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# Psychosocial Assessment in Orthopedic Evaluations: A Clinical Tool for Occupational Therapists

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PSYCHOSOCIAL ASSESSMENT IN ORTHOPEDIC EVALUATIONS:  
A CLINICAL TOOL FOR OCCUPATIONAL THERAPISTS

by

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This Scholarly Project Paper, submitted by Sara M. Sipple in partial fulfillment of the requirement for the Degree of Master's of Occupational Therapy from the University of North Dakota, has been read by the Faculty Advisor under whom the work has been done and is hereby approved.

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Date

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## ABSTRACT

*“When I touch a human hand, I touch heaven.” – Malebranche*

Holistic, occupation-based treatment in a hand therapy setting is associated with enhanced patient outcomes (Chan & Spencer, 2004), yet it is easy for occupational therapists working in hand and upper extremity orthopedic settings to become fixated on the pathology and anatomy of medical diagnoses and inadvertently ignore psychosocial and contextual influences on rehabilitation. Although there is research that identifies how physical disease may lead to psychosocial role changes, there is a paucity of literature that addresses how hand and upper extremity injuries affect these roles (Schier & Chan, 2007).

This scholarly project culminated in a clinical reference guide intended for use as a quick reference to assist occupational therapy providers in client centered and evidence based assessment and intervention for patients with upper extremity orthopedic injuries. Guided by the biopsychosocial and occupational adaptation frames of reference, this product supports an integrated care model that considers unique characteristics of physical anatomy, personal beliefs, and pertinent context for each and every patient seeking rehabilitation for upper extremity injury.



## CHAPTER I

### INTRODUCTION

The definition and scope of practice of hand therapy identifies comprehensive knowledge of behavioral science as a key foundation to the profession (Muenzen et al., 2002), yet psychological and social factors are often undervalued when treating individuals with upper extremity dysfunction (Schier & Chan, 2007). Hand therapy professionals are attentive to somatic symptoms of musculoskeletal injury and are often considered experts in mechanical application of medical model theory. Therefore emphasis of assessment and intervention is consistently on body function and structure and lacks recognition of participation in activity and individualized context (Winthrop-Rose, Kasch, Haenosh-Aaron, & Stegink-Jansen, in press).

The human hand and upper extremity provides one with not only vocational functions such as prehension and sensitivity, but also with social functions such as expression, competence, and self-perception (Meyer, 2003). It is, therefore, vital for hand therapy professionals to be able to fluently incorporate psychodynamic and cognitive-behavioral, as well as biomechanical, frames of reference to provide holistic rehabilitative care. Unfortunately, existing literature is deficient of concrete examples that document how hand therapy providers can shift emphasis from mechanistic to client-centered and occupation-based approaches of assessment and intervention (Jack & Estes, 2010).

Holistic, occupation-based treatment in a hand therapy setting is associated with enhanced patient outcomes (Chan & Spencer, 2004). Not only is this paramount for our patients, but also for our payer sources. The evolution of our Nation's health care system continues to emphasize provisions that protect successful medical communities by incorporating payment approaches that reward those who minimize spending while improving patient outcomes. We must, then, have methods in place to document treatment effectiveness using outcome measures that are relevant to our patients (Davis et al., 1999)

The goal in creating and developing this scholarly project was to bestow a clinical reference guide to assist occupational therapists in hand and upper extremity orthopedic settings in providing holistic and evidence based assessment and intervention for the patients they serve. This reference is based on the biopsychosocial and occupational adaptation models, both of which seek to appreciate the unique body, mind, and environment characteristics of each client (Mosby, 1974).

Empowering hand therapy professionals to evaluate non-functional criteria, such as psychosocial elements, as well as functional impairment ultimately results in holistic, client-centered care, and the benefit of selecting and implementing evidence-based assessment tools provides articulately documented outcome measures for therapeutic interventions. Chapter II of this document includes a detailed analysis of literature that supports the subject matter prefaced in this introduction. Chapter III provides a description of the methodology used in development of *Holistic Assessment and Outcome Measurement for Orthopedic Upper Extremity Injuries: A Clinical Tool for Occupational Therapist*,. which is included in Chapter IV. Demonstration of clinical application,

including function, usability, and opportunity for future development, is specified in Chapter V.

## CHAPTER II

### REVIEW OF LITERATURE

Upper extremity disorder is a term used to define the significant number of musculoskeletal conditions affecting the shoulder, elbow, forearm, wrist, or hand (Royal College of Physicians, 2009). Whether cumulative or traumatic in nature, such disorders are quite common among the adult population with prevalence rates documented as high as 35% for upper limb pain and sensory disorders (Walker-Bone et al., 2004) and 30% of all trauma seen in the emergency department (Rizzo, 2011). Although symptom severity presents a wide range, it is clear that specific upper extremity disorders, regardless of mechanism of injury or pathology, are frequently associated with functional disability and social compromise (Walker-Bone et al., 2004).

Research that identifies how physical disease may lead to psychosocial role changes exists, yet there is a paucity of literature that addresses how hand and upper extremity injuries affect these roles (Schier & Chan, 2007). Within this review of literature, I sought to examine the unique history and evolution of hand therapy as a profession. In addition, endeavors to find documented evidence of the psychological impact on upper extremity musculoskeletal disorders and the direct implications to occupational therapy practice within an orthopedic setting were accomplished.

#### Evolution of Hand Therapy

The establishment of physical medicine and rehabilitation units in response to the increasing number of combat-related upper extremity injuries in World War II

(Yakobina, Yakobina, & Harrison-Weaver, 2008) resulted in a unique practice opportunity for occupational therapists. Previously referred to as reconstruction aides of World War I, occupational therapists, as well as physical therapists, were recruited by a growing number of physicians specializing in injuries and impairments of the hand (Amini, 2008). These select therapists were trained in upper extremity evaluation and treatment and worked alongside surgeons to develop specialized treatment protocols (Hand Therapy Certification Commission [HTCC], 2011).

Following the birth of hand surgery in World War II (Beadling, 2003), continued development of the profession brought advancement in microsurgical techniques and an increased need for specialized post-surgical rehabilitation (Amini, 2008). By the 1970s, many occupational and physical therapists continued to work directly with physicians to solely treat patients with upper extremity injuries (HTCC, 2011) and began to gain recognition as integral members of this orthopedic specialty team (British Association of Hand Therapists Limited [BAHT], n.d.). In 1975, the official term “hand therapy” was conceived as a medical profession (Amini, 2008).

In 1989, the Hand Therapy Certification Commission (HTCC) established an autonomous credentialing program designed to recognize occupational and physical therapists as advanced clinical specialists in rehabilitation of the upper limb (Dimick et al., 2009). In order to obtain this advanced certification, the following requisites must be achieved: 1. Minimum of five years clinical experience, 2. Minimum of 4,000 hours in direct hand therapy practice, 3. Successful completion of the Hand Therapy Certification Examination (HTCE), a comprehensive test of advanced clinical skills and theory in upper quarter rehabilitation (Dimick et al., 2009).

Early hand surgeons such as Sterling Bunnell and Paul Brand expressed appreciation for the holistic intervention that occupational therapists practicing in hand therapy offered (Amini, 2008). Yakobina, Yakobina, and Harrison-Weaver directly referenced Bunnell in a 2008 article summarizing the effect of war on the development of hand therapy:

In the rehabilitation of the injured hand, [occupational therapy] played an extremely important role. The patient was assigned a job on the basis of his needs, not just to keep him working. The [occupational therapist] knew the results desired and devoted her efforts to restoration of the special function which had been lost. (p. 109)

However, the influence of a scientific-based culture and therapist's desire to learn more about detailed hand surgery techniques eventually shifted the primary focus of hand rehabilitation from qualitative measures such as mind, body, and spirit to quantitative outcomes such as anatomy and biomechanics (Amini, 2008). This led to the remedial approach of modern day hand therapy that deviates from the philosophies and theories on which the profession of occupational therapy was founded.

#### *A Remedial Patient Care Model*

Although the definition and scope of practice of hand therapy identifies comprehensive knowledge of behavioral science as a key foundation to the profession (Muenzen et al., 2002), psychological and social factors have become undervalued when treating individuals with upper extremity dysfunction (Schier & Chan, 2007). This remedial care approach, heavily influenced by the medical model (McEneaney, McKenna, & Summerville, 2002), has resulted in hand therapy professionals increased attentiveness

to somatic symptoms of musculoskeletal injury and reliance on a biomechanical frame of reference.

The human hand and upper extremity provides one with not only vocational functions such as prehension and sensitivity, but also with social functions such as expression, competence, and self-perception (Meyer, 2003). It is, therefore, vital for hand therapy professionals to be able to fluently incorporate psychodynamic and cognitive-behavioral, as well as biomechanical, frames of reference to provide client-centered rehabilitative care.

#### Psychological Impact on Musculoskeletal Disorders of the Upper Extremity

Every day, humans connect with the world around them through intricate muscle coordination and sensory mechanisms of the upper extremity. It is simple to take for granted the many ways we interact with the use of our hands; that is, of course, unless musculoskeletal injury, trauma, or pain temporarily or permanently limits functional use of one or both upper limbs.

Alexander, Hutchison, and Sutherland (2006) identified posttraumatic psychopathology as common following musculoskeletal trauma. More specific correlations have been made emphasizing the significant impact of psychological, social, and economic consequences on individuals who have experienced traumatic hand injury (Gustafsson & Ahlstrom, 2004). Although individuals with upper extremity trauma have been identified as particularly vulnerable to such psychosocial consequences of injury in acute stages (Gustafsson, Persson, & Amilon, 2000), there is growing awareness of long-term persistence of cognitive, affective, physiological, and behavioral symptoms through chronic stages of recovery (Grunert et al., 1992).

In comparison to other members of an interdisciplinary medical care team, hand therapists have the unique opportunity to interact most frequently with upper extremity injured patients. It is therefore vital for hand therapy professionals to accept responsibility for recognizing and addressing psychological symptoms related to trauma (Koestler, 2010).

#### Correlation of Upper Extremity Musculoskeletal Injury and Emotional Distress

Physical trauma of the shoulder, arm, wrist, and/or hand has the potential to significantly compromise an individual's quality of life (Bradford, 1999). Cederlund, Thorén-Jönsson, and Dahlin (2010) directly associated serious hand injury with psychosocial consequences such as social isolation and stress, financial burden, and depression. However, the prevalence and austerity of psychological and social stressors and their impact on rehabilitation outcomes in individuals with upper extremity musculoskeletal trauma may vary dependent on injury type, severity of injury, or post-injury phase of rehabilitation.

#### *Injury Type and Severity*

##### *Work-related vs. Non-work-related Upper Extremity Injuries*

Individuals with work-related injuries of the shoulder, elbow, wrist, and hand possess a unique battery of psychosocial risk-factors, including high-perceived job stress, high job demands, and personal non-work related stress factors (Bongers, Kremer, & ter Laak, 2002). Work-related musculoskeletal symptoms rarely occur in solitude, rather are often accompanied by psychosocial factors such as somatization and anxiety (Hunt, Macfarlane, & Silman, 2000). Individuals with work-related hand injuries tend to



experience persistent psychological symptoms beyond the acute phases of injury (Grunert et al., 1992).

### *Idiopathic vs. Traumatic Injury*

Individuals experiencing upper extremity idiopathic pain, or vague, diffuse pain with no clear source, have unique physiological treatment needs in comparison to those who have an identifiable and distinct diagnosis attributed to their pain (Jupiter et al., 2005). These individuals tend to demonstrate significantly more extreme complaints of pain during upper extremity use and while at rest and also demonstrate greater pain fear, anxiety, and helplessness with regards to their pain.

In a study performed by Crichlow et al. (2006), the association between degree of physical injury and emotional distress was confirmed. Specifically, injury severity and the severity of physical dysfunction directly correlate with the prevalence and severity of depression. Objective scores from Disabilities of the Arm, Shoulder, and Hand (DASH), the most widely used outcome measurement instrument specific to injury of the upper extremity, also demonstrated direct correlation with depression, pain, and anxiety (Ring et al., 2006). For example, lower DASH scores indicate low physical functioning, increased symptomology, and direct correlation with increased predominance of depression and anxiety; higher DASH scores indicate high physical functioning, decreased symptomology, and direct correlation with decreased predominance depression and anxiety.

### *Phases of Rehabilitation*

Throughout the continuum of occupational therapy intervention lies the potential for individual psychological responses that correlate with phases of rehabilitation such as

acute trauma, cumulative trauma, chronic pain, and psychogenic hand conditions (Grunert, Devine, & Weis, 2011). Hand therapy providers are often the primary medical contact for patients being treated for upper extremity disorders and therefore must be astute in recognizing and addressing the unique psychosocial needs of each individual (Grunert, Devine, & Weis, 2011).

#### *Acute vs. Chronic Injury*

Several studies of individuals with severe hand and upper extremity trauma have confirmed the vulnerability of psychosocial implications during the first three months post-injury (Gustafsson, Persson, & Amilon, 2000). In 2004, Gustafsson and Ahlstrom revealed that psychosocial symptoms of intrusion, avoidance, anxiety, and depression most commonly presented immediately following a traumatic hand injury then decreased in the first three months post-injury; however, no significant change in psychosocial symptoms were recognized between three months and one year. Individuals who experience work-related injury have a higher prevalence of persistent psychological and behavioral symptoms beyond the acute stage post-injury (Grunert et al., 1992).

#### *Impact of Emotional Distress on Rehabilitation Outcomes*

Cognitive, affective, physiological, and behavioral psychological symptoms following upper extremity musculoskeletal injury have a negative impact on the affected individual's ability to actively participate in a successful rehabilitation program (Grunert et al., 1992). Following trauma or injury, an individual must accept responsibility for his or her current condition and commit to a rehabilitation plan that will lead to full restoration of hand and upper extremity function (Lai, 2004). Individuals who

demonstrate inability to self-motivate or to be influenced to motivate by others are at risk for sub-optimal rehabilitation outcomes.

In a 2004 comparison study of motivational constructs of hand-injured patients with and without work-related injuries, Lai identified similarities between the two cohorts. Specific characteristics of motivation were also distinguished and hold clinical implications for hand therapists facilitation of motivation in individuals with upper extremity injuries. Motivational characteristics, along with implications for rehabilitation, are identified in Table 1.

Table 1. Characteristics of Motivation (Lai, 2001)

Characteristic	Impact on Rehabilitation
Hope & optimism for the future	Adaptive and positive emotional response
Attitude toward disability	Acceptance of body image
Goal setting	Accountability to patient-centered goals
Social support	Perceived helpfulness of relationships

### *Cultural Considerations in Hand Therapy*

The United State’s apparent evolution from “melting pot” to “cultural mosaic” has stimulated a multicultural approach to healthcare. As hand therapists, not only must we consider anatomical, physiological, and psychosocial impacts a person with an upper extremity injury, we must also make careful consideration of cultural values and expectations regarding use of one’s hand.

Black (2010) identified gesture, touch, toileting, self-feeding, dressing, wearing jewelry and hand painting/tattoos in a non-inclusive list of key cultural contributors to outcomes of hand rehabilitation. In order to deliver a client-centered, best model care

approach, we must become skilled at providing culturally competent care that emphasizes knowledge of cultural being, understanding of cultural impact on health beliefs and decisions, and intra-cultural relationship building (Black, in press).

#### Role of Occupational/Hand Therapy Providers

Occupational therapy professionals are obligated to eloquently assert the profession's unique focus on occupation-based and client-centered care by directly applying the *Occupational Therapy Practice Framework: Domain and Process, 2<sup>nd</sup> Edition* (American Occupational Therapy Association [AOTA], 2008) to evaluation, intervention, and outcomes regardless of practice setting. This movement requires a shift from the acquired medical model of hand therapy and return to a holistic approach that addresses emotional, psychological, and physically observable aspects of occupational performance (Amini, 2008).

Subsequently, the expectation of occupational therapists practicing in hand therapy is to consistently provide client-centered assessment and intervention and to facilitate outcomes that equally address human occupation, support systems, and coping mechanisms in addition to biomechanical performance components (Schier & Chan, 2007). Throughout the continuum of rehabilitative care following upper extremity injury, therapists practicing in hand therapy settings must be aware of potential psychological barriers that may interfere with optimal outcomes (Malette & Ring, 2006) and also must incorporate psychological assessment into medically based intervention planning and implementation (Jaquet et al., 2002).

### *Psychosocial Assessment: Gathering Objectively Verified Data*

Clients referred to occupational therapy for treatment of an upper extremity disorder must endure a comprehensive medical-based evaluation, however the value of objectively identifying psychosocial symptoms present at this initial encounter must not be underestimated. Jaquet et al. (2002) revealed that 94% of patients experienced psychological stress within the first 30 days following a surgically involved upper extremity injury, therefore indicating the importance of recognizing both physical and emotional stress factors following trauma to the shoulder, arm, and/or hand must not be minimized. During evaluation and assessment of musculoskeletal disorders, hand therapy providers must be astute to perceiving the potentially adverse psychosocial effects as related to upper extremity trauma (Starr, 2008). Hand therapists must also demonstrate keen insight into recognizing signs and symptoms that warrant referral for comprehensive psychological evaluation (Koestler, 2010). Skills necessary to assist therapists in early detection of complicating psychosocial and behavioral factors in patients with hand injuries include identification of individual stress factors and recognition of personal coping mechanisms.

#### *Identifying Stress Factors*

Physical trauma and/or temporary or permanent loss of upper extremity function has a negative impact on an individual's quality of life and threatens personal health, wellness, and ultimately rehabilitation outcomes (Bradford, 1999). Recognizable stressors are common following musculoskeletal injury and, if identified, can be addressed to avoid chronic psychosocial effects (Gustafsson, Persson, & Amilon, 2000).

Due to their detrimental effect on functional outcomes following hand and upper extremity trauma, individual stress factors must be recognized in the acute phase post-injury, addressed throughout intervention, and continuously re-assessed throughout the rehabilitation continuum. Stress factors commonly identified in individuals following upper extremity injury are listed in Table 2.

Table 2. Stress Factors Identified in Individuals with Upper Extremity Musculoskeletal Dysfunction (Bradford, 1999; Gustafsson, Persson, & Amilon, 2000).

Stress Factors
Problems with activities of daily living
Uncertainty and anxiety about the future
Chronic or recurring pain
Social isolation
Dependency on others
Financial Burden
Cosmetic appearance of affected extremity
Anger, depression, and/or guilt surrounding the trauma experience
Disorganization and lack of control

A sense of empathy, understanding, and support is pertinent in relieving stress felt by patients experiencing medical illness or disability (Spira, 1997). Therefore the ability to identify stress factors and effort to assist in the development of effective coping strategies allows hand therapists the opportunity to positively influence client-centered, therapeutic outcomes following upper extremity injury (Bradford, 1999).

### *Recognizing Coping Mechanisms*

Conclusions of a qualitative study performed by Gustafsson, Persson, and Amilon, (2002) indicated that psychosocial responses to traumatic hand injury most often present acutely; therefore, the importance of hand therapists' early recognition of individual coping methods, defined as actions used to manage stress, has been emphasized. Prompt response to facilitate an individual's mental acceptance toward injury is equally important.

An individual's ability to cope with pain following musculoskeletal trauma has been identified as a homogenous predictor of therapeutic outcomes (Koestler, 2010). A number of coping strategies commonly identified following upper extremity injury are listed in Table 3.

Table 3. Coping Strategies Identified in Individuals with Upper Extremity Musculoskeletal Dysfunction (Gustafsson, Persson, & Amilon, 2002; Koestler, 2010).

Coping Strategies
Comparing current situation with something worse
Positive self-statements
Pain-relief
Distancing
Accepting current situation
Seeking additional information
Problem solving
Seeking social support
Maintaining control

When a lack of effective coping skills or use of negative coping strategies are identified in a patient following upper extremity trauma, hand therapists must seize the opportunity to employ patient education and intervention that facilitates development of active coping (Koestler, 2010).

### *Therapeutic Intervention*

It is documented that psychosocial consequences of musculoskeletal upper extremity trauma often appear during the acute phase of injury (Gustafsson, Persson, & Amilon, 2000); thus the importance of recognizing stress factors and coping mechanisms in the initial phase of hand therapy assessment. However, the value of engaging holistic treatment approaches throughout rehabilitative intervention cannot be underestimated.

In 2006, Alexander, Hutchison, and Sutherland conducted a descriptive quantitative study that confirmed the presence of posttraumatic psychopathology (PTP), defined as a complete description of abnormal responses to trauma, following musculoskeletal trauma. Accompanying these findings was the recognition that many symptoms of PTP presented *after* the acute onset of injury. These results confirm the need for hand therapy providers to address psychosocial concerns beyond initial assessment and throughout the continuum of rehabilitative care.

As previously illustrated, a medical model approach to upper extremity rehabilitation overlooks psychological and social impact of injury. However alternative care models, such as biopsychosocial and occupational adaptation, are suggested to incorporate all characteristics of being and may be successfully implemented by occupational therapists in orthopedic treatment settings.



### *Biopsychosocial Approach to Hand Therapy*

In 1977, psychiatrist George L. Engle introduced a holistic paradigm of health care designed to encompass psychological and social factors in addition to biological factors (McKee & Rivard, in press). Thus, the birth of the biopsychosocial model. Congruent with the profession of occupational therapy, this model, designed as an alternative to the reductionist medical and health models, seeks to appreciate the unique body, mind, and environment characteristics of each client (Mosby, 1974).

Fridlund, Marklund, and Martensson (1999) recognized a biopsychosocial approach to therapy for chronic pain patients as involving physiological, psychological, social, cultural, philosophical, and religious factors. This behavioral approach to symptomatic complaints results in significant improvement in patient's perception of well being, ability to manage pain, self confidence, and improved habits of living within this patient population (Fridlund, Marklund, & Martensson, 1999).

Pain is an axiomatic consequence to hand injury and has also been identified as a bourgeois stress factor appearing in the acute phase of upper extremity trauma (Koestler, 2010). Implementation of a biopsychosocial approach to hand therapy facilitates a therapist's abilities to prevent, identify, and/or treat psychological and behavioral factors that may serve as an impediment to the process of rehabilitation (Koestler, 2010) and an individual's ability to return to previous level of functioning following injury.

Occupational therapy providers practicing in the field of orthopedics are obligated to implement effective intervention strategies designed to promote physiological healing, however must also be astute to their roles as problem solvers and educators who interact with each client, offering individualized support and facilitating return to a functional

lifestyle (Amini, 2008). Utilization of a biopsychosocial approach to hand therapy may be an effective means to achieve such balance.

#### *Application of Occupational Adaptation*

Upon recognizing a health care trend toward increased specialization and the resultant tapered scope of occupational therapy intervention, Schkade and Schultz (1992) created and refined the occupational adaptation model. This model is defined as a singular process that integrates the individual constructs of occupation and adaptation into a collective design (Schkade & Schultz, 1992) and emphasizes treatment that facilitates an individual's ability to achieve mastery over desired performance following occupational challenge (Crist, 2001).

Adaptation to hand and upper extremity injury is an evolving process and therapists must be equipped to identify internal and external factors that influence an individual's ability to adapt (Chan & Spencer, 2004). Implementation of occupational adaptation facilitates investigation of these factors by giving careful consideration to three key elements: the person, the occupational environment, and the interaction between person and occupation environment (Schkade & Schultz, 1992).

Schkade and Schultz (1992) identify the person element as consisting of sensorimotor, cognitive, and psychosocial functioning and the occupational environment as related to the person's occupational role expectations. Using an occupational adaptation model of intervention, it is the joint responsibility of patient and therapist to determine therapeutic methods of intervention that focus on the patient as an occupational being with an innate desire to master his or her environment (Schultz & Schkade, 1992). This fosters a therapeutic relationship between patient and therapist and ultimately

conceives an individualized, occupation-based treatment experience for individuals with upper extremity injury.

### *Facilitating Optimal Outcomes*

In recent years, societal demands in this Nation have influenced the health care environment and thus the profession of occupational therapy. In general, United States citizens are no longer satisfied assuming the role of passive participant in decisions regarding personal health and wellness and rather consider themselves active contributors of medical treatment planning and intervention (Tickle-Degnen, 2000). From the perspective of an occupational/hand therapist, roles and responsibilities have evolved from the construct of providing therapy *to* a patient, to the concept of providing therapy *for* a patient, and ultimately collaborating to provide therapy *with* a patient. In response to the needs of occupational therapy consumers, occupational therapists must work to resume an orthopedic practice model congruent with the *Occupational Therapy Practice Framework: Domain and Process, 2<sup>nd</sup> Edition* (OTA, 2008). This can be accomplished by consciously employing occupation-based rehabilitation and facilitating holistic, client-centered care within the hand therapy setting.

### *Occupation-based Rehabilitation*

A client-centered approach to occupational therapy must take into consideration both subjective and objective aspects of an individual's occupational performance (Amini, 2008). Likewise, in hand therapy, occupation-based rehabilitation must be initiated immediately in the assessment phase of therapy. The role of a hand therapist is to identify functional abilities and limitations as well as individualized activities that hold meaning and purpose for each client (Kimmerle, Mainwaring, & Borenstein, 2003).

The *Canadian Occupational Performance Measure* (COPM) (Law et al., 1994) and the *Disabilities of the Arm, Shoulder, and Hand* (DASH) (MacDermid & Tottenham, 2004) are examples of objective measurement tools used to assess functional limitations as well as a patient's perceived limitations. Based on data gathered from batteries such as this, hand therapists are capable of supporting occupation-based care through collaboration with individuals and determination of problem areas that formulate objective and attainable goals (Amini, 2008).

#### *Enabling Accountability*

Following upper extremity injury, individuals do not consistently accept responsibility for their rehabilitation process despite the fact that it is necessary to achieve optimal outcomes (Haese, 1985). From a psychosocial perspective, this demonstrates the importance for hand therapy providers to enable their patient to retain accountability throughout all phases of rehabilitation following hand injury.

Education plays an important role in facilitating active contribution to rehabilitation on behalf of an injured individual. Hand therapy providers must be willing to actively assume the role of teacher in order to ensure that patients, family members, and/or care providers are knowledgeable regarding the patient's quality of life, assessments to be performed, and probable outcomes of relevant treatment interventions (Tickle-Degnen, 2000).

Emphasis on occupation-based rehabilitation fosters an environment of client-centered care that naturally involves patients throughout the treatment process. Focusing on an individual's ability to engage in meaningful occupation shows support for their

unique wants and needs and enables them to become accountable for obtaining successful therapeutic outcomes (Amini, 2008).

### *Professional Responsibility*

The current, dynamic environment of healthcare within the United States continues to hold uncertainty for many health professionals. Policymakers and consumers alike are demanding higher quality care at a lesser cost. In addition, presence of evidence to support their success is an expectation. This has created a culture that enables competitiveness among sub-specialty health professions, each striving to maintain recognition by proving viable contribution to the wellness of our society (Corcoran, 2006). Hand therapists can assist in affirming our professional role through commitment to lifelong learning, application of evidence-based practice, and cognizance of resource allocation and the financial impact of our services.

### *Evidence Based Rehabilitation*

The important concept of utilizing research to guide practice in the medical field dates back to the early 1900s (Rubin, 2011). Yet a more recent and ever-changing healthcare environment is requiring affirmation that occupational and physical therapists base current assessment and intervention on credible scientific evidence (Dubouloz, Egan, Vallerand, & von Zweck, 1999).

Tickle-Degnen (2000) has identified five key components of evidence-based practice as applied to clinical implementation in a rehabilitative setting: 1. Organization of known information into a clinical question, 2. Research and assembly of current evidence related to the clinical question, 3. Evaluation of relevancy and prioritization of gathered evidence, 4. Descriptive communication of retrieved evidence with

patient/family/colleagues, and 5. Continuous monitoring and documentation of chosen evaluation and intervention processes.

When adapted to the arena of orthopedic intervention, these values predicate the intent of hand therapists to deliver current and best-practice methods of evaluation and treatment. It is vital to understand the insufficiency of simply exploring and appraising research evidence pertinent to our practice area and to recognize the necessity to implement actual change within clinical practice based on knowledge gained from such appraisals (Roberts & Barber, 2001).

Roberts and Barber (2001) introduced three strategies effective in promoting clinical practice change in accordance with providing evidence-based practice. These strategies are support for continuing education, implementation of clinical guidelines, and utilization of opinion leaders. Theoretically, these tools provide pathways to achieve successful employment of evidence-based practice. However, as promising tools to facilitate clinical change using evidence-based practice exist, so do barriers that limit practical employment of evidence-based principles.

The most documented barrier to the utilization of evidence-based practice in clinical settings is lack of time (Curtin & Jaramazovic, 2001). In a fast-paced healthcare environment that demands high quality care at a lesser cost for more consumers, a seemingly unattainable goal, clinicians increasingly struggle with achieving organizationally instituted productivity measures while simultaneously taking into consideration the needs of each patient. Other barriers to the utilization of evidence-based practice include difficulty with comprehension of research literature and limited organizational support of evidence-based practice (Curtin & Jaramazovic, 2001).

Despite identified barriers to clinical application of evidence-based practice, hand therapy providers are obligated to escalate their individual ability to understand, create, and implement evidence into daily practice. Corcoran (2006), while agreeing with perceived barriers indicated above, also proposed that knowledge and skill acquisition of evidence-based principles enables a busy clinician to efficiently find and use evidence on a daily basis.

### *Fiscal Accountability*

A fairly recent shift in consumer demand for healthcare has resulted in the need to ensure medical and rehabilitative services that are equally effective and cost efficient (Corcoran, 2006). In addition, the reality of significant healthcare reform in the United States is on the horizon and health care systems are appropriately reacting by allocating resources toward the development of accountable care organizations and medical homes (Kaufman, 2011). These cost issues, along with current changes in third party payer mix and decreased government reimbursement rates, requires effort from every healthcare provider to practice wise and efficient judgment in resource allocation while meeting the needs of our patients.

In order to maintain fiscal accountability, the therapy professional must fully understand the impact of the fluid healthcare environment. Each care provider must accept responsibility for adhering to productivity targets and overall decreasing the cost of care (Kaufman, 2011). It is feasible for this to occur while maintaining focus on patient care, and all health care providers must be equally liable for patients and payer sources (Jack & Estes, 2010).

## Best Practice Models to Support Holistic Hand Therapy Rehabilitation

Developing a therapeutic relationship with hand therapy clients is essential for successful outcomes, however dedicating time and energy to do so seems contradictory to the fast-paced, time-constrained, United States health care system (Jack & Estes, 2010). Hand therapists with an educational background in occupational therapy understand the importance of connecting with patients through rapport, empathy, and trust, as well as its relationship to client-centered, high quality care. Yet how may occupational therapists commit necessary resources toward building an affinity with each of their patients while simultaneously respecting diligence to fiscally responsible care?

In 2010, McKee and Rivard (in press) identified 15 guiding principles necessary for application of a biopsychosocial approach to orthotic intervention. These authors addressed concepts specific to the application of external neuromuscular and skeletal structurally-modifying devices. However, greater than half of these principles are equally applicable when applying holistic care for hand therapy consumers in general and, through clinical application, encourage a mindset that emphasizes client-centered care throughout the cycle of rehabilitation. The following eight principles apply to this provision of salubrious rehabilitative care in an orthopedic setting: utilizing a patient-centered approach, considering psychosocial factors, optimizing body structure and function, enabling activity and participation, providing patient choice, dispensing comprehensive patient and caregiver education, monitoring and modifying individual treatment plans, and evaluating treatment outcomes.



### *Utilizing a Patient-Centered Approach*

The establishment of a partnership among patient, therapist, physician, and other key players in the multi-disciplinary team is necessary in order to facilitate successful therapeutic outcomes following upper extremity musculoskeletal injury (McKee & Rivard, 2010). Hand therapists who demonstrate biomechanical expertise and clinical application must be particularly cognizant of their ability to return the caring roots of the occupational therapy profession in order to facilitate a client-therapist relationship (Jack & Estes, 2010).

### *Considering Psychosocial Factors*

McKee and Rivard (2010) quoted Elaine Ewing Fess when describing the inexplicable consideration of psychosocial factors to hand and upper extremity injury: “injured extremities are attached to an individual being, each with his/her own set of physical and emotional parameters (p. 4).” This statement clearly communicates the importance of considering unique individual factors pertaining to orthopedic injury and response to intervention.

Not only do psychosocial factors occur as the result of an upper extremity injury, pre-existing determinants may also lead to the development of upper extremity pain and dysfunction. Hunt, Macfarlane, and Silman (2000) have identified psychological, somatization, anxiety, behavioral, mechanical, and work-related factors as potential contributors to the onset of upper extremity musculoskeletal disorders.

### *Optimizing Body Structure and Function*

Despite the importance of incorporating a psychosocial approach to orthopedic therapy, the importance of biomechanical knowledge cannot be underestimated.

Particularly within an orthopedic setting, therapists must be clinicians skilled in post-operative interventions and management, experts in anatomical and physiological structural stability, and proficient in objective measurement and management of edema, range of motion, and strength (Jack & Estes, 2010). Hand therapy providers must commit to continuous learning and maintain a passion to remain abreast of current practice models regarding upper extremity neuromusculoskeletal structures and healing (McKee & Rivard, 2010).

### *Enabling Activity and Participation*

According to Hasselkus (2002), individuals view themselves in relation to their unique occupational abilities. Upper extremity injuries that interfere with these roles create a sense of dysfunction and a desire for normalcy (AOTA, 2007). With each individual patient, hand therapy providers must spend ample time identifying specific functional abilities and limitations within meaningful and purposeful occupational contexts (Kimmerle, Mainwaring, & Borenstein, 2003). This approach allows therapists the opportunity to develop a unique treatment plan relative to each patient's needs which facilitates goal-directed activity, client interest, and motivation to participate in rehabilitation.

### *Providing Patient Choice*

Documented evidence supports the fact that individuals feel included in their medical care and respected as a member of the care team if they are provided with choices (McKee & Rivard, 2010). In order for hand therapy clients to assume responsibility for improvement of their functional, physical, and psychosocial being, they must be included in all aspects of decision making and care planning throughout the

medical process. This requires the delivery of appropriate information that facilitates active involvement and informed decision making on behalf of each client (Griffin, McKenna, & Tooth, 2003).

#### *Dispersing Comprehensive Patient and/or Caregiver Education*

Patients, family members, and/or caregivers own the right to fully understand their current medical condition, options for treatment, intervention methods, and therapeutic outcomes. Therefore a client-centered means of dispersing appropriate educational materials must be based on specific individuals and characterizations of each treatment method that leads to skill acquisition and autonomy (Greber, Zivani, & Rodger, 2007). An honorable attribute of hand therapy providers is the ability to provide education that matches the individual needs and personality type of each client (Moorhead, Cooper, & Moorhead, in press).

#### *Monitoring and Modifying Individual Treatment Plans*

Ongoing evaluation and collaboration is vital throughout the rehabilitation process following upper extremity trauma or injury (McKee & Rivard, 2010). Awareness of an individual clients response to rehabilitative intervention provides the therapist with insight regarding the need for treatment plan modification, additional education, or clarification of therapeutic intent.

#### *Evaluating Treatment Outcomes*

As the approach of accountable health reform nears, so does the need for hand therapy providers to articulately document outcome measurements for therapeutic interventions (Stegink-Jansen, 2002). Although it is despondent to think that therapists have the capacity to divulge evidence regarding each client encounter, today's healthcare

environment challenges therapy providers to correlate clinical expertise with evidence-based practice (Stegink-Jansen, 2002).

### The Future of Hand Therapy

The World Health Organization (WHO) published the International Classification of Functioning, Disability, and Health (ICF) in 2002 as a standard for describing and measuring health and disability. This document identifies functioning and disability as a complex interaction among individual health, contextual considerations, and personal factors (Centers for Disease Control and Prevention [CDC], 2010). Specifically, the ICF considers three primary domains to individual health and wellness (McKee & Rivard, 2010): body functions and structures, activity and participation, and environmental factors.

This ICF standard recognizes the importance of a biopsychosocial approach to healthcare and therefore supports revolution of hand and upper extremity rehabilitation toward an adaptive model of client-centered care.

### Summary

In accordance with the WHO-ICF, as well as the philosophies on which the profession of occupational therapy was founded, hand therapy providers must acknowledge the significant and tenacious relationship among an individual's body, mind, and spirit (Amini, 2008). Rather than simply emphasizing body structure and biomechanical function, therapists must equally consider the impact of musculoskeletal injury on individual quality of life (American Psychological Association, n.d.) and interference with occupational performance (Amini, 2008). The challenge for today's therapy professionals practicing in orthopedic settings is for treatment approaches to

consistently epitomize the character of our profession by focusing on holistic and client-centered evaluation and intervention.

This review establishes the need for a restitution of holistic, client-centered therapeutic evaluation and intervention of individuals who have suffered upper extremity trauma or musculoskeletal injury. In addition, it has established the need for occupational therapists specializing in orthopedic hand and upper extremity rehabilitation to provide care that appreciates high quality services that are congruent with fiscally responsible healthcare (Dale et al., 2002).

Descriptive methodological application of the literature toward the development of an advantageous resource for hand therapy providers is further described in Chapter III.

### CHAPTER III

#### METHODOLOGY

The methodology implemented in the development of *Holistic Assessment and Outcome Measurement for Orthopedic Upper Extremity Injuries: A Clinical Tool for Occupational Therapists* is described in the following section. This tool is intended as a quick reference to assist occupational therapy therapists in hand and upper extremity orthopedic settings to provide holistic and evidence based assessment and intervention for the patients they serve.

This product was conceived from the author's passion for the founding constructs of occupational therapy practice combined with personal recognition of the dissipated principle of individualized care throughout hand therapy clinics. After a decade of professional practice within medically based hand and upper extremity orthopedic settings, I chose to make an effort to return to the "caring" roots of our profession by creating a functional reference designed to facilitate therapists abilities to incorporate individualized and meaningful experiences for all patients, despite a mechanistic, productivity driven, fast-paced clinical environment. The timing is impeccable as the development of Accountable Care Organizations in our country emanates insight regarding a holistic view of health and function to reimbursement agencies and consumers alike.

Initially, I sought to investigate existing published research and theory regarding the incorporation of psychosocial frames of reference into the evaluation and treatment of

individuals with upper extremity musculoskeletal disorders. Medline, CINHALL, and PubMed databases were accessed through the Harley E. French Library of the Health Sciences at the University of North Dakota School of Medicine and Health Sciences to accomplish this review. The following websites provided additional literature to support the foundational constructs of the profession of occupational and hand therapy: American Occupational Therapy Association, American Society of Hand Therapists, and Hand Therapy Certification Commission.

Critical evaluation of literature obtained contributed to the identification of best practice models that support a holistic approach to hand therapy. Such models included recognition of the following considerations: injury type and severity, phases of rehabilitation, impact of emotional distress, and cultural attentiveness. Additional research was then performed to identify specific content and psychometric properties of acclaimed assessment and outcome measurement tools for upper extremity, general health, and injury-related psychosocial disorders.

A thorough review of literature was integrated with clinical experience to guide the development of *Holistic Assessment and Outcome Measurement for Orthopedic Upper Extremity Injuries: A Clinical Tool for Occupational Therapists*. A detailed description of this reference is included in Chapter IV.

## CHAPTER IV

### PRODUCT

*Holistic Assessment and Outcome Measurement for Orthopedic Upper Extremity Injuries: A Clinical Tool for Occupational Therapists* is intended to assist occupational therapy providers in acknowledging individual characteristics of orthopedic upper extremity medical diagnoses and to facilitate implementation of client-centered and occupation based care. This functional reference includes two primary resources.

The first resource consists of a simple algorithm that apprises occupational therapy providers to consider intrapersonal characteristics coinciding with a medical reason for referral. The second directs therapists to a comprehensive table designed to compare clinically relevant assessment and outcome measures based on content as well as reliability, validity, and response statistics.

Influenced by biopsychosocial and occupational adaptations frames of reference, this product supports an integrated care model that cogitates the unique characteristics concerning physical anatomy, personal conviction, and apposite surroundings for each and every patient seeking rehabilitation for upper extremity injury. *Holistic Assessment and Outcome Measurement for Orthopedic Upper Extremity Injuries: A Clinical Tool for Occupational Therapists* is located in its entirety in the appendix.



## CHAPTER V

### SUMMARY

The intent of this scholarly project was to develop a practical tool to assist hand therapy professionals in individualized and occupation based assessment and intervention for shoulder, elbow, wrist, and hand orthopedic diagnoses. Through investigation of existing published research and theory regarding the incorporation of psychosocial frames of reference into the evaluation and treatment of individuals with upper extremity musculoskeletal disorders, as well as critical evaluation of this research to identify best practice models that support a holistic approach to hand therapy, a clinical tool was created to guide occupational therapists in orthopedic settings in the provision of characterized, occupation based care. This product derives from the foundation of the profession that supports health promotion through active participation and mastery of meaningful occupational engagement.

Clinical application of *Holistic Assessment and Outcome Measurement for Orthopedic Upper Extremity Injuries: A Clinical Tool for Occupational Therapists* will ensure therapists to view each patient as a complex being with multiple considerations affecting the therapeutic process and eventual outcome. As a simple reference, this tool provides basic information regarding outcome measures recommended for use with upper extremity, general health, and psychosocial dysfunction.

Whereas the simplicity of the tool is successful in providing a quick reference to assessment and outcome measurement tools, its abstinence of detail also serves as a

limitation. Opportunity for future development includes the creation of an analytical algorithm that directs therapists toward definitive evaluative tools. Likewise, a more detailed description of specific measures, including access and availability, may be beneficial for smaller clinics that are limited in resource connection and availability. Finally, clinical occupational therapists may not be familiar with statistical reports of reliability, validity, and responsiveness and may benefit from a general review of psychometric significance.

Although a clinical reference was created as a result of this scholarly project, the tool has not yet been introduced to clinicians. It would be beneficial to gather feedback regarding functional application and usefulness from occupational therapists practicing in hand and upper extremity clinics. Subjective reactions could then be used to promote further growth of this product.

Through development of *Holistic Assessment and Outcome Measurement for Orthopedic Upper Extremity Injuries: A Clinical Tool for Occupational Therapist*, it is my greatest hope to remind occupational therapy providers practicing within hand therapy clinics to commemorate the importance of addressing psychological aspects of orthopedic injuries. For, in the words of Paul Brand, “The mind, not the cell of the injured hand, will determine the final extent of rehabilitation”.

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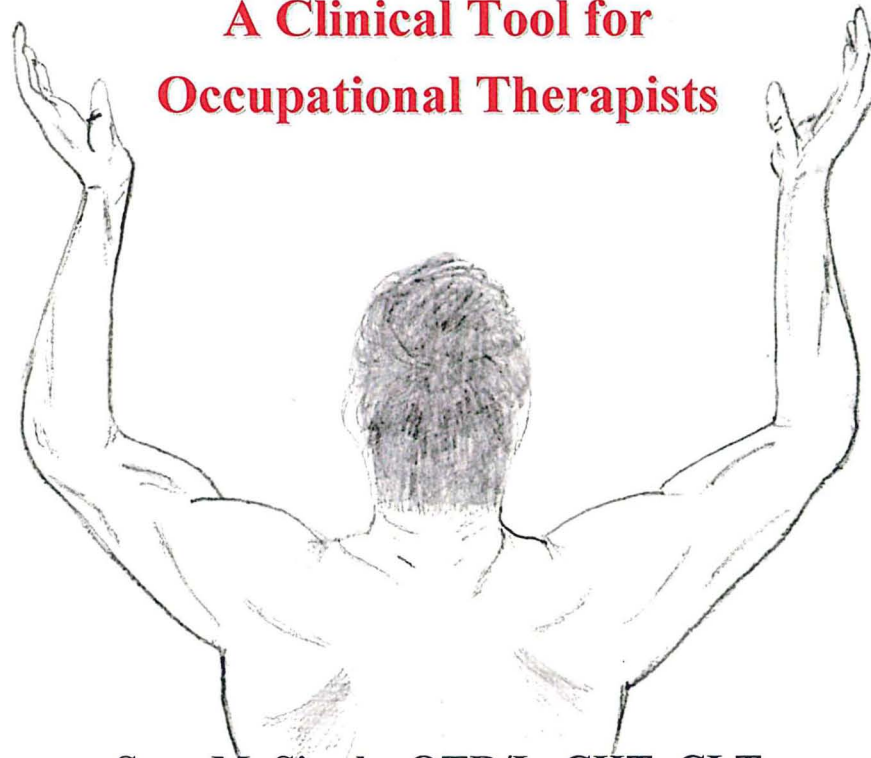
## APPENDIX

Holistic Assessment and Outcome Measurement for Orthopedic Upper Extremity

Injuries: A Clinical Tool for Occupational Therapists

# **Holistic Assessment and Outcome Measurement for Orthopedic Upper Extremity Injuries:**

**A Clinical Tool for  
Occupational Therapists**



**Sara M. Sipple, OTR/L, CHT, CLT**

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## Introduction

In 2002, the World Health Organization (WHO) published the International Classification of Functioning, Disability, and Health (ICF) as a standard for describing and measuring health and disability. This document identifies functioning and disability as a complex interaction among individual health, contextual considerations, and personal factors.<sup>12</sup> Specifically, the ICF considers three primary domains to individual health and wellness: body functions and structures, activity and participation, and environmental factors.<sup>37</sup>

In accordance with the WHO-ICF, as well as the philosophies on which the profession of occupational therapy was founded, hand therapy providers must acknowledge the significant and tenacious relationship among an individual's body, mind, and spirit.<sup>4</sup> Rather than simply emphasizing body structure and biomechanical function, therapists must equally consider the impact of musculoskeletal injury on individual quality of life<sup>2</sup> and interference with occupational performance.<sup>4</sup> The challenge for today's therapy professionals practicing in orthopedic settings is for treatment approaches to consistently epitomize the character of our profession by focusing on holistic and client-centered evaluation and intervention.

*Holistic Assessment and Outcome Measurement for Orthopedic Upper Extremity Injuries: A Clinical Tool for Occupational Therapists* is intended as a quick reference to assist occupational therapy providers in hand and upper extremity orthopedic settings to provide holistic and evidence based assessment and intervention for the patients they serve. The development of this reference is

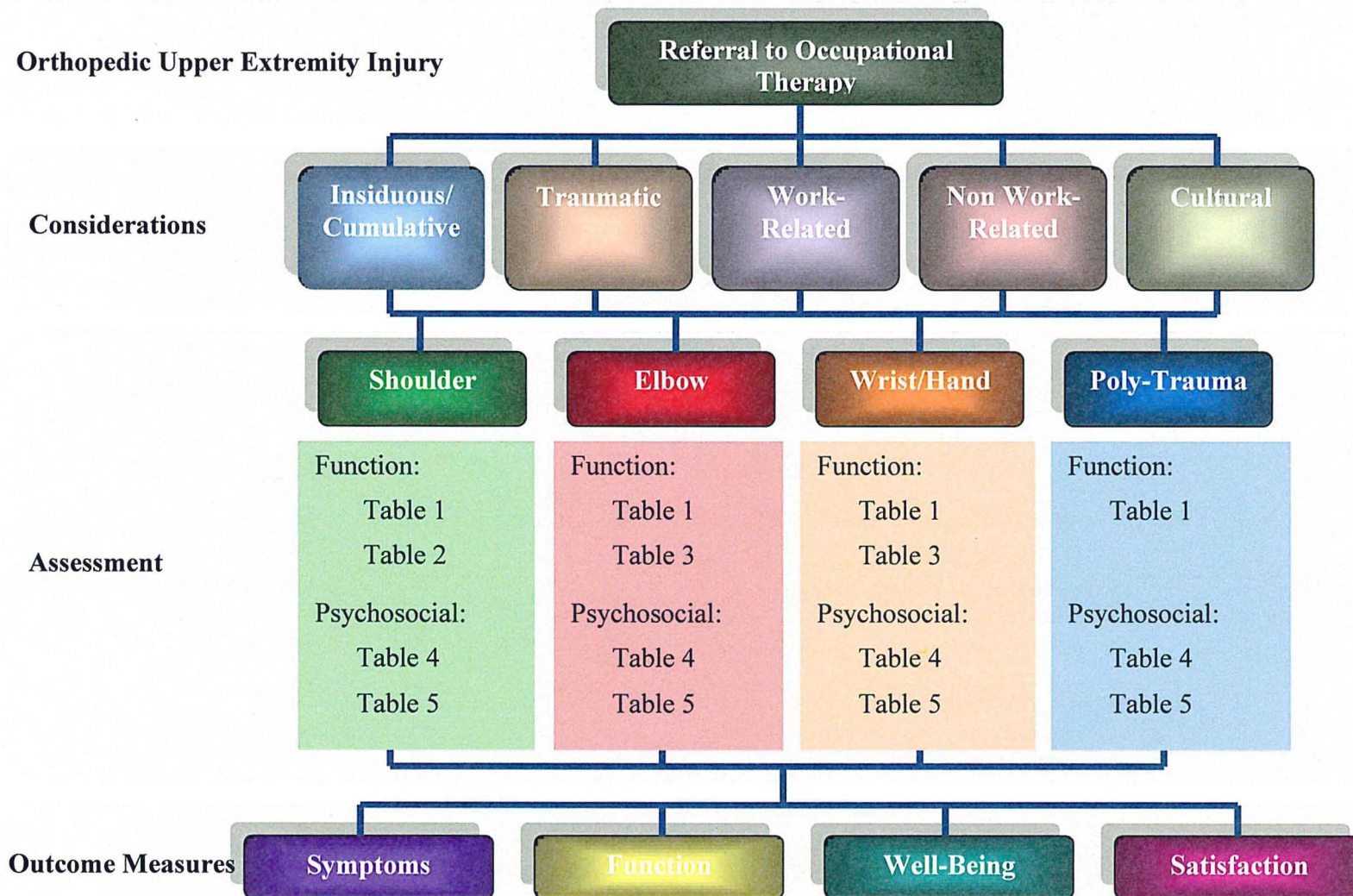
based on the biopsychosocial and occupational adaptation models, both of which seek to appreciate the unique body, mind, and environment characteristics of each client.<sup>41</sup>

Through the use of a simple algorithm, occupational therapy providers are reminded to address each client's interpersonal considerations beyond the medical reason for referral. Next, they are directed to a comprehensive table that lists assessment and outcome measurement tools appropriate for their client's injury. Each table compares content and psychometric properties of relevant measures, thus allowing the therapist to choose a valid, reliable, and responsive measure based on unique needs of each client.

Clinical use of this reference encourages therapists to look beyond a medical model approach to upper extremity rehabilitation and take into consideration the psychological and social impact of injury. The benefit of selecting and implementing evidence-based assessment tools is the assurance of providing client-centered care as well as the existence of articulately documented outcome measures for therapeutic interventions.



## An Algorithm: Holistic Assessment and Outcome Measurement



**Comparison of Content and Psychometric Properties for Assessment and Outcome  
Measurement Tools**

**TABLE 1**  
**Upper Extremity Assessment and Outcome Measurement Tools**

Measure	Domain	Number of Items	Rating/Response	Time to Administer	Scoring Complexity	Reliability (ICC)	Validity ( $\alpha$ )	Responsiveness (SRM)
Disabilities of the Arm, Shoulder, and Hand (DASH) <sup>17,20,62</sup>	Symptoms, Function	30	5-point Likert	5-7 minutes	Moderate	0.98	0.96	2.2
Nexk and Upper Limb Index (NULI) <sup>52</sup>	Function, Psychosocial	20	7-point scale	3-5 minutes	Easy	0.88	0.9	1.48
QuickDASH <sup>17</sup>	Symptoms, Function	11	5-point Likert	3-5 minutes	Moderate	0.94	0.94	0.79
Upper Extremity Functional Functional Index (UEFI) <sup>30</sup>	Pain, Function	20	5-point scale	3-5 minutes	Easy	0.95	PPNL*	PPNL*
Upper Extremity Functional Scale (UEFS) <sup>20,52</sup>	Function	8	10-point Likert	1-3 minutes	Easy	0.92	0.89	1.33
Upper Limb Functional Index (ULFI) <sup>20</sup>	Function	25	Yes/No	1-5 minutes	Easy	0.96	0.89	1.9

\*Psychometric Properties Not Located (PPNL)

**TABLE 2**  
**Shoulder Assessment and Outcome Measurement Tools**

Measure	Domain	Number of Items	Rating/Response	Time to Administer	Scoring Complexity	Reliability (ICC)	Validity ( $\alpha$ )	Responsiveness (SRM)
Modified American Shoulder and Elbow Surgeons Shoulder Form (M-ASES) <sup>6,39,57</sup>	Pain, Function	15	VAS 4-point scale	5 minutes	Easy	0.84	0.86	1.54
Pennsylvania Shoulder Score (PSS) <sup>39,57</sup>	Pain, Function, Satisfaction, ROM, Strength	24	10-point scale 4-point Likert	5-7 minutes	Moderate	0.94	0.93	1.27
Shoulder Disability Questionnaire (SDQ) <sup>35</sup>	Pain, Disability	16	Yes/No	3 minutes	Easy	PPNL*	PPNL*	1.14
Shoulder Pain and Disability Index (SPADI) <sup>6,26,33,56</sup>	Pain, Disability	121	VAS	3-5 minutes	Moderate	0.94	0.92	1.27
Shoulder Rating Questionnaire (SRQ) <sup>9,44</sup>	Pain, Function, Social	21	VAS 5-point scale	5-10 minutes	Complex	PPNL*	PPNL*	1.23
Shoulder Severity Index (SSI) <sup>6,7,9</sup>	Pain, Disability	31	Scale variety	7 minutes	Complex	0.97	PPNL*	1.05
Simple Shoulder Test (SST) <sup>6,49,50,51</sup>	Pain, Function	12	Yes/No	3 minutes	Easy	0.98	0.85	1.73
Subjective Shoulder Rating Scale (SSRS) <sup>6,7,29</sup>	Pain, Disability, Satisfaction	5	Multiple choice-weighted	3 minutes	Easy	0.71	PPNL*	0.65

\*Psychometric Properties Not Located (PPNL)

**TABLE 3**  
**Elbow, Wrist, and Hand Assessment and Outcome Measurement Tools**

Measure	Domain	Number of Items	Rating/Response	Time to Administer	Scoring Complexity	Reliability (ICC)	Validity ( $\alpha$ )	Responsiveness (SRM)
Australian/Canadian Osteoarthritis Hand Index (AUSCAN) <sup>8,40</sup>	Pain, Function, Stiffness	15	5-point Likert	3-5 minutes	Easy	0.87	0.96	0.67
Carpal Tunnel Questionnaire (CTQ) <sup>13,14</sup>	Activity, Pain, Weakness, Sensation	19	5-point Likert	4-7 minutes	Complex	0.92	0.9	1.22
Hand Clinic Questionnaire (HCQ) <sup>54</sup>	Pain, Function, Aesthetics, Sensation	9	4-point scale	2-4 minutes	Easy	PPNL*	0.76	PPNL*
Manual Ability Measure (MAM-16) <sup>15</sup>	Function	16	4-point scale	3-5 minutes	Easy	PPNL*	PPNL*	PPNL*
Michigan Hand Questionnaire (MHQ) <sup>14,16,24,60</sup>	Pain, Function, Activity, Aesthetics, Satisfaction	63	5-point scale	8-10 minutes	Complex	0.73	0.93	1.05
Patient Evaluation Measure (PEM) <sup>16,23</sup>	Pain, Disability, Satisfaction	14	VAS	3-5 minutes	Moderate	PPNL*	0.94	0.95
Patient-Rated Wrist Evaluation (PRWE) <sup>32,38,61</sup>	Pain, Disability	15	10-point scale	3-5 minutes	Easy	0.9	0.96	2.27
Patient-Rated Wrist/Hand Evaluation (PRWHE) <sup>38</sup>	Pain, Function, Appearance	17	10-point scale	3-5 minutes	Easy	0.89	0.93	1.51

\*Psychometric Properties Not Located (PPNL)

**TABLE 4**  
**General Function and Health Assessment and Outcome Measurement Tools**

Measure	Domain	Number of Items	Rating/Response	Time to Administer	Scoring Complexity	Reliability (ICC)	Validity ( $\alpha$ )	Responsiveness (SRM)
Canadian Occupational Performance Measure (COPM) <sup>27</sup>	Function	5 patient-identified	10-point Likert	30 minutes	Moderate	0.81	0.77	0.93
Short Form - 36 (SF-36) <sup>10,34,46</sup>	Health, Function	36	5-point scale	5-10 minutes	Moderate	0.9	0.85	0.45
Short - Musculoskeletal Function Assessment (Short - MFA) <sup>18,42,59</sup>	Health, Function	46	5-point scale	10-12 minutes	Complex	0.9	0.95	1.14
General Health Questionnaire - 28 (GHQ-28) <sup>19,25</sup>	Mental Well-Being	28	4-point scale	5-7 minutes	Easy	PPNL*	0.95	PPNL*
Health Assessment Questionnaire (HAQ) <sup>1</sup>	Function	20	4-point scale	30 minutes	Moderate	0.76	0.94	PPNL*
Musculoskeletal Function Assessment (MFA) <sup>18,34,42</sup>	Health, Function	101	Yes/No, Rating scale	15-20 minutes	Complex	0.92	0.9	0.74

\*Psychometric Properties Not Located (PPNL)

**TABLE 5**  
**Psychosocial Assessment and Outcome Measurement Tools**

Measure	Domain	Number of Items	Rating/Response	Time to Administer	Scoring Complexity	Reliability (ICC)	Validity ( $\alpha$ )	Responsiveness (SRM)
Beck Depression Inventory (BDI) <sup>3,31,47,53,55</sup>	Depressive Severity	21	4-point scale	5-10 minutes	Easy	0.87	0.85	1.6
Center for Epidemiologic Studies - Depression Scale (CED-S) <sup>48,53,55</sup>	Depression	20	4-point scale	5-10 minutes	Easy	0.79	0.92	0.9
Impact of Events Scale - Revised (IES-R) <sup>5</sup>	Post-traumatic Stress	22	5-point Likert	4-6 minutes	Easy	0.87	0.87	PPNL*
Montgomery-Asberg Depression Rating Scale (MADRS) <sup>22,28</sup>	Depression	10	7-point scale	3-5 minutes	Easy	0.94	0.61	PPNL*
Multidimensional Health Locus of Control Scale (MHLC) <sup>45</sup>	Perceived Health Control	10	6-point scale	3-5 minutes	Moderate	0.93	0.7	PPNL*
Pain Anxiety Symptom Scale - 20 (PASS-20) <sup>11,36</sup>	Pain-specific Anxiety	20	6-point scale	3-5 minutes	Easy	0.95	0.91	0.77
Pain Catastrophizing Scale (PCS) <sup>21,43,58</sup>	Perceived Internal/external Catastrophe	12	5-point scale	3-5 minutes	Easy	0.93	0.95	1.12

\*Psychometric Properties Not Located (PPNL)

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