
# Employers' Perception of Occupational Therapists' Entry-Level Competence for the Treatment of Upper Extremity Dysfunction

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# Employers' Perception of Occupational Therapists' Entry-Level Competence for the Treatment of Upper Extremity Dysfunction

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Abstract

Upper extremity dysfunctions can have devastating effects on an individual's functional status. Therefore, restoring upper extremity function is instrumental in increasing participation and performance in activities of daily living and leads to improved quality of life. Addressing upper extremity dysfunctions is a complex process that requires specific skill sets. Entry-level occupational therapists often treat patients with upper extremity dysfunctions. The purpose of this study was to explore the current perception of employers regarding entry-level occupational therapists' expertise, or lack thereof, in the treatment of upper extremity dysfunction. A qualitative study using a basic interpretive approach was conducted using semi-structured interviews with seven direct supervisors of occupational therapy providers who had supervised entry-level occupational therapists within two years of the study. Three major themes were identified: overarching skills, evaluation skills, and intervention skills. These themes help to provide a greater understanding of the skills needed in the management of upper extremity dysfunctions, the skills expected for entry-level competence, and the perception of current entry-level competence.

*Keywords:* upper extremity dysfunction, hand therapy, occupational therapy, entry-level competence

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# Employers' Perception of Occupational Therapists' Entry-Level Competence for the Treatment of Upper Extremity Dysfunction

Upper extremity dysfunction (UED), due to neurological or orthopedic conditions, can have devastating effects on the individual's functional status. Sauers et al. (2011) found that pain resulting from upper extremity orthopedic injuries can lead to a decrease in quality of life. Upper extremity dysfunction after stroke can also lead to impaired functional use of the affected extremity (Raghavan, 2015). According to Gabr, Levine, and Page (2005), UED negatively affects performance in activities of daily living. As such, the use and training of the affected upper extremity after stroke is central to many stroke rehabilitation theories and considered essential to recovery (Urton, Kohia, Davis, & Neill, 2007). A significant implication to the restoration of upper extremity function is increased participation and performance in activities of daily living, leading to improved quality of life (Urton, Kohia, Davis, & Neil, 2007).

Accurately assessing upper extremity dysfunction and developing an adequate treatment plan to remediate UED is a complicated process (Colclough, Copley, Turpin, Justins, & De Monte, 2015; Raghavan, 2015). Colclough et al. (2015) identified a "dynamic relationship between knowledge and skills" (p.1416) when treating UED, requiring a higher level of clinical reasoning skills. Similarly, Kuipers and Grice (2009) described the level of reasoning and decision-making needed to address UED after traumatic brain injury as challenging and complex.

Occupational therapists are trained to be competent generalists upon graduation from accredited occupational therapy programs. According to the Accreditation Council for Occupational Therapy Education (ACOTE, 2012), occupational therapy students are educated "as generalists with a broad exposure to the delivery models and systems used in settings where

occupational therapy is currently practiced and where it is emerging as a service" (p. S6). According to Schofield (2012), entry-level competence includes problem-solving and clinical reasoning skills in order to determine the impact that UED has on clients' occupational profile and thereafter, to develop an effective treatment plan to improve occupational performance. Entry-level competence of occupational and physical therapists for the treatment of UED has been compared to expert level in a few studies (Kuipers, & Grice, 2009; May, Withers, Reeve, & Greasley, 2010; Sizer Jr., 2007). They found that clinical reasoning of novice therapists was not as sophisticated as expert therapists and relied mostly on cognitive process, without the ability to fully integrate all components into efficient assessment and targeted interventions.

**Problem Statement**

Although occupational therapy entry-level competence has been explored from the perspective of occupational therapy students, clinical instructors, novice therapists, and clinicians (Dimick et al., 2009; Hodgetts et al., 2007; McCombie & Antanavageb, 2017; Wallingford & Knecht-Sabres, 2016), there has been no study exploring entry-level competence of occupational therapist from the employers' perspective. Occupational therapists entering the job market are expected to meet the entry-level expectations (Avi-Itzhak, & Krauss, 2014); however, there are no specific guidelines regarding expected competencies required from an entry-level therapist treating UED.

**Purpose Statement**

The purpose of this study was to explore the current perception of employers regarding entry-level occupational therapists' expertise, or lack thereof, in the treatment of UED.

**Research Questions**

This study sought to address the following primary research question and sub-questions:

- How do direct supervisors of occupational therapy staff currently perceive entry-level competence of occupational therapists for the treatment of upper extremity dysfunction?
    - What suggestions would supervisors have to improve entry-level competency for the treatment of UED?
    - What resources do supervisors have available for the training of novice therapists in relation to the treatment of UED?

**Significance of the Study**

As the price of healthcare continues to rise (U.S. Centers for Medicare & Medicaid Services, 2018), it becomes even more imperative to provide skilled client-centered interventions while being mindful of resources. Therapists entering the field of rehabilitation need to have the knowledge and skills necessary to meet the needs of their clients while meeting the expectations of the job. A better understanding of the demands and expectations placed on entry-level occupational therapists will help better prepare them for their first job, as well as help employers identify targeted areas of growth for new employees.

**Definition of Terms**

**Entry-level therapist.** Entry-level generally refers to the skills that health professionals are expected to have acquired during their professional studies (Avi-Itzhak & Krauss, 2014; Baum et al., 2010; Jette et al., 2007). There is no agreement in the literature regarding the amount of time that a new graduate's skills remain at entry-level (Crist, Brown, Fairman, Whelan, & McClure, 2007; Diede, McNish, & Coose, 2000; May et al., 2010; Mulholland & Derdall, 2004). For the purpose of this study, entry-level will be defined as the first year of employment after graduation.

**Upper extremity dysfunction.** In the context of this study, upper extremity dysfunction will refer to impairments of the upper extremity from a neurological or orthopedic injury that is causing difficulties in functional use of the affected upper extremity and requiring interventions from an occupational or physical therapist (Hsu et al., 2011).

**Manual therapy.** For this study, manual therapy refers to intervention strategies that utilize a manual, hands-on technique in order to facilitate physical changes.

## Review of Literature

### Scope of Practice

Occupational therapists' main concern is the ability of their clients to engage in and participate in occupations (American Occupational Therapy Association [AOTA], 2014). Occupational therapists use their unique knowledge of the interconnection between the components of the person, environment, and context to design and implement interventions "that facilitate change or growth in client factors (…) and skills (…) needed for successful participation" (AOTA, 2014, p. S1). Although the components of the person, or intrinsic factors, are not the main focus of occupational therapy, they are of great importance if they affect the client's ability to engage in meaningful occupations (AOTA, 2014).

The Illinois occupational therapy scope of practice further defines what occupational therapy entails (AOTA, State Affairs group, 2014). According to the Illinois scope of practice, occupational therapy interventions may include (….) "remediation or restoration of performance abilities that are limited due to impairment in biological, physiological, psychological, or neurological processes" (p. 8). As such, occupational therapists are well suited to address intrinsic factors of the person, such as UED, for optimal remediation of deficits as related to increased occupational performance (AOTA, 2014; Baum et al., 2010; Carroll & Lawson, 2014).

## Upper Extremity Dysfunction

**Complexity.** Because addressing UED requires a complex set of skills, several authors have looked at the skill set needed to successfully address UED. According to Adam, Strong, and Chipchase (2013), occupational and physical therapists require an in-depth knowledge of anatomy and its implication related to human function. In their analysis of hand therapy practice, Keller et al. (2016) identified 25 fundamental knowledge and basic sciences and 26 common conditions in hand therapy. Kuipers and Grice (2009) reported that clinical reasoning and decision-making for the treatment of UED are complex and challenging. Colclough, Copley, Turpin, Justins, and De Monte (2015) described in more depth the skill set needed when addressing UED with hypertonicity. They described the knowledge base and skillsets necessary for addressing upper extremity hypertonicity as having a good understanding of neurological and biomechanical concepts, anatomy, and of the intervention process and implementation. They also describe the skill sets needed for the treatment of UED as demonstrating competence in task performance and in soft tissue interventions.

In 2013, Proud, Miller, Martin, and Morris's study focused on the assessment of UED due to Parkinson's disease. They found that the method used most frequently by therapists to assess UED in patients with Parkinson's disease was observational analysis. Similarly, according to Bernhardt, Bate, & Matyas (2001), sound clinical judgment and decision-making depend in part on observational skills. Yet, according to Carroll and Lawson (2014), "considerate anatomical instruction is necessary for an occupational therapist to effectively analyze functional performance and subsequently design a plan for rehabilitation" (p. 495). Furthermore, detailed analysis of functional anatomy and the understanding of the impact that UED has on performance are essential skills for all occupational therapists (Schofield, 2017).

Manual therapy is a highly specific skill set used in the treatment of UED. It refers to skilled passive movement of soft tissues and joints used to improve range of motion and flexibility, and decrease pain and edema (APTA, 2014). Sizer Jr. (2007) describes a set of eight critical skillsets needed for competent manual therapy practice. These manual techniques include: joint assessment, proficiency in fine sensorimotor characteristics, patient management, bilateral hand-eye coordination, gross characteristics of the upper extremity, control of self and patient movement, and discriminate touch (Sizer Jr, 2007, p. 38).

Finally, it is critical to address UED following a stroke. Upper limb impairments after stroke lead to functional limitations in using the affected upper extremity. This can lead to learned non-use, overuse of compensatory strategies, or inattention to the affected upper limb during occupational performance (Raghavan, 2015). It is therefore imperative to address the underlying upper extremity impairments to restore proper function. However, according to Raghavan (2015), developing a comprehensive understanding of UED is not an easy task and requires a solid knowledge of the disease process and the underlying deficits. The management of motor impairments after stroke is a complex process. It requires therapists to combine evidenced-based treatment strategies to address each client's individual needs and achieve maximal motor recovery for the upper extremity (Hatem et al., 2016). Furthermore, sensory deficits are common following strokes with an incidence of up to 85% (Hatem et al., 2016). Sensory impairments can negatively affect motor task performance and are associated with lower recovery prognosis (Hatem et al., 2016). Unfortunately, Doyle, Bennett, and Gustafsson (2013) identified lack of knowledge and skills as the main barrier to adequately treating sensory impairments post-stroke.

**Skill acquisition.** According to Carroll and Lawson (2014), "considerate anatomical instruction is necessary for an occupational therapist to effectively analyze functional performance and subsequently design a plan for rehabilitation" (p. 145). Although occupational therapy students generally learn anatomy, physiology, and kinesiology during their educational program or as prerequisites the amount of time spent and modalities used for instructions vary greatly between educational programs (Carroll, & Lawson, 2014). Despite the amount of knowledge needed for UED management, Short et al. (2020) found that entry-level OT program faculty were satisfied with the inclusion of hand therapy content within their curriculum with the recommendation to increase the "emphasis on occupation during didactic instruction" (p. 112).

Even though Bethea, Castillo, and Harvison (2014) found that the use of stimulation within OT educational programs improved "clinical reasoning, problem-solving and decision making, and communication among students" (p. S32), more advanced learning occur after graduation, during the first two years of practice (Dimick et al., 2009; Short et al., 2020). Many studies looked at the process of skill acquisition within clinical practice. Colclough et al. (2015) reported that exposure to clients over time in clinical setting is important to the development of skills for competent practice. Additional training after graduation helps in developing stronger clinical reasoning and decision-making skills for the treatment of UED (Bernhardt, Bate, & Matyas, 2001; Colclough et al., 2015; Kuipers, & Grice, 2009; May et al., 2010). Bernhardt, Bate, and Matyas (2001) found that training improved the accuracy of judgment in the observation of UED after stroke. Schneider, Lannin, and Ada (2019) found that a professional development program improved the use of evidence-based clinical practice guidelines by inpatient rehabilitation staff.

Others found a significant difference when comparing the clinical expertise of entry-level therapists to more experienced therapists. According to Sizer Jr. et al. (2007) entry-level therapists used a cognitive-based learning technique and focused on the mechanical aspects of the task whereas experienced therapists were able to integrate their perception skills and increase their focus on implementation using a combination of psychomotor skills. As such, entry-level therapists used straight forward motor skills such as clinician's control of self and patient movements whereas experienced therapists used skills that required the integration of knowledge, the ability to combine previously developed skills, and a higher level of intuition and sensory-motor skills. May et al. (2010) found that entry-level therapists failed to associate many aspects of the history with significant findings or clinical implications. They found that over 50% of entry-level therapists failed to consider important aspects of decision-making and clinical reasoning for the treatment of shoulder problems. These included duration and status since onset; pain on resisted tests; capsular restriction; diagnostic implications of painful arc; differentiating muscle, capsule, and joint source of symptoms; and the use of markers to judge treatment effectiveness. With experience, therapists began to combine strategies and concepts into more advanced clinical reasoning skills (May et al., 2010).

Overall, clinical reasoning, decision-making, and manual skills of entry-level therapists for the assessment and treatment of UED were weak and lacked sophistication (May et al., 2010). Of even greater concern, Kuipers and Grice (2009) found that before being exposed to clinical reasoning protocols, study participants either did not access or did not rely on prior knowledge of UED assessment and intervention. Therefore, experience appears to be a key component to the integration of advanced knowledge and skills (Dimick et al., 2009). As such, Colclough et al. (2015) recommended for future training to be focused on the development of

clinical reasoning. This would allow therapists to better integrate individualized circumstances into treatment planning, hence implementing a holistic approach to care and facilitating positive client outcomes.

**Entry-Level Competence**

Overall, the goal of educational programs is to produce entry-level generalists who are equipped with the skills and knowledge to deliver entry-level evidence-based occupational therapy services (Avi-Itzhak & Krauss, 2014). Entry-level occupational therapists should be "able to meet the needs of clients, families, and communities in a variety of practice settings" (Schofield, 2017, p. 1). The Fieldwork Performance Evaluation (FWPE/OTS) "defines competency as adequate skills and abilities to practice as an entry-level occupational therapist" (Wallingford & Knecht-Sabres, 2016). In the United States, it is the Accreditation Council for Occupational Therapy Education (ACOTE) that outlines the current standards for entry-level OT education (Wallingford & Knecht-Sabres, 2016). According to ACOTE (2012), entry-level occupational therapists should "be educated as a generalist with a broad exposure to the delivery models and systems used in settings where occupational therapy is currently practiced and where it is emerging as a service" (p. S6). Jette et al. (2007) describe entry-level as "the level of knowledge, skills, and professional behavior expected of a new graduate when entering the profession of physical therapy" (p. 834).

Despite having defined standards for entry-level educations, its clinical application remains somewhat suggestive. Wallingford and Knecht-Sabres (2016) found that the definition and perception of entry-level might be site-specific or influenced by the setting or employers where the occupational therapist practices. They also found that the level of supervision required for entry-level therapists may be situation or skill specific. In 2013, Adam, Strong, and

Chipchase found that educators perceived entry-level occupational and physical therapy students as being able to perform the majority of work-related tasks with only minimal supervision. According to Sass et al. (2006), the latest version of the Physical Therapy Clinical Performance Instrument described entry-level performance as the ability to treat complex patients and provide skilled assessment and interventions, whereas highly skilled intervention and assessment were reserved to beyond entry-level. In other words, entry-level clinicians are not expected to be entirely independent at all times (Sass et al., 2006).

Several entities stand to benefit from more consistent and reliable entry-level expectations and performance. Occupational therapy clients expect occupational therapists to have adequate training and be well-prepared to address their needs in a competent manner (Sellar et al., 2017). Avi-Itzhak and Krauss (2014) reported that entry-level OT should be well prepared to join the job market with the expected competencies to meet their job demands.

**Entry-level skill demands.** In 2007, Crist, Brown, Fairman, Whelan, and McClure analyzed the use of a variety of interventions by entry-level OT and occupational therapy assistant (OTA). They identified a list of ten most utilized interventions. It is noteworthy to mention that 50% of these interventions relate directly to the treatment of UED. Furthermore, four out of the five interventions related to the treatment of UED were amongst the five most commonly used interventions. They are, in order of importance: therapeutic exercise, fine motor training, strength and endurance training, therapeutic activities, and gross motor coordination training. In Britain, The College of Occupational Therapists (2016) included the knowledge and skills needed in the analysis of body functions and structures as part of the recommended core knowledge and skills. More specifically, they were described as:

> [the] knowledge: of anatomy and physiology and how impairment impacts on activity and functioning [as well as the] skills in understanding the structures and functions of the body and the impact of a range of impairments on setting and achieving a range of occupational performance goals (The College of Occupational Therapists, 2016, p. 6).

Erickson et al. (2017) found that anatomy and surface anatomy, kinesiology, physiology, pathology, and common UED diagnoses should be covered in detail within the curriculum. Thomas, Saroyan, and Snider (2012) addressed the expected level of evidence-based practice from entry-level therapists. They admitted that entry-level therapists could not provide evidence-based practice to the same level as experienced therapists. This is explained by the fact that expertise in evidence-based practice is highly dependent on extensive experience and practice (Thomas, Saroyan, & Snider, 2012)

**Challenges.** There continue to be significant skill disparities across the schools of occupational therapy, leading to varying levels of entry-level competence amongst graduates from accredited programs (Crist et al., 2007). As such, Grace (2007) recommended the implementation of "uniform entry-level educational competencies for the professional and technical levels of education" (p. 281) to ensure equality of skills and outcomes amongst entry-level therapists.

In response to the increasing demands for efficient and accelerated interventions, and the requirements to better document the need for skilled therapy, Dimick et al. (2009) recommended that occupational therapy programs incorporate more practical skill training and education in foundational knowledge. They found that experienced therapists felt that there were several technical skills used for the treatment of UED that they would have benefited from learning within the first two years of practice. Accordingly, Hodgetts et al. (2007) found that occupational

therapy students and recent graduates felt that they were lacking general technical skills. As such, Rassafiani (2009) determined that clinical experience was an important component in the development of clinical expertise.

The difference in clinical skills and expertise between entry-level therapists and experienced therapists has been documented in a variety of studies. Schofield (2017) found a significant difference in the perception of the knowledge of anatomy between entry-level therapists and experienced therapists. When experienced and entry-level therapists were asked to rate the knowledge of anatomy of therapists with up to two years of experience, entry-level therapists consistently rated their own knowledge higher as compared to the rating given by more experienced therapists. Failla, Maher, and Duffy (1999) also documented a heighten self-perception of skills and knowledge in entry-level professionals. New nursing graduates rated their own performance significantly higher as compared to their performance assessment completed by faculty and employers.

McCombie and Antanavageb (2017) explored the transition of occupational therapy students over the first year of employment. They found that entry-level occupational therapists were more likely than experienced therapists to experience burnout and job stress and rated the transition from student to clinician in a less positive way. New graduates only felt marginally prepared for practice, especially when it comes to interacting with other healthcare professionals and applying evidence-based practice (McCombie & Antanavageb, 2017). The authors' recommendation was for entry-level occupational therapists to assess the clinical demands and expectations of the job to ensure a proper fit between personal skills and expectations.

**Employers' Perspective**

It is easy to see how a good education can benefit students and potential clients of occupational therapy. However, employers of occupational therapy staff also have high stakes in quality education. According to Mulholland and Derball (2004), educational programs must not only be accountable to students, providing them with a solid knowledge base and clinical skills, but also to employers. They recommended for the academic community to be aware of employers' needs and balance those needs with the development of the profession and professional education. Knowledgeable students with strong clinical skills are more marketable to employers looking for individuals with a certain set of skills and attributes (Mulholland & Derball, 2004). The academic community needs to be aware of the needs of employers and attempt to balance their needs with the development of the profession and professional education (Mulholland & Derball, 2004).

Unfortunately, employers' expectations are not always in line with those of entry-level therapists and new employees. McCombie and Antanageb (2017) found that there was disagreement in performance rating between the employer's rating and the entry-level therapist's self-assessment. This may suggest a difference in expectations for occupational therapy entry-level performance. As such, Grace (2007) highlighted the importance to engage in an open dialogue with external constituencies and educational programs to better assess the impact that changes or modifications in OT education could have on the constituents.

To better align employers' expectations to entry-level OT skills, it is important to understand what employers are looking for. According to Crist et al. (2007) recommendations, the OT profession needs to identify the interventions used in practice while considering professional expertise and the impacts of the demands and expectations on clinicians. They

recommended that the profession become more accountable regarding the specific skills and knowledge that are expected from entry-level occupational therapists. In 2004, Mulholland and Derball explored what Canadian employers were looking for when hiring OTs. They found that employers were looking for a certain combination of professional skills as well as personal attributes such as professional experience and interpersonal and communication skills. Desirable personal traits included the willingness to learn, independence, resourcefulness, flexibility, professionalism, creativity, enthusiasm, maturity, confidence, and overall personality (Mulholland & Derball, 2004).

## Method

### Study Design

This study utilized a qualitative, basic interpretive approach. A basic interpretive approach is one that seeks to "understand how people make sense of their lives and their experiences" (Merriam & Associates, 2002, p. 38). The basic interpretive approach is used to explore and understand the lived experience from the participants' point of view. Accordingly, this study used a basic interpretive approach to better understand the lived experience of occupational therapists' direct supervisors, especially examining their experience supervising entry-level OT involved in the treatment of UED. Prior to data collection, the study was approved by the University of Indianapolis Institutional Review Board.

### Participants

**Inclusion and exclusion criteria.** Inclusion criteria included participants who directly supervise occupational therapy staff and who have supervised at least one entry-level OT within the past 2 years. Given limited resources for the study, participants not fluent in the English language were excluded.

**Sample size.** Seven participants were recruited for this study. Data thematic saturation was reached. Sample size was based on previous qualitative studies of similar constructs (Colclough, Copley, Turpin, Justins, & De Monte, 2015; May et al., 2010). Saturation of data was determined when the data collection reached a point of redundancy, where participants did not contribute new information to the study (Cottrell & McKenzie, 2011).

## Procedures

**Recruitment.** Participants were recruited from rehabilitation clinics or departments in the Chicago land area using a purposive sampling and snowball recruitment strategy. A sample of convenience is used when researchers recruit participants that are available and accessible to the researcher (Hess-Biber & Leavy, 2011). The Chicago land area was selected as a matter of geographical convenience, while providing for a wide selection of occupational therapy worksites and educational programs. This allowed for a better representation of entry-level competence rather than site-specific or program-specific competence. When using purposive sampling, the researcher selects participants that can best contribute to the study (Carter, Lubinsky, & Domholdt, 2011). Qualitative researchers use purposive sampling "not for representativeness, but for diversity of views" (Carter, Lubinski, & Domholdt, 2011, p. 162). By using purposive sampling, the principal investigator was able to recruit therapy supervisors who have had experience working with entry-level OTs and who can best contribute to the study objectives.

When using snowball sampling, the researcher asks participants to identify other potential participants (Carter, Lubinsky, & Domholdt, 2011). The principal investigator used this strategy in order to identify a greater number of potential participants. Recruitment strategies included contacting therapy supervisors from a variety of hospitals and clinics within the Chicago land

area via phone calls and emails (Appendix A) and selecting participants within the principal investigator's professional network.

**Consent.** Informed consent was obtained verbally prior to the start of the interview. Participants were provided with written information regarding the goal and purpose of the study, the structure of the interview, as well as the risks and potential benefits from the study (Appendix B). Informed consent was assumed when participants verbally agreed to participate in the interview after a review of the study information document. Potential risks to the participant include psychological distress. To minimize the risk, participants were given the choice not to answer any question and to terminate the interview at any time.

**Data collection.** Data was collected using semi-structured, in-depth interviews conducted in person. The primary investigator conducted a 45 to 60 minutes interview with each study participant using a semi-structured, in-depth interview guide. The interviews were conducted at a time and place that was convenient for the participant and were audio-recorded. Each participant received a gift card as incentive for participating in the study.

**Interview guide.** The interview guide (Appendix C) was reviewed by a qualitative researcher serving as the analysis expert for this study. In addition, the principal investigator piloted the interview guide through an interview with one direct OT supervisor to obtain her feedback concerning the interview process and the interview guide. The principal investigator made small revisions to the interview guide to reflect comments and suggestions obtained from pilot testing and the analysis expert. The interview guide included questions exploring the supervisors' perception of the skills required for the treatment of UED, level of expertise in the treatment of UED, and resources needed and available for the mentorship or support of entry-level OT.

**Data Management & Analysis**

The principal investigator transcribed the interviews verbatim after each interview using Temi transcription software. The transcriptions were identified using pseudonyms only and were stored electronically in a password-protected computer. The audio recordings were saved electronically in a password-protected computer. The electronic files and hard copy materials will be destroyed 36 months after the completion of the study.

Since the aim of this study was to explore entry-level competency on the treatment of UED from the direct OT supervisors' point of view, an inductive approach to data analysis was used. According to Thomas (2006), "the inductive approach is a systematic procedure for analyzing qualitative data in which the analysis is likely to be guided by specific evaluation objectives" (p. 238). When using an inductive approach, the researcher completes a comprehensive reading and interpretation of the raw data to form concepts, themes, or models (Thomas, 2006). As such, it is the raw data that guides the analysis through the emergence of "frequent, dominant, or significant themes inherent in raw data, without the restraints imposed by structured methodologies (Thomas, 2006, p. 239).

As suggested by Carter, Lubinsky, and Domholdt (2011), the principal investigator and the analysis expert completed independent parallel coding of the first two interviews. Following the inductive approach for analyzing qualitative evaluation data described by Thomas (2006), the initial codes were developed through careful examination of the interview transcript. The researchers identified and organized relevant information from the text into larger categories based on the research questions. The principal investigator and the analysis expert then worked in collaboration to reduce overlap and redundancy amongst categories until an agreement was reached. Finally, a model was created to include the five overarching themes that had emerged.

The first three themes were developed based on the skills participants identified for competent UED management and were grouped into three sections: overarching skills, evaluation process, and intervention process. These themes were then applied to the expected skills needed for entry-level competence and perceived entry-level competence. Themes regarding suggestions for improved competence and available resources were developed individually. The data analysis process was completed using Microsoft Word revision and comment functions. The principal investigator conducted periodic checks with the analysis expert throughout the analysis process.

The principal investigator kept a detailed audit trail and memos with reflective notes during the transcription, coding, and theme development process. The principal investigator performed member checking to ensure proper interpretation of the narrative. Two participants from different work settings were sent a copy of the primary themes and sub-themes identified to verify that it reflected their perception of the topic. Both respondents provided written feedback and found that the themes and subthemes were reflective of their perception of entry-level OTs' competence. Furthermore, an expert in the field reviewed a copy of the completed report. Finally, the principal investigator used triangulation to compare the study results with data from existing literature.

## Results

Seven participants were interviewed for this study (Table 1). This group was comprised of three physical therapists and four occupational therapists. All participants were employed in managerial roles at the time of the interview. Participants had nine to 25 years of experience in their respective professions, with an average of 17.2 years of experience. Participants worked in various settings with four participants working primarily in an outpatient setting and three participants working primarily in an inpatient setting. Additionally, two of the participants had

dual roles in outpatient and inpatient settings, including one participant in a day rehabilitation outpatient setting. All participants were confident in their expertise for treating upper extremity dysfunction, with only one participant indicating a decreased level of confidence in addressing hand and finger injuries or conditions but feeling confident addressing elbow and shoulder dysfunction.

Five themes were identified: overarching skills, evaluation skills, intervention skills, suggestions for improved entry-level competence, and resources available to managers in clinical settings. For the first three themes that are related to skills, results were organized in three subsections:

- Skills needed for UED management
- Skills expected for entry-level competence
- Employers' perception of actual entry-level competence

## Overarching Skills

Overarching skills (Table 2) includes all skills that are applicable through the entire occupational therapy process. Six sub-themes have been identified: safety, knowledge, communication skills, interpersonal skills, and holistic and client-centered care.

### Safety.

***Skills needed for UED management.*** Participants identified safety as being an important component of the occupational therapy process and as such, they expected entry-level OTs to maintain safety throughout the OT process. Participant 4 identified safety as one of three pillars of practice monitored and addressed within his institution:

> The big three pillars here are basically safety- patient safety, outcomes, and then customer and patient satisfaction- and they've got to be doing well in those areas.

> Certainly if there's (…) safety issues, we have safety reporting software here and people can go on that and do things anonymously. That would warrant conversations with the employee and we would have to do remediation of various kinds.

Interventions targeting UED have the potential to cause harm. According to the participants, OT treating UED must know and understand the precautions associated with different conditions and to apply them within their intervention. Participants highlighted the importance of not harming patients by understanding the precautions associated with a specific diagnosis, understanding the physician's orders, and correctly identifying the cause of the dysfunction and ruling out other potentially harmful causes. According to Participant 5, "if you're going to treat patients in that population, in that setting, you need to know how to rule out the cervical spine. Because again, you could be making things worse." Participants even expressed the willingness to prioritize safety over some of the quality of intervention. For example, Participant 2 felt that "even if the mechanics aren't the best, they have to be just safe."

***Perceived entry-level competence.*** Participants expressed concerns regarding the ability of entry-level OT to maintain safety throughout the intervention process. According to participant 7, entry-level OTs need some additional time to learn how to incorporate safety to patient care: "Learning how to just work and be safe with patients, with different diagnoses or pathophysiology. What are the optimal treatments for certain presentations? They struggle."

**Knowledge.**

***Skills needed for UED management.*** All participants agreed that having a foundational knowledge base was crucial when treating UED. The knowledge base needed to address UED was grouped into four categories: conditions, protocols or guidelines, sciences of the human body, and life-long learning.

*Conditions*. Participants agreed that in order to address UED, therapists needed to have the knowledge and understanding of common conditions affecting the upper extremities: "You need to know and understand the common diagnoses" (P1). "You also need to know some neurological diagnosis as well such as a wrist drop or hemiparesis of an extremity" (P6).

*Protocols and guidelines.* When discussing protocols and guidelines, participants referred to knowing the typical progression according to specific diagnoses. This also related to OTs knowing when to implement or not implement certain interventions, such as range of motion or strength training or as Participant 6 said:

> You need to know the protocols that are out there. So, if someone has a tendon injury, let's say a flexor zone 1 tendon injury, or zone 2, you have to know what the protocol is in order to treat the patients.

Participants spoke of the ability to use protocols as guidelines for typical patient progression. As such, therapists should have the ability to modify the protocol based on the patient's progress and circumstances:

> Good surgeons right now, hand surgeons, would say they're guidelines. Protocols are kind of a thing of the past. Protocols are very strict and that's, most of the doctors I work with have guidelines. They have a general timeframe, but if you're not doing well, you have to either bump it up or move it so they're not… And I think that's where it is difficult. (P3)

*Sciences of the human body.* Anatomy, functional anatomy, physiology, and pathophysiology were grouped within the sciences of the human body. All participants agreed that OTs treating UED should have a foundational knowledge of the sciences of the human body and apply this knowledge to the intervention process.

Participants discussed the need to know anatomy in terms of knowing basic structures and the connection and interacting between these structures. According to participant 3, the knowledge of anatomy is the building block to competent UED practice: "I think anatomy is the skeleton of it all, the base of everything." Participant 5 reported that the knowledge of biomechanics was also important to addressing UED: "I think they need to have an understanding of the anatomy, both the musculature and the biomechanics of it. And again, how does it relate to the joints above and below."

Participants also discussed the importance of pathophysiology or the understanding physiological processes associated with specific conditions and the typical response to injuries. Once again, participants discussed the need to integrate this knowledge during the intervention process: "Have a deeper understanding of some of the pathophysiology going on or the decision-making process. You know, if this then do this, if this, then this. Like an algorithm type of decision making" (P7).

*Life-long learning.* Despite being experts in their field, all participants agreed with the need to continually seek additional knowledge to provide optimal interventions. They further expressed the importance to remain up to date with evidence as UED interventions continue to grow and surgical procedures continue to evolve. As such, participants believed that in order to be proficient in managing UED, therapists should commit to life-long learning:

> Because we live in a fast-paced medical world, you've got to do a lot of outside [work] until you know what you're doing. I'm still doing stuff outside. Looking stuff up. So it doesn't matter […]. An OT you should always be willing to grow and develop. (P3)

In order to seek knowledge and commit to learning, one must possess a certain level of self-awareness. According to Participant 1, "I think more importantly, are skills of knowing your

strengths and your weaknesses […] and take feedback, and learning from it". Being open to feedback is an important skill to help develop self-awareness and it allows for further learning.

Finally, life-long learning requires therapists to take the initiative for their own learning, actively seek out knowledge without depending on others, and know-how to utilize available resources: "You have to go off on your own and, and do readings, and practice. You have to read up on the diagnosis that you're treating. So that that's important" (P6). According to Participant 1, therapists should be skilled in "utilizing your resources, communicating with other OTs, utilizing your resources as far as friends, colleagues who may have some experience in it. Utilizing the books and the foundations."

***Skills expected for entry-level competence.*** When it comes to knowledge, participants expressed having similar expectations for entry-level OTs than for experienced clinicians, especially in regards to the sciences of the human body. Entry-level OTs are expected to enter the field with the foundational knowledge of anatomy, functional anatomy or kinesiology, physiology, and pathophysiology. Additionally, they should have the ability to integrate their knowledge into the intervention plan and implementation. As such, they are expected to know conditions and diagnoses commonly seen in practice and to have a basic understanding of associated protocols or guidelines. However, they are not expected to know everything there is to know, but rather, they are expected to take the initiative for their own learning: "Doing some research outside. You know, even though you're a new clinician, you're still a student" (P3). Entry-level therapists are expected to take the initiative to research topics they are not familiar with and independently use available resources to improve their knowledge base continuously: "Go read and practice the skill, research what you don't know" (P6).

***Perceived entry-level competence.*** Participants felt that entry-level OTs did not demonstrate the level of knowledge of common conditions they expected for entry-level competence.

*Conditions, protocols, and guidelines.* Some participants felt that entry-level OTs did not have enough knowledge of common UE diagnoses and conditions seen in occupational therapy. Many participants expressed concerns regarding the lack of knowledge of the typical progression or outcomes of common diagnoses: "Like expected recovery times for injuries, either post-surgery or post-trauma, or even non-surgical cases. I don't think there's a very good understanding of how those cases should progress" (P4).

*Sciences of the human body.* Participants felt that entry-level OTs did not display the level of knowledge Entry-level OTs' knowledge of anatomy, kinesiology, physiology, and pathophysiology they expected for entry-level competence:

> A lot of the OTs first coming out of school don't have that knowledge of the biomechanics and the musculature. I think the ones that I have seen that had been very successful, are the ones that either have become certified hand therapists or have made it a point to gain additional knowledge. (P5)

One participant was intrigued by the lack of knowledge of anatomy: "I am so intrigued that the anatomy is not as strong as it should be. There are so many ways to get that knowledge" (P3). Other participants contrasted the lack of knowledge of OTs to the foundational knowledge base displayed by entry-level physical therapists:

> I think that's where PT programs do a very good job of bringing it back to basic science. They are good at using a scientific approach to treating some of the injuries that we deal with on an outpatient basis, as opposed to the OT students. (P4)

*Life-long learning.* Participants felt that a strength of entry-level OTs resided within the commitment to life-long learning. The perceived entry-level OTs as willing and capable to learn: "[They are] open to learning whatever they could about different ways of treating that patient. So I mean, they're kind of like a sponge. Whatever we teach them these, they soak it up" (P6).

Participants felt that even though entry-level OTs had the desire to learn, they did not always take ownership of their own learning. Despite entry-level OTs' energy and willingness to learn, participants felt that they lacked the independence needed for life-long learning: "Lately it's been more like just tell me what to do. I feel like as a new graduate you should be coming to me and present your thoughts of what you want to do" (P3).

**Clinical reasoning.** All participants expressed the importance of clinical reasoning skills for effective UED management.

***Skills needed for UED management***. According to participants, OTs use clinical reasoning skills throughout the intervention process. These skills are used to apply their knowledge to clinical practice; triage and select important information; interpret evaluation results and apply the results to intervention planning; select and grade interventions in order to facilitate the best outcomes; and adjust clinical practice and protocols/guidelines based on each patient's unique circumstances and clinical presentation.

When working with patients, OTs receive information from several different channels such as subjective reports from patients, assessment or evaluation results, and clinical observations. According to Participant 4, OTs need to have enough clinical reasoning skills to be able to select the relevant information from all the different sources: "It is like drilling down to and focusing on what is important for that particular case."

Occupational therapists must also triage and apply relevant information from the evaluation and their base of knowledge to design and implement effective interventions. OTs should select interventions in a thoughtful and purposeful manner to address specific impairments and help the patient progress towards specific outcomes: "Understanding why you're doing a certain intervention. Having that mindset of being able to answer the question: why am I doing this?" (P1). OTs must also consider each client's individual circumstances:

> Not every patient is the same, and not every injury is the same, and not every surgical procedure is the same. So you have to be able to adapt to what the gains of the patients are at that time. (P6)

Experienced OTs demonstrate the ability to use a scientific approach to problem solving by developing and using algorithms to guide their decision-making process.

***Skills expected for entry-level competence.*** Participants did not expect the same rigor and expertise from entry-level OTs as they did for experienced OTs. They identified the ability to justify interventions as being a more basic level of clinical reasoning. In comparison, experienced OTs would not only be able to justify his choice of intervention, but also utilize a deeper level of analysis and clinical reasoning while doing so: "I think doing an assessment and then having good critical thinking skills, to then treat the dysfunction, are the things that I see as setting the entry-level clinician apart versus someone who has the experience" (P2).

Entry-level OTs are expected to interpret assessment results and apply their interpretation to selecting appropriate interventions to address patient's individual dysfunctions. Participants did not expect entry-level OTs to select the optimal intervention. Instead, they expected entry-level OTs to demonstrate the ability to select and implement interventions that were appropriate to their client's case.

Finally, participants expected entry-level OTs to use clinical reasoning skills to analyze functional performance and relate functional dysfunction to specific impairments: "I think the thing that I always look at is, based on the functional performance, which systems are involved first" (P2).

***Perceived entry-level competence.*** Participants identified several areas they felt entry-level OTs could improve upon. They reported that entry-level OTs' ability to integrate their knowledge base into the evaluation and intervention process was not at the level they expected for entry-level competence. More specifically, they reported that entry-level OTs had difficulty applying their knowledge of conditions to the development of intervention plans: "We spend a lot of time on that with new graduates - processing all that information to arrive at an appropriate treatment plan" (P4). As Participant 6 said: "They would know the general upper extremity stuff as such as manual muscle testing, range of motion and stuff, but they didn't know what to do after that." Furthermore, participants felt that entry-level OTs had difficulty modifying their interventions based on the needs, circumstances, and responses of their patients:

> They come in thinking, 'well it's going to be this diagnosis so I will treat them this way.' They're not doing the critical thinking to realize people are going to come in differently, If someone's not doing well and seems stiffer, you're always modifying your treatment. (P3)

**Communication skills.**

The primary communication skills participants identified as important for the treatment of UED included documentation and effective communication to all stakeholders, including the client, family members, physicians, and others.

***Skills needed for UED management.***

*Documentation.* When looking at the components needed for effective documentation, participants highlighted the importance of documenting outcomes to "distill that information down into a coherent and succinct document without producing a six page initial evaluation" (P3).

*Effective communication with all stakeholders.* The importance of effective communication was described at different levels. First, therapists need to provide clear instruction and education to their clients: "I think being able to instruct and guide a patient through the evaluation process. You need to learn to talk with people basically" (P4). It is then important to be able to communicate with physicians and referral sources. It is important to maintain a communication channel between the therapist and physician to improve outcomes and maintain client's safety:

> And of course, you always have to check back with the physician because every physician is different in terms of what level of protocols they use. And then to crosscheck with the physician to make sure he agrees to the plan. (P4)

Finally, participants reported that it was important to maintain open communication with peers and team members.

***Skills expected for entry-level competence.***

*Effective communication with all stakeholders.* Participants did not expect entry-level OTs to be excellent communicators at the beginning of their career, however, some communication skills were deemed important for entry-level competence. Participants identified the ability to reach out to physicians and clarify orders as needed and to build their comfort level when communicating with physicians: "I think within the first year, having the ability to have that comfort level to have conversations with doctors, physicians, and referral sources" (P1).

Finally, entry-level OTs were expected to provide patient instructions clearly throughout the occupational therapy process.

***Perceived entry-level competence.***

*Effective communication with all stakeholders.* Although participants felt that entry-level OTs generally possessed entry-level communication skills for some circumstances, their ability to communicate with physicians in a person-to-person manner did not meet their expectations: "Learn how to talk more person-to-person. They're starting to learn. They want to do everything via email. I see the new graduates, they can't break barriers until they start seeing faces" (P3). Participants felt that the main barrier to effective communication with physicians was related to the lack of confidence in their ability to communicate effectively with physicians.

**Interpersonal skills.**

Participants described several interpersonal skills needed for the management of UED. These included general interpersonal skills, teamwork, general attitude, and therapeutic use of self.

***Skills needed for UED management.*** Several participants spoke of the importance of interpersonal skills: "A huge piece of what we do is just the interpersonal skill set and the people person skills. So if they're good with people, they will usually do pretty good" (P7). Participants emphasized that having good technical skills was not enough, therapists needed to create a connection with their patients.

> Sometimes, it's not the actual treatment and interventions that you're giving the patient. Sometimes, it's the experience that they are having at your facility. (…) If the patient has a good experience as opposed to a bad experience you're probably going to have a better outcome. (P1)

An important part of building trust and rapport with clients resides in the ability to truly listen to patients, to be an active listener:

> And I think the difference was that I listened to her, talked to her, and acknowledged what she was feeling, and that's it's ok that she was feeling that.(…) Sometimes, it's not the actual treatment and interventions that you're giving the patient. The trust that they have with you. Feeling like, or having that sense or feeling like you care or that you are watching them. (P1)

*Teamwork.* Participants discussed the importance of teamwork as a component of interpersonal skills. Several participants felt that the ability to work well within a team and to be a team player was one of the most important skills all therapists should have, regardless of the diagnoses or specialty area: "But what makes a good clinician: (…) is a good team member, someone who gets along very well with the rest of the team, the rest of the department" (P7). Another benefit of teamwork is that it offers continued opportunities for professional development. Team members become part of your resources "to build knowledge and skills around specific topics" (P3).

***Skills expected for entry-level competence.*** Although participants felt that entry-level OTs should have the skills needed to build a rapport or a therapeutic relationship with their clients, the expectations for entry-level OTs focused around the idea of teamwork.

*Teamwork.* Entry-level OTs entering the job market will most likely have to integrate a team. As such, entry-level OTs are expected to work well within that team and contribute to the team process:

> It kind of goes down like what's her personality like? What's her interpersonal skills? My hiring process is quite robust. I do team interviews. I get staff feedback to get their ideas.

> Do you think this person would be a good fit for our team? (…) Learning really to be part of a team and a person who really gives for the betterment of the team and not so much self-focused. (P7)

***Perceived entry-level competence.*** Participants discussed entry-level OTs' general attitude and therapeutic use of self.

*General attitude.* General attitude was described as a strength of entry-level OTs. Participants felt that they were energetic, compassionate, creative, had great personalities, and were dedicated to their job: "They have great personality and workability skills, you know patient rapport or things like that you can tell they get along" (P3). However, participants felt that entry-level OTs needed to improve their level of self-confidence. According to several participants, entry-level OTs lacked the confidence to communicate effectively throughout the intervention process and with physician or referral sources:

> Yeah, I think that part of this comes with confidence in treating too. I didn't want to mess up and I wanted to do the things on the list of things I had to check off for my supervisor, the hospital, or wherever it was. (P2)

*Therapeutic use of self.* Although entry-level OTs demonstrated good therapeutic use of self, or the ability to use their personality, insight, and perception as part of the therapy process, during basic day-to-day interaction with patients, they did not have the skill set needed to manage difficult situations. When working with patients, it is difficult to separate the deficits or impairments from the person. You are working with individuals with different personalities. Working with a patient who loves therapy, who is motivated to participate, and who listens to the therapist does not require the same level of interpersonal skills as working with a non-compliant patient or a patient with a more difficult personality:

> You are not just dealing with orthopedic or biomechanical injuries. You're now also dealing with personalities and people. So having patients who might have a little bit of a difficult personality to deal with and learning how to deal with that. As an entry-level, you don't have enough experience enough with it [dealing with difficult personalities] to figure out how to get through it in a positive way. As far as with my experience, seeing and dealing with different personalities, I've learned how to: A) not take it too personal and B) how to find a different avenue to get a patient to buy into the therapy process. (P1)

**Holistic and client-centered care.**

***Skills needed for UED management and skills expected for entry-level competence.*** Participants agreed that client-centered care and using a holistic approach throughout the occupational therapy process is important. As such, entry-level OTs were expected to effectively provide client-centered and holistic care to their patients. Therapists need to look at the whole person instead of compartmenting their care. As participant 3 said, OTs should be "looking at the whole person. It's not always just a diagnosis."

> The hands-on touch-and-feel and looking at the whole person. Because you know what, you can look at 'this is the best evidence approach for a distal radius' but yet, I haven't looked at the whole, the psychological part of it. Why is this person struggling so much? Like the fear… why is that part of it? (P3)

***Entry-level competence.*** Entry-level OTs tend to focus on the diagnosis or the area directly affected by the injury or condition. It is difficult for them to use therapeutic activities or occupations that are meaningful to their patients during the occupational therapy process:

> How do you bring the patient's goals into it. I hate looking at someone in the therapy space who's reaching for cones. When do we ever reach for cones in our life? Make it

> into something functional. Make it into: we're reaching to hang something up on the laundry line, make it something that somebody cares about. That's what I see setting apart a lot of the experienced OTs compared to the entry-level. (P2)

In summary, participants found that entry-level OTs' strength centered on their willingness and desire to learn, their energetic personality, their compassion, and their dedication to work. According to participants, entry-level OTs were not at the level they had expected when it came to safety, clinical reasoning, knowledge, communication, holistic and client-centered care, and advanced interpersonal skills.

## Evaluation Skills

Evaluation is an important part of the occupational therapy process as it is during an evaluation that OTs determine the impairments that are affecting occupational performance. Furthermore, it is the results of the evaluation that inform the development of an intervention plan. Three different sub-themes were identified within the evaluation process: completion of an occupational profile, skilled assessment, and goal writing and intervention planning (Table 3).

### Occupational profile.

***Skills needed for UED management.*** When looking at the evaluation process, it is important to gather information regarding the patient's past medical history and the history and of the present condition and to understand the impact of the condition or injury on the patient's daily life and goals. As Participant 1 said:

> Therapists must gain an understanding of the patient, understanding what they are going through. Knowing the basics and the foundations to listen and get a history of what's going on for the patient, being able to get their client or his patient's profile.

Participants emphasized the need to understand the impact UED has on function or occupation and not to focus mainly on the physical impairments. In order to do so, therapists should complete an activity or occupational analysis:

> And I think it goes back to the very first portion of the evaluation. So we know what occurred, what the injury is, what's causing the dysfunction, and then what function do you need to return to. Whether it's a work function, whether it's a home function, whether it's any of those things, sports or athletics as well. You focus your entire treatment program off of that: the initial identification of what function is required. (P4)

***Skills expected for entry-level competence.*** Participants believed that entry-level OTs should be able to obtain a comprehensive occupational profile.

***Perceived entry-level competence.*** The ability to obtain a good occupational profile as part of the evaluation process was identified as a strength of entry-level OTs:

> Coming back to an occupation-based or a functional-based approach [to the evaluation process], (…) is a very strong suit of entry-level therapists and I think that is probably the product of focusing a lot on occupation and function during the academic process. (P4)

**Skilled assessment.**

***Skills needed for UED management.*** All participants agreed that OTs addressing UED should be proficient with the selection and administration of assessments commonly used to measure UE function. These include the ability to accurately measure range of motion, pinch and grip strength, upper extremity strength through manual muscle testing, and sensation.

Furthermore, some participants discussed the importance of diagnostic skills. Although OTs working with UED work under a physician's order, oftentimes, it is up to the OT to accurately identify the source of the problem or the therapy diagnosis:

> I think you need to be able to differentiate the diagnosis. I think you need to be able to explore what are potentially the other things that could be causing that pain and to rule them out and know how to rule them out, and then proceed from there. (P5)

This requires a higher level of diagnostic skills, especially when working in an outpatient setting:

> In the outpatient arena you need a higher level of diagnostic skills. I think there are potentials for the diagnosis to not to be what it not seems. I think there's a big chance you need to rule out possible cervical involvement, especially with outpatient things (…) But when in the outpatient world I think there is a greater diagnostic skill level that's needed. (P5)

***Skill expected from entry-level competence.*** Participants expected entry-Level OTs to select and administer relevant assessment tools and outcomes measures: "But what makes a good clinician is good outcomes as measured through objective outcome measures. That encompasses a good clinician" (P7).

> I think basic goniometry skills, knowing how to look at a wrist, look at a finger, look at the form, and then know how to measure joint angles. That should be in the back pocket of any entry-level therapist. (P4)

***Perceived entry-level competence.*** Participants identified the selection and administration of common assessment tools as a strength of entry-level OTs:

> They've had good basic level skills they can look at what's the strength, what's the function, how are they using it. Assessments like doing a box and blocks or a grip strength test, and looking at outcomes measure that would relate to upper extremity. (P2)

Furthermore, entry-level OTs have the skillset needed to assess normal movement in relation to basic activities of daily living such as dressing and bathing: "I think they are good at assessing normal movement and how it works in conjunction with ADLs" (P5).

According to participants, diagnostic skills are higher-level skills that entry-level OTs do not master. Several participants expressed typically having more experienced therapists work with patients with more complex UED:

> Anytime that we had a shoulder it went to a therapist that was more experienced with upper extremity. It wasn't an entry-level person. I think there was a gap between the skill levels of the person who was newer versus the person who had experience in hands and had focused on learning much more about upper extremity. (P5)

**Treatment planning.**

***Skills needed for UED management.*** The process of treatment planning involves the ability to triage or select the relevant information obtained from the occupational profile and assessments and interpret this date to produce a client-centered plan of care. It also includes the ability to write function-based of occupation-based goals that are specific to each patient.

***Skills expected for entry-level competence.*** The expectation is for entry-level OTs to have the skillset needed to develop and document plans of care that are specific to each patient and that focusses on function and occupation.

***Perceived entry-level competence.*** According to participants, entry-level OTs were able to write occupation-focused goals. The challenge they encountered relates the lack of knowledge of the typical recovery process in relation to specific diagnoses. This rendered goal setting difficult since entry-level OTs did not have the knowledge base needed to determine reasonable

outcomes: "[They don't have the] experience to know what the expectations are with the patients and their outcomes" (P1).

Overall, participants felt OTs met their expectations of entry-level level competence during the evaluation process. They found that entry-level OTs were able to gather a comprehensive occupational profile, administer common assessments used with UED, and write functional goals. However, entry-level OTs had difficulty setting reasonable expectations and integrating the results of their evaluation into the development of an intervention plan.

## Intervention Skills

The intervention process refers to the ability to implement effective treatment strategies in order to meet specific outcomes. Three sub-themes have been identified: technical skills, intervention planning and implementation, and the ability to facilitate functional improvements (Table 4).

### Technical skills.

#### *Skills needed for UED management.*

*Modalities.* Electrical and thermal physical agent modalities are used frequently when addressing UED and as such, participants felt that it was important for OTs working with UED to have the knowledge and skills needed to select and use modalities. As Participant 6 stated: "modalities is an important aspect of outpatient".

*Splinting.* Splinting refers to the process of recommending, fabricating, and assessing orthosis while ensuring proper fit and function. Orthoses are commonly referred to as splints, hence the use of the term splinting. Orthoses are often utilized when addressing UED: "Splinting is something that I think is very beneficial" (P1). Therefore is it a skillset needed when working with that population. The level of skills required is dependent on the setting or population: "So

on the outpatient side I'd expect them to be able to do splints and all these crazy splints with expertise, which definitely requires a higher-level skill set" (P7). Furthermore, some participants considered splinting as a hallmark of the profession and as such, believed that all occupational therapists should have some level of splinting abilities:

> Granted, PTs have kind of made inroads at our territory because they've become more functional. I mean hand therapy did start with OT. I know there's PTs there too, but in the end, that's our territory. Splinting is our big thing. That's kind of been our specialty and why should we give it up? (P3)

*Manual therapy*. Manual therapy, or the skills to use hands-on techniques to facilitate physical changes, is an important component to interventions when addressing UED: "I think manual skills are necessary to effectively treat the patient if you want them to have optimal outcomes" (P6). Some participants felt that manual therapy remained underutilized in practice:

> I think we've lost something though. I think there's a lot to be said for being able to put your hands on a patient and give a small cue and all of the sudden, they're posture changes. And to put a little of a hand on somebody and shift their weight at the pelvis and see how that affects everything in their kinetic chain, from their feet all the way up to whatever their upper extremity is doing. (P2)

***Skills Expected for Entry-Level Competence.***

*Modalities.* Entry-level OTs working with patients with UED are expected to have basic knowledge of physical agent modalities. However, entry-level OTs are not expected to have the competency to administer physical agent modalities immediately after graduation. Instead, they are expected to achieve competency within the first year of practice:

> Yeah, having a basic understanding of modalities. Understanding what the purpose of heat is, the purpose of ice is. They are not expected be competent in modalities [straight out of school]. (P1)

*Splinting.* Although splinting is a technical skill that is required for entry-level OT practice, the expectation is not that of an experienced therapist. Entry-level OTs are expected to demonstrate basic splinting competency:

> You have to be able make splints, like the three basic types of splints: the resting hand splint, the wrist cock up splint, and thumb spika. That pretty much covers 80% of the splitting that they'll need to know whether they're in a rehab, acute care, or outpatient setting. The other 20%, they'll learn later on with experience. (P6)

OTs are then expected to continue building their splinting proficiency through mentorship: "I certainly benefited from the opportunity of having proper mentorship to be able to learn more splinting while I was working" (P1) or continuing education courses: "I think basic splinting courses are important" (P4).

*Manual therapy*. Since manual therapy is often considered an advanced skillset, participants expected entry-level OTs to have a basic understanding of manual therapy techniques. The expectation was for entry-level OTs to utilize proficiently a lower level of manual skills, such as range of motion, stretching, and soft tissue mobilization: "I would not expect them to really have strong skills and be able to do joint mobilizations and manipulations. I think just the basics, passive range of motion, stretching, would be expected" (P1). "They would need to be proficient in ranging patients that are stiff" (P6).

***Perceived entry-Level Competence.***

*Splinting.* Although the expectations for entry-level competence for splinting is for a basic level of mastery, participants were disappointed with splinting skills of entry level OTs. They expressed concerns with the relatively low exposure to splinting within educational settings: "So splinting is also a big thing, which is amazing. Our last year student didn't, they maybe did one splint in school" (P3).

*Manual therapy*. Participants identified Manual therapy as an area for improvements. Entry-level OTs often do not demonstrate basic levels of manual skills: "I do think that some of those hands-on skills don't seem to be coming out of occupational therapy programs" (P2). "From what I'm seeing coming out, they don't have a lot of real hands-on" (P3). Other participants were disappointed that entry-level OTs do not have the knowledge of basic manual therapy skills to provide safe range of motion: "They have not been taught in their program how to do an inferior glenohumeral glide for example to work on minimizing compression at the AC joint with shoulder elevation" (P2).

**Facilitation of functional improvements and function-focused interventions.**

***Skills needed for UED management.*** An important component of occupational therapy intervention is the ability to facilitate functional improvement through the use of function-focused interventions:

> Going back to the true OT, going back to getting them back to whatever it is they want to do. How to correct their dysfunction to get them back functionally. As an OT, our whole goal is to think functional. (P3)

***Skills expected for entry-level competence.*** According to participants, entry-level OTs are expected to be proficient in the use of occupation during the intervention process and in the ability to facilitate functional improvement: "Definitely be able to masterfully work through

ADL performance with patients who are really impaired in order to get them back into the community" (P7).

***Perceived entry-level competence.*** Although entry-level OTs are generally competent in writing occupation-focused goals, they are not always able to integrate the use of functional or occupation-based activities within their intervention plan: "Entry-level OTs may use therapies that are not meaningful to patients; it takes experience to think of activities that are real and relevant" (P2).

> That is the challenge, trying to teach them how to relate to function. They are thinking about their patients' limitations but are having a harder time connecting the dots. What are the impairments limiting them from doing? How do you get them to function? Yes, you have these limitations, but how has this affected function. (P3)

Overall, participants felt that although entry-level OTs had the skills to provide intervention for less complex patients, they lacked the technical skills (splinting and manual therapy) to effectively manage UED, including shoulder dysfunctions. Furthermore, entry-level OTs had difficulty implementing function-based interventions.

**Suggestions for Improved Entry-Level Competence**

Suggestions provided by participants were grouped in four themes (Figure 1). Three of the themes addressed suggested changes at the occupational therapy education level: increasing the knowledge base of the sciences of the human body, providing more opportunities for hands-on experience, and providing exposure to the clinical setting of interest. One theme addressed suggestions at the clinical practice level: ensuring that entry-level OTs have access to mentorship when entering the profession.

**Sciences of the human body.** Participants suggested that there should be more emphasis on the basic sciences of the human body and physical disabilities related content within the occupational therapy curriculum:

> I think traditionally some of the knowledge or content such as diagnostic skills and the science-related content hasn't been traditionally part of what OTs generally learn going in. That's your goal, to have that knowledge base. You get to build your knowledge base in school. Having that core knowledge puts you a step ahead and serves as a base when pursuing additional educational opportunities, such as continuing education, when you enter the field. (P5)

There should be a greater balance between focusing on occupational-based and function related knowledge and obtaining the core knowledge needed to address physical disabilities, more specifically, upper extremity dysfunctions: "OT education could be a little more focused on physical disabilities type stuff rather than such a focus on function and occupation-based interventions" (P4).

Finally, OT education should include content focused on UED, including common upper extremity injuries/diagnoses and basic interventions utilized when addressing UED:

> Having more classes related to upper extremity in OT school would help. Add content related to some of the basic protocols that you'll see, some basic fractures or diagnoses that you'll see. If you add maybe five, of the most common things that you see in outpatient, at least once they graduate and they enter the field, they will already be familiar with it. (P6)

**Hands-on experience.** Participants recommended increasing the amount of hands-on experience and exposure to real patients within OT education: "It's one thing to read a case study

but it's another thing to see a patient, work with a patient, and see the subtle difficulties because nothing is ever, or very rarely textbook presentation" (P5). "I think having hands-on exposure with actual patients and diagnoses in fieldwork would be beneficial" (P1).

**Exposure to clinical setting.** Although participants felt that it would ideal for all occupational therapy students to have direct exposure to real patients as part of occupational therapy education, they were mindful of the logistics associated with providing real-life clinical experience within the educational setting. As such, participants recommended that OT students with a known interest in UED be streamlined into completing a level 2 fieldwork experience within UED settings:

> I think one of the main things that academic programs could do to support entry-level competence is to allow those students that have an interest in a subspecialty like hand therapy, to track into a level 2 fieldwork in hand therapy. I think that's kind of a critical entry-level requirement for new grads interested in UED. (P4)

**Mentorship**. Participants highly recommended a structured mentorship or orientation process for entry-level OTs working with UED: "I would definitely say that mentorship is really important. If you have a mentorship in place then they can work through a lot of the details" (P7). "I think you need some mentoring, someone who's been in outpatient or who's worked with UED. That includes being able to shadow or work with an experienced therapist who specializes in UED" (P6).

**Resources Available to Managers in Clinical Settings**

Participants agreed that entry-level OTs needed to continue improving their skills in order to become proficient in the management of UED. As such, there was generally resources set aside to help entry-level OTs continue to develop their skills.

**Clinical expertise.** There is often some form of mentorship provided or available to entry-level OTs. This can be done in the form of a formal structured mentorship program or by setting up an informal mentorship where entry-level OTs are paired with more experienced OTs. The length of the mentorship program varies based on available experienced staff or productivity requirements: "A lot of times, they'll learn hands-on with the experienced therapists. We have them shadow someone for a while before they go off on their own" (P6). "The first year we do set new graduates up with a mentor. So it's a one to one mentorship for the first 12 months because again, that first 12 month period is just so overwhelming" (P7).

**Learning opportunities.** Other resources available to entry-level OTs are continuing education courses. These courses are generally provided by outside companies and cover a wide variety of topics. In some settings, the cost of continuing education is either partially or fully covered as part of employees' benefits: "They can also take a continuing education course; there are always CE courses out there" (P6).

**Barriers to onsite training.** Participants described productivity as being a barrier to entry-level learning and support: "Unfortunately, in the day and age of business, making sure that our volume is up, takes over the learning and mentoring opportunities" (P1).

## Discussion

Several skills were identified as important for the management of UED. Although participants identified some strengths in the area of evaluation, interpersonal skills, willingness to learn, and basic planning and implementation, they found that entry-level OTs did not possess most skillsets specific to UED management. As such, employers enrolled in this study reported that entry-level OTs meet their expectations entirely or partially for only five of the 17 general skill sets they considered as important to the management of UED.

**Knowledge and Clinical Reasoning Skills**

Participants in this study identified knowledge as an important aspect to the management of UED. This included the knowledge of common upper extremity diagnoses or conditions, anatomy, physiology, and kinesiology, as well as a commitment to life-long learning. Erikson et al. (2017), Keller et al. (2016), and Short, Sample, Murphy, Austin, and Glass (2018) agreed that OTs and physical therapists required knowledge of common upper extremity conditions or diagnoses in other to efficiently address UED. As such, Erickson et al. (2017) found that experts in the field of hand therapy recommended the inclusion of upper-extremity diagnosis-related content within entry-level physical therapy education. Several authors supported the need for the mastery of knowledge related to the sciences of the human body including anatomy and physiology (Adam et al., 2013; Carroll, & Lawson, 2014; Colclough et al., 2015; Erickson et al., 2017; Keller et al., 2016; Schofield, 2018; Short et al., 2018).

Unfortunately, in this study, participants found that entry-level OTs did not possess the level of knowledge employers expected for entry-level competence. These findings are further corroborated within the existing literature. Schoffield (2018) found that OTs with over three years of experience felt that entry-level OTs did not have sufficient knowledge of anatomy to effectively address UED. In other studies, Doyle, Bennett, and Gustaffson (2013) and Jolliffe, Hoffman, Lannin (2019) found that even occupational therapists working within physical disability settings perceived their lack of knowledge as a barrier to providing effective intervention for upper extremity impairments.

Therapists require high level of clinical reasoning to integrate the knowledge into the development of effective interventions (Colclough et al., 2015, Kuipers & Grice, 2009). Unfortunately, Kuipers and Grice (2009) found that, according to employers, entry-level OTs did

not possess the level clinical reasoning skills they expected for entry-level competence. Similarly, May et al. (2010) found clinical reasoning to be a major weakness in entry-level physical therapists when treating shoulder impairments. It is the clinical reasoning skills that allow for the integration of the theoretical knowledge and clinical presentation to the development and implementation of a safe and effective intervention plan (May et al., 2010). Similarly, participants in this study described the high level of clinical reasoning skills needed to integrate the theoretical knowledge to each client's clinical presentation in order to develop and implement an intervention plan targeting each client's unique needs.

According to Schofield (2018), knowledge is also crucial to provide safe intervention. Safety is embedded within the profession of occupational therapy and as such, it is reflected within the principles and standards of the occupational therapy code of ethics. According to AOTA (2015), the first principle of conduct, beneficence, is defined as "Occupational therapy personnel shall demonstrate a concern for the well-being and safety of the recipients of their services" (p. 6913410030p2). Safety is also reflected within the second principle of conduct, nonmaleficence, which states that "occupational therapy personnel shall refrain from actions that cause harm" (AOTA, 2015, p. 6913410030p3). It is therefore not surprising that participants identified safety as an important overarching skill when treating UED. The importance of maintaining safety and preventing harm to patients was also reflected within the literature (Keller et al., 2016; Schofield, 2018). Furthermore, the Accreditation Council for Occupational Therapy Education (ACOTE) defined the need to "demonstrate sound judgment in regard to safety of self and others and adhere to safety regulations throughout the occupational therapy process" (p. 27). Although participants expected entry-level OTs to maintain safety during the occupational

process, some felt that entry-level OTs needed more training and time in order to maintain safety during the intervention process.

**Communication Skills**

According to Radomski and Trombly Latham (2014), communication is an important component to the occupational therapy process as it helps establish a therapeutic relationship with clients. Accordingly, participants in study identified effective communication as an important aspect of the therapeutic process. They felt that entry-level OTs were able to communicate effectively with their patients in their day-to-day interactions. However, communication skills are also required when interacting with members of the therapy teams, such as physicians, co-workers, and other allied health professionals. According to the participants of this study, entry-level OTs continued to need improvement in self-confidence when communicating with members of the interprofessional team, peers, and referral sources and therefore did not meet their expectations for entry-level performance.

**Interpersonal Skills**

In this study, participants found that some aspects of interpersonal skills, such as being energetic, compassionate, and dedicated, were a strength of entry-level OTs. Being able to interact with clients is crucial within the practice of occupational therapy as it helps establish a therapeutic relationship with the client (Radomski, & Trombly Latham, 2014). Client/therapist interaction relies heavily on interpersonal skills, including therapeutic use of self, or the ability to establish and maintain a therapeutic relationship with your client (Davidson, 2011). However, occupational therapists are sometimes placed in more complex situations where they have to "diffuse heated situations, work across language barriers, use truthful but tactful communication about functional limitations, and be proficient in therapeutic use of self" (Short et al., 2018, p.

312). Participants of this study identified stress management, confidence during interpersonal interactions with peers and physicians, the ability to create a therapeutic relationship with their client, and being able to negotiate and manage difficult interaction as not meeting entry-level expectations. Interestingly, Davidson (2011) found that although faculty included therapeutic use of self within their curriculum, they tended to focus on positive aspects such as empathy, establishing rapport, self-awareness, active listening, and giving praise amongst others. However, skills associated with a more difficult or negative connotation such as "setting limits, conflict negotiation, dealing with clients' attempts to coerce or manipulate, dealing with potential aggression toward self or others, and sharing bad news" (Davidson, 2011, p. 93) were taught with less frequency and, in some instances, omitted. Although interpersonal skills and therapeutic use of self can improve with experience, it is concerning that the areas that were identified as not meeting the expectations of employers were also the areas that were the least frequently addressed within occupational therapy educational programs.

**Holistic and Client-Centered Care**

According to the Occupational Therapy Practice Framework (AOTA, 2014), "the occupational therapy process is the client-centered delivery of occupational therapy services" (p. S10). Colclough et al. (2015) emphasized the importance of client-centered and holistic care when addressing UED. Furthermore, occupational therapists consider all aspects of the person, occupation, and environment, hence utilizing a holistic view of the person (AOTA, 2014). It is therefore not surprising that employers identified holistic and client-centered care as being essential to the delivery of occupational therapy for the management of UED. Unfortunately, entry-level OTs did not meet the expectations when it came to delivering holistic care when treating UED, focusing on the deficit area rather than looking at the whole picture. This might be

related to the lack of confidence, knowledge, and clinical reasoning skills previously mentioned. The level of complexity inherent to UED might increase the difficulty using clinical reasoning to integrate their theoretical knowledge and clinical presentation to form a holistic client-centered intervention plan.

**Evaluation Skills**

Skills identified related to the evaluation of UED included the ability to gather an in-depth occupational profile, administer skilled assessment, and integrate the findings into the development of a comprehensive intervention plan. Colclough et al. (2015) described the importance to obtain a thorough occupational profile. They determined that in order to provide client-centered care, occupational therapists needed to gather information regarding each client's individuality, including their client's current life context. Employers in this study found that entry-level OTs met their expectations in terms of obtaining a comprehensive occupational profile, including completing the initial interview and relating UED to functional performance. The distinct value of occupational therapy is to promote occupational engagement through the use of occupation (AOTA, 2014). As such entry-level OTs were perceived as proficient in gathering data focused on occupation during the evaluation process and in considering the impact of UED on function. This may be a reflection of the focus on occupation as the unique contribution of the profession within the occupational therapy profession.

Once the occupational profile is completed, occupational therapists must then select and administer assessments to gather information regarding the client factors, environment and contexts affecting occupational performance (AOTA, 2014). Assessments specific to UED might include but are not limited to range of motion, strength, sensation, edema, pain, biomechanics, and spasticity (Colclough et al., 2015; Erickson et al., 2017; Schofield, 2018). Employers within

this study reported that entry-level OTs were skilled in the administration of standardized assessments such as goniometry and manual muscle testing. Although the administration of such assessments requires hands-on practice, it does not require high level of clinical reasoning skills. The administration process is well-defined and can be mastered with repetitions and practice. It becomes a skill set that can easily be acquired early on. Therefore, despite the limited amount of clinical skills identified within this study, entry-level OTs were able to meet expectations for the administration of assessment tools commonly use when working with UED.

Finally, occupational therapists triage and select relevant information/findings in order to write functional goals, set reasonable outcome expectations, and the integrate all information into to development of an intervention plan. In order to meet these expectations, entry-level OTs should be able to interpret the assessment data, develop and refine hypotheses about the client's strengths and limitations, establish client-centered occupation-focused goals, and delineate potential intervention approaches based on the best practice and available evidence (AOTA, 2014, p. s14). Employers enrolled in this study found that a strength entry-level OTs possessed was the ability to write functional or occupation-focused goals. This is not surprising considering the central part occupation holds within the profession.

However, participants also identified some areas within the evaluation process where entry-level OTs did not meet their expectations: the ability to set reasonable expectations and to anticipate the progress or outcomes of the interventions, and the ability to integrate all information into developing an effective, evidence-based intervention plan. Several skills are needed in order to set reasonable expectations and develop an intervention plan. A deep understanding of anatomy and physiology, as well as the knowledge of a variety of conditions, are needed in order to understand the expected progression related to specific clinical

presentations (Carroll, & Lawson, 2014; Keller et al., 2016; May et al., 2010; Schofield, 2018.). Furthermore, occupational therapists must use clinical-reasoning reasoning skills in order to interpret and integrate all information relevant to intervention planning (Carroll, & Lawson, 2014; Colclough et al., 2015; May et al., 2010; Short et al., 2018). Therefore, it is probable that failure of entry-level OTs meet expectations in the area of intervention planning is associated and interconnected with the lack of knowledge and clinical reasoning skills previously identified by employers enrolled in this study.

**Intervention Skills.** Employers within this study identified three different sets of skills needed for the management of UED: technical skills, intervention planning and implementation, and the ability to facilitate function.

There is an agreement within the literature that proficient use of physical agent modalities is an important component to treating UED (Hodgetts et al., 2007; Short et al., 2018). Although employers within this study agreed that physical agent modalities should be part of interventions for UED, they did not expect OTs to possess the skill upon graduation. This could be in part due to the additional education required in Illinois for occupational therapists to use physical agent modalities. Although ACOTE standards mandate that students of accredited entry-level OT program "demonstrate knowledge and use of the safe and effective application of superficial thermal agents, deep thermal agents, electrotherapeutic agents, and mechanical devices" (ACOTE, 2018, p. 38), it does not specify how educational programs educational program should achieve this standard, leaving each program to set their own objective and instruction modalities. Therefore, not all programs can certify that OT graduates have met all the requirements for certification in the use of physical agent modalities. Employers within this

study were aware of the legal requirements and as such, expected students to meet these requirements within one year of practice.

Employers also identified orthoses fabrication as a must when addressing UED. This is in agreement with the literature (Colclough et al., 2015; Hodgetts et al, 2007; Short et al., 2018). However, there was a consensus that most OTs entering the field were not competent in the design and fabrication of complicated orthosis. Rather, they expected entry-level OTs to demonstrate the skills and knowledge needed to fabricate common simple orthoses. Unfortunately, although employers' expectations were reasonable for entry-level competence, they found that entry-level OTs often were not able to fabricate even the most common orthoses. Hodgetts et al. (2007) found that Canadian OT graduates would have preferred to learn orthoses fabrication skills within their educational program as they felt unprepared to meet the workplace expectations.

According to Short et al. (2018), OT practitioners with the field of hand therapy expected OT students to have acquired some knowledge of manual therapy within their educational program. Since manual therapy skills develop over time with experience, employers within this study expected entry-level OTs to demonstrate basic manual skills such as range of motion, soft tissue mobilization, and joint mobilization. They then expected entry-level OTs to further their proficiency in the use of manual therapy during interventions for UED within their first year of practice. Unfortunately, employers reported that entry-level OTs did not meet their expectations or basic knowledge and skills in the use of manual therapy. Participants within this study proposed that it could be due to the lack of hands-on experience and educational content related to manual skills within OT entry-level educational programs.

When it comes to intervention planning and implementation, employers within this study expected entry-level OTs to be independent thinkers and demonstrate some autonomy, to know how to use intervention to progress clients towards expected outcomes, and to have basic knowledge of interventions for common diagnosis. Entry-level OTs did not meet the expectations of this study' participants because of: 1) a limited skill set to address shoulder dysfunction, 2) difficulty selecting and implementing optimal interventions, 3) difficulty using the scientific approach to care and integrate theoretical knowledge within clinical practice, and 4) entry-level OTs' expectation to have direct guidance when selecting and implementing interventions. This finding could be in consequence to the previously identified lack of knowledge and clinical reasoning skills. According to this study's participants, entry-level OTs had sufficient skillset and knowledge to work with less complex diagnoses or clients. Furthermore, they felt that entry-level OTs brought new ideas and fresh way of thinking to the clinical site.

Finally, employers within this study expected entry-level OTs to be able to relate UED to function, use equipment and interventions to support return to function, progress clients towards safe return to community, use occupation and meaningful activities as interventions, and be proficient when addressing occupational performance related to basic activities of daily living. There has been an emphasis within the profession on the use of occupation as a therapeutic modality and as outcome. The American Occupational Therapy Association's participation within the "choose wisely" campaign (Richardson, 2019) further illustrates that trend. As such, Short et al. (2020) found that faculty within entry-level OT educational programs strongly encouraged the use of an occupation-based model in hand therapy. Unfortunately, despite entry-

level OTs demonstrating the ability to write occupation-focused goals, employers within this study found that it did not translate to the ability to implement function-based interventions.

**Perceptions of Entry-Level Competence**

This study explored employers' perception of OT entry-level competence when addressing UED dysfunctions. For the most part, employers felt that entry-level OTs did not meet their expectations. In their study, Hodgetts et al. (2007) examined the perception of OT students and graduates regarding their "satisfaction with their professional education and preparedness for practice" (p. 148). They found that students and OT graduates "expressed varying degrees of frustration with initial work expectations, feeling that work demands were too high for their initial knowledge base" (p. 154). Hodgetts et al.'s study suggested that OT students and graduates did not feel they had the knowledge and skills to meet the expectations of clinical practice. The findings of this current study and those of Hodgetts et al. (2007) suggest a dissatisfaction with the preparedness to meet the expectations of clinical practice from two different perspectives.

In contrast, Short et al. (2020) found that a majority of faculty from entry-level occupational therapy programs felt that students received sufficient hand therapy-related education within their program. In relation to their finding, Short et al. (2020) suggested that "contradicting perceptions of adequate preparation for students may represent a disconnect between OT education and clinical expectations" (p. 116). Further supporting these findings, Carroll and Lawson (2014) found that "although the occupational therapy curriculum has progressed, improved, and expanded, the relative importance and prerequisite for anatomical training have not changed" (p. 498). Although the standards for OT education set by ACOTE states that students graduating from an accredited OT program must "demonstrate knowledge of

the structure and function of the human body to include the biological and physical sciences, neurosciences, kinesiology, and biomechanics" (AOTA, 2018, p. 31), the responsibility to design learning objectives and activities rests with each program (Carroll, & Lawson, 2014).

These conflicting findings may support Short et a. (2020) suggestion of a disconnect between entry-level OT education and the expectations of clinical practice and would warrant further exploration of the topic.

**Suggestions for Improved Entry-Level Competence**

Employers' in this study provided a few suggestions they felt could improve OT entry-level competence for effective management of UED. These included three suggestions at the OT entry-level educational level: increase the instruction related to UED, including anatomy, physiology, and kinesiology; provide more hands-on experience; and provide more exposure to clinical settings. The last suggestion at the clinical site level: provide structured mentorship for graduate students working with UED.

Participants' suggestion to increase the amount of instruction provided UED management related content could improve the foundational cognitive understanding of entry-level OTs. According to Short et al. (2018) found that clinician working in hand therapy expected fieldwork students to have the foundational cognitive understanding without the full development of related skills (p. 312).

Participants also suggested that entry-level OT educational programs provide students with added opportunities to practice hands-on skills and exposure to clinical settings. According to Colclough et al. (2015) and Short et al. (2018), hands-on or clinical experience can help better integrate skills such as splinting, manual therapy, conflict resolution, and setting reasonable goals/outcomes (Colclough et al., 2015; Short et al., 2018). Integrating clinical experience within

educational programs can be challenging. However, according to Bethea, Castillo, and Harvision (2014), simulated experiences can help "develop safety with clients, practice clinical skills, use clinical reasoning and critical thinking, prepare for fieldwork, and facilitate concept integration" (p. S35).

Finally, participants suggested that clinical sites provide structured mentorship opportunities for entry-level OTs working with UED. According to McCombie and Antanavageb (2017), occupational therapists within their first year of practice were more likely to perceive their worksite as a good clinical fit, had higher job expectations and minimal job-related stress, and were better able to develop professional relationships as opposed to those without mentors.

**Limitations**

This study is not without limitations. As with any qualitative study, there is a risk of the researchers' biases influencing the outcomes of the study. This is further emphasized in this study since the primary researcher is an occupational therapist with special interest and clinical expertise in the management of UED. Furthermore, the primary researcher also works in academia and is responsible for teaching content related to physical disabilities, including content related to UED. To decrease the risk of biases, content validity for the interview guide was obtained from occupational therapists working with UED. To ensure the validity of the results, two participants were sent the preliminary findings of the study for review. Both responded that it captured their experience related to entry-level competence for the management of UED. Furthermore, although data saturation was obtained, the sample size was relatively small and all participants worked within the Chicagoland area. Results are therefore not transferable to all employers supervising entry-level OTs.

**Implications for Practice and Future Research**

Insufficient knowledge to address UED is concerning because of the potentials to cause harm and the inability to provide effective interventions. It would be beneficial to study entry-level competence when treating UED, including the safety and effectiveness of interventions provided by entry-level OTs. Another area of study It would also be beneficial to further examine the way foundational knowledge, particularly knowledge of the sciences of the human body, are delivered within entry-level OT educational programs. According to ACOTE (2018) educational programs must include content related to anatomy, physiology, physical sciences, neurosciences, kinesiology, and biomechanics. However, there are no specific guidelines regarding the delivery of such content (Carroll, & Lawson, 2014).

Further studies are needed to compare and contrast the perception of entry-level competence from different stakeholders. Faculty and educational programs might place more emphasis on the knowledge and skills needed as defined by the profession and the accreditation body; whereas, employers' expectations might be influence by patient satisfaction and outcomes, as well as managerial aspects such as finance and productivity. On the other hand, payers or reimbursement sources may emphasize the need for efficient and economical interventions.

The management of UED, and more specifically hand therapy, is considered a specialty area within the field of OT. Should entry-level OTs work in hand therapy or address UED? If so, it is imperative to address entry-level competence related specifically to UED. The possible disconnect between employers' expectations and entry-level competence places OTs entering the profession at a disadvantage, increasing their risk for job dissatisfaction and work-related frustration (Hodgetts et al., 2007).

It would be beneficial to implement strategies to ensure proper competence of entry-level OTs working with UED. At the OT education level, this could mean re-assessing the application

of foundational knowledge to clinical reasoning throughout the program, hence facilitating knowledge integration. Since hands-on experience and exposure to clinical settings were identified by employers as crucial to developing the skill set needed for the management of UED, educational programs could integrate authentic learning opportunities such as simulations, clinical setting observations, volunteering experience, or standardized patients. Educational program could consider the implementation of an additional clinical site experiences for students interested in UED management or target students with a known interest in UED management for fieldwork experiences in UED management. Finally, educational program could facilitate information sessions between colleges and area inpatient and outpatient centers to align understandings about the preparation programs and needs in the field, further emphasis on mentorship programs in workplaces for entry-level OTs.

**Conclusion**

Even with the stated limitations, this study helped in further defining the complexity and skills needed for the management of UED and the expectations of employers on entry-level competence for the management of UED. It is to the researcher's knowledge the first study examining employers' perception of entry-level competence in relation to UED.

Occupational therapists are often responsible to address UED dysfunction in a variety of physical disability settings and is not exclusive to a hand therapy setting. As such, this study included participants from inpatient and outpatient settings working with orthopedic and neurological populations. Without the skillset and knowledge needed to treat UED, there is a potential to cause harm or provide ineffective care (Schofield, 2018). It is OT's ethical responsibility to ensure that no matter the level of expertise, therapists working with UED have

sufficient knowledge to not only avoid harm, but also to facilitate client's progress throughout their recovery (AOTA, 2015).

This study's findings are concerning as employers' reported that entry-level OTs only met expectations for five out of seventeen skills identified as important for the management of UED. This may be due to either inadequate preparation of occupational therapy students for the management of UED, or employers' unrealistic expectations of entry-level competence. Both scenarios could lead to unsafe or ineffective practices, and increased job-related stress and dissatisfaction. As such, there is a need for further studies exploring entry-level expectations from different perspectives, entry-level competence for the treatment of UED, and entry-level OT program curriculum content related to the management of UED.

References

Accreditation Council for Occupational Therapy Education. (2018, November). 2018 Accreditation Council for Occupational Therapy Education (ACOTE) standards and interpretive guide (effective July 31, 2020). *The American Journal of Occupational Therapy*, *72*(supplement 2), 7212410005p1-7212410005p83.

Accreditation Council for Occupational Therapy Education. (2012). Accreditation Council for Occupational Therapy Education (ACOTE) standards. *The American Journal of Occupational Therapy, 66*(6), S6-S74.

Adam, K., Strong, J., & Chipchase, L. (2013). Foundations for work-related practice: occupational therapy and physiotherapy entry-level curricula. *International Journal of Therapy and Rehabilitation, 20*(2), 91-100.

American Occupational Therapy Association. (2014, March-April). Occupational Therapy Practice Framework: Domain and process, 3rd edition. *The American Journal of Occupational Therapy, 68*(supplement 1), S1-S51. doi:10.5014/ajot.2014.682006

American Occupational Therapy Association. (2015). Occupational therapy code of ethics (2015). *The American Journal of Occupational Therapy, 69*(Supplement 3), 6913410030p1-6913410030p8.

American Occupational Therapy Association, State Affairs Group. (2019, June). Occupational therapy profession – Scope of practice definitions. Retrieved from: https://www.aota.org/~/media/Corporate/Files/Advocacy/Licensure/StateRegs/Scope-of-Practice-Chart-2019.pdf

American Physical Therapy Association. (2014). Manual therapy techniques. *Guide to Physical Therapy Practice.* Retrieved from:

http://guidetoptpractice.apta.org/content/1/SEC38.body

Avi-Itzhak, T., & Krauss, A. (2014). Assessing occupational therapy students' clinical competence for entry-level work-related practice. *Work, 47*, 235-242. doi:10.3233/WOR-121571

Baum, C., Barrows, C., Bass-Haugen, J. D., Chasanoff, D., Dale, L., Jenkins, G., … Harvison, N. (2010). Blueprint for entry-level education. *American Journal of Occupational Therapy, 64*(1), 186-203.

Bernhardt, J., Bate, P. J., & Matyas, T. (2001, November). Training novice clinicians improves observation accuracy of upper extremity after stroke. *Archives of Physical Medicine and Rehabilitation, 82*(11), 1611-1618. doi:10.1053/apmr.2001.25143

Bethea, D.P., Castillo, D.C., & Harvison, N. (2014). Use of stimulation in occupational therapy education: Way of the future? *The American Journal of Occupational Therapy, 68*(supplement 2), S32-S39.

Carroll, M. A., & Lawson, K. (2014, November/December). The intermingled history of occupational therapy and anatomical education: A retrospective exploration. *Anatomical Sciences Education, 7*, 494-500. doi:10.1002/ase.1451

Carter, R. E., Lubinsky, J., & Domholdt, E. (2011). *Rehabilitation research, principles and applications (4th ed.)*. St-Louis, MO: Elsevier Saunders

College of Occupational Therapists. (2016). *Entry level occupational therapy core knowledge and practice skills.* London: the College of Occupational Therapists Ltd.

Colclough, S., Copley, J., Turpin, M., Justins, E., & De Monte, R. (2015). Occupational therapists' perceptions of requirements for competent upper limb hypertonicity practice. *Disability and Rehabilitation, 37*(17), 1416-1423. doi:10.3109/09638288.2014.972585

Cottrell, R. R., & McKenzie, J. F. (2011). *Health promotion & education research methods: Using the five-chapter thesis/dissertation model (2nd ed.).* Sudbury, MA: Jones and Bartlett Publishers.

Creswell, J.W. (2013). *Qualitative inquiry & research design: Choosing among five approaches* (pp. 69-110). Thousand Oaks, CA: SAGE Publications, inc.

Crist, P., Brown, L. I., Fairman, A., Whelan, L., & McClure, L. (2007). Entry-level OTR and COTA intervention utilization derived from NBCOT practice analysis: Implications for fieldwork experience. *Occupational Therapy in Health Care, 21*(1-2), 71-89. doi:10.1080/J003v21n01_06

Diede, N., McNish, G., & Coose, C. (2000). Performance expectations of the associate degree nurse graduate within the first six months. *Journal of Nursing Education, 39*(7), 302-307.

Dimick, M. P., Caro, C. M., Kasch, M. C., Muenzen, P. M., Fullenwider, L., Taylor, P. A., Landrieu, K., & Walsh, W. J. (2009, October, December). 2008 practice analysis study of hand therapy. *Journal of Hand Therapy, 22*(4), 361-376. doi:10.1016/j.jht.2009.06.001

Doyle, S., Bennett, S., & Gustafsson, L. (2013, October). Occupational therapy for upper limb post-stroke sensory impairments: a survey. *British Journal of Occupational Therapy, 76*(10), 434-442. doi:10.4276/030802213X13807217284143

Erickson, M., Armstrong, C., Caldwell, C., Faeth, J., Gaston, B., Wood, J., & Yoder, E. (2017). Hand therapy content for entry-level physical therapists education programs: A survey study [Abstract]. *Journal of Hand Therapy, 30*(4), e13.

Failla, S., Maher, M. A., & Duffy, C. A. (1999). Evaluation of graduates of an associate degree nursing program. *Journal of Nursing Education, 38*(2), 62-68.

Gabr, U., Levine, P., & Page, S. (2005). Home-based electromyography-triggered stimulation in

chronic stroke patients. *Clinical rehabilitation, 19*(7)*,* 737-745. doi:10.1191/0269215505cr909oa

Grace, P. (2007) Future considerations in occupational therapy education. *Occupational Therapy In Health Care*, *21*(1-2), 281-283. doi:10.1080/J003v21n01_26

Hatem, S. M., Saussez, G., della Faille, M., Prist, V., Zhang, X., Dispa, D., & Bleyenheuff, Y. (2016). Rehabilitation of motor function after stroke: A multiple systemic review focused on techniques to stimulate upper extremity recovery. *Frontiers in Human Neuroscience, 10*(442), 1-22. doi:10.3389/fnhum.2016.00442

Hesse-Biber, S. N. & Leavy, P. (2011). *The practice of qualitative research (2nd ed.).* Thousand Oaks, CA: SAGE Publications, inc.

Hodgetts, S., Hollis, V., Triska, O., Dennis, S., Madill, H., & Taylor, E. (2007). Occupational therapy students' and graduates' satisfaction with professional education and preparedness for practice. *Canadian Journal of Occupational Therapy, 74*(3), 148-160.

Hsu, J., K., Thibodeau, R., Wong, S., J., Zukiwsky, D., Cecile, S., & Walton, D., M. (2011). A "Wii" bit of fun: The effects of adding Nintendo Wii bowling to a standard exercise regimen for residents of long-term care with upper extremity dysfunction. *Physiotherapy Theory and Practice, 27*(3), 185-193. doi:10.3109/09593985.483267

Jette, D.U., Bertoni, A., Coots, R., Johnson, H., McLaughlin, C., & Weisbach, C. (2007). Clinical instructors' perceptions of behaviors that comprise entry-level clinical performance in physical therapist students: A qualitative study. *Physical Therapy, 87*(7), 833-843. doi:10.2522/ptj.20070003.2010.

Jolliffe, L., Hoffman, T., & Lannin, N. (2019). Increasing the uptake of stroke upper limb guideline recommendations with occupational therapists and physiotherapists. A

qualitative study using the Theoretical Domain Framework. *Australian Occupational Therapy Journal, 66*, 603-616.

Keller, J.L., Caro, C.M., Dimick, M.P., Landrieu, K., Fullenwider, L., & Walsh, J.M. (2016). Thirteen years of hand therapy: The 2014 practice analysis. *Journal of Hand Therapy, 29*, 222-234.

Kuipers, K., & Grice, J. (2009). The structure of novice and expert occupational therapists' clinical reasoning before and after exposure to a domain-specific protocol. *Australian Occupational Therapy Journal, 56*, 418-427. doi:10.1111/j.1440-1630.2009.00793.x

May, S., Withers, S., Reeve, S., & Greasley, A. (2010). Limited clinical reasoning skills used by novice physiotherapists when involved in the assessment and management of patients with shoulder problems: a qualitative study. *Journal of Manual and Manipulative Therapy, 18*(2), 84-88. doi:10.1179/106698110X12640740712770

McCombie, R. P., & Antanavageb, M. E. (2017). Transitioning from occupational therapy student to practicing occupational therapist: First year of employment. *Occupational Therapy in Health Care, 31*(2), 126-142. doi:10.1080/07380577.2017.1307480

Merriam, S. B., & Associates. (2002). *Qualitative research in practice. Examples for discussion and analysis*. San Francisco, CA: Jossey-Bass.

Mulholland, S., & Derdall, M. (2004). Exploring what employers seek when hiring occupational therapists. *Canadian Journal of Occupational Therapy, 71*(4), 223-229.

Proud, E. L., Miller, K. J., Martin, C. L., & Morris, M. E. (2013). Upper-limb assessment in people with Parkinson disease: Is it a priority for therapists, and which assessment tools are used? *Physiotherapy Canada, 65*(4), 309-316. doi:10.3138/ptc.2012-24

Radomski, M.V., & Trombly Latham, C. A. (2014). *Occupational Therapy for Physical*

*Dysfunction (7th ed.)*. Baltimore, MD: Lippincott Williams & Wilkins, a Wolters Kluwer business.

Raghavan, P. (2015). Upper limb motor impairment after stroke. *Physical Medicine and Rehabilitation Clinics of North America, 26*(4), 599-610.

Rassafiani, M. (2009). Is length of experience an appropriate criterion to identify level of expertise? *Scandinavian Journal of Occupational Therapy*, *16*, 247-256.

Richardson, H. (2019, March). Implementing the choosing wisely recommendations. *OT Practice.* Retrieved from https://www.aota.org/Publications-News/otp/Archive/2019/implementing-choosing-wisely.aspx

Sass, K., Frank, L., Thiele, A., Newton, A. D., Bork, B., Hartung, S., & Rosenbaum, M. (2011, Fall). Physical therapy clinical educators' perspectives on students achieving entry-level clinical performance. *Journal of Physical Therapy Education, 25*(3). 46-52.

Sauers, E. L., Dykstra, D. L., Bay, R. C., Huxel Bliven, K., & Snyder, A. R. (2011). Upper extremity injury history, current pain rating, and health-related quality of life in female softball pitchers. *Journal of Sport Rehabilitation, 20*(1), 100-114.

Schofield, K. A. (2017). Anatomy education in occupational therapy curricula: Perspectives of practitioners in the United States. *Anatomical Sciences Education, 00:00–00,* 1-11. doi:10.1002/ase.1723

Seller, B., Murray, C. M., Stanley, M., Stewart, H., Hipp, H., & Gilbert-Hunt, S. (2017, November). Mapping an Australian occupational therapy curriculum: Linking intended learning outcomes with entry-level competency standards. *Australian Occupational Therapy Journal,* 1-10. doi:10.1111/1440-1630.12430

Short, N., Bain, J., Barker, C., Dammeyer, K., Fahrney, E., Hale, K., & Nieman, C. (2020).

Inclusion of perception of hand therapy content in occupational therapy programs: A mixed-method study. *Journal of Hand Therapy, 32*, 112-118.

Short, N., Sample, S., Murphy, M., Austin, B., & Glass, J. (2018). Barriers and solutions to fieldwork education in hand therapy. *Journal of Hand Therapy, 31*, 308-314.

Sizer Jr., P. S., Felstehausen, V., Sawyer, S., Dornier, L., Matthews, P., & Cook, C. (2007). Eight critical skill sets required for manual therapy competency: A Delphi study and factor analysis of physical therapy educators of manual therapy. *Journal of Allied Health, 36*(1), 30-40.

Thomas, D. (2006). A general inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation, 27*(2), 231-246. doi:10.1177/1098214005283748

Thomas, A., Saroyan, A., & Snider, L. M. (2012, April). Evidence-based practice behaviours: A comparison amongst occupational therapy students and clinicians. *Canadian Journal of Occupational Therapy, 79*(2), 96-107. doi:10.2182/cjot.2012.79.2.5

Urton, M., Kohia, M., Davis, J., & Neill, M. (2007). Systematic literature review of treatment interventions for upper extremity hemiparesis following stroke. *Occupational Therapy International, 14*(1)*,* 11-27. doi:10.1002/oti.220

U.S. Centers for Medicare & Medicaid Services. (2018). *National Health Expenditure Data*. Retrieved from: https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html

Wallingford, M., & Knecht-Sabres, L. J. (2016). OT practitioners' and OT students' perception of entry-level competency for occupational therapy practice. *The Open Journal of Occupational Therapy, 4*(4), 9-13. doi:10.15453/2168-6408.1243

**Table 1**

*Participants Characteristics*

| ID | Years of experience | Professional Background | Role | Setting | Expertise | Advanced Certifications |
|---|---|---|---|---|---|---|
| P1 | 9 | OT | Manager in an OP clinic | OP hand | Ortho UE | CHT |
| P2 | 15 | PT | Therapy supervisor | IP rehab | Ortho/neuro elbow/shoulder LE | |
| P3 | 25 | OT | Coordinator | OP hand | Ortho UE | CHT |
| P4 | 18 | OT | Coordinator | OP hand | Ortho UE | CHT |
| P5 | 20 | PT | Manager of rehab services | OP hand day rehab IP acute IP rehab | Ortho UE/LE | |
| P6 | 22 | OT | Senior OT | IP acute OP hands | Ortho UE | CHT |
| P7 | 22 | PT | Manager | IP acute IP rehab | Geriatric | APTA geriatric certification |

Note. ID = participant identifier, OT = occupational therapist, PT = physical therapist, Ortho = orthopedic, Neuro = neurology, UE = upper extremity, LE = lower extremity, IP = inpatient, OP = outpatient, rehab = rehabilitation, CHT = certified hand therapist, APTA = American Physical Therapy Association

**Table 2**

*Overarching Skills*

| Skills Needed | Skills for Entry-Level Competency | Observed Entry-Level Competence |
|---|---|---|
| Safety | Needs to maintain safety for self and others | **Needs improvement**<br>Safely work with different clients and diagnosis |
| Clinical reasoning | • Synthesis of important information<br>• Interpretation of clinical findings<br>• Relation between impairments and function<br>• Integration of evaluation results into a treatment plan<br>• Justification for interventions | **Needs improvement:**<br>• Adjust approach to clinical presentation and specific client's circumstances<br>• Integrate evaluation results into a treatment plan<br>• Select optimal interventions<br>• Justify interventions |
| Knowledge: | | |
| Conditions | • Know and understand common diagnosis<br>• Know typical progression/outcomes<br>• Increase knowledge of shoulder within the first year<br>• Know protocols and guidelines associated with common conditions | **Need improvement:**<br>• Understand common diagnosis<br>• Knowledge of typical progression<br>• Knowledge of the shoulder |
| Sciences of the human body | • Strong knowledge of anatomy and functional anatomy/kinesiology<br>• Understanding pathophysiology in relation to the healing process | **Needs improvement**<br>• Low knowledge of the sciences of the human body<br>• Difficulty applying knowledge to therapy process |

| | | |
|---|---|---|
| Commitment to life-long learning | • Know how to find information needed<br>• Willingness to learn and grow<br>• Ownership of own learning | **Strength:**<br>Willingness and desire to learn<br><br>**Needs improvement:**<br>• Confidence to ask questions<br>• Take ownership of own learning |
| <u>Communication Skills:</u> | | |
| Documentation | Not mentioned | Not mentioned |
| Effective communication | • Education/instruction to patients<br>• Communication with physician/referral source | **Needs improvement**:<br>Building confidence to talk to peers, physicians, and referral source |
| Interpersonal Skills:<br>• Team work<br>• Therapeutic use of self<br>• Customer service<br>Attitude/personality | • Work within a team and<br>• Contribute to the team<br>• Have confidence<br>• Have a positive attitude<br>• Create therapeutic relationship with clients | **Strength:**<br>• Energetic<br>• Compassionate<br>• Dedicated<br>**Needs improvement:**<br>• Stress management<br>• Creating therapeutic relationship<br>• Knowing how to react to difficult interactions<br>• Confidence |
| <u>Holistic and client-centered care</u> | • Look at result in holistic manner<br>• Look at the whole person, not only at the deficit or injury<br>• Need to be client-centered and address what is meaningful to client | **Needs improvement:**<br>• Difficulty seeing past the condition/deficit,<br>• Difficulty looking at the whole picture |

Note. UED = upper extremity dysfunction

**Table 3**

*Evaluation Skills*

| Skills Needed | Skills for Entry-Level Competency | Observed Entry-Level Competence |
|---|---|---|
| Occupational profile:<br>• Previous level of function<br>• Past medical history<br>• History of present condition/injury<br>• Client's goals | • Obtain a past medical history and of present condition<br>• Assess client specific impact on function<br>• Client's goals | **Strength:**<br>• Complete initial interview<br>• Evaluate impact on function specific to client circumstances<br>• Relate UED to function |
| Skilled Assessment | • Administration of common assessments | **Strength:**<br>generally good at administration of assessment tools evaluation |
| Treatment Planning | • Functional goal setting<br>• Reasonable expectations<br>• Triage of important information<br>• Develop intervention plan accordingly | **Strength:**<br>• Writing functional goals<br>**Needs improvement:**<br>• Reasonable expectation<br>• Anticipated outcome/progress<br>• Integrate all information into developing a POC |

Note. UED = upper extremity dysfunction

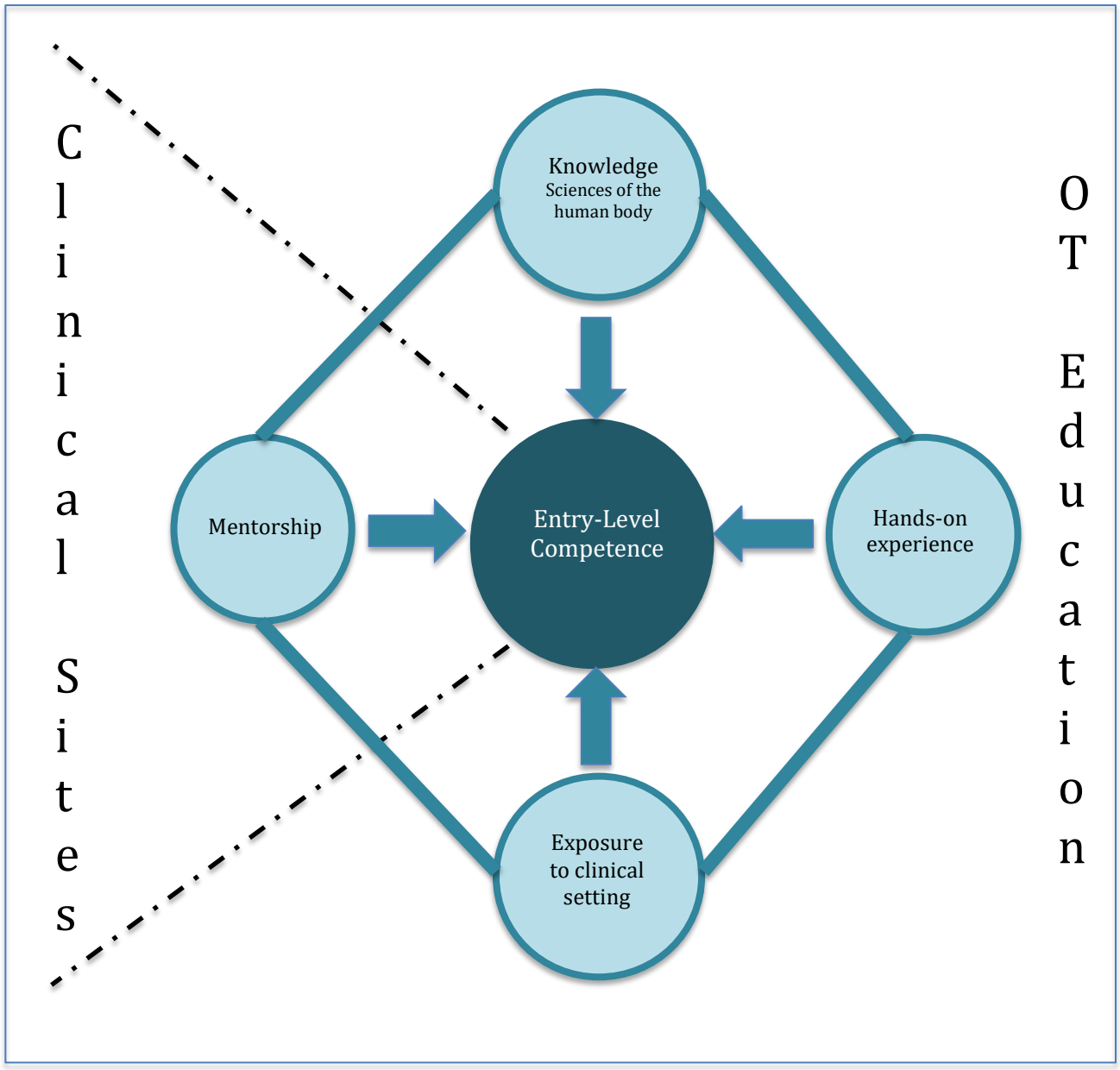
**Table 4**

*Interventions Skills*

| Skills Needed | Skills for Entry-Level Competency | Observed Entry-Level Competence |
|---|---|---|
| Technical Skills | | |
| Modalities | Not expected straight out of school however expected within first year of practice | Not mentioned |
| Splinting | • Basic splinting competency<br>• Fabrication or most common splints<br>• Obtain proficient splinting skills within first year of practice | **Need improvement**<br>• General consensus with splint fabrication training within the orientation process |
| Manual skills | • Basic manual skills: ROM, stretching, soft tissue mobilization<br>• Basic knowledge of joint mobilization<br>• Should increase proficiency within first year of practice | **Need improvement:**<br>• Lack of hands on experience<br>• Limited knowledge on manual skills |
| Intervention planning and implementation | • Independent thinker<br>• Some autonomy needed<br>• Know how to progress patients towards expected outcomes<br>• Basic knowledge of interventions for common diagnosis | **Positive:**<br>• Skilled for less complicated patients<br>• Have news ideas and "fresh way of thinking<br>**Needs improvement:**<br>• Skill set for treating the shoulder<br>• Selection of optimal interventions<br>• Intervention implementation<br>• Expect to be told what to do<br>• Difficulty using scientific approach to care, bringing back knowledge of human sciences |
| Facilitate functional improvements | • Relate to function<br>• Use of equipment/intervention to support return to function<br>• Progress towards safe return to community<br>• Use of occupation/meaningful activities during intervention<br>• Strong ability to work through ADLs performance | **Needs improvement**:<br>• Generally able to include function into goals however, difficulty implementing function-based interventions |

**Figure 1**

*Suggestions for Improved Entry-Level Competence*



## Appendix A
## RECRUITMENT SCRIPT

We would like to invite you to participate in our research study to explore the current perception of employers regarding entry-level occupational therapists' expertise, of lack thereof, in the treatment of upper extremity dysfunction. The researchers conducting the study are MarieClaude Touchette, MHS, OTR/,L and Dr. Laura Santurri from the Doctor of Health Science Program at the University of Indianapolis.

If you agree to participate, you will complete a 45-60 minute, one-on-one interview with MarieClaude at a place of your choice. The interview will be comprised of questions regarding your perception of entry-level occupational therapists' competence when treating clients with upper extremity dysfunctions. You may also be asked, at a later time, to review and provide feedback on the results of the study. Participation is voluntary and all answers will be kept anonymous. You may choose to not answer any questions, and you may discontinue participation at any time for any reason.

You will receive a gift card at the completion of the interview as a thank you for your time and participation in our research study. Furthermore, participants may benefit from knowing that participation may be of assistance to future practice. The risks to participation are not more than those encountered in everyday life.

If you have any questions or concerns, you may contact the principal investigator, Dr. Laura Santurri, from the Doctor of Health Science Program at the University of Indianapolis at (317)788-2409 or santurril@uindy.edu. If you have any questions regarding your rights as a research subject, you may contact the UIndy HRPP Office (hrpp@uindy.edu) or (317)781-5774 or (800)232-8634 x5774.

This research study has been approved by the University of Indianapolis, Office of Human Research Protections Program (Exempt Study #0929).

***Marie-Claude Touchette, MHS, OTR/L***
*University of Indianapolis*
*Doctor of Health Science Program*

Appendix B
INFORMED CONSENT FORM

Study Principal Investigator: Laura Eileen Santurri, PhD, MPH, CPH
School/Department/Program: University of Indianapolis, Doctor of Health Sciences Department
UIndy Email: santurril@uindy.edu
UIndy Telephone: (317) 788-2409; Toll free: 800-232-8634 x2409

Co-Investigator: Marie-Claude Touchette, MHS, OTR/L
UIndy Email: touchettem@uindy.edu

INFORMED CONSENT TO PARTICIPATE IN HUMAN SUBJECTS RESEARCH

Study Title: ***Employers' Perception of Occupational Therapists' Entry-Level Competence for the Treatment of Upper Extremity Dysfunction***

Introduction:
The investigators invite you to participate in a research study. The purpose of this Informed Consent Form (ICF) is to provide information you should have in order to make a well-informed decision to consent to participate in the study. Please read the form carefully. You should ask questions about why the research is being done, what you will be asked to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. Your consent must be well informed and voluntary, without influence from the investigators or anyone else associated with this study. This process is called "informed consent."

Who is sponsoring/funding this study?
This study is conducted as part of a doctoral project from the University of Indianapolis.

Why are you invited to participate?
You directly supervise occupational therapy staff, you have supervised at least one entry-level OT within the past 2 years.
You will be excluded from this study if are not fluent in English.

If you choose to participate, then you will be one of approximately 15 supervisors participating in this study.

What is the purpose of this study?
The purpose of this study is to explore the current perception of employers regarding entry-level occupational therapists' expertise, or lack thereof, in the treatment of UED.

What will you do while in this study?

- Complete a 45-60 minutes interview that will be audio-recorded. The purpose of the recording is for the interview to be transcribed word for word after the completion of the interview.
- You will be recorded using a hand-held recording device.

- The recording will be transcribed and analyzed using a Microsoft Word and a wed-based qualitative analysis software.
- We will assign a pseudonym to the transcript and will not include any personal identifiable information.
- Once the analysis is completed, you may receive an email asking you to review and provide feedback on the study's findings.
- The transcript and audio recording will be kept in a password secured computer. The material will be destroyed 36 months after the conclusion of the study.

How long will your participation in this study last?
The interview will last 45 to 60 minutes.
If you are asked to review the findings and provide feedback, it should take you an additional 30 to 60 minutes.

How will you benefit from participating in this study?
The investigators do not intend or guarantee that you will receive any benefit as a direct result of participating in this study. Others may benefit from the results of this study because of your participation.

What are the harms/discomforts that you can expect from participating in this study?
Your participation in this study will expose you to little, if any, harm or discomfort. Unlikely harm(s) and/or discomfort(s) include emotional or psychological responses from answering questions, or loss of confidentiality. We will provide pauses as needed to limit emotional of psychological discomfort. You may choose not to answer any of the questions or terminate your participation in the interview at any time, without any repercussion.

What will be done to keep your information confidential?
Every effort will be made to keep your study-related information confidential (e.g., password-protected electronic devices, storing information in locked facilities, etc.). Personal information regarding your participation in this study may be disclosed if required by law (e.g., you are being threatened/harmed, you threaten to harm someone else, etc.). Also, your research records may be reviewed by regulatory authorities involved in the oversight of research in order to ensure that your rights as a research participant are being protected [i.e., Office for Human Research Protections or other federal, state, or international regulatory agencies, and members and/or representatives of the University of Indianapolis (UIndy) Human Research Protections Program (HRPP)]. The transcript and audio material will be saved on a password-protected computer, and destroyed 36 months from the completion of the study.

When investigators present study results at professional conferences or publish results in professional journals the investigators will NOT use any individually identifiable information that may have been collected from/about you.

What are your costs for participation in this study?
There is no cost associated to participating in this study.

What compensation/payment will you receive for participation in this study?
To thank you for your participation in this study, you will receive a $20 gift card. The drawing will occur once all the interviews are completed.

What are your rights as a participant in this study?

- ➢ To ask all questions/receive all information you need to make an informed, voluntary decision to consent;
- ➢ To choose to quit/withdraw from the study at any time. If you choose to quit/withdraw, then
  - o You will NOT lose any benefits to which you are otherwise entitled, and
  - o Your decision will not affect your present or future relationship with UIndy or other organizations associated with this study, including employment and/or academic status; and
  - o You may ask investigators NOT to use any IDENTIFIABLE information collected from you. Investigators may retain and use ANONYMOUS information.
  - o You should notify the investigator if you should to withdraw from this study
- ➢ To refuse to answer any questions/perform any tasks that may be asked/required during the study
- ➢ To request results of the study. If you want results of this study (NOT your individual results), then you should contact Marie-Claude Touchette at : touchettem@uindy.edu
- ➢ To have a copy of this informed consent form. You should either print this informed consent form, if online, or ensure you receive a hard copy from the investigators.

What do you do if you have questions about this study?
For questions about the study you may contact Marie-Claude Touchette at touchettem@uindy.edu, or Laura Santurri at santurril@uindy.edu

The UIndy HRPP has reviewed and approved this study. The UIndy HRPP has the responsibility of protecting the rights and welfare of research participants. For questions regarding your rights and welfare as a participant in this study, you may contact the UIndy Human Research Protections Program (HRPP) Director, Dr. Greg E. Manship (manshipg@uindy.edu) or 317-781-5774 or 800-232-8634 x5774.

How do you indicate your informed consent to participate in this study?
If you decide to participate, then your participation will indicate your voluntary, informed consent. You will NOT sign this or any other document to indicate your informed consent.

If you consent to participate in this study, then you affirm that you satisfy inclusion criteria and your consent is voluntary. To indicate your voluntary consent and proceed with the questionnaire, select one of the following options:

I voluntary consent to participate in this study.

I do NOT consent to participate in this study.

# Appendix C

## Interview Guide

The aim of this study is to explore direct supervisors' perception of occupational therapists' entry-level competence for the treatment of upper extremity dysfunction. This will be achieved by completing an in-depth interview that should last between 45 to 60 minutes. If at any time you wish to skip a question or terminate this interview, you may do so at any time without any consequences.

This interview will be audio-recorded. The transcription will not include personal information that could be linked to you. The electronic files of the recorded interviews will be password protected and destroyed 36 months after the conclusion of the study. Other hard copy materials will be destroyed with a shredder 36 months from the completion of the study. All information is strictly confidential unless disclosure is required by law.

Do you have any questions regarding this interview process? If you are ready to begin, I will now start the audio recorder.

1. Can you please describe your role within this organization?
2. Can you please describe your level of expertise in the management of upper extremity dysfunction?
    a. In general, what skills do you think are needed to successfully treat upper extremity dysfunction?
    b. What specific skills do you think entry-level therapists should have already learned in their entry-level education in order to successfully address upper extremity dysfunction?

    c. What skills or knowledge related to the treatment of upper extremity dysfunction do you think an entry-level occupational therapist should pursue or acquire within his/her first year as an occupational therapist?

3. In your department or setting, who do you think should be responsible to treat upper extremity dysfunction?
    a. What makes them best suited to treat upper extremity dysfunction?
4. Think about the last time you supervised an entry-level occupational therapist, what did you think of her/his skills while treating upper extremity dysfunction?
    a. What were her/his strengths?
    b. What were her/his areas for improvements?
    c. How do you think entry-level skills differ from experienced occupational therapists when treating upper extremity dysfunction?
5. What resources do you have available to assist entry-level therapists when treating upper extremity dysfunctions?
    a. How much time can you dedicate for the training of entry-level occupational therapists?
    b. Can you please describe the orientation process for a newly employed entry-level occupational therapist?
6. What suggestions do you have to improve occupational therapists' entry-level competence for the treatment of upper extremity dysfunction?
    a. What do you see as a barrier to improved entry-level competence of occupational therapists when treating upper extremity dysfunction?

b. In the best case scenario, what would you like your workplace to do to help improve the skill set of entry-level occupational therapist for the treatment of upper extremity dysfunction?
c. In the best case scenario, what would you like OT educational programs to do to help improve the skill set of entry-level occupational therapist for the treatment of upper extremity dysfunction?

Is there anything else that you would like to share on the topic?

Can I leave you my email address if you think of anything else that you would like to add?