who are medically complex and critically ill, such as those in the ICU.

Previous Attempts to Address the Problem

Johns Hopkins Medicine is a leading organization in critical care medicine and research. Johns Hopkins holds the Annual John Hopkins Critical Care Rehabilitation Conference, a multidisciplinary continuing education opportunity for critical care professionals to network and obtain resources specific to ICU care. An aim of the conference is to “bridge the interdisciplinary gap from research to the bedside and bring together clinical experts who are creating a culture based on proactive rehabilitation” (The Johns Hopkins University^c, n.d., para. 1). Johns Hopkins has created the Activity Mobility Promotion Adult ICU Early Rehabilitation Program (AMP-ICU) which is an evidence-based multidisciplinary program for early rehabilitation services (The Johns Hopkins University^a, n.d.). This program includes information needed for implementing and sustaining a rehabilitation program in critical care. AMP-ICU includes competencies for occupational and physical therapy practitioners on working in the ICU. Seven competencies are covered in these modules including; introduction to ICU rehabilitation, understanding ICU equipment, oxygen delivering systems, understanding mechanical

ventilation, ICU lab values, ICU delirium, and optimal assessment and treatment planning. These competencies are available in a \$495 package (The Johns Hopkins University^a, n.d.).

Another competency program for occupational therapy in the ICU is the New York University Langone Medical Center (NYULMC) OT ICU Competency. This competency program is used for training and mentoring occupational therapists for working in the ICU at NYULMC. However, this competency is not accessible online for public use (Evangelist & Gartenberg, 2016).

The “Occupational Therapy in Acute Care” textbook by Smith-Gabai (2011) is a comprehensive textbook on topics specific to occupational therapy in acute care. There is one chapter covering occupational therapy in the ICU including precautions, lines, laboratory values, etc. A second edition of this book was published in 2017.

In summary, minimal educational and professional resources are available to support occupational therapists on providing care in the ICU. Current resources require purchasing, are not comprehensive or are not easily accessible. Occupational therapy practitioners would benefit from a comprehensive guide to use as a quick reference when evaluating and treating patients in the ICU or as an adjunct for educating occupational therapy and occupational therapy assistant students on topics specific to occupational therapy in the ICU. This need led this author to the development of the *OT ICU Guide*.

Implications for Program Design

To ensure that health care professionals deliver safe and evidence-based services, continuing education is essential. Continuing education has been found to improve

professionals “knowledge, skills, attitudes and behavior” (Robertson, Umble & Cervero, 2003, p.152). Common teaching methods utilized among health care professionals include simulations, virtual world education, in person workshops, and online training. With the advances made in technology, simulations are more commonly being used for training health care professionals and assessing competency. Simulation can be implemented through online modules, team training, and manikins (McDougall, 2015). Simulation is considered a learner-centered approach incorporating repetitive skill practice. It provides immediate feedback and allows the learner to review their performance and make immediate changes (McDougall, 2015). In the United States, web-based simulation modules are even being used to test the competency of general surgery residents’ (McDougall, 2015). Simulation-based learning is also being used to prepare occupational therapy students for fieldwork rotations in the ICU (Wu & Shea, 2009). Despite the benefits of simulation-based and web-based training, not all facilities have the equipment and funds needed for this learning opportunity.

There are a variety of teaching strategies utilized in health care education, making it difficult to identify which teaching strategy is best for each teaching scenario. Robertson et al. (2003) suggests evaluating the specific setting, situation, and learner needs to help determine which teaching strategy to utilize. Robertson et al. (2003) completed a research synthesis on continuing education for health care professionals in order to identify which educational strategy is the most effective. Results of the synthesis indicated that no individual educational strategy is superior over the other. A variety of educational strategies are found to be effective in educating health care professionals,

including in person workshops and conferences, peer review and feedback, and educational materials (Robertson et al., 2003).

Theoretical Basis for the Program

Due to variations in learning styles and educational strategies for health care professionals, this author used Knowles' Adult Learning Theory, Andragogy, to guide the design of the *OT ICU Guide*. According to Tough and Knowles (1985), Knowles' Adult Learning Theory can be used in a variety of settings including professional education, business settings, continuing education, industrial and government settings. Knowles Adult Learning Theory is fitting for the *OT ICU Guide* as it provides a foundation for creating and developing adult learning programs (Holton, Swanson & Naquin, 2008).

Malcolm Knowles proposed six assumptions about the characteristics of adult learners.

The six assumptions are:

1. Before learning new information, "adults need to know why they need to learn something" (Knowles, Holton, & Swanson, 2005, p.64).
2. Adult learners are independent and self-directed (Knowles, 1980).
3. Adult learners have life experiences that they use as a resource for their learning (Knowles, 1980).
4. Adults have a readiness to learn when the information they are learning is applicable to their life roles (Knowles, 1980).
5. Adults want to learn problem-centered or performance-centered information that they can immediately apply to their life (Knowles, 1980).
6. Adults are primarily motivated by internal factors such as self-esteem and job satisfaction (Knowles et al., 2005).

The material in the *OT ICU Guide* is organized in a way that facilitates learning, carryover, and application of the information in accordance with the principles of Knowles' Adult Learning Theory. Knowles' Adult Learning Theory is best used with learners who are self-directed and autonomous. In line with Knowles' principles, the

resource guide will be self-directed where the learner (occupational therapy practitioner or student) is expected to direct their own learning experience and be independent throughout the learning process. The *OT ICU Guide* is a resource that can be used as a quick reference, educational tool, or for self-paced and self-directed learning.

CHAPTER THREE – Description of the Program

Program Description

The *OT ICU Guide* is a resource for occupational therapy practitioners on providing occupational therapy services in the ICU. The intended outcome for this program is to increase the confidence, competency, and knowledge of occupational therapy practitioners working with critically ill patients in the ICU; with the ultimate goal of increasing the number of patients receiving occupational therapy during their stay in the ICU and increasing the frequency of these services. The *OT ICU Guide* can be used as a quick reference or as an educational tool. This guide assists occupational therapy practitioners with providing evidence-based occupational therapy in the ICU.

Additionally, the *OT ICU Guide* includes resources for promoting the profession of occupational therapy in the ICU and educating patients, families, critical care team members, and hospital administration on the role and benefits of occupational therapy in the ICU setting.

A small percentage of patients in the ICU are receiving occupational therapy, which is partly due to the challenges occupational therapy practitioners report they encounter when attempting to provide therapy in the ICU. The *OT ICU Guide* can help the following challenges: critical care professionals not understanding the role of occupational therapy in the ICU; patients having acute medical lines and monitors connected to them; patients having severe conditions and illnesses: occupational therapists' ability to create goals and treatments for ICU patients, and lack of staffing in the ICU (Foreman, 2005 & Zanni et al., 2010). According to Dinglas et al. (2013),

“training and education may help overcome perceived barriers of critical illness in initiating earlier occupational therapy interventions in the ICU” (p.358). It is vital that occupational therapy practitioners have evidence-based resources and support to guide them in providing safe and effective occupational therapy services in the ICU.

With a small percentage of patients receiving occupational therapy in the ICU, it is necessary for occupational therapy practitioners to promote the profession and educate critical care team members on the role occupational therapy practitioners play in patient recovery. According to Campbell (2014), occupational therapists should educate ICU staff on the benefits of occupational therapy and advocate for prioritizing occupational therapy in a patient’s daily schedule. The *OT ICU Guide* includes information for educating families and hospital staff on the role of occupational therapy. It also includes information for occupational therapy practitioners on providing safe and evidence-based occupational therapy to patients in the ICU. The primary outcome of this resource guide is to increase the knowledge, competency, and confidence of occupational therapy practitioners providing therapy in the ICU.

Target Population and Method to Recruit Participants

The target population for the *OT ICU Guide* is occupational therapy practitioners, which includes occupational therapists and occupational therapy assistants, who are novice to working in the ICU, and therapists who are seeking support and resources for providing care in the ICU. This program can also be a beneficial resource for occupational therapy students, occupational therapy assistant students and fieldwork students doing rotations in acute care, the ICU, or long-term acute care.

The target population for this program will be recruited through online platforms and professional networking. Promotional activities and advertising will be completed to educate the occupational therapy profession on the *OT ICU Guide* and the benefits of occupational therapy in the ICU. Specific recruitment and advertisement activities are included in Chapter Six, The Dissemination Plan.

Theory Guidance for the *OT ICU Guide*

Knowles' Adult Learning Theory, as described in Chapter Two, was used to guide the program designer in the development of the *OT ICU Guide*. Table 3.1 displays how the program designer used Knowles' Adult Learning theory to guide the development of the program and optimize the learning experience and outcomes for the adult learners using the resource guide.

Knowles's Assumption	Application to <i>OT ICU Guide</i>
Adult learners are independent and self-directed (Knowles, 1980)	The <i>OT ICU Guide</i> is self-directed. The learner is expected to seek out the program and utilize the resource in a way that is most beneficial to their learning and professional development.
Adults are motivated by internal factors (Knowles et al., 2005).	The <i>OT ICU Guide</i> targets internal factors of the program user such as their knowledge, competency, and confidence treating medically complex patients in the ICU. The goal of this program is to improve the internal factors of the occupational therapy practitioner in order to optimize their learning, carryover and application of information for facilitating positive patient outcomes.
Adults have a readiness to learn when the information they are learning is applicable to their life roles. In addition, adults want to learn problem-centered or performance-centered information they can immediately apply to their life (Knowles, 1980).	The proposed program will include information that occupational therapists can immediately apply to their practice in the ICU. Examples are brochures to give patients and their families, handouts for ICU and hospital staff, resources to guide the therapist's clinical decision making and safety working in the ICU, and specific assessment and intervention ideas to implement with patients in the ICU.

Table 3.1 Application of Knowles's Adult Learning Theory

Role of Personnel and Key Elements of the Proposed Program

The *OT ICU Guide* contains evidence-based resources for implementing occupational therapy with patients who are critically ill and medically complex, primarily those in the ICU. The *OT ICU Guide* is a comprehensive document where information is presented through written handouts, brochures, charts, and diagrams. Users of this program will find new resources created by the program designer based on current evidence in the literature as well as referrals to already existing resources and websites that can support occupational therapy practitioners' practice. The *OT ICU Guide* is self-guided by the user. The *OT ICU Guide* will be accessible for quick information look up through a personalized website and a PDF download will be hosted on this website to download free of charge. The website will be created with the assistance of a website graphic designer. The graphic designer will also be consulted for periodic website updates as needed. The program designer will be the primary person responsible for managing the website and program content. The program designer will make modifications and updates as evidence in the literature evolves and as feedback is received from program users.

The *OT ICU Guide* consists of the following four sections: 1. Overview of occupational therapy in the ICU, 2. Medical review and safety information, 3. Occupational therapy evaluations for patients in the ICU, and 4. Treatment ideas to implement with patients in the ICU. The *OT ICU Guide* includes new resources developed by this author and guides users to already existing resources that can support

and optimize practice. Each section of the *OT ICU Guide* will be expounded upon in subsequent paragraphs.

Overview of Occupational Therapy in the ICU

This section on the overview of occupational therapy in the ICU includes handouts for educating families, patients, medical providers, and hospital administration on the role and benefits of occupational therapy in the ICU. Resources in this section are displayed as brochures and handouts created by the program designer. Brochures are included to educate patients and their family members on what occupational therapy is, the role of occupational therapy in the ICU, common questions about occupational therapy in the ICU, and a case study providing a practical real-life example of an occupational therapy evaluation and treatment session with a patient in the ICU. An example of a brochure for family members is included in Appendix A. Due to the variability in medical complexity among patients in the ICU, one brochure is included for families of patients who are mechanically ventilated or too ill to communicate and cognitively understanding the information. Another handout is included that can be used to educate patients in the ICU who are awake, able to communicate, and follow commands. This brochure focuses on the role of occupational therapy in the ICU setting, common questions about occupational therapy in the ICU, and a case study displaying a real-life story of a patient who received occupational therapy during their ICU stay. An example of a brochure for patients is included in Appendix B.

A handout is included for the primary audience of medical professionals and hospital administration on evidence-based literature supporting the need for occupational

therapy, benefits of occupational therapy, and treatments occupational therapy practitioners typically provide in the ICU. An example of this handout is included in Appendix C. This handout can be an educational tool for a variety of professionals such as physicians, nurses, rehabilitation managers, and hospital administration. Using this handout to educate physicians on the role and benefits of occupational therapy in the ICU can increase the number of referrals for occupational therapy with patients in the ICU despite the medical complexity of the patient. This handout can support the education of nursing staff on the role and benefits of occupational therapy in order to increase their follow through with occupational therapy practitioners' recommendations on activities, positioning suggestions, and environmental modifications for their patients. If nursing staff understand the literature supporting occupational therapy with patients who are medically complex, this may increase their confidence in occupational therapy practitioners mobilizing and treating their patients. Occupational therapy practitioners can use this handout to promote the profession to rehabilitation managers and hospital administration with a goal of improving the investment and staffing of occupational therapy practitioners in the ICU.

Medical and Safety Review

This section on medical and safety review is comprised of information to guide occupational therapy practitioners on how to complete chart reviews and safely provide occupational therapy services to patients with a variety of medical complexities. The program designer created a quick reference laboratory value resource. This resource includes common laboratory values of tests assessed with patients in the ICU, the purpose

of laboratory values, normal range for each individual laboratory value, considerations for therapists, and precautions for therapy and activity based on abnormal laboratory values. This handout is included in Appendix D.

It is important for occupational therapy practitioners to have a general understanding of the lines and tubes they may encounter in the ICU to assure the safety of their patients and themselves. Some lines, if pulled out, can cause patient death whereas if other lines are pulled out it causes no harm to the patient. The *OT ICU Guide* includes a resource on common lines and tubes seen with patients in the ICU, the role of each line, precautions, and contraindications for therapy and activity based on patients' lines. This resource is displayed in a handout created by the program designer using a compilation of evidence-based information.

Patients in the ICU require varying levels of respiratory support. Treating a patient who is on mechanical ventilation can be scary and intimidating for therapists. A handout covering the modes of respiratory support is included in the *OT ICU Guide*. The medical and safety review section also guides the user to professional websites and literature to help support the practitioner in providing safe care to patients in the ICU.

Occupational Therapy Evaluation Ideas

This section of the *OT ICU Guide* includes evaluations for occupational therapists to implement with patients in the ICU. Evaluations for patients with high medical and physical needs are included as well as evaluations for patients who have lower medical and physical needs but still require ICU monitoring and care. Evaluations that do not have a copyright are included directly in the resource guide, whereas evaluations that

have a copyright requiring user registration and purchase are suggested, but not included in the guide.

Occupational Therapy Treatment Ideas

This section includes treatment ideas for occupational therapy practitioners to implement with patients who have varying levels of medical complexity. A wide range of treatment ideas are provided for practitioners to implement based on patients' medical complexity and function. Treatments that have evidence supporting their efficacy are included as well as treatment ideas based on the program designer's professional experience and literature search.

Outcome

The primary outcome of the *OT ICU Guide* is to improve occupational therapy practitioners' knowledge, competency, and confidence treating medically complex patients in the ICU. The secondary outcome is to increase the number of patients receiving occupational therapy during their stay in the ICU and increase the frequency of these services. The secondary outcome can be achieved by increasing the number of therapists who have the knowledge and confidence to work in ICU. Additionally, promoting the role and benefits of occupational therapy in the ICU, through the *OT ICU Guide*, can increase the number of occupational therapy referrals for patients in the ICU.

A long-term outcome is for the profession of occupational therapy to be a mandatory member of the critical care team in ICUs throughout the United States. In 2010, the National Health Surveillance Agency made it mandatory for occupational therapy to be present and active on the ICU team in Brazil (Bombarda, Lanza, Santos, &

Joaquim, 2016). In the United States, occupational therapy services in the ICU are not consistent. Some ICUs have occupational therapy practitioners working part-time, some occupational therapy practitioners are full-time in the ICU, whereas some ICUs do not have any occupational therapists seeing their patients. The *OT ICU Guide* is a building block towards increasing the number of occupational therapy practitioners active in the ICU, increasing the number of patients seen in the ICU, and increasing the frequency of therapy among these patients.

Potential Barriers and Challenges

A challenge encountered when creating the *OT ICU Guide* was developing something that is comprehensive and beneficial to a wide range of occupational therapy practitioners. Currently occupational therapy and occupational therapy assistant programs provide varying degrees of education to students on occupational therapy practice in the ICU. There is not a standard of care for occupational therapy and research on the efficacy of holistic occupational therapy treatment in the ICU is limited. To address this challenge, the program designer surveyed occupational therapy practitioners and students, through the American Occupational Therapy Association CommunOT Forum, to ask what gaps of knowledge they experience and what information they would find most helpful in a resource guide for practicing in the ICU. The feedback provided by the occupational therapy practitioners and students guided the program designer on what items to include in the resource guide.

Since there is not a standard of care for occupational therapy in the ICU, the program designer completed an extensive review of literature, not just in occupational therapy journals, but medical journals from multiple disciplines such as physical therapy, critical care, nursing, psychiatry, and respiratory therapy. The program designer gathered information on the complex needs of patients in the ICU and the efficacy of treatments with patients in the ICU. This evidence-based information guided the development of the *OT ICU Guide*.

Summary and Conclusion

The *OT ICU Guide* can positively impact occupational therapists, the profession of occupational therapy, and patient outcomes. It helps occupational therapy practitioners promote the profession of occupational therapy in the ICU, through educational handouts and brochures for health care professionals, families and patients on the role of occupational therapy in the ICU. The *OT ICU Guide* directs occupational therapists on how to provide effective and evidence-based care in the ICU. By improving the implementation of evidence-based care in the ICU, patients can have improved quality of life and outcomes.

CHAPTER FOUR – Evaluation Plan

Introduction

The *OT ICU Guide* was created as a reference for occupational therapists and certified occupational therapy assistants who work in the intensive care unit (ICU) or are interested in the working in the ICU. Patients in the ICU experience physical and mental impairments during their hospital stay. Occupational therapy in the ICU can improve patients' cognition, strength, and functional independence, and decrease the incidence and duration of delirium (Alvarez et al., 2017). In a survey of 500 ICUs in the United States, only 34% reported having a dedicated occupational therapy and physical therapy team (Bakhru et al., 2015). Entry level occupational therapy and occupational therapy assistant programs are only required to provide "broad exposure to current practice settings...and emerging practice areas defined by the program" (ACOTE Manual, 2018, p. 19); which may leave some occupational therapy practitioners without the knowledge and confidence to work in the ICU. In a survey conducted by Foreman (2005), skills that increased occupational therapist's effectiveness assessing and treating patients in the ICU were their "familiarity with specialized equipment, an ability to prioritize treatment needs and to offer creative and flexible solutions" (p. 17). To increase occupational therapists' knowledge and confidence working in the ICU, the *OT ICU Guide* provides an overview of occupational therapy in the ICU for patients and medical providers, reviews medical and safety information for the ICU, and provides examples of occupational therapy assessments and treatments. To assess the effectiveness of the *OT ICU Guide* a program evaluation will be conducted.

Vision

Short term outcomes of this resource guide are to improve occupational therapists' ability, knowledge, and confidence with treating patients in the ICU who are medically complex. Intermediate outcomes of the program are to increase the number of occupational therapists working in the ICU, increase the number of patients receiving therapy in the ICU, and improve critical care team members' understanding of the role of occupational therapy in the ICU.

To assess the program's effectiveness and usefulness, a program evaluation of the *OT ICU Guide* will be conducted. The program evaluation will be completed in two phases. The first phase will be initiated immediately upon the program completion through a pilot study. This will be formative program evaluation focused on program improvement. A pilot study pretest-posttest quasi experimental design will be used and discussed in detail in the subsequent paragraphs.

The second phase of the program evaluation will be a summative program evaluation. This evaluation will be initiated approximately one year after the program is implemented. The intention of the second phase will be determining the effectiveness and long-term effects of the *OT ICU Guide*. This evaluation will identify program benefits and whether the program should be continued. Phase two evaluation questions will focus on the long-term program outcomes including patient outcomes, patient quality of life, and patients' length of stay in the ICU and hospital. Details of the second phase of the program evaluation (summative) will be determined as the program progresses.

Evaluation Purpose

The goal of the phase one program evaluation is to improve the *OT ICU Guide* by assessing if the intended program outcomes are being met. This evaluation will also identify the program strengths, limitations, and areas for improvement. The results of this program evaluation will be used to make improvements and improve effectiveness of the *OT ICU Guide*.

The phase one program evaluation will be a formative evaluation. According to Newcomer, Hatry, and Wholey (2015), a formative program evaluation is used to “improve the way a program is delivered” (p.11). A formative program evaluation is conducted while the program is being implemented. The program evaluation for the *OT ICU Guide* will determine if the guide is impacting occupational therapists’ ability to deliver care in the ICU. It will assist with identifying the effectiveness of the resource guide and the adaptations necessary to improve the program effectiveness. A core purpose of this program evaluation will be to identify if the program is meeting the primary program objective, which is to increase the confidence, competency, and knowledge of occupational therapists working with critically ill patients in the ICU.

Evaluation Scope

The program evaluation will be conducted by the program designer and will start immediately after the *OT ICU Guide* is complete and piloted. Twenty occupational therapy practitioners will be recruited to use the *OT ICU Guide* and be participants in the program evaluation. The program evaluation will consist of a pre-survey and post-survey

to assess occupational therapists' knowledge and confidence working in the ICU, as well as the usefulness and effectiveness of the resource guide.

Evaluation Questions

To determine whether the outcomes of the educational program are being met, the program designer will assess the following questions:

- How often are occupational therapists using the resource guide?
- How confident do occupational therapists feel providing care in the ICU?
- How knowledgeable are occupational therapists about providing care in the ICU?
- What are the strengths and weaknesses of the program?

Research Design and Method

The program evaluation will be a quantitative research design using a pretest-posttest quasi experimental design. The quasi experimental design will assist with evaluating the effectiveness of the resource guide. As part of the program evaluation, a pilot program of the *OT ICU Guide* will be implemented using a convenience sample of 20 occupational therapy practitioners. The therapists will be recruited through professional networking. Inclusion criteria for participants will be occupational therapists or certified occupational therapy assistants who currently work in ICU, who work in acute care, and/or new graduate occupational therapists intending to work in the ICU. Additionally, the participants must have access to a computer or mobile device that has

internet access for completion of web-based surveys. The experience level of these occupational therapists may vary. At the start of study, the participants will be issued a copy of the resource guide to use for their professional development and reference.

The participants will be asked to complete a pre-survey within one week of receiving the *OT ICU Guide*. The participants will then be asked to complete a post-survey three months and six months after distribution of the program. The surveys will gather information on the participants' knowledge as a result of the *OT ICU Guide*, as well as the practicality and the effectiveness of the *OT ICU Guide*.

Survey

The surveys will be web-based and distributed through email. With the digital age and ease of completing surveys online, it is anticipated that the return rate will be higher with a convenient web-based survey compared to a pen and paper survey through the mail.

The survey questions cover the following themes: occupational therapists' experience level and education, their understanding and knowledge of occupational therapy in the ICU, their ability to provide occupational therapy in the ICU, and their confidence working with patients in the ICU. These themes align with the primary outcome of the *OT ICU Guide*, which is to improve occupational therapist's ability, knowledge, and confidence with treating medically complex patients in the ICU. The pre-survey questions are displayed in Appendix E and post-survey questions are displayed in Appendix F.

The surveys consist of both fixed-choice and open-ended questions. The fixed-choice questions are displayed using a Likert rating scale. The pre-survey consists of Likert rating scale survey questions and open-ended questions. Each participant will complete this survey prior to using the *OT ICU Guide*. This pre-survey data will be used to determine program effectiveness by comparing it to post-survey data. Each participant will be asked to complete a post-survey three months and then six after they received the *OT ICU Guide*. The post-survey includes the same Likert rating scale questions as the pre-survey with additional open-ended questions seeking feedback on the usability and effectiveness of resource guide. The mean will be calculated for the responses of each item on the pre-survey and post-surveys. The means will then be compared using a t-test. Data from the open-ended questions will be compiled in one document and used for program improvement.

Data Management Plan

The pre and post surveys will be distributed through an online tool called *Google Forms*. At the start of the study, participants will receive an email with a description of the program, a link for the pre-survey, and they will be thanked for their participation in the study. Four days after the initial email was sent, a follow up email will be sent to remind participants to complete the survey and thank those who have already completed the survey. Three months and then six months after the initiation of the program, participants will receive another email with a survey link and a thank you. Four days after the post-surveys were send, a follow up email will be sent to remind participants to

complete the survey and thank the participants for their involvement in the study. After data analysis, the results of the program evaluation will be shared with the participants and all participants will receive any updates made to the *OT ICU Guide* as a result of the program evaluation.

During the program evaluation, confidentiality of participants will be maintained, and the survey responses will be kept anonymous. Quantitative data received from the pre and post surveys will be recorded and managed using the spreadsheet program *Google Sheets*. In addition to the quantitative data, a list of answers to the open-ended questions will be compiled in *Google Sheets* and will be used to improve the *OT ICU Guide* prior to making the program available to all occupational therapy practitioners.

The *OT ICU Guide* logic model, which includes the program inputs, resources, problem, theory, activities, outputs, and intended outcomes are presented in Figure 4.1.

The Occupational Therapy Intensive Care Unit Guide: A Practical Guide For Implementing Occupational Therapy Services with People who are Critically Ill

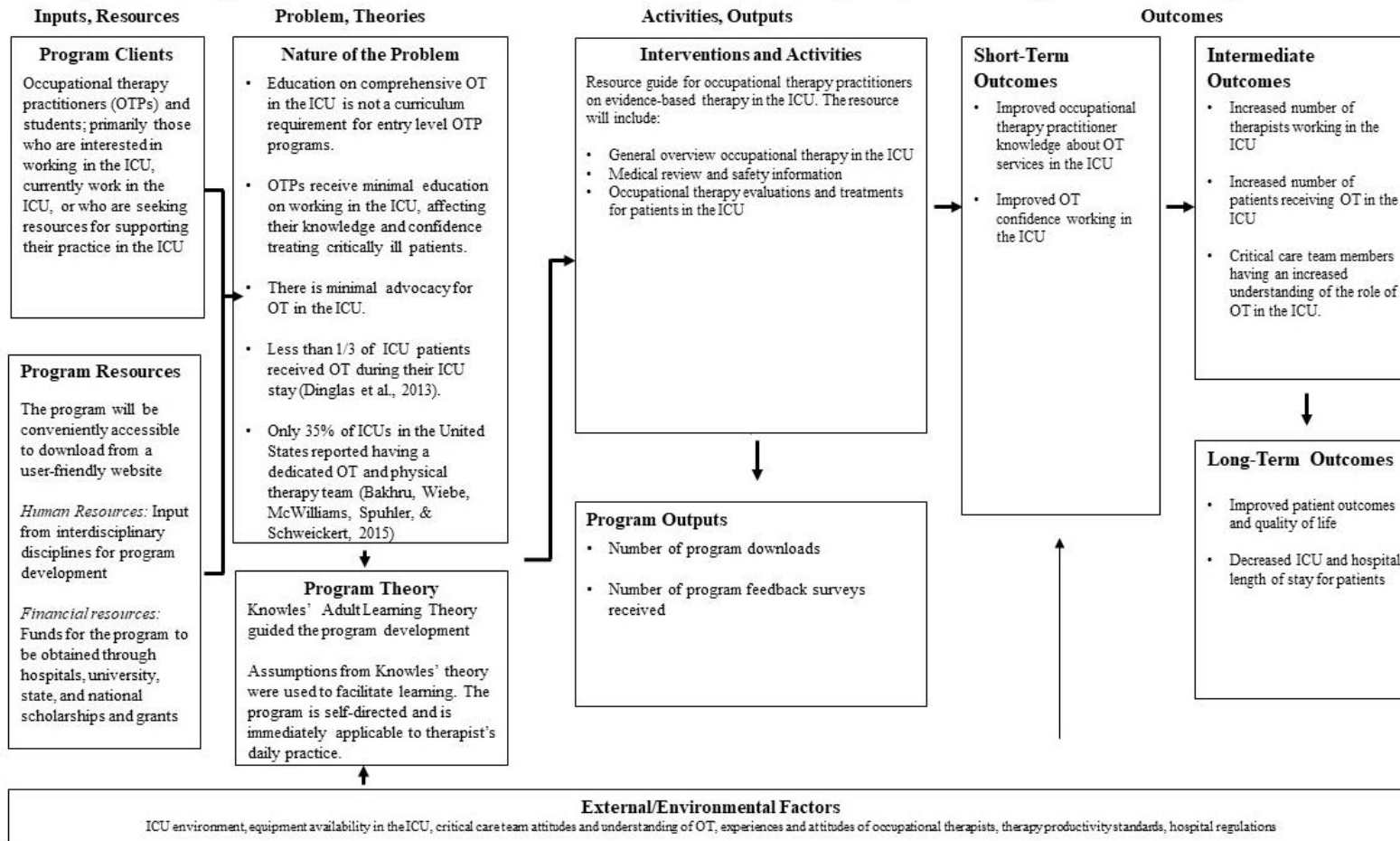


Figure 4.1: Logic Model

CHAPTER FIVE – Funding Plan

Project Description

The *OT ICU Guide* is a comprehensive resource created to support occupational therapy practitioners in providing therapy services in the ICU. The objective of this guide is to increase the confidence, competency, and knowledge of occupational therapy practitioners working with patients who are critically ill in the ICU. The target population for the *OT ICU Guide* is entry level occupational therapy practitioners, occupational therapy students, occupational therapy assistant students, occupational therapists new to the ICU, and occupational therapists interested in pursuing a career in the ICU. This comprehensive resource guide, which is available through an online website, can be used as an educational tool and a “quick stop” reference to answer questions about ICU specific information as it relates to occupational therapy. The guide consists of four sections: an overview of occupational therapy in the ICU, a review of medical and safety information for ICU patients, suggested occupational therapy evaluations for the ICU, and treatment ideas for patients in the ICU.

Funding Plan Overview

Developing and implementing the *OT ICU Guide* accrues costs for personnel and equipment. The objectives of this funding plan are to identify resources to aid in the development and dissemination of the program, identify program expenses, and identify potential funding sources to support the program.

Resources and Program Expenses

Personnel

The two categories of resources necessary to support this program are personnel and equipment. The program designer, this author, is developing, implementing, and modifying the *OT ICU Guide*. The first-year funding plan focuses on program development with time spent reviewing current evidence-based resources, consulting with professional mentors and co-workers, and gathering information from the program designer's clinical experience to develop and implement the *OT ICU Guide*. In the second year, the program designer will be responsible for website updates, program updates based on current trends in evidence, and program evaluation of the *OT ICU Guide*. The program designer is completing these tasks free-of-charge for her doctoral project, but fees for these services will be included in the budget in the case that funds became available. The program designer's spouse is skilled in the use of Microsoft Office and volunteers his services to assist with the formatting and readability of program handouts. He will also provide expertise to assist the program designer with creating a poster presentation for marketing the *OT ICU Guide* to the occupational therapy profession.

A graphic designer, through mermazingdesign, will be consulted to assist with website design and updates. Mermazingdesign is a graphic design company that provides consultation services for website design. Mermazingdesign charges \$25/hour for a graphic designer to provide consultation services. It is anticipated the website would take approximately 10 hours to build. The program designer will meet with the graphic

designer weekly until the website is complete. After the website is up and running, the program designer will meet with the graphic designer for website updates only as needed.

Equipment

The *OT ICU Guide* is offered online through a website; therefore, no costs will be accrued in the categories of instruction, supplies, material preparation, travel and facility rental. The *OT ICU Guide* will be offered to the public free of charge, although if participants wish to have a hard copy of the program, they will be responsible for printing the document.

Equipment necessary for the program is a computer, internet access, website software, and an internet domain registrar. A computer is needed for the development, implementation, and dissemination of this program. The program designer, this author, utilizes an MSI 15.6” laptop. The retail price for this laptop is \$1,699, which is a one-time fee (Best Buy, 2019). Since the program is offered online, internet access is required for the program development and implementation. The program designer is a Georgia resident utilizing Mediacom as an internet provider costing \$72.41 per month or \$869 a year. Internet access will be an expense accrued for as long as the program is offered.

Squarespace will be used for the website development and hosting. Squarespace business plan costs \$18 per month or \$216 per year (Squarespace, 2019). This cost will be accrued each year that the program is in existence. To gain access to the personalized website domain, Go Daddy, a registrar for internet domains, will be utilized. For the first year Go Daddy will cost \$9.99 per year, but for the subsequent years cost will be \$17.99 per year (GoDaddy Operating Company, 2019).

A budget outlining the program expenses for the first two years of the program is represented in Table 5.1. The first year of expenses start during program planning and the second year of expenses are for program implementation and dissemination.

	Item	Rationale	Planning Expense Year 1	Implementing Expense Year 2
Personnel	Program Designer	In the first year, the program designer, this author, is responsible for completing research, program development, implementation, and dissemination. In the second year the program designer will be responsible for website updates, program updates based on changes in evidence-based information, and program evaluation.	\$50/hour x100 hours = \$5,000	\$50/hour x50 hours=\$2,500
	Graphic Designer	Designs, updates, and maintains website needed for accessing the program.	\$250 (\$25/hour for 10 hours of design)	\$100 budgeted for as needed meetings and website updates
Equipment	Internet (Mediacom)	Internet is required for program development, updates, and program access.	\$869/year	\$869/year
	Laptop Computer	Laptop computer is required for program research, creation of all program documents website development and maintenance.	\$1,699 (1-time fee)	\$0
	Square Space	Software program used for creating the program website.	\$216/year	\$216/year
	Go Daddy	Registrar company used for gaining copyright of program website.	\$9.99/year	\$17.99/year
	Dissemination Plan Activities	Dissemination of the OT ICU Guide through professional presentations, networking, print media, and virtual means.		\$4,963.16
	Total Expenses		\$8,043.99	\$8,666.15

Table 5.1: One- and Two-Year Program Budget

Potential Funding Sources

Funding to cover the costs associated with developing and disseminating the *OT ICU Guide* can be obtained through university, state, and national scholarships and grants. Potential funding sources applicable to the demographics of the program designer are summarized in Table 5.2.

Funding Source	Amount	Information
Boston University Women's Guild Scholarships	\$500-1,000	<p>In the past, this scholarship has helped cover a variety of financial needs such as childcare, medical treatment, tuition, and thesis costs (Boston University Women's Guild, n.d.).</p> <p>Eligibility: Women enrolled in a graduate program. Must be 30 years of age and older</p> <p>https://www.bu.edu/womensguild/scholarships-awards/buwg-scholarships/</p>
Dudley Allen Sargent Research Fund: Doctoral Student Competition	Should not exceed \$5,000	<p>Financial assistance for doctoral students whose research may be delayed due to lack of funds (Boston University Sargent College, n.d.).</p> <p>Eligibility: Available for any post-professional doctorate students to apply for.</p> <p>https://www.bu.edu/sargent/research/research-funding-administration/dudley-allen-sargent-research-fund/</p>
National Military Family Association Scholarship	Average \$1,000	<p>Financial assistance that can be used towards education degrees, licensure, CEUs, business expenses, and employment (National Military Family Association, 2019).</p> <p>Eligibility: spouse of an active duty military member. Funds can be used for education and employment.</p> <p>https://scholarships.militaryfamily.org/offers/nmfa-spouse-scholarship/</p>

Pat Tillman Foundation Grant	Average of \$10,000 per academic year	<p>This grant provides financial assistance for military members and military spouses to further their education. It can be used for academic expenses and professional development (Pat Tillman Foundation, 2019).</p> <p>Eligibility: Veteran, active duty service member, or military spouses pursuing undergraduate, graduate, or professional degree.</p> <p>https://pattillmanfoundation.org/apply-to-be-a-scholar/</p>
Linda Stephens Scholarship	Not specified	<p>Provides financial assistance for students enrolled in an occupational therapy program and committed to serving the profession.</p> <p>Eligibility: Must be a Member of Georgia Occupational Therapy Association (Georgia Occupational Therapy Association, n.d.).</p> <p>https://www.gaota.com/recognitions-awards</p>

Table 5.2: Potential Funding Sources

Conclusion

Financial and personnel resources are essential in the development, implementation, and dissemination of the *OT ICU Guide*. A one year and two-year budget of estimated expenditures associated with this program are outlined in Table 5.1. Category expenses anticipated for the *OT ICU Guide*, are personnel and equipment. To cover the estimated expenses of the program, potential university, state, and national funding sources have been identified.

CHAPTER SIX – Dissemination Plan

Brief Description of Program

The *OT ICU Guide* is a reference for occupational therapy practitioners that includes evidence-based resources for implementing occupational therapy with patients in the intensive care unit (ICU). The *OT ICU Guide* was created to provide an accessible resource for occupational therapy practitioners for improving their knowledge and confidence treating patients who are critically ill. Entry-level occupational therapy programs are not required to provide education specific to ICU care, which impacts occupational therapists' competency and confidence working in the ICU setting. Additionally, a standard of practice for occupational therapy in the ICU does not exist and resources to guide occupational therapy practitioners on best practice in the ICU are limited. The *OT ICU Guide* was created for occupational therapy practitioners to use as a daily or periodic reference when treating patients in the ICU. The *OT ICU Guide* includes the following four sections; overview of occupational therapy in the ICU, medical review and safety information, occupational therapy evaluations for patients in the ICU, and occupational therapy treatment ideas for patients in the ICU.

Dissemination Plan Objectives

To educate the community about new the *OT ICU Guide*, a plan for disseminating the program was created. The dissemination plan will include the following information: dissemination long- and short-goals, target audiences for dissemination, key messages for the target audiences, messengers or spokespersons for conveying the key messages, dissemination activities, dissemination budget, and evaluation of the dissemination

activities.

Dissemination Goals

Long-term goal

- Frequency of occupational therapy services in ICUs in the United States will increase resulting in improved patient outcomes and quality of life, and decreased ICU and hospital length of stay.

Short-term goals

- Short-term goal one: 100 downloads of the *OT ICU Guide* will be completed by occupational therapy practitioners, occupational therapy and occupational therapy assistant students, and occupational therapy educators within six months of the program dissemination.
- Short-term goal two: Occupational therapy practitioners and occupational therapy students will report improved competency, knowledge, and confidence working in the ICU after using the *OT ICU Guide*.
- Short-term goal three: Critical care team members will demonstrate an improved understanding of the role of occupational therapy in the ICU based on an increased number of occupational therapy orders.

Target Audiences

The primary audience for dissemination of the *OT ICU Guide* is occupational therapy practitioners. The target audience for the *OT ICU Guide* is specifically occupational therapy practitioners who are working in the ICU or interested in working in

the ICU. In contrast, the dissemination plan will not only include advertisement to occupational therapy practitioners currently working in the ICU, but to all occupational therapists and occupational therapy assistants. Advertising the program to the entire occupational therapy profession brings awareness of available resources for practicing in the ICU. Advertising to a large population of occupational therapy practitioners can increase the likelihood that practitioners will hear about the program through professional networking.

The secondary audience for dissemination of the *OT ICU Guide* is occupational therapy educators and students. Occupational therapy educators will be defined as educators teaching in occupational therapy or occupational therapy assistant programs. Occupational therapy educators will be targeted for dissemination because they have access to students who will be attending fieldwork assignments and students who are preparing to graduate and start their career in occupational therapy. The *OT ICU Guide* can be used as a tool to educate students on the role and benefits of occupational therapy in the ICU. Additionally, occupational therapy educators can also advertise this program to their students as a resource to use in their practice as a new occupational therapy practitioner. Dissemination activities will also directly target occupational therapy and occupational therapy assistant students, as the *OT ICU Guide* can help them feel prepared to complete their fieldwork rotations and practice as an occupational therapy practitioner.

Key Messages for Occupational Therapy Practitioners

- It is vital for occupational therapy practitioners to be present and actively involved in providing care in the ICU.

- Occupational therapy in the ICU can increase patients' cognition, strength, and functional independence and decrease the incidence and duration of delirium (Alvarez et al., 2017).
- Only a small percentage of patients the United States ICUs are receiving occupational therapy. Not providing occupational therapy in the ICU is a disservice to our patients, their family members and the profession. The *OT ICU Guide* can help increase the number of therapists working in the ICU by improving practitioners' knowledge and confidence working with critically ill patients.
- The *OT ICU Guide* is a quick resource that can be used as a daily reference for medical and safety information, evaluation and treatment ideas for the ICU. The *OT ICU Guide* also has resources available to educate patients, family members, and healthcare professionals about the role and benefits of occupational therapy in the ICU.

**Key Messages for Occupational Therapy and Occupational Therapy Assistant
Educators and Students**

- Current occupational therapy curriculum in the United States does not adequately prepare entry level occupational therapy practitioners to work with medically complex individuals in the ICU. The Accreditation Council for Occupational Therapy Education (ACOTE) requires that occupational therapy and occupational therapy assistant programs prepare therapists to be a generalist practitioner by providing “broad exposure to current practice settings...and emerging practice

areas defined by the program” (ACOTE, 2018, p. 19). Programs are only required to provide broad exposure to current practice settings and programs are allowed to choose which emerging areas of practice to cover in the curriculum. Therefore, entry level occupational therapy practitioners may have limited knowledge of the scope of practice for occupational therapy in the ICU and may not feel comfortable providing therapy services in the ICU. Additionally, entry-level occupational therapy practitioners may not know where to find ICU specific resources to guide their practice.

- To safely and confidently treat patients in the ICU, occupational therapy and occupational therapy assistant students must be educated on safety, evaluations, and interventions for patients who are critically ill.
- The *OT ICU Guide* is a resource students and occupational therapy practitioners can use to improve their knowledge and confidence treating medically complex patients. This guide helps fill the educational gap that students experience in entry-level occupational therapy programs regarding ICU specific care.

Dissemination Activities and Messengers

Key messages for the primary and secondary audiences will be distributed through a variety of means including presentations, professional networking, print media, and virtual media. Specific dissemination activities for *The OT ICU Guide* are displayed in Table 6.1.

Dissemination Activity	Messengers	Activity Explanation
AOTA Annual Conference poster presentation	Program designer	<p>The program designer will submit a proposal for a poster presentation at the annual AOTA Annual Conference and Expo. The poster presentation will promote the <i>OT ICU Guide</i> and the role of occupational therapy in the ICU.</p> <p>This activity will target occupational therapy practitioners and occupational therapy and occupational therapy assistant educators and students.</p>
Johns Hopkins Critical Care Rehabilitation Conference poster presentation	Program designer	<p>Johns Hopkins hosts a Critical Rehabilitation Conference annually for critical care professionals. The program designer will submit a proposal for a poster presentation at conference. A poster presentation at this conference will allow the program designer to interact with occupational therapy practitioners as well as other critical care professions such as physicians, physical therapists, respiratory therapists, speech language pathologists, etc. The poster presentation will promote the <i>OT ICU Guide</i> and the role of occupational therapy in the ICU.</p> <p>This activity will primarily target occupational therapy practitioners.</p>
Albany State University presentation	Program Designer	<p>A presentation will be completed at a nearby Occupational Therapy Assistant program at Albany State University.</p> <p>This activity will target occupational therapy assistant educators and students.</p>
Augusta University	Program Designer	<p>A presentation will be completed at a nearby occupational therapy program at Augusta University.</p> <p>This activity will target occupational therapy educators and students.</p>
Professional Networking	Occupational therapy practitioners involved in the pilot study of <i>The OT ICU Guide</i> and the program designer	<p>Occupational therapy practitioners involved in the piloting of the <i>OT ICU Guide</i> will be asked to share their experience using the <i>OT ICU Guide</i> with the occupational therapy profession through informal networking. Additionally, quotes will be taken from these practitioners to use on the website and posters for positive advertising.</p> <p>The program designer will share the program through informal networking with her peers and coworkers.</p> <p>This activity will target occupational therapy practitioners, occupational therapy students and educators, and occupational therapy assistant students and educators.</p>

CommunOT advertising	Program designer	<p>CommunOT is an online forum for AOTA members to have discussions, share ideas, and advertise programs (AOTA, 2019a). The program designer will advertise the <i>OT ICU Guide</i> on the CommunOT forum, and the website link will be shared for practitioners to learn more about the program and download the program.</p> <p>This activity will target occupational therapy practitioners and occupational therapy and occupational therapy assistant students and educators.</p>
Instagram	Program designer	<p>A social networking Instagram account will be created by the program designer. Through this Instagram account the program designer will create posts related to occupational therapy, research evidence, and creative treatment ideas for occupational therapy in the ICU. This account will also be used to advertise the <i>OT ICU Guide</i>. To increase visibility of the Instagram account, the program designer will follow other medical and rehabilitation related Instagram accounts. The hashtag #oticuguide will be used to track posts related to the program.</p> <p>This activity will target occupational therapy practitioners and occupational therapy and occupational therapy assistant students and educators.</p>
Website	Program designer	<p>The <i>OT ICU Guide</i> will be advertised online through a website. The website will include information the <i>OT ICU Guide</i>. Consumers will be able to download the program directly from the website. The website will be advertised through networking, virtual media and print media.</p> <p>This activity will target occupational therapy practitioners and occupational therapy and occupational therapy assistant students and educators.</p>
OT Practice Magazine Advertisement	Program designer with support and assistance from Academic Mentor Wendy Coster PhD, OTR/L, FAOTA	<p>OT practice is the AOTA magazine that includes practical, professional and clinical information for occupational therapy practitioners (AOTA, 2019c). OT Practice is available online and in print for all AOTA members. It is published monthly and reaches over 61,000 readers (AOTA, 2019b). An advertisement of the <i>OT ICU Guide</i> will be displayed on one-quarter page of the OT Practice magazine in an effort to reach a large population of occupational therapy practitioners and students.</p> <p>This activity will target occupational therapy practitioners and occupational therapy and occupational therapy assistant students and educators.</p>

Custom <i>OT ICU Guide</i> Pens	Program designer	Custom pens advertising the <i>OT ICU Guide</i> will be created. To target occupational therapy and occupational therapy assistant educators and students, the pens will be distributed to occupational therapy and occupational therapy assistant programs and at Fieldwork educator certificate regional workshops via the mail. To target occupational therapy practitioners, the pens will be distributed at state and national occupational therapy conferences and United States hospitals both in person and via mail.
Brochures	Program Designer	Brochures will be created and disseminated to target the occupational therapy practitioners, educators and students. They will be disseminated at professional conferences, including AOTA annual conference, Johns Hopkins Critical Care Rehabilitation Conference, Fieldwork educator certificate regional workshops; hospitals; and occupational therapy and occupational therapy assistant educational programs to target both occupational therapy practitioners and occupational therapy and occupational therapy assistant students and educators.

Table 6.1: Dissemination Activities

Dissemination Budget

Dissemination activities will be completed during the second year of the program. Expenses for each dissemination activity vary. Some activities are free, whereas others have expenses associated with them. Additionally, the time required for the program designer to develop and implement the dissemination activities will be included in the budget. Anticipated expenses for each dissemination activity are displayed in Table 6.2.

Dissemination Activity	Expenses
AOTA Annual Conference poster presentation	Flight and Hotel: \$800 Conference fee: \$451 (AOTA, 2019d) Poster printing: \$189 (PosterPresentations.com, 2019)
Johns Hopkins Critical Care Rehabilitation Conference poster presentation	Flight and Hotel: \$500 Conference fee: \$670 (The Johns Hopkins University ^b , n.d.). Poster printing: \$0 (the poster from AOTA will be reused)
Albany State University presentation	Bagels and refreshments: \$50
Augusta University	Bagels and refreshments: \$50
Professional Networking	\$0
CommunOT advertising	\$0
Instagram	\$0
Website	\$0 Already budgeted during program development phase
OT Practice Magazine Advertisement	\$1,044 for ¼ page (AOTA, 2019b)
Custom <i>OT ICU Guide</i> Pens	\$686.08 (500x \$1.34/pen) (Office Depot, Inc., 2019)
Brochures	Brochure Printing: \$123.08 (500 copies) (UPrinting.com, 2019)
Program Designer Fees	\$50/hr. for 8 hours = \$400
Total Expenses	\$4,963.16

Table 6.2: Dissemination Budget for First Two Years of The *OT ICU Guide*

Evaluation

Success of the dissemination activities will be evaluated by whether the short-term dissemination goals were met. The following criteria will determine if the short-term goals are met as a stepping stone for reaching the long-term goal.

- Short-term goal one: 100 occupational therapy practitioners and occupational therapy students will download the *OT ICU Guide* within six months of the program dissemination. This will be evaluated based on the number of program downloads from the website.
- Short-term goal two: 75 occupational therapy practitioners and occupational therapy students will report improved ability, knowledge, and confidence working in the ICU. This will be evaluated based on the results of a web-based survey distributed to all individuals who download the *OT ICU Guide*.
- Short-term goal three: Occupational therapy practitioners will report a 10% increase of occupational therapy orders in the ICU; which reflects an increased understanding of the role of occupational therapy in the ICU among critical care team members.

In addition to assessing if the dissemination goals are met, an evaluation of each dissemination activity will be completed to determine which activities should be continued and discontinued for the betterment of the dissemination plan. An overarching evaluation of dissemination efforts will be the number of website visits and program downloads from the *OT ICU Guide* website. When consumers download the program, they will be asked to share how they heard about the program. These subjective responses will highlight which dissemination activities are yielding successful results.

The success of in-person activities, virtual activities, and print activities will be evaluated based on measurable criteria. These evaluation efforts are displayed in Table 6.3.

Dissemination Activity	Evaluation
AOTA Annual Conference poster presentation	Number of individuals visiting the poster presentation and the number of individuals requesting access to the program.
Johns Hopkins Critical Care Rehabilitation Conference poster presentation	Number of individuals visiting the poster presentation and the number of individuals requesting access to the program.
Albany State University presentation	Number of students requesting access to the program. The number of times the program designer gets asked to complete future presentations.
Augusta University	Number of students requesting access to the program. The number of times the program designer gets asked to complete future presentations.
Professional Networking	Number of program downloads where individuals reported learning about the program through professional networking.
CommunOT advertising	Number of responses on the online forum and number of program downloads as a result of the forum.
Instagram	Number of followers, “likes”, the number of posts from outside sources with the hashtag #oticuguide, and the number of posts shared.
Website	Number of website visits.
OT Practice Magazine Advertisement	<p>The OT practice magazine advertisement will be displayed virtually or in print. OT Practice reaches over 61,000 readers which include occupational therapy practitioners, students, and educators (AOTA, 2019b).</p> <p>This dissemination effort will be evaluated based on the number of program downloads where the individual shares they learned about the program through the OT Practice advertising.</p>
Custom <i>OT ICU Guide</i> Pens	<p>Number of items created and distributed.</p> <p>Number of program downloads where the individual learned about the program from a pen advertisement.</p>
Brochures	<p>Number of items created and distributed.</p> <p>Number of program downloads where individual learned about the program from a brochure.</p>

Table 6.3: Evaluation of Dissemination Activities

Conclusion

This dissemination plan for the *OT ICU guide* includes in-person, virtual, and print activities with a goal to disseminate the program to the occupational therapy and occupational therapy assistant profession as a whole. The program designer anticipates that widespread dissemination of the *OT ICU Guide* can promote the profession of occupational therapy in the ICU, improve patient outcomes, and improve the knowledge and confidence of occupational therapists working in the ICU.

CHAPTER SEVEN - Conclusion

Occupational therapy in the ICU improves positive patient and hospital outcomes. However, occupational therapy practitioners do not have the necessary support and resources to provide safe and effective services in the ICU. In the United States, occupational therapy practitioners are not active and present in the ICU. On the contrary, Brazil requires occupational therapy practitioners to be on the ICU team as active members (Bombarda et al., 2016). To increase the presence of occupational therapy practitioners in the ICU the *OT ICU Guide* was created. The *OT ICU Guide* is a professional resource for occupational therapy practitioners on providing therapy in the ICU. Additionally, the *OT ICU Guide* is a promotional tool to promote the role and benefits of occupational therapy in the ICU to health care providers, rehabilitation staff, and hospital management.

The *OT ICU Guide* is an innovative approach to increasing the presence of occupational therapy in the ICU. The program designer completed an extensive review of literature and professional resources in the medical community to compile an easily accessible “one-stop shop” for occupational therapy practitioners. Resources in the *OT ICU Guide* include new and innovative handouts, brochures, and references, created by the program designer, in addition references to resources readily available through professional organizations to help support practice.

The *OT ICU Guide* addresses two populations of individuals; occupational therapy practitioners already working in acute care or the ICU as well as occupational therapy practitioners and students interested in pursuing a career in the ICU. The *OT ICU*

Guide is a resource primarily for novice therapists but offers resources and references for occupational therapy practitioners and students of all experience levels.

The *OT ICU Guide* is the building block towards improving the presence of occupational therapy in the ICU and increasing the number of patients receiving occupational therapy during the stay in the ICU. In addition, *OT ICU Guide* is a first step towards developing a standard of care for occupational therapy in the ICU, through increasing the availability of evidence-based resources. The program designer will complete a program evaluation to assist with identifying which items in the resources guide are most beneficial for occupational therapy practitioners as well as topics and items that should be added. Compiling evidence from the literature in one place provides occupational therapy practitioners and students an overview of occupational therapy in the ICU, gaps of care, and areas that require future research; such as the efficacy of specific occupational therapy interventions in the ICU.

The *OT ICU Guide* includes resources that are based on evidence in the literature, in addition to the program designers professional experience and professional networking. Use of the *OT ICU Guide* gets occupational therapy practitioners interested in implementing evidence based occupational therapy and encourages practitioners to complete future research opportunities in occupational therapy. Costigan et al. (2019) states “there could be opportunities for occupational therapists to expand their role and spearhead original research investigating an enriched breadth of ICU interventions” (p. 1). In accordance with the call to action by Costigan et al. (2019), the *OT ICU Guide* is a starting point to enhance occupational therapy practitioners understanding of the need for

occupational therapy in the ICU, the benefits of occupational therapy in the ICU, and future research opportunities to advance the profession of occupational therapy for the benefit of our patients.

APPENDIX A: Brochure for Families of Patients in the ICU (Bi-Fold)

Success Story

Larry is a 70-year-old man who had open heart surgery. Before surgery he was able to care for himself. He is retired and enjoys volunteering in his community.

Larry had his first occupational therapy session one day after his surgery. At this time, he still was attached to many heart monitoring devices and had a breathing tube to help him breathe.

Occupational Therapy helped Larry with:

- Communicating with Larry using yes/no questions or pictures until he got his breathing tube out.
- His thinking skills
- His strength and energy so he could do more for himself
- Moving safely so he could help with his self-cares.

When Larry was medically ready to be discharged from the hospital he was:

- Able to get dressed and shower with a little help
- Able to walk to the bathroom and go the bathroom with help
- Ready to go to rehabilitation for more therapy

Helpful Information

American Heart Association
www.heart.org

American Occupational Therapy Association
www.aota.org



OCCUPATIONAL THERAPY IN THE INTENSIVE CARE UNIT (ICU)



This Photo by Unknown Author is licensed under CC BY-ND

*Helping your loved one
recover*

Outside panels of brochure

What is Occupational Therapy?

- Occupational therapists help people with health challenges do things that are meaningful to them.
- Occupational therapists work with people of all ages, in schools, rehab centers, hospitals, nursing homes, communities, and clinics.



Occupational Therapy In the Intensive Care Unit (ICU)

Occupational therapy will help your loved one return to participating in their daily activities.

The occupational therapist may help your loved one regain their independence with things such as:

- Self-care activities
- Moving safely for participation in daily tasks and meaningful activities (ex: dressing, bathing, leisure activities)
- Following directions, cognitive thinking skills, social participation

The occupational therapist can help you create an ICU diary for your loved one to help them understand what happened during their hospital stay.

Common Questions

What will happen during my loved one's first occupational therapy session?

The occupational therapist will spend time getting to know your loved one and learning about how they were doing prior to coming to the hospital, if they normally needed any help with daily tasks, what their living situation is, and what things are meaningful to them.

The occupational therapist will start helping your loved one move and participate in small tasks

What will I do in occupational therapy?

The occupational therapist will help you and your loved one make goals for therapy. Sessions may focus on things such as total body exercises, direction following, rolling, sitting on the edge of bed to improve their strength for participation in self cares and daily activities, and getting to a bedside toilet to go to the bathroom.

Is it safe for my loved one to do therapy with all of these lines and tubes?

Yes!

Therapy helps your loved one get better so they can do things that are meaningful to them.



What is the difference between occupational and physical therapy?

Occupational therapy helps people get back to their daily activities. Physical therapy helps people with physical movement.

APPENDIX B: Brochure for Patients in the ICU (Bi-Fold)

Success Story

Larry is a 70-year-old man who had open heart surgery. Before surgery he was able to care for himself. He is retired and enjoys volunteering in his community.

Larry had his first occupational therapy session one day after his surgery. At this time, he still was attached to many heart monitoring devices and had a breathing tube to help him breathe.

Occupational Therapy helped Larry with:

- Communicating with his family and medical providers using yes/no questions or pictures until he got his breathing tube out
- His thinking skills
- His strength and energy so he could do more for himself
- Moving safely for doing his self-cares


When Larry was medically ready to be discharged from the hospital he was:

- Able to get dressed and shower with a little help
- Able to walk to the bathroom and go the bathroom with help
- Ready to go to rehabilitation for more therapy


Helpful Information

American Heart Association
www.heart.org

American Occupational Therapy Association
www.aota.org



OCCUPATIONAL THERAPY IN THE INTENSIVE CARE UNIT (ICU)



* This Photo by Unknown Author is licensed under CC BY-SA-NC

Helping you live your life

Outside Panels of Brochure

What is Occupational Therapy?

- Occupational therapists help people with health challenges do things that are meaningful to them.
- Occupational therapists work with people of all ages, in schools, rehab centers, hospitals, nursing homes, communities, and clinics.



Occupational Therapy In the Intensive Care Unit (ICU)

Occupational therapy can help you regain your independence with your self-cares and mobility.

Your occupational therapist can also help:

- Improve your energy so you don't get as tired when doing your daily activities
- Recommend equipment to help you with your daily activities (for example; shower chair)
- Recommend further therapy for once you leave the hospital

Common Questions

What will happen during my first occupational therapy session?

The occupational therapist will get to know you and learn what is important to you, how you were doing before coming to the hospital, what your house setup is like, and what you need to get back to doing.

The therapist will then test your strength and abilities and help you create goals for therapy that focus on what you need/want to get back to doing for yourself.

What will my occupational therapy sessions be like?

Sessions will focus on the goals you and your therapist created. Some common things you may work on are getting to the chair, walking to the bathroom, standing to brush your teeth, taking a shower, or getting dressed.

Is it safe to do therapy with all of these lines and tubes?

Yes!



What is the difference between occupational and physical therapy?

Occupational therapy helps people get back to their daily activities. Physical therapy helps people with physical movement.

APPENDIX C: Handout for Critical Care Professionals

Occupational Therapy: A Necessity in the Intensive Care Unit

The Need for Occupational Therapy:

- Patients in the Intensive care Unit (ICU) are at risk for cognitive, mental and physical impairments.
- More than half of ICU survivors experience long term cognitive impairments (Alvarez et al., 2017; Jackson et al., 2015).
- Depression occurs in 25-50% of individuals who survive a critical illness (Jackson et al., 2015).
- A person can lose 1-1.5% muscle strength each day they spend on bed rest (Hopkins & Spuhler, 2009).
- ICU acquired weakness is associated with more time spent on the ventilator. Twenty five percent of patients who are on mechanical ventilation for a week or more have ICU acquired weakness (Hashem, Nelliot, & Needham, 2016; Schweickert et al., 2009).
- Patients in the ICU need occupational therapy to prevent and rehabilitative impairments from an ICU stay.

The Benefits of Occupational Therapy in the Intensive Care Unit

Occupational therapy improves patient outcomes and saves the hospital money!

- Occupational therapy in the ICU improves patients' cognition, strength, and functional independence, and decreases the incidence and duration of delirium. It decreases patient length of stay in the hospital and saves the hospital money (Alvarez et al., 2017; Lord, et al., 2013).
- Patients who receive occupational therapy and physical therapy daily while mechanically ventilated have less time spent on the ventilator, shorter duration of delirium, and increased independence compared to those who do not receive therapy (Schweickert et al., 2009).

What do Occupational Therapy Practitioners do in the Intensive Care Unit?

- Occupational therapy practitioners offer a holistic perspective, focusing on the whole person, including their physical health, psychosocial health, mental health, communication needs, social abilities, and how their environment impacts their recovery and engagement in meaningful activities
- Examples of treatment activities include:
 - Delirium prevention and recovery
 - Addressing patient's safety during their activities of daily living and mobility
 - Orientation activities
 - Short- and long-term memory activities
 - Improving command following
 - ICU Diary to assist with recall of their hospital stay
 - Polysensory stimulation
 - Relaxation techniques
 - Communication interventions
 - Task endurance and strengthening
 - Fine and gross motor coordination activities
 - Positioning
 - Mobility for engagement in activities of daily living
 - Activities of daily living training
 - Equipment recommendations
 - Compensatory technique education
 - Splinting and skin care
 - Sleep interventions
 - Family education on assisting their loved one physical and mentally in the ICU and at discharge

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APPENDIX D: Laboratory Values Handout

Laboratory (lab) values reflect a patient's health. As stated in Smith-Gabai (2011), lab values "are used to screen or establish a diagnosis, rule out a condition, monitor therapies and medications, or establish a prognosis" (p. 713). Lab value results can impact how a patient functions and how much activity a patient can tolerate. Dependent on patient lab values, therapy may need to be deferred or activity altered to assure patient health and safety.

This chart is a quick reference to assist you with determining appropriate activity for patients. This guide was developed based on current evidence in the literature but be sure to follow your hospital's lab value policies. Consult your patients' medical team if questions or concerns arise.

Things to consider:

- What is the lab value trend from the last 24-48 hours?
- What is causing the lab value to be abnormal?
- Have the doctors commented on the abnormal lab value in their notes?
- Is the lab value chronic or acute?
- If the lab value is abnormal, consider the benefit versus risk of therapy
- Use your clinical judgment and consult the patients nurse and or physician if you are questioning appropriateness of therapy intervention due to abnormal lab values.

Laboratory Value	Purpose	Normal Range	Indication for Therapy	Precautions for Abnormal Lab Values
Hematology				
Hemoglobin	Protein in red blood cells that carries oxygen from the lungs to other tissues in the body. ^{1,3}	Female: 12-16g/dl Male: 14-18 g/dl ⁴	<p><8g: Proceed with caution. No exercise recommended, essential ADLs, consult with medical team about treatment.</p> <p>8-10: ADLs, light exercise and light weights (1-2#)</p> <p>>10: Ambulation, exercise and ADLs as tolerated. Resistive exercise.^{1,4}</p>	<p>If hemoglobin is low, the heart must work harder to transport enough oxygen to the body.¹</p> <p>Closely monitor blood pressure, heart rate and oxygen saturation. Patients may have low activity tolerance-implement rest breaks as needed. Keep SpO2 >90%¹</p> <p>Low hemoglobin can cause weakness, exercise intolerance, fatigue, dyspnea, dizziness, blurred vision, tachycardia, orthostatic hypotension¹</p> <p>Consult your facility about treating patients while they are receiving a blood transfusion. If treating a patient who is receiving a blood transfusion complete light activity only and closely monitor vitals.</p>
Hematocrit	Represents the percentage of red blood cells in the blood volume. Value assesses the body's fluid balance and blood loss. ^{1,3}	Female: 37-47% Male: 42-50% ⁴	<p><25% : No exercise, essential ADLs, consult medical team regarding possible transfusion prior to mobilization</p> <p>25-30%: Light exercise and light weights (1-2#), light aerobics, ADLs, progress activity based on patient symptoms</p> <p>>30%: Resistive exercises, aerobic activity, ambulation and ADLs as tolerated</p> <p>>60% defer therapy, can indicate spontaneous blood clotting^{1,5,6}</p>	<p>Closely monitor blood pressure, heart rate and oxygen saturation. Implement rest breaks as needed.</p> <p>Low hematocrit symptoms are the same as low hemoglobin; weakness, exercise intolerance, fatigue, dyspnea, dizziness, blurred vision, tachycardia, orthostatic hypotension.¹</p>

<p>White Blood Cell Count (Leukocyte count)</p>	<p>Reflects the status of the body's immune system, can indicate an infection or inflammation.</p> <p>White blood cells shield the body from infection. ^{1,7}</p>	<p>4,000-11,000 microL⁴</p>	<p>Use symptoms-based approach</p> <p><4,000: Neutropenic precautions</p> <p><5,000: Consult patient's team about ADL treatment session no exercise</p> <p>>5,000: Light exercise progressing to resistive exercises as tolerated ^{1,5}</p>	<p>Neutropenia: low number of neutrophils that fight off infection.</p> <p>Neutropenic precautions: strict hand washing, gloves, mask and down (as ordered by physician). Wash all equipment prior to bringing it into the patient's room. ¹</p> <p>If sick, do not treat patients on neutropenic precautions.</p> <p>Pancytopenia: shortage of blood cells (red blood cells, platelets, white blood cells)¹</p> <p>Pancytopenia precautions relevant to therapy include; avoid shaving with razors and no flossing¹</p>
<p>Platelets</p>	<p>Clot Blood¹</p>	<p>150,000-450,000 microL⁴</p>	<p><10,000 or temperature >100.5 degrees: No exercise (risk for spontaneous bleeding). Hold therapy</p> <p>10,000-20,000: light exercise, AROM, NO PROM, ADLs, ambulation ok</p> <p>>20,000: progress to resistive exercise as patient tolerates ^{1,5}</p>	<p>Thrombocytopenia (platelets <150,000) can cause bleeding from mucosal surfaces (gums, nose, GI tract, respiratory tract, and uterus). These patients are at higher risk of bruising and bleeding. ¹</p> <p>Modifications for patients with thrombocytopenia:</p> <ul style="list-style-type: none"> • Avoid flossing • Use soft bristle toothbrush • Use electric razor instead of straight razor • Inspect skin and mouth for sores¹ <p>With abnormal platelet count, implement strict fall prevention strategies due to high risk of hemorrhage</p>

Laboratory Value	Purpose	Normal Range	Indication for Therapy	Precautions for Abnormal Lab Values
Coagulation				
International Normalized Ratio (INR)	Determines blood coagulation ⁵	2-3 therapeutic range ⁴	<p>>4 No resistive exercises, edge of bed ADLs and ROM</p> <p>>5 Consult medical team, consider DEFERRING therapy d/t high risk of bleeding</p> <p>>6 potential bed rest⁵</p>	<p>Patients with elevated INR are at a higher risk of bleeding. Implement fall prevention techniques.¹</p> <p>Speak with medical team prior to assisting patient with shaving with razor (use electric razor if available) due to increased risk of bleeding if the patient cuts themselves.</p>
Prothrombin Time	Determines blood coagulation with coumadin (warfarin) ^{1,6}	11-13 seconds ⁴	>25 consult medical team, consider DEFERRING therapy d/t high risk of bleeding ⁶	<p>When elevated, patients are at greater risk for bleeding.</p> <ul style="list-style-type: none"> • Implement fall prevention techniques. • Speak with patients' medical team prior to assisting them with shaving with razor (use electric razor if available) due to increased risk of bleeding if the patient cuts themselves.
Partial Thromboplastin Time (activated)	Determines blood coagulation with heparin. Monitors anti-coagulation therapy. ¹	25-35 seconds ⁴	>70 consult medical team, consider DEFERRING therapy d/t high risk of spontaneous bleeding ^{1,2}	<p>Patients with greater than range are at risk for bleeding.</p> <ul style="list-style-type: none"> • Avoid excessive resistive exercise. • Implement fall prevention techniques. • Speak with patients' medical team prior to assisting them with shaving with razor (use electric razor if available) due to increased risk of bleeding if the patient cuts themselves.

Laboratory Value	Purpose	Normal Range	Indication for Therapy	Precautions for Abnormal Lab Values
Electrolytes				
Potassium (serum)	Affects neuromuscular function, heart rate and heart contraction. ^{1,5}	3.5-5.0 <u>mEq/L</u> ⁴	<2.8 OR >5.1 : Defer Therapy ⁵	Imbalances can lead to cardiac arrest, arrhythmias, muscle spasms. ^{1, 5} Monitor vitals throughout session CHF patients may be able to tolerate increased potassium levels. ⁵
Sodium (serum)	Determines volume of fluid in the body ¹ Facilitates nerve impulses ¹	136-145 <u>mEq/L</u> ⁴	<120 OR >155 : defer therapy OR consult medical team ⁵	Abnormal values to impact cognition ⁶ <120 can cause weakness or neurological symptoms ⁵ >155 life threatening, can cause seizures ⁵
Calcium (serum)	Important for bone and teeth formation, cell division and growth, cardiac conductivity and blood coagulation ¹	8.6-10.2 mg/dL ⁴	Determine therapy based on patient symptoms. Monitor vitals and cognition if abnormal value ⁶	Cardiac changes are possible with abnormal calcium. Monitor vitals during therapy. Hypercalcemia (high levels of calcium) symptoms: confusion, cardiac symptoms (heart block, asystole, ventricular dysrhythmias), weakness, abdominal or muscle cramping, numbness or tingling of fingers, dehydration, nausea and vomiting ¹ Hypocalcemia (low levels of calcium) symptoms: confusion, anxiety, lethargy, weakness, fatigue, tachypnea, cardiac changes ¹
Magnesium (serum)	Regulates nerve and muscle function ¹	1.6-2.6 <u>mEq/L</u> ⁴	Determine therapy based on patient symptoms. ⁶ Critical values are <0.5 OR >3.0 ¹	<u>Hyper</u> magnesium (elevated magnesium) symptoms: cardiac changes (hypotension, heart block), nausea, vomiting, muscle weakness, decreased reflexes, drowsiness, diaphoresis, respiratory depression ¹ <u>Hypo</u> magnesium (decreased magnesium) symptoms: hypotension, confusion, delusions, seizures, arrhythmias, muscle spasms, numbness, increased reflexes, lower extremity cramps ¹

Laboratory Value	Purpose	Normal Range	Indication for Therapy	Precautions for Abnormal Lab Values
Cardiac Markers				
Troponin	Used to diagnose myocardial infarctions (MI) and stress to the heart. ¹ Protein found in cardiac muscle tissue that released with cardiac injuries. ¹ Two types of troponin tests: <u>Troponin I</u> increases 4-6 hours after injury ¹ <u>Troponin T</u> increases 4-8 hours after injury rises 4-8 hours after injury ¹	Troponin I <0.04 ng/mL ⁴ Troponin T: 0.01 ng/mL ⁴	DEFER therapy 24 hours after troponin peaks ² DEFER therapy if troponin is trending up and has not yet been treated by physician. DEFER therapy if chart reveals patient has been having chest pain and the physician has ordered troponin labs	Monitor the trend of troponin. Is it trending upward or downward? Review patients' chart to identify reason for upward trending troponin. Consult team if any questions regarding patients elevated troponin. Elevated troponin can be caused by other reasons than MI (cardiac surgery, rhabdomyolysis, congestive heart failure, critical illness, etc.) ⁶
Creatine Kinase (CK)	CK is elevated/released into the blood after a cardiac, brain, and skeletal injury. ⁶ CK can elevate after myocardial infarction, rhabdomyolysis or compartment syndrome. ⁵	Female: 30-135 units/L Male: 55-170 units/L ⁴	HOLD therapy or LIMIT activity. Closely monitor vitals ⁵	Resume therapy once levels are trending down. Observe CK levels the day after therapy session. If CK has elevated since your therapy it may be due to too much activity. Consider why the CK is elevated, cardiac injury? Brain Injury? Skeletal Injury? Types of CK enzymes: ⁶ CK-MB: in Cardiac Muscle CK-BB: in Brain Tissue CK-MM: in Skeletal Muscle
Other				
Glucose	Measures blood sugar levels in the blood. ¹	70-99 mg/dL (fasting) ⁴	<60 OR >300: defer therapy until blood sugar is corrected ¹	Symptoms of hypoglycemia: weakness, headache, shakiness, blurred vision, clamminess, delayed motor and cognitive responses ¹ Symptoms of hyperglycemia: increased heart rate, nausea, vomiting, weakness, dehydration, acetone breath ¹

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APPENDIX E: Pre-Survey Program Evaluation Questions

For each of the questions below, select the response that best characterizes how you feel about the statement. 1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4=Slightly Agree, 5= Agree, 6= Strongly Agree

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. I received education on working in the intensive care unit while in occupational therapy school	1	2	3	4	5	6
2. I have attended continuing education focused on occupational therapy in the intensive care unit	1	2	3	4	5	6
3. I understand the role of occupational therapy in the intensive care unit	1	2	3	4	5	6
4. I have the knowledge I need to work in the intensive care unit	1	2	3	4	5	6
5. I have the skills necessary to treat patients in the intensive care unit	1	2	3	4	5	6

6. I know where to find resources to assist me with working in the intensive care unit 1 2 3 4 5 6

7. I feel **confident** working in the intensive care unit 1 2 3 4 5 6

8. How many years have you been an occupational therapist?

9. Do you currently work in the ICU?

 If yes? How long have you worked in the ICU?

APPENDIX F: Post-Survey Evaluation Questions

Implemented three and six months after participants receive the *OT ICU Guide*

For each of the questions below, select the response that best characterizes how you feel about the statement. 1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4=Slightly Agree, 5= Agree, 6= Strongly Agree

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. I have attended continuing education focused on occupational therapy in the intensive care unit	1	2	3	4	5	6
2. I understand the role of occupational therapy in the intensive care unit	1	2	3	4	5	6
3. I have the knowledge I need to work in the intensive care unit	1	2	3	4	5	6
4. I have the skills necessary to treat patients in the intensive care unit	1	2	3	4	5	6
5. I know where to find resources to assist me with working in the intensive care unit	1	2	3	4	5	6

6. I feel confident working in the intensive care unit	1	2	3	4	5	6
7. The Occupational Therapy Intensive Care Unit Resource Guide has improved my knowledge for working in the intensive care unit	1	2	3	4	5	6
8. The Occupational Therapy Intensive Care Unit Resource Guide has improved my confidence for working in the intensive care unit	1	2	3	4	5	6
9. I plan to use the Occupational Therapy Intensive Care Unit Resource Guide in the future	1	2	3	4	5	6
10. I would recommend the Occupational Therapy Intensive Care Unit Resource Guide to other occupational therapists	1	2	3	4	5	6

11. How often are you using The Occupational Therapy Intensive Care Unit Resource Guide? Please circle the best fitting answer.

1-3 times a week 4-7 times a week 1-2 times a month <1 time a month

12. What changes would you make to the Occupational Therapy Intensive Care Unit Resource Guide?

13. What components of the Occupational Therapy Intensive Care Unit Resource Guide are most beneficial?

EXECUTIVE SUMMARY

The Occupational Therapy Intensive Care Unit Guide: A Practical Guide for Implementing Occupational Therapy with People Who are Critically Ill

Introduction

Greater than five million people in the United States are hospitalized in the intensive care unit (ICU) per year (SCCM, n.d.). Patients in the ICU are critically ill and undergo continuous monitoring and specialized treatment for their medical conditions (SCCM, n.d.). A large portion of patients' time is spent in bed connected to multiple lines and tubes for monitoring and medical interventions. In addition to the diagnosis that first brought them to the hospital, patients in the ICU are at risk for developing secondary impairments. For each day spent in bed, a patient can lose 1–1.5% of their muscle strength (Hopkins & Spuhler, 2009). Patients in the ICU are also at risk for developing cognitive impairments, depression, anxiety, and decreased ability to care for themselves (Affleck et al., 1986; Girard, et al., 2010; Hashem et al., 2016; Jackson, Mitchell, & Hopkins, 2015). More than half of patients who survive their ICU stay experience long term cognitive impairments (Alvarez et al., 2017; Jackson et al., 2015;).

Occupational Therapy in the ICU

“The primary goal of acute care [hospitals] is to stabilize the patient’s medical status and address life-threatening issues. An essential second goal is to improve functional status and safety to prevent physical and cognitive complications- which are also key components of occupational therapy” (AOTA, 2017, para. 1). Occupational therapy in the ICU is a specialty area. Patients have complex medical conditions, safety precautions, and require specialized equipment to sustain their life and improve their

health and well-being. In the ICU, occupational therapy practitioners provide a wide range of holistic interventions. Occupational therapy practitioners in the ICU provide interventions focused on improving patients' safety during self-care and mobility activities, memory activities, relaxation techniques, coping skills, communication activities, feeding, self-care training, delirium prevention and interventions, positioning, splinting, sleep, sensory stimulation, and family training on creating a (ICU diary) to document the patient's hospital stay (Costigan et al., 2019). In addition, occupational therapists provide interventions focused on range of motion, strengthening, endurance training, coordination activities, durable medical equipment recommendations, and mobility training for participation in daily activities. With these specialized treatments occupational therapists can help prevent and rehabilitate the deficits patients experience in the ICU.

Problem

Occupational therapy practitioners in the ICU work to improve patients' cognition, strength, and functional independence, and decrease length of time spent on the ventilator (Alvarez et al., 2017 & Schweickert et al., 2009). Despite positive outcomes associated with occupational therapy in the ICU, many ICUs do not have a dedicated occupational therapy and physical therapy team. Additionally, despite the benefits of early rehabilitation on patient outcomes, only a small number of patients receive occupational therapy while in the ICU. A contributor to this problem is that entry level occupational therapy and occupational therapy assistant programs are not required to provide education specific to working in the ICU (ACOTE, 2018). This results in a gap

in knowledge and confidence for occupational therapy practitioners wanting to practice in the ICU.

Resources and evidence-based studies focused on the effectiveness of detailed occupational therapy interventions in the ICU are limited. Most studies combine occupational therapy and physical therapy interventions and outcomes together when evaluating the effectiveness of therapy in the ICU. This makes it difficult to differentiate which occupational therapy interventions are the most effective for patients who are critically ill; leaving occupational therapy practitioners without a standard of care to guide their practice.

In addition to the knowledge level required and limited resources available to occupational therapy practitioners, many critical care team members and hospital administrators have limited awareness and understanding of the role and benefits of occupational therapy in the ICU. Improving the understanding of occupational therapy in the ICU among hospital team members could increase the number of occupational therapy evaluate and treat consultations and ultimately improve patient outcomes resulting in cost saving for the hospital (Lord et al., 2013).

Overview of Program

To provide guidance and support to occupational therapists working in the ICU, the *OT ICU Guide* was created. The primary goal of the *OT ICU Guide* is to improve occupational therapists' knowledge, competency, and confidence treating patients in the ICU who are medically complex. The secondary outcome is to increase the number of patients receiving occupational therapy during their stay in the ICU. It is predicted that

occupational therapists will be more confident to treat patients who are medically complex if they have resources to support their practice, which in turn will lead to an increased number of patients achieving positive outcomes from occupational therapy during their ICU stay.

The *OT ICU Guide* can be used as a daily reference for occupational therapy practitioners and an educational tool for students and practitioners. The *OT ICU Guide* includes the following four sections; educational handouts for patients, families, and healthcare team members on the role and benefits of occupational therapy in the ICU, a review of medical and safety information, examples of occupational therapy evaluations, and ideas for occupational therapy treatments with patients in the ICU who have varying levels of medical complexity. The *OT ICU Guide* will be easily accessible online and available for PDF download.

Development of the *OT ICU Guide* was supported by research evidence and use of Knowles' Adult Learning Theory, also known as andragogy. Knowles' Adult Learning Theory provides a foundation for creating and developing adult learning programs (Holton et al., 2008). The material was organized in a way that facilitates learning, carryover, and application of information for adult learners.

Evaluation

A pilot study of the *OT ICU Guide* will be completed to identify the program effectiveness and areas for improvement. Twenty occupational therapy practitioners will be recruited to participate in the pilot study. The participants will complete a survey within one week of receiving the *OT ICU Guide* and another survey three months and six

months after receiving the program. The surveys will gather information on the participants knowledge, clinical reasoning, and practical ability to implement occupational therapy in the ICU. Results of the participants pre- and post- surveys will be compared to identify the strengths and weakness of the program. The results of the pilot study will be used for program revisions in order to increase the program effectiveness.

Dissemination and Funding Plan

To educate the community about the *OT ICU Guide*, the program designer will advertise the program to occupational therapy practitioners, occupational therapy educators, and occupational therapy students. The program will be promoted through presentations at universities and conferences, professional networking, print media (pens, brochures, magazine), and virtually through social media.

Developing and implementing the *OT ICU Guide* will incur expenses. Expenses for the first year of planning and developing the program will be \$8,043.99. Expenses for the second year of implementing and advertising the program will be \$8,666.15. Overall costs associated with the first two years of the *OT ICU Guide* is \$16,710.14. Funding to cover the costs associated with developing and disseminating the *OT ICU Guide* can be obtained through university, state, and national scholarships and grants.

Conclusion

The *OT ICU Guide* is a new program developed to increase the knowledge and confidence of occupational therapy practitioners and students working in the ICU. The *OT ICU Guide* can also help promote occupational therapy in the ICU to patients, families, and medical professionals. Having a resource available to promote the

profession and guide occupational therapy practitioners work in the ICU can increase the presence of occupational therapy practitioners in the ICU, increase the number of patients receiving occupational therapy during the ICU stay, and improve patient and hospital outcomes.

FACT SHEET



The Occupational Therapy Intensive Care Unit Guide: A Practical Guide for Implementing Occupational Therapy Services with People Who Are Critically Ill

Mallory M. Woodard, OTR/L, CLT
OTD Candidate

Overview of the Intensive care Unit

Over *five million people* in the United States are admitted in the Intensive Care Unit (ICU) per year (SCCM, n.d.)



- Patients in the ICU are at risk for:
- Mortality
 - Depression
 - Anxiety
 - Contractures
 - ICU acquired weakness
 - Decreased independence
 - Decreased Cognition
 - Persistent Pain
 - Delirium
 - PTSD
 - Sensory Deprivation

(Afflek, Liberman, Polon, & Rohrkemper, 1986; Cavallazzi, Saad, & Marik, 2012; Girard, et al., 2010; Hashem, Nelliot, & Needham, 2016; Stevens et al., 2009)

Occupational Therapy in the ICU

- Occupational therapy practitioners offer a holistic approach to addressing patients' cognitive, psychosocial, and physical health and wellbeing.
- Occupational therapy (OT) improves patient outcomes
 - Occupational therapy in the ICU improves cognition, functional independence, strength, decreases delirium and reduces the length of time spent on a ventilator (Alvarez et al., 2017; Schweickert et al., 2009)
- Occupational therapy improves hospital outcomes
 - A rehabilitation program in the ICU is projected to decrease a patients ICU length of stay by 22% and save the hospital \$817,836 annually (Lord et al., 2013)



https://www.emory.edu/otcna/2018/04/health_pt_in_the_icu/camp.html

Problem

- Patients are not receiving occupational therapy in the ICU
 - In a study of 514 patients in 11 ICUs, only 30% of patients received occupational therapy (Dinglas et al., 2013)
- Occupational therapy practitioners are not assigned full time to ICUs
 - 35% of ICUs do not have a dedicated occupational and physical therapy team (Bakhr, Wiebe, McWilliams, Spuhler, & Schweickert, 2015)

Factors contributing to the problem

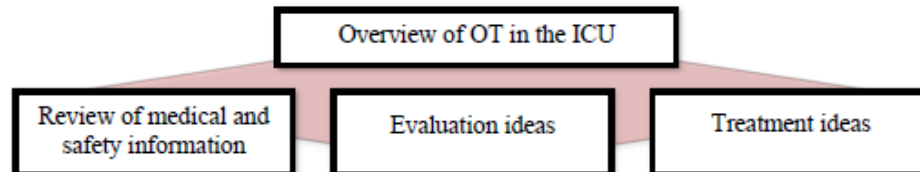
- Therapist knowledge
 - Education specific to occupational therapy in the ICU is not a requirement (ACOTE, 2018)
 - Resources and studies focused on detailed occupational therapy interventions in the ICU are limited
- Hospital and environmental factors
 - Lack of referrals for therapy
 - Limited staffing for occupational therapy in the ICU
 - Complexity of ICU environment
 - Decreased understanding of the role of an occupational therapist in the ICU (Dinglas et al., 2013, Foreman, 2005 & Zanni et al, 2010)

Solution to the Problem: *The Occupational Therapy Intensive Care Unit Guide (OT ICU Guide)*

An accumulation of evidence-based resources for implementing occupational therapy in the ICU.

The *OT ICU Guide* includes brochures for families and patients, handouts for ICU team members, and references for occupational therapy practitioners.

The guide contains the following sections:



The *OT ICU Guide* will be available for download online; free of charge.

Theory Guiding the *OT ICU Guide*

Knowles' Adult Learning Theory (Andragogy)- Provides a foundation for developing adult learning programs

- Following Knowles' principles, the *OT ICU Guide* is self-directed and immediately applicable.

Impact on the Future Occupational Therapy Practice

- The *OT ICU Guide* is an evidence-based resource that will be easily accessible for occupational therapy practitioners.
- The *OT ICU Guide* can facilitate an increase in confidence and knowledge for occupational therapy practitioners in the ICU.
- Brochures and handouts included in the *OT ICU Guide* can promote occupational therapy to families and ICU team members. The ultimate goal is to make occupational therapy a mandatory member of the ICU team.
- Increasing the presence of occupational therapy in the ICU can result in improved patient and hospital outcomes.

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CURRICULUM VITAE

Mallory Woodard, OTR/L, CLT

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Professional Profile

- Occupational therapist with experience working in skilled nursing, long term care, outpatient, acute care, and intensive care
- An experienced interdisciplinary team member who is passionate about helping others
- Positive and knowledgeable instructor and mentor for multiple clinical students and new hire therapists
- Developed and implemented outpatient and inpatient lymphedema services as a facility's only certified lymphedema therapist

Formal Education

Post- Professional Doctorate in Occupational Therapy Student: Boston University-
Boston, MA, 2018-Present

- Anticipated graduation date January 2020
- Doctoral Project: Resource Guide for Occupational Therapy in the Intensive Care Unit

Master of Occupational Therapy: University of North Dakota - *Grand Forks, ND, 2012*

- Cumulative GPA 3.82
- President's Honor Roll
- Graduated Magna Cum Laude
- Member of Pi Theta Epsilon Occupational Therapy Honor Society
- Independent Research Study: The Use of Occupation Based Interventions in Long-Term Care:
A Qualitative Study

Professional Credentials

Licensed Occupational Therapist, Georgia #OT007069

Registered Occupational Therapist by the National Board for Certification in Occupational Therapy, #296179

Certified Lymphedema Therapist since 2013

- Certified to provide evaluation and treatment services to individuals affected by lymphedema and edema through specialized therapeutic techniques
- Experienced in developing and implementing a new treatment program for patients with chronic lymphedema or edema from surgery, illness, or injuries

American Heart Association Basic Life Support Provider

Kinesiotape Qualified

American Occupational Therapy Association Member since 2009

Professional Experience

Occupational Therapist: South Georgia Medical Center - *Valdosta, GA, 2019- Present*

- Occupational therapist at a not-for-profit medical center providing care across 15 counties in the southeast
- Provide comprehensive occupational therapy evaluation and treatment for patients who have endured strokes, orthopedic injuries, open heart surgeries, general medical illnesses and surgeries
- Experienced working in cardiovascular and medical intensive care units
- Collaborate with certified occupational therapists to implement an effective plan of care for each patient
- Collaborate with certified occupational therapy assistants, physical therapists, speech language pathologists, nurses, patient care technicians, surgeons, physicians, case managers, and social workers to provide exceptional care

Volunteer Occupational Therapist: Osan Medical Facility - *Osan Air Base, South Korea, 2018*

- Volunteered as the only occupational therapist at the Osan Air Base clinic providing therapy services to military members and their families
- Helped wounded service members and their families return to work and meaningful occupations
- Provided outpatient evaluation and treatment of musculoskeletal injuries

Occupational Therapist: Banner University Medical Center - *Tucson, AZ, 2014-2017*

- Occupational Therapist in fast-paced Level 1 Trauma Center
- Provided comprehensive occupational therapy services for patients with a variety of conditions including, but not limited to, burns, traumatic brain injuries, surgeries, strokes, orthopedic injuries, lymphedema, heart assistive devices, heart transplants, lung transplants, and kidney transplants
- Experienced working in cardiovascular, medical, and trauma intensive care units
- Instructed, mentored, and supervised occupational therapy students
- Trained and mentored new occupational therapists
- Supervised and collaborated with certified occupational therapy assistants to provide optimal care
- Collaborated with hospital professionals including nurses, nursing assistants, physical therapists, speech language pathologists, doctors, physician assistants, nurse practitioners, case managers and social workers to best meet patient needs and facilitate discharge planning

- Actively participated in Therapy Shared Leadership Council focused on therapy staff morale, planning continuing education, and addressing areas of improvement within the therapy department and hospital

Occupational Therapist: Aegis Therapies, Texhoma Christian Care Center - *Wichita Falls, TX, 2012-2014*

- Developed and implemented new lymphedema treatment services as the only certified lymphedema therapist at facility
- Provided comprehensive occupational therapy services to older adults in skilled nursing facility, long term care, memory care and outpatient settings
- Provided direct supervision and communication with certified occupational therapy assistants to provide optimal care
- Collaborated with rehabilitation professionals including, nurses, nursing assistants, doctors, physical therapists, certified occupational therapy assistants, and speech language pathologists to meet patient needs and create safe discharge plans

Occupational Therapy Clinicals

- Summerlin Hospital - Inpatient Rehabilitation - *Las Vegas, NV, 2012*
- Regions Hospital - Mental Health - *St Paul, MN, 2011*
- Development Center - Mental Health - *Grafton, ND, 2011*
- Southeast Kids - Infant Development - *Fargo, ND, 2010*
- University of Minnesota Medical Center Riverside - Physical Disabilities - *Minneapolis, MN, 2010*
- Med Center One - Physical Disabilities - *Bismarck, ND, 2010*
- Therapy Place - Pediatrics - *Bloomington, MN, 2009*

Continuing Education

- Johns Hopkins Critical Care Rehabilitation Conference - *Baltimore, MD, 2017*
- Hand Therapy for the Non-Hand Therapist - *Allied Health Education Online, 2017*
- Clinical Concepts (K3) Kinesiotaping - *Scottsdale, AZ, 2016*
- Cognitive Rehabilitation: Therapeutic Strategies for Effective Intervention - *Scottsdale, AZ, 2016*
- Evaluation and Intervention of Shoulder Complex Pathologies - *Phoenix, AZ, 2015*
- Comprehensive Lymphedema Management for American Health Care - *Woodbury, MN, 2013*
- Fundamentals and Advanced Kinesiotaping (KT1 and KT2) - *McKinney, TX, 2013*