Implications for occupational therapy practice in a client with burn injury

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Note: This document describes a capstone dissemination project reflecting an individually planned experience conducted under faculty and site mentorship. The goal of the capstone experience is to provide the occupational therapy doctoral student with a unique experience whereby he/she can demonstrate leadership and autonomous decision-making in preparation for enhanced future practice as an occupational therapist.
Abstract

Occupational therapy has an important role in the recovery of a burn injury. A significant burn injury can require extensive rehabilitation to achieve functional range of motion and independence in occupations of daily living. The current case study highlights a Marine with bilateral hand burn injuries, who undergoes two consecutive hand reconstruction surgeries. Limitations in participation of occupations that the client deems meaningful and decreased perception of occupational performance are addressed through his occupational therapy sessions. This case discusses the evaluation, goals, interventions, and outcomes achieved through the use of a biomechanical and client-centered model of practice.
Introduction

The client, who will be referred to as Mr. T., is a 2-year-old active duty Marine Lance Corporal who had a burn injury during a training accident on June 20, 2008 in Palm Springs, CA. Subsequently, the client developed hypertrophic burn scar contracture to both of his hands that limited his range of motion during daily functioning. On February 3, 2009 he underwent surgical release and a full thickness skin graft to his left-hand web space. The same surgery was performed on his right-hand web space on April 1, 2009. The initial outpatient evaluation was completed on February 20, 2009, which indicated the following primary problems: 1) decreased independence in occupations of daily living due to a) limited bilateral hand range of motion, b) limited grip strength, and c) post-surgical protection and splinting of the left hand, 2) decreased socialization and participation in the community due to a decreased comfort level and fatigue, and 3) decreased perception of occupational performance.

The models of practice that were utilized for the case study were the Canadian Model of Occupational Performance (Law, Baptiste, & Mills, 1995) and the biomechanical model (Radomski & Trombly, 2008). The Canadian Model of Occupational Performance (CMOP) is a client centered model of practice that focuses on the person’s “ability to choose, organize, and satisfactorily perform meaningful occupations” (Law, Polatajko, & Baptiste, 1997, p. 30). Increased client motivation can be accentuated by allowing for client choice and control in the treatment plan (Law, Baptiste, & Mills, 1995). On the Burn Specific Health Scale- Brief (Kildal, Andersson, Fugl-Meyer, Lannerstam, & Gerdin, 2001), the client identified that he sometimes has feelings of being trapped or caught. The strict military culture, numerous mandatory medical appointments, and a family that fosters dependence are factors that may limit the client’s feelings of control. This model was chosen for the client because the occupational therapy student
believed the client would benefit from a collaborative approach, providing him with more control in the decision-making aspect of his treatment. The CMOP allows for the focus to be on occupational performance problems that the client ascertains to be the most important to address. Client participation in the rehabilitation process has been shown to improve with the use of the Canadian Occupational Performance Measure, which is a principal component of this model that guides the assessment and goal setting process (Wressle, Eeg-Olofsson, Marcusson, & Henriksson, 2002; Law, Baptiste, & McColl, 1990). This model was employed with the intent to increase the client’s participation in occupations of daily living and promote an enabling attitude by providing him with information, the opportunity for successful occupational performance, guidance, and collaborative problem solving.

The biomechanical model is based on anatomical factors that influence the motion of the body. When using this model in the context of occupational therapy, the focus is on the motion, strength, and endurance that is needed for the person to perform various occupations (Flinn, Jackson, Gray, & Zemke, 2008). This model is appropriate to use in burn rehabilitation because of the debilitating effects of scar contracture and the decreased strength and endurance associated with a prolonged recovery.

Scar tissue formation is a common response during wound healing after a burn injury (Grisby deLinde & Miles, 1995). Hypertrophic scar over a joint can limit range of motion and as a result limit a person’s functioning. In order to counteract the effects of scar contracture, an opposing force needs to be applied to maintain or improve range of motion. Tissue will elongate when a force is applied due to the elongation of the elastic fibers and the uncoiling of the collagen fibers of the skin (Richard & Stanley, 1994). A prolonged stretch is recommended to increase range of motion (Bandy, 2001). Several authors have supported application of
prolonged stretch to increase range of motion at a joint affected by burn scar contracture. Kowalske, Holavanahalli, Hynan, O’Toole, Myers, Sterzik, et al. (2003) found that range of motion measurements improved with passive stretching after each treatment session and over time in subjects with contracture caused by burn injury. Richard, Miller, Finley, and Jones (1987) found that range of motion increased in patients with hand burn injuries immediately following passive range of motion. Positioning of the burned client through splinting is an important aspect of burn rehabilitation to aid in the prevention of burn scar contracture (Jordan, Daher, & Wasil, 2000).

This case can be considered innovative in regards to the assessments and interventions that were employed. Non-routine assessments were performed through the administration of an occupational performance interview and self-assessment regarding the client’s perception of his ability to perform occupations, psychosocial implications, and skin care. The outpatient facility that the client was attending for therapy primarily focuses on increasing range of motion through stretching and positioning. By utilizing the Canadian Model of Occupational Performance, a more collaborative approach was taken to focus on the client’s problems in occupational performance. Occupational limitations are not normally addressed directly, which was a focus for this case. Occupations that the client indicated to be difficult to perform were addressed in the outpatient gym, as well as other atypical locations. Access to an occupation of daily living apartment was arranged at a nearby facility for a cooking group session. A nearby tourist attraction park was a location of another treatment session to focus on increasing his comfort level within the community. One-handed techniques were taught to the client to increase his independence during the healing of his hands post-operatively. Normally during treatment sessions, clients have limited participation during passive stretching. The case study client was
able to work on completing a project with his right hand during passive stretching of his left hand to increase his grip strength, improve his perception of occupational performance, provide a distraction from his burn injury, as well as increase his participation during treatment.

Evaluation

The initial evaluation for outpatient burn rehabilitation was completed on February 20, 2009. The evaluation included range of motion, grip strength, pinch strength, observation, the Disabilities of the Arm, Shoulder, and Hand (Hudak, Amadio, & Bombardier, 1996), The Burn Specific Health Scale-Brief (Kildal, Andersson, Fugl-Meyer, Lannerstam, & Gerdin, 2001), and the Canadian Occupational Performance Measure (Law et al., 1990).

Client History

Client history was established through an interview and review of past medical charts. The Marine states that he was loading explosives in the Abrams tank in Palm Springs, California for training when it pre-maturely detonated, igniting his clothing on June 20, 2008. Fellow Marines assisted in extinguishing the blaze. He was transported to a nearby hospital arriving awake and alert. Escharotomies to the hands and fingers were performed on the date of injury. The client underwent five operative procedures for excision and grafting to 33.5% total body surface area and subsequently was transferred to the Institute for Surgical Research U.S. Army Burn Center on July 29, 2008 for inpatient treatment and discharged at a later date. On February 3, 2009 the client was readmitted to the U.S. Army Burn Center for reconstructive surgery. The client complained of hypertrophic burn scar contracture on multiple sites on the body and desired a surgical release of his left-hand webspace for improved functioning. The surgical procedure involved a release of the left-hand burn contracture with full thickness skin graft that was taken from the right groin. A burn splint was fabricated to position the hand in the intrinsic plus
position, with the wrist in slight extension, metacarpal-phalangeal flexion, interphalangeal extension, and thumb palmer and radial abduction. The client was released from the inpatient unit on February 5, 2009 and was seen in outpatient therapy fifteen days later. During the evaluation the client stated he would be having a similar reconstructive surgery on his right hand on April 1, 2009. After undergoing two consecutive reconstructive surgeries of the hands, the patient would be limited to using only one hand for occupational functioning for at least three months in order to provide protection and a position of optimal healing post-operatively. The client stated that he is right handed.

**Range of Motion**

Range of motion measurements are consistent with the biomechanical model of practice and as a physical component of the person in the CMOP. An overview of the results of the client’s hand range of motion can be viewed in Appendix A. Skin tightness and joint stiffness were present prior to the surgical release and persisted following two weeks post-operative immobilization of the left hand. Pain and apprehension appeared to be the most limiting factor of left-hand active range of motion at the time of the initial outpatient evaluation. Mr. T. also demonstrated limited right hand active thumb radial and palmer abduction secondary to skin and scar tightness. A photograph of the client’s hand during active composite flexion can be referred to in Figure 1.

**Grip and Pinch Strength**

Grip and pinch strength are two key components that are considered in the biomechanical model and are addressed in the CMOP as a physical performance component of the person. The results of grip and pinch strength assessment can be referred to in Appendix B. The client presented with limited right hand strength that was – 4.17 standard deviations, indicating a
significant limitation that may be causing decreased functional use. Decreased pinch strength was also noted.

*Observation of Skin*

Burn scar can greatly affect an individual’s participation in occupations, socially, and emotionally. Taking this into account, observation of the skin is an appropriate assessment in order to provide appropriate interventions to improve scarring. Observation of the client indicated the presence of hypertrophic scarring ranging from minimal to severe. The client’s face had moderate scarring on the left side of the face, under the chin, on the jawline, and nose. Minimal scarring to the chest and donor site on the back, as well as severe hypertrophic scarring on the right upper extremity, and bilateral hands was present. The left hand had severe palmer hypertrophic scarring and was healing from the reconstructive palmer release and graft. The left dorsal hand scarring was greater in comparison to the right hand, which has a scar band in the first web space. The lower extremities have moderate hypertrophic scar on the thighs and legs, however do not limit range of motion.

*The Disabilities of the Arm, Shoulder, and Hand (Hudak, Amadio, & Bombardier, 1996)*

The Disabilities of the Arm, Shoulder, and Hand (DASH) evaluates the disability and symptoms of the upper extremity. Hudak, Amadio, and Bombardier developed this assessment in 1996. It is a self-report measure consisting of 30 items related to occupations of daily living and the extent of associated symptoms. Scores can range from zero, denoting no disability, to 100, indicating severe disability. The questionnaire takes approximately five to ten minutes to complete. This assessment is consistent with the Canadian Model of Occupational Performance because is a self-assessment, which promotes a more client-centered approach. It addresses the person, environment, and occupation, which are three primary components of the CMOP. Jester,
Burn Injury

Harth, Wind, Germann, and Sauerbier (2005, p. 23) believe that the DASH has the potential to be utilized “in the development of client-centered treatment programs which are tailored to the individual clients' requirements and have relevance to their daily activities.” This statement supports the use of the DASH in conjunction with the client-centered model of practice that has been chosen to guide the treatment process for my case study client.

Several studies have been published that supports the use of the DASH for measuring the disability of the upper extremity. A study by Beaton, Davis, Hudak, and McConnel in 2001 shows the DASH to have good test-retest reliability (ICC = 0.96). Construct validity was established (r > 0.69) by comparing the DASH to the Brigham Carpal Tunnel Questionnaire, the Shoulder Pain and Disability Index, and other pain measures (Beaton, Davis, Hudak, & McConnel, 2001). Fon SooHoo, McDonald, Seiler, and McGillivary (2002) found that the DASH had fewer ceiling and floor scores when compared to the SF-36 subscales. The scores of the DASH modules can differentiate amongst diagnostic groups, including burn injury. Opening a tight jar, doing yard work, and carrying a heavy object were found to be mild to moderately difficult for subjects with a burn injury, showing differentiation at the item level (Jester, Harth, Wind, Germann, & Sauerbier, 2005).

The DASH was administered on February 20, 2009 (Appendix C). The total DASH score was 55, indicating decreased perception of occupational performance that may improve with increase in range of motion, grip strength, and the use of assistive devices. The client indicated severe difficulty with opening a tight jar, turning a key, preparing a meal, opening a heavy door, doing household chores, making a bed, washing his back, using a knife to cut food, and recreational activities in which you move your arm freely. The client reported that he was
unable to garden or do yard work, change a light-bulb overhead, work, participate in recreational activities such as playing cards.

*Burn Specific Health Scale- Brief (Kildal, Andersson, Fugl-Meyer, Lannerstam, & Gerdin, 2001)*

The Burn Specific Health Scale-Brief (BSHS-B) is a 40 item self-assessment regarding health status of four different domain areas. The client assesses the amount of difficulty he/she has in the specific area on a 5-point scale from 0, indicating the most possible difficulty, to 4 indicating no difficulty. This scale has shown good internal consistency with a Cronbach’s of 0.75–0.93 (Kildal, Andersson, Fugl-Meyer, Lannerstam, & Gerdin, 2001). The BSHS-B can be divided into four broad domains: affect and relations, function, and skin involvement, and work (Willebrand, & Kildal, 2008). THE BSHS-B was found to be more useful in rendering information regarding fear avoidance and post-traumatic stress disorder in association with return to work when compared with the SF-36 (Dyster-Aas et al 2007).

The Burn Specific Health Scale- Brief was administered on February 20, 2009 (Appendix D). Results indicate a mean score of 3.25 for affect and relations, 2.33 for function, 1.43 for skin, and 0 for work. This scale was especially beneficial in that it was specific to the client’s injury. This scale is unique when compared to other available assessments because it provides information regarding psychosocial aspects of a burn injury, skin sensitivity, and skin care. This information can provide occupational therapists a more holistic understanding of the client.

*The Canadian Occupational Performance Measure (Law, Baptist,& McColl,1990)*

The Canadian Occupational Performance Measure (COPM) is a semi-structured interview that that provides a means of assessing the client’s self-care, productivity, and leisure. The assessment takes approximately 30 minutes to administer. The COPM is sensitive to changes in the clients’ perception of occupational performance and has the ability to identify
problems in occupational performance (Law, Baptist, & McColl, 1990). The COPM was found to be a reliable (Sewell & Singh, 2001) and valid (Chan & Lee, 1997; McColl, Paterson, & Davies, 2000) assessment tool. This assessment is utilized in conjunction with the Canadian Model of Occupational Performance.

Mr. T. identified occupational performance problems and rated the importance of each occupation on a scale of one to ten, with ten being the most important. In the area of self-care the client identified fastening buttons, tying shoe laces, and compression garments as areas of difficulty, stated an importance rating for dressing as a seven. He rated the importance of transportation as a nine and explained that he would like to regain his independence in this area of occupation. The client’s mother and brother are currently assisting with his transportation.

In regards to productivity, the client identified work (7/10 importance rating), cleaning (8/10 importance rating), cooking (9/10 importance rating), and doing laundry (10/10 importance rating) as being difficult to perform. The client stated that he currently did not have access to a kitchen where he was staying, but he was in the process of purchasing a home. He was apprehensive of his ability to prepare meals independently and stated that his mother is staying with him and will be available for assistance. He indicated the desire to be independent with making his meals. The client also stated that he was having difficulty opening the laundry detergent container and with transporting his laundry basket to the washer and dryer.

In the area of leisure Mr. T. stated that video games (4/10 importance rating), working out (9/10 importance rating), and socialization with friends within the community (8/10 importance rating) were difficult to perform. The client stated that it was difficult to use the video game controllers and lift weights with his left hand. He also explained that he fatigues
quickly and has decreased comfort level in the community, which was affecting his socialization with friends.

The client was instructed to identify his primary problems and rated his performance on each problem as well as his satisfaction with his performance, with 10 being the best possible performance or satisfaction. The client identified working out, driving, dressing, laundry, and cooking to be his most important problems. His total performance score was calculated to be 2.4 and his total satisfaction score was 1.

Assessment through Observation

Observation of the client in the outpatient gym provided further information regarding the client’s functioning. Upon the initial evaluation he was hesitant to move his left hand for the first time and winced when moving his thumb into palmer and radial abduction. He was limited to using only his right hand to open the door and had difficulty performing wound care independently. The client asked for assistance in opening packages, cutting wound care dressings, and putting on a compression garment for his right hand. He was also unable to open a Gatorade bottle while in the outpatient gym. Mr. T. was independent in using tweezers to debride the left hand of dead skin. The patient was able to strengthen his right upper extremity on the Baltimore Therapeutic Equipment during pinch and gripping tasks.

Goal Setting

Assessment information obtained from the initial evaluation was utilized to identify the client’s goals as well as occupational therapy goals. The client’s short-term goals were to do his laundry, socialize with friends within the community, cook and dress independently. When asked about his long-term goal, the client stated that he wanted to “work as a police officer”, “live in a house on my own,” and “use both of my hands like I did before I was burned.”
**Occupational Therapy Goals**

Occupational therapy long-term and short-term goals were established with the collaboration of the client and based on the evaluation results. The first long-term goal was that the client would be independent in doing his laundry at home each week with the use of assistive equipment as necessary in eight weeks. The following short-term goals were identified: (a) The client will independently wash and dry one load of laundry in the ADL apartment with three or less verbal cues for technique in an OT session in five weeks, (b) The client will demonstrate independence with carrying a ten pound bag of laundry and soap with his right hand for a distance of 30 feet with no assistance and no breaks to rest 100% successfully in four weeks, (c) The client will demonstrate his ability to open the liquid laundry detergent container with his right hand independently and pour out the appropriate amount of detergent with no spills with one verbal cue for technique once with 100% success in four weeks, and (d) The client will have 3.5 cm of right hand palmer abduction to independently grasp the handle of the liquid laundry detergent during a laundry occupation in three weeks.

The second long-term goal identified was for the client to be independent in making his own meals daily at home with the use of assistive devices, if needed, in eight weeks. The following short-term goals were established: (a) The client will make chocolate chip cookies in the ADL apartment with the use of assistive devices, if needed, and three verbal cues for technique one time in six weeks, (b) The client will boil an egg on the stove in the ADL apartment with three verbal cues for techniques to ensure safety one time in four weeks, (c) The client will demonstrate independence in slicing one tomato with a modified kitchen knife once in the ADL apartment in three weeks, and (d) The client will open a new jar with the use of an assistive device, if needed, in one out of two attempts in three weeks.
Long-term goal number three was for the client to be independent with daily dressing at home and utilize compensations as needed in eight weeks. Short-term goals related to this long-term goal were as follows: (a) The client will demonstrate independence with putting on a shirt and fastening six buttons utilizing a button hook in two minutes or less with 100% success in three weeks, (b) The client will tie his shoelaces of both shoes using a one-handed technique in three minutes or less with one verbal in four weeks, and (c) The client will have an improved perception of his ability to tie his shoes on the Burn Specific Health Scale as demonstrated by rating this occupation as "a little bit difficult" in four weeks.

The fourth long-term goal was for the client to verbalize an enhanced level comfort of being in public and independently demonstrate an increased participation within the community in eight weeks. Subsequently the following short-term goals were set: (a) The client will participate in an occupational therapy session with another patient and rate his comfort level as a seven or greater, with ten indicating the highest level of comfort in two weeks, (b) The client will rate his comfort level as a seven or greater during a public community reintegration outing to Sea World one time during the day with a group of patients and the therapist in four weeks, and (c) The client will independently participate in a spectator sporting event with a family member or friend and rate his comfort level as a seven or greater, with ten indicating the most comfortable, in six weeks.

The fifth long-term goal is that the client will have an improved perception of his occupational performance as demonstrated by a total DASH score of 40 in eight weeks. The short-term goals associated with improving his perception of occupational performance are as follows: (a) The client will demonstrate improved self perception of his ability to open a new jar with the use of an assistive device, if needed, by rating the difficulty of the occupation as a two
or less on a one to five, with five being the most difficult in three weeks, (b) The client will demonstrate improved self perception of his ability to independently use a knife to cut food by rating the occupation as a two or less on a one to five scale, with five being the most difficult in three weeks. (c) The client will participate in one card game during an occupational therapy session and will independently deal out cards, utilize a card holder, and shuffle with moderate assistance in four weeks, and (d) The client will complete a mosaic tile table project in the outpatient gym 100% successfully with three verbal cues for technique from the occupational therapy student in six weeks.

The Canadian Model of Occupational Performance guided the formation of the occupational therapy goals, which are client-centered and based on problems identified by the client in the COPM, DASH, and Burn Specific Health Scale. It can be assumed that Mr. T. will find goals centered on laundry, driving, cooking, and dressing to be meaningful and purposeful because he rated these occupations as being highly important for him as well as rated dissatisfaction of his current performance.

Interventions

Occupational Forms

The client interacted with a variety of occupational forms that addressed the goals established. The occupational forms that will be discussed are unique from the typical rehabilitation that the client receives, consisting of passive and active range of motion, splinting, and strengthening on the Baltimore Therapeutic Equipment.

The occupational therapy student was able to provide the opportunity for the patient to practice using assistive kitchen devices in the activities of daily living kitchen at the Center for the Intrepid. The patient demonstrated the ability to cut a tomato into six slices using a rocker
knife and an adaptive cutting board to stabilize the food. The client found the rocker knife beneficial and was provided one for home use. He was also educated about a variety of compensations he could utilize to open jars. He demonstrated the ability to open a tight jar of peanut butter using a non-slip and gripping material to assist. He was provided with Dycem to utilize for home use. The client used the stovetop to boil an egg and the occupational therapy student collaborated with the client regarding safety. It was recommended using pots with only one handle versus two and letting the pot cool on the stove before moving it to the sink to be washed. The client was successful, however hesitant in performing this task because he needed to reach over the boiling pot to turn off the burner.

A mosaic table project was introduced to the client to improve his perception of occupational performance, which is portrayed in Figure 2. By participating in the project it was theorized that the client would gain a sense of accomplishment and a realization that he was able to participate in hobbies, despite being limited to using only one hand. This occupation also aimed to improve his right-handed grip strength while squeezing a glue bottle with his right hand in order to secure small decorative marbles onto a wooden table. The grouting process involved utilizing a three-jaw chuck pinch to clean the grout off of the marbles. The project provided as a distraction during stretching of his left hand while in the outpatient therapy gym.

After collaborating with the patient about his choice of using elastic shoelaces or regular shoelaces, the patient decided to wear regular shoelaces and learn a one-handed shoe tying technique. The patient was provided with verbal instructions, a demonstration, and a web site link for additional instructions of how to tie his shoes with one hand. The patient practiced tying his own shoes with one hand. In a later session the patient was instructed to tie both of his shoes using the one-handed technique and timed. A buttonhook was provided to the patient with
instructions and demonstration of use. In a future session, the patient was timed donning a button-up shirt.

During the initial evaluation it was determined that the client was having difficulty with doing his laundry. The client stated he was unable to open up the laundry detergent bottle or grasp handle to pour out the detergent. The therapist suggested an alternative and recommended non-liquid, powder laundry detergent so that the client would just have to scoop out the detergent from a bucket. The client stated he preferred to use liquid detergent. The OTS perceived the client to have decreased occupational performance perception and brought in a bottle of liquid laundry detergent to evaluate his performance of opening and pouring the detergent. The client was successful with opening the bottle independently and poured out the appropriate amount to do one load of laundry with no spills. The OTS problem solved with the client regarding how he can get his laundry to the washing machine. It was decided that he would utilize a laundry bag instead of a laundry basket, enabling him to carry his laundry with only one hand. The patient was presented with a laundry bag, weighing greater than ten pounds. He demonstrated the ability to carry the bag across the room and back, a total distance of 42 feet. The client stated he felt confident about doing his laundry independently and the OTS provided encouragement.

The client participated in a group cooking occupation and rated his comfort level as a nine out of ten. He also went on a community integration outing to Sea World with his girlfriend, other clients, and two staff members as seen in Figure 3. The outing consisted of a behind the scenes tour and provided him with the opportunity to converse with others and have fun. The OTS educated him on energy conservation techniques during this outing to reduce his fatigue. The client was also provided with the opportunity to go to a Spurs basketball game, however declined and stated he was too tired to go. The client was encouraged to utilize
community supports, including the Warrior and Family Support Center, for leisure, group, and community integration occupations. He also was consulted for a community integration evaluation at the Center for the Intrepid and plans to participate in future events through this program.

Passive stretching was performed five days a week in the outpatient therapy gym for one to two hour sessions. The first week of outpatient therapy involved active range of motion of the left hand. Isolated joint passive range of motion was performed to stretch the joint capsule followed by composite flexion and extension to stretch the skin of the left hand, which began during the second week of outpatient therapy. Active flexion and extension during blocking exercises of the PIP and DIP joints were performed to promote flexor tendon excursion. The client wore a left volar forearm based splint with the wrist in 20 degrees of extension, fingers in extension, and thumb in radial abduction 23 hours a day to promote optimal positioning for the healing graft. The client complained of his ring finger and small finger rotating due to skin tightness. A strap was added around the ring finger and small finger to reduce the fingers from rotating. During the re-evaluation the client requested more conformity around his left web space and a splint was fabricated out of an elasticized polyester material with the client expressing satisfaction with fit.

**Descriptive Occupational Therapy Session**

One therapeutic occupation that was particularly interesting and effective was a group cooking session. The client participated cooking session with one other client that had burns in the occupations of daily living apartment at the Center for the Intrepid, which can be referred to in Figure 4.

**Occupational Performance**
Although there were two clients participating in this occupation, only the occupational performance of the case study client will be highlighted. The clients gathered the ingredients and supplies. Mr. T. opened the cabinet and reached towards the back of the cupboard for the \( \frac{3}{4} \) full bag of flour with his right hand. In his first attempt, he was unable to maintain a good grasp on the flour to be able to lift it up, but was successful on the second attempt. He opened up the refrigerator and retrieved two eggs from the carton. All of the ingredients and supplies were placed onto the counter. Mr. T. opened up a drawer and retrieved the measuring cups. Both clients measured out different ingredients. With his right hand he was able to scoop out the appropriate amount of sugar into the bowl, using his left forearm to stabilize the package of sugar. He was able to use his right hand to open two packages of butter and place on a plate. Mr. T. successfully was able to open the door of the microwave, transfer the plate of butter to the microwave, and set it for 30 seconds to soften the butter. The client said, “Hmm let’s see,” as he was about to crack an egg on the rim of the mixing bowl using only his right hand. The client was successful and only a small piece of shell fell into the bowl, which was retrieved with a spoon. “Oh yea! Not bad,” said Mr. T. After the dry mixture and wet mixture were mixed by the other client, Mr. T. poured the dry ingredients into the bowl with the wet mixture using his right upper extremity. He grasped a wooden spoon and was able to maintain adequate grip and upper extremity strength to mix the ingredients for about three minutes while using his left forearm to stabilize the bowl. The client attempted to open up the bag of chocolate chips by stabilizing the package on the counter with his left forearm and using his right hand to pull the package apart. The OTS provided him with scissors, which he utilized to open the package and subsequently poured the chocolate chips into the dough. Mr. T. mixed the dough for another two minutes. The client demonstrated the ability to scoop out the cookie dough onto a baking sheet.
with a spoon held in his right hand. When instructed to put the cookies into the oven the client stated, “No, I can’t do that. It is too hot.” The cookies were transferred to the oven by the other client.

The other client that was chosen to participate in the session had very similar burns and was very self-motivated. He had recently begun running four miles a day and living independently in his own apartment. Normally the Mr. T. does not engage in conversation with other clients during his therapy, but the relaxed two-hour long session in the kitchen was an opportunity that encouraged the clients to converse. While the cookies were baking in the oven the conversation between the two clients flowed into the topic of the pain felt while being burned. Some of the statements made were that “There is no other worse pain. Well maybe delivering a child,” said the case study client.

“No, I think it is probably even worse than that. The showers were the worst too…when the nurses would scrub me down and shave me. It was horrible. I would just scream,” said the other client.

The case study client shifted the conversation about dreams and said, “When I was in the hospital I was having weird dreams about being burned. I was never unconscious, but everything is fuzzy from that time and hard to remember.”

The cookies were removed from the oven by the occupational therapy student and the client positioned the cookie tray against the end of the counter to provide stabilization as he utilized a spatula to transfer the cookies to a plate. After letting the cookies cool for two minutes, the client picked up a cookie and began eating it. He then said “Well, they came out pretty good.”
Meaning and Purpose

This occupation was inferred to be meaningful and purposeful to the client for multiple reasons. During the initial evaluation Mr. T. stated that he did not currently have access to a kitchen at the guesthouse, but would be purchasing his own home with a kitchen soon. He stated his desire to be independent with making his meals and rated his importance of cooking as a nine out of ten on the COPM. Because he was previously uneasy of his ability to prepare meals independently, one can assume that this occupation was purposeful for him because it gave him the opportunity to practice in the kitchen under the guidance of the occupational therapy student. This occupation can be inferred to have provided the patient with a meaning of improved perception of his occupational performance because of the successful end result of the cookies.

As I listened to this conversation between the two clients I thought about the therapeutic value of being able to share such a traumatic experience. The two clients were very engaged in the conversation, leading me to the assumption that it was very meaningful.

The perceived purpose of a group cooking occupation for clients with burn injuries has been explored by Hill, O’Brien, and Yurt (2007). This study found that of subjects (N = 27) with burn injuries who participated in a therapeutic cooking group, 48% had less anxiety in the kitchen after the cooking group, 78% thought the cooking group provided a distraction from thinking about their injury, 78% thought that the group assisted them with meeting other people they could talk to about their burns, and 61% thought they could move better after attending the cooking group. Based on the OTS observations and knowledge of the client, it can be inferred that the client found the purposes of this occupation were to decrease his anxiety in the kitchen, provide a distraction from his injury, and meet another person with a similar injury.
Compensations and Adaptations

The occupational therapy student provided minimal assistance to the client. The client and the OTS collaborated regarding the difficult steps, such as cracking an egg and opening the chocolate chip package. A one-handed egg cracking technique was utilized as an adaptation. He utilized the counter to stabilize the cookie sheet and his forearm to stabilize the bowl when mixing the cookies. A compensation used by the client was when he used scissors to open up the bag of chocolate chips. Another compensation was when the other client removed the cookies from the hot oven.

Assessment Information

Assessment information gained through the observation of occupational performance provided the OTS with increased confidence that the patient would be able to function in a kitchen independently with the use of some assistive devices. Mr. T. did have some difficulty grasping heavier ingredients that were moved towards the back of the shelf due to his inability to use his left hand at the time, and decreased right hand range of motion and grip strength. It was also revealed that client had heat intolerance, which prevented him from transferring food to and from a hot oven. The client was able to utilize one handed techniques and adaptations that allowed him to be successful in the completion of this occupation.

Changes and Re-synthesis

The occupation was planned to have both clients share in completing the different steps involved in baking cookies so that I could observe and assess independent functioning in the kitchen. Originally I had planned to have the case study client transfer the cookies to and from the hot oven at least once. After cueing him to remove the cookies from the oven, the client stated, “Oh no, I will never be able to do that for the rest of my life.” He explained that the oven
was too hot for him and he did not want to get close. This forced me to change the planned occupation and to have the other client transfer the cookies out of the oven. The other client explained that the heat intolerance does improve with time. After the session, I was able to research assistive device that could allow the client to independently transfer food to and from a hot oven. The device recommended was a long handle that can hook onto the oven rack and push and pull the rack without getting too close to the heat source. The client expressed interest in the device and a request was written up for the physician assistant to order the device. I also had originally planned to have Mr. T. use a hand mixer to mix the dough, however he was able to maintain a good grasp on the wooden spoon. By mixing dough with the wooden spoon he was able to work on improving his grip strength in a functional manner.

I would re-synthesize the occupational form by having an adaptive device available for removing the cookies from a hot oven to allow the client to practice. I would also have arranged for the client to go to the grocery store with the OTS to promote community integration. I think it would also have been more appropriate for the client to make a meal versus cookies, which would require the use of the stove and the oven.

Outcomes

Several of the intervention goals were achieved as a result of the intervention. The client was able to make progress on the laundry goals that were established. The client was able to carry a ten pound bag of laundry and soap with his right hand over 30 feet with no assistance and no breaks. His right hand palmer abduction did increase a half of centimeter, however did not achieve the goal of 3.5 centimeters. Despite his limitations in range of motion he was able to open a laundry detergent container with Dycem and pour an appropriate amount for one load of laundry with no spills. The client did not feel it was necessary to practice washing his laundry in
the ADL apartment as he had achieved the long term goal and was independently doing his laundry at home each week with the use of Dycem to assist with opening the bottle.

The second long-term goal of being independent with making meals at home daily with assistive devices if needed was almost accomplished. The client purchased a home, however was not able to move in at this time due to personal family issues. Due to not having access to a kitchen, he was utilizing a microwave to make his meals until he would be able to transition to his new home. The client and the OTS felt confident that he would be able to cook his meals independently when this transition occurs. All of the short-term goals established for meal preparation were achieved. He was able to make chocolate chip cookies in the ADL apartment with two verbal cues for technique. The client was able to demonstrate boiling an egg on the stove with three verbal cues for techniques to ensure safety. Mr. T. sliced a tomato into 6 slices using a modified rocker knife. He was also able to demonstrate the ability to open a new jar of peanut butter with the use of Dycem.

The long-term goal regarding dressing was met, as the client is independent with daily dressing with the use of compensations for buttoning his shirt and a one-handed shoe tying technique. He was able to demonstrate putting on a shirt and fastening six buttons utilizing a buttonhook in one minute and 35 seconds. The client met the goal of being able to demonstrate tying his shoes using a one-handed technique in two minutes and nine seconds in four weeks.

The client did verbalize an enhanced level of comfort of being in public, as long as he is wearing his face compression garments. The long-term goal of increasing his participation in the community was set for eight weeks. Upon four weeks, it is noted that the client has had an increased participation in the community. The client stated he was able to go to the store and buy furniture for his new home, went to the movies with his girlfriend, and plans to get involved
in the community integration program through the Center for the Intrepid. The client was encouraged to continue working on this goal and it is expected to improve when he is able to return to driving, which will provide him with more opportunities to go out into the community. The client has been consulted for a driving evaluation to allow for independent community integration and transportation. Related short-term goals that were met included rating his comfort level as a seven or higher during a cooking group at the Intrepid, as well as during a public community reintegration outing to Sea World. He did not achieve the goal of independently participating in a spectator-sporting event with a family member or friend. The client was presented with the opportunity to go to a Spurs basketball game he declined to attend, stating he was fatigued.

Several short-term goals were met related to improving the client’s self-perception of his occupational performance. He demonstrated improved self perception of his ability to cut food by rating the occupation as a two on five point scale, with five being the most difficult. The client was also able to participate in one card game during an occupational therapy session and independently deal out the cards, utilize a cardholder, and shuffle with moderate assistance. The goal of perceiving the difficulty of opening a jar as a two or less was not met, however improved from the initial rating of a four, which indicated severe difficulty. The client was able to open a new jar with the use of Dycem and rated the difficulty as a three, indicating moderate difficulty. Mr. T. was also able to complete a mosaic tile table project in the outpatient gym with three verbal cues for technique from the occupational therapy student within six weeks. The goal of perceiving his ability to tie his shoes as "a little bit difficult” was not met, however his perception did improve with a rating of “moderately difficult”. He went from a score of zero
initially to a score of two on The Burn Specific Health Scale when rating difficulty of tying his shoes (Appendix D).

The client felt that he progressed overall in the areas of dressing, doing laundry, cooking, and community integration. He stated that doing laundry continued to be difficult because of the increased time required to fold his clothes. Although he felt his meal preparation performance would improve with the tools he had been provided once he is able to move into his home, he continued to feel limited due to the increased amount of time necessary to complete the occupation. Mr. T. also felt that once he had recovered from his second reconstructive surgery, he would be able to drive and increase his socialization with friends in the community. The client anticipated that after recovering from the reconstructive surgery on the right hand that he would greatly improve his performance of these occupations.

It was inferred that the client found meaning and purpose in the interventions that were implemented. It was inferred that the mosaic table was a meaningful project for him because he was able to design and make the table himself, and was in need of furniture for his new home. It can be inferred that it was also seen as purposeful to increase his right hand grip strength and increase his involvement in hobbies. The Sea World tour was also deemed to be meaningful to the client, who stated he had a lot of fun and was glad that he attended. He smiled when he was able to pet the animals and laughed with others during the outing. It can be judged that the client felt this outing to be purposeful because he identified socializing with friends in the community as being important to him during the initial evaluation. The interventions involved in increasing his independence with laundry were assumed to be purposeful and meaningful, as the client collaborated about how to achieve this goal and rated a substantial increase in his satisfaction of his performance of doing laundry. As previously mentioned, the group cooking occupation
provided meaningful socialization and the opportunity to address performance issues that were limiting his independence in the kitchen. It can be assumed the client felt this to be purposeful, as he expressed interest in receiving assistive devices to improve his functioning in the kitchen.

The standardized assessment scores were analyzed from evaluation to one month post initial evaluation. The COPM indicates an improved performance score from 2.5 to 3.6. The client’s satisfaction score also increased from 1.0 to 2.8. The client rated improvements in his occupational performance and his satisfaction with performance in dressing, laundry, and cooking. Although the score of specific items on the DASH fluctuated, the total score remained the same at 55.8. Upon analysis, several of the occupational based items did increase, including opening a new jar, turning a key, writing, pushing open a heavy door, carrying a heavy object, and putting on a sweater. Items that did decrease included interference of normal social activities, weakness, stiffness, difficulty sleeping, and level of confidence. The Burn Specific Health Scale indicated an increase in function from 2.33 to 2.67, however the affect and relations domain decreased from 3.25 to 2.56 and the skin domain decreased from 1.43 to .71. The client rated a lower score on the statements “I have no one to talk to about my problems,” “I have feelings of being trapped or caught,” and “My injury has put me further away from my family”. He also rated a lower score on the statements, “Sometimes I would like to forget that my appearance has changed,” “My general appearance really bothers me,” and “The appearance of my scars bothers me”. Mr. T. also rated a lower score in several of the areas related to skin care.

Between the time of the initial evaluation and re-evaluation, the client experienced changes in other areas of his life that are important to note because they may explain some of the changes in the standardized assessments. Abrupt changes in the client’s living arrangements were decided by the military due to the client’s anger management problems. Mr. T. expressed
his distress, anger, and loss of control over the situation. The new living arrangement in the barracks separated him from his family. The client also shared his frustration with the other Marines’ behavior in the barracks and came into therapy very angry due to some verbal confrontations regarding the client’s appearance. This change in living situation forced the client to be independent in taking care of his burn injury.

Other changes not specified in the formal goals were improved left-hand total active range of motion. The client presented with decreased tendon gliding, which was determined by measuring active proximal interphalangeal flexion with the metacarpal phalangeal joint in flexion and extension. The client was encouraged to perform blocking exercises of the left hand to promote tendon excursion. Mr. T.’s left hand radial abduction has also improved, however the development of a palmer scar band was noted that may begin to limit this movement.

Conclusions

The client will continue outpatient therapy after his reconstructive surgery on the right hand. Involvement with the driving rehabilitation, vocational rehabilitation, and community integration programs will also help to improve the client’s independence and progress towards his long-term goals. It is recommended that the client continues receiving passive stretching to his bilateral hands and wear a night splint to maintain the left hand webspace. Continuation of utilizing the Burn Specific Health Scale, DASH, and COPM will provide the therapist with an improved understanding of the client to work towards client-centered goals and occupationally based interventions.

Initially the occupational approach was undermined by a physical therapist, who made negative comments in front of the client that initially influenced the client’s motivation to work on the mosaic table. The physical therapist also poked fun at the cooking group and other
occupationally based interventions that were implemented. The physical therapist’s attitude did seem to change at the completion of the project, as he allowed the occupational therapy student to order assistive devices for two other clients as well as arrange for a home evaluation to be completed. The case study was presented to approximately 25 staff members and was very well received. The author of this case study plans to continue to promote an occupationally based treatment plan through the evaluation and interventions. Home evaluations, the implementation of assistive devices and assistive technology, occupationally based treatments, community integration outings, occupational distraction during passive stressing of tissues, and occupationally based assessments are areas of focus that the author hopes to address with each patient in the outpatient burn rehabilitation setting at this facility.

An implication of this case is to utilize a client-centered model in conjunction with the biomechanical model of practice for improved independence in clients with burn injury. In regards to the development of occupational therapy program development, this case helps to support the importance of occupationally based treatments to determine valuable assessment information, achieve functional goals, and provide a more active approach of the client involved in burn rehabilitation. Implications for research include analyzing the use of the COPM with clients with burn injury, the effects of heat intolerance on independent cooking in the client with burn injury, and long term follow up on the range of motion of a client with burn injury after a bilateral webspace release with full thickness skin graft. Other considerations for research are analyzing the effects of occupational distraction during passive stretching and an occupational approach versus a rote approach to increasing range of motion. It would be interesting to research the effect that an occupational approach versus a rote approach has on the perception of
functioning. It would also be interesting to study the effect that anger or frustration has on perception of functioning.

This case is innovative because of the non-routine assessments administered, which provided a more in depth understanding of the client. The interventions were atypical in this particular setting in that the focus shifted from passive intervention to occupationally based treatment to increase client participation. Even when passive stretching to the client’s hand was applied, he continued to be actively involved in the treatment by working on a project with his opposite hand. This case also highlights the importance of observing a client participate in occupations to gain valuable assessment information and to provide opportunities to problem solve through specific difficulties in occupational performance. The atypical occupational forms used in the outpatient gym to work on occupational performance problems as well as the non-routine treatment settings also contributed to the uniqueness of this case.
References


Appendix A

<table>
<thead>
<tr>
<th>Left Hand Active Range of Motion: February 20, 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thumb</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>MCP extension-flexion</td>
</tr>
<tr>
<td>MCP hyperextension</td>
</tr>
<tr>
<td>PIP extension-flexion</td>
</tr>
<tr>
<td>DIP extension-flexion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Left Hand Active and Passive Range of Motion: March 23, 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive motion is indicated in parentheses.</td>
</tr>
<tr>
<td>Thumb</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>MCP extension-flexion</td>
</tr>
<tr>
<td>MCP hyperextension</td>
</tr>
<tr>
<td>PIP extension-flexion</td>
</tr>
<tr>
<td>DIP extension-flexion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Left</th>
<th>Left</th>
<th>Right</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>February 20</strong></td>
<td><strong>March 23</strong></td>
<td><strong>February 20</strong></td>
<td><strong>March 23</strong></td>
</tr>
<tr>
<td>Opposition (Distance from tip of thumb to distal palmer crease)</td>
<td>Deferred</td>
<td>3.5 cm</td>
<td>1.5 cm</td>
</tr>
<tr>
<td>Web space in Palmer Abduction (Distance from IF MCP flexion crease to IP joint of thumb)</td>
<td>6.5 cm</td>
<td>6.5 cm</td>
<td>2.5 cm</td>
</tr>
<tr>
<td>Web space in Radial Abduction (Distance from IF MCP flexion crease to IP joint of thumb)</td>
<td>5 cm</td>
<td>7 cm</td>
<td>2.5 cm</td>
</tr>
</tbody>
</table>
Appendix B

Grip and Pinch Strength : February 20, 2009

<table>
<thead>
<tr>
<th></th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grip</td>
<td>Deferred 2/2 post-op</td>
<td>35 lbs</td>
</tr>
<tr>
<td>Lateral</td>
<td>Deferred 2/2 post-op</td>
<td>16 lbs</td>
</tr>
<tr>
<td>3 Jaw</td>
<td>Deferred 2/2 post-op</td>
<td>16 lbs</td>
</tr>
<tr>
<td>Tip to Tip</td>
<td>Deferred 2/2 post-op</td>
<td>13 lbs</td>
</tr>
</tbody>
</table>

Grip and Pinch Strength : March 23, 2009

<table>
<thead>
<tr>
<th></th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grip</td>
<td>16 lbs</td>
<td>40 lbs</td>
</tr>
<tr>
<td>Lateral</td>
<td>9 lbs</td>
<td>18 lbs</td>
</tr>
<tr>
<td>3 Jaw</td>
<td>6 lbs</td>
<td>18 lbs</td>
</tr>
<tr>
<td>Tip to Tip</td>
<td>7 lbs</td>
<td>14 lbs</td>
</tr>
</tbody>
</table>
## Disabilities of the Arm Shoulder, and Hand (Hudak, Amadio, & Bombardier, 1996)

**Administered February 20, 2009**

1 = No difficulty, 2 = Mild Difficulty, 3 = Moderate Difficulty, 4 = Severe Difficulty, 5 = Unable

<table>
<thead>
<tr>
<th>Item</th>
<th>Date: 2/20/09</th>
<th>3/23/09</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Open a tight or new jar.</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>2. Write.</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3. Turn a key.</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>4. Prepare a meal.</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5. Push open a heavy door.</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6. Place an object on a shelf above your head.</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>7. Do household chores (e.g. wash walls, wash floors).</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. Garden or do yard work.</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>9. Make a bed.</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>10. Carry a shopping bag or briefcase.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>11. Carry a heavy object (over 10 lbs).</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>12. Change a light bulb overhead</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>13. Wash or blow dry your hair.</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14. Wash your back.</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>15. Put on a pullover sweater.</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>16. Use a knife to cut food.</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>17. Recreational activities which require little effort (card playing, knitting, etc.).</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>18. Recreational activities in which you take some force or impact through your arm, shoulder, or hand (e.g., golf hammering, tennis, etc.).</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>19. Recreational activities in which you move your arm freely (e.g. playing Frisbee)</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>20. Manage transportation needs (getting from one place to another).</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>21. Sexual activities.</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

I = Not at all, 2 = Slightly, 3 = Moderately, 4 = Quite a bit, 5 = Extremely

<table>
<thead>
<tr>
<th>Item</th>
<th>Date: 2/20/09</th>
<th>3/23/09</th>
</tr>
</thead>
<tbody>
<tr>
<td>22. During the past week, to what extent has your arm, shoulder or hand problem interfered with your normal social activities with family, friends, neighbors, or groups.</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>23. During the past week, were you limited in your work on other regular daily activities as a result of your arm, shoulder, or hand problem?</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

I = None, 2 = Mild, 3 = Moderate, 4 = Severe, 5 = Extreme

<table>
<thead>
<tr>
<th>Item</th>
<th>Date: 2/20/09</th>
<th>3/23/09</th>
</tr>
</thead>
<tbody>
<tr>
<td>24. Arm, shoulder, or hand pain.</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>25. Arm, shoulder, or hand pain when you perform any specific activity.</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>26. Tingling (pins and needles) in your arm, shoulder or hand.</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>27. Weakness in your arm, shoulder, or hand.</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>28. Stiffness in your arm, shoulder or hand.</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

I = No Difficulty, 2 = Mild Difficulty, 3 = Moderate Difficulty, 4 = Severe Difficulty, 5 = So much that I can’t sleep.

<table>
<thead>
<tr>
<th>Item</th>
<th>Date: 2/20/09</th>
<th>3/23/09</th>
</tr>
</thead>
<tbody>
<tr>
<td>29. During the past week, how much difficulty have you had sleeping because of the pain in your arm, shoulder, or hand?</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

I = Strongly Disagree, 2 = Disagree, 3 = Neither Agree or Disagree, 4 = Agree, 5 = Strongly Agree

<table>
<thead>
<tr>
<th>Item</th>
<th>Date: 2/20/09</th>
<th>3/23/09</th>
</tr>
</thead>
<tbody>
<tr>
<td>30. I feel less capable, less confident or less useful because of my arm, shoulder or hand problem.</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total DASH Score** 55.8 55.8
Appendix D

The Burn Specific Health Scale (Kildal, et al., 2001)

*0=Extreme(ly), 1=Quite Often, 2=Moderate(ly), 3=A Little Bit, 4=None (none at all)*

Please rate the following items using the answers provided above:

<table>
<thead>
<tr>
<th>How much difficulty do you have?</th>
<th>Date:</th>
<th>2/20/09</th>
<th>3/23/09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathing independently?</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Dressing by yourself?</td>
<td></td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Getting in and out of a chair?</td>
<td></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Signing your name?</td>
<td></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Eating with utensils?</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Tying shoelaces, bows, etc?</td>
<td></td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Picking up coins from a flat surface?</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Unlocking a door?</td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Working in your old job performing your old duties?</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*To what extent does each of the following statements describe you?*

<table>
<thead>
<tr>
<th>Item</th>
<th>Date:</th>
<th>2/20/09</th>
<th>3/23/09</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am troubled by feelings of loneliness.</td>
<td></td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>I often feel sad or blue.</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>At times, I think I have had an emotional problem.</td>
<td></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>I am not interested in doing things with my friends.</td>
<td></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>I don’t enjoy visiting people.</td>
<td></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>I have no one to talk to about my problems.</td>
<td></td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>I have feelings of being trapped or caught.</td>
<td></td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>My injury has put me further away from my family.</td>
<td></td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>I would rather be alone than with my family.</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>I don’t like the way my family acts around me.</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>My family would be better off without me.</td>
<td></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>I no longer hug, hold, or kiss.</td>
<td></td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Sometimes, I would like to forget that my appearance has changed.</td>
<td></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>I feel that my burn is unattractive to others.</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>My general appearance really bothers me.</td>
<td></td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>The appearance of my scars bothers me.</td>
<td></td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Being out in the sun bothers me.</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hot weather bothers me.</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>I can’t get out and to things in hot weather.</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>It bothers me that I can’t get out in the sun.</td>
<td></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>My skin it more sensitive than before.</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Taking care of my skin is a bother.</td>
<td></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>There are things that I’ve been told to do for my burn that I dislike doing.</td>
<td></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>I wish that I didn’t have to do so many things to take care of my burn.</td>
<td></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>I have a hard time doing all the things I’ve been told to take care of my burn.</td>
<td></td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Taking care of my burn makes it hard to do other things that are important to me.</td>
<td></td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>My burn interferes with my work.</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Being burned has affected my ability to work.</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>My burn has caused problems with my working</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Affect and Relations Mean Score** | **2.56**<br>**Function Mean Score** | **2.67**<br>**Skin Mean Score** | **.71**

The need for this research was well supported based on the literature review. The methodology was well described so that this study may be duplicated. It had a large sample size, which was divided by age group. The large sample size reduces the risk of type 1 and type 2 errors. The grip and pinch assessment was utilized on my case study. I used this article to define my patient’s strength in comparison to the norms. It helped me to determine how many standard deviations he was away from the mean, which helped me to set goals for his grip and pinch strength.

Abstract: The primary purpose of this study was to establish clinical norms for adults aged 20 to 75+ years on four tests of hand strength. A dynamometer was used to measure grip strength and a pinch gauge to measure tip, key, and palmar pinch. A sample of 310 male and 328 female adults, ages 20 to 94, from the seven-county Milwaukee area were tested using standardized positioning and instructions. Right hand and left hand data were stratified into 12 age groups for both sexes. This stratification provides a means of comparing the score of individual patients to that of normal subjects of the same age and sex. The highest grip strength scores occurred in the 25 to 39 age groups. For tip, key, and palmar pinch the average scores were relatively stable from 20 to 59 years, with a gradual decline from 60 to 79 years. A high correlation was seen between grip strength and age, but a low to moderate correlation between pinch strength and age. The newer pinch gauge used in this study appears to read higher than that used in a previous normative study. Comparison of the average hand strength of right-handed and left-handed subjects showed only minimal difference.


Helm developed positioning guidelines to prevent burn scar contracture from limiting functional range of motion at the affected joints. This information is very important in supporting the use of biomechanical principles for my case study and provides rationale for the direction of stretch. It also guides my understanding of how a burn scar will contract. I did not have access to the full article to analyze the methodology, however I did utilize the diagram that shows the appropriate position of the body to prevent contracture. Further research on Helm’s specified body position is currently taking place at the ISR, specifically at the axilla in regards to the brachial plexus.

Abstract: Coincident with the recent development of more effective acute care of burn injured patients, has been the growth of dynamic, integrated rehabilitative efforts. The physical, emotional, and social problems that face the thermally injured patient must be solved in a constructive, coordinated manner within the matrix of total patient care. Most burns are minor
burns, which may be optimally treated on an outpatient basis in a physical medicine department. Hospitalized patients, with more extensive and severe burns, should have the benefit of rehabilitative team efforts immediately after injury. We describe a comprehensive approach to the rehabilitative care of the thermally injured, including the techniques of wound management, positioning, splinting, and exercise at all chronologic phases of care. The psychosocial component of patient care is also discussed and the importance of counseling and relaxation methods addressed. Specialized problems and therapeutic techniques associated with hand burns are explained and appropriate splinting methods are illustrated.


This reference was very useful in determining the models of practice to apply to my case study. It provided a general explanation of each model as well as the associated assessments and organization of treatment interventions. The Canadian MOP, Model of Human Occupation, and PEO model were described in great detail. The benefits and limitations of each model were also described.


This article helps to support the use of the DASH with the client-centered model. It was a cross sectional study that compared the scores of the DASH assessment based on diagnostic criteria. A limitation of the study is that there were significant differences in the number of subjects in each diagnostic category (i.e. 160 subjects for scaphoid reconstruction versus 31 for burn injuries). Also, the effects that a burn injury has on an individual can vary extremely depending on the depth of burn, number of joints the burn crosses, and if it is circumferencial. Each burn injury is so unique that I do not believe an assessment can establish an activity profile based on the diagnosis of “burn injury”. The DASH is a self-assessment that I plan to administer to my case study. This article was part of my literature review on this particular assessment, which provided me with a better understanding of the assessment as well as reliability data.

Abstract: The Disability of Arm, Shoulder and Hand (DASH) questionnaire is a standardized measure which captures the patients' own perspective of their upper extremity health status. Based on the scores of the DASH modules: symptoms, function and sport, this follow-up study of 590 hand-injured subjects from 11 diagnostic groups evaluated impairments and disabilities perceived 2 to 5 years postoperatively. Secondly, we explored the relationships between the diagnostic groups at the individual DASH item level. Exploratory testing of statistical significance showed that the DASH modules differentiated well among the groups (ANOVA P-value 0.001) and further differences existed at the item level, so that functional activity problem profiles could be developed for each diagnostic group. Our findings confirm that the DASH is a useful instrument for outcome evaluation. Moreover, in view of the continuing challenge to provide comprehensive care which meets patients' needs in the shortest space of time, we
consider that DASH has potential in the development of patient-centered treatment programs which are tailored to the individual patients' requirements and have relevance to their daily activities.


This piece of literature describes the development of the DASH. I thought that the number of subjects (n=20) utilized for pretesting was somewhat low, however it did allow for confirmation of understanding of the assessment and resulted in changes. The format of the assessment is based on literature review, however this is not detailed as to what references were used for the formatting decisions. Based on my critique, I feel that it adequately describes the development process and addresses future plans to complete reliability and validity research to support the use of the assessment. This assessment will be appropriate to use with my case study to better understand his abilities and symptoms. I will use this reference to cite the DASH assessment for the dissemination project.

Abstract: This paper describes the development of an evaluative outcome measure for patients with upper extremity musculoskeletal conditions. The goal is to produce a brief, self-administered measure of symptoms and functional status, with a focus on physical function, to be used by clinicians in daily practice and as a research tool. This is a joint initiative of the American Academy of Orthopedic Surgeons (AAOS), the Council of Musculoskeletal Specialty Societies (COMSS), and the Institute for Work and Health (Toronto, Ontario). Our approach is consistent with previously described strategies for scale development. In Stage 1, Item Generation, a group of methodologists and clinical experts reviewed 13 outcome measurement scales currently in use and generated a list of 821 items. In Stage 2a, Initial Item Reduction, these 821 items were reduced to 78 items using various strategies including removal of items which were generic, repetitive, not reflective of disability, or not relevant to the upper extremity or to one of the targeted concepts of symptoms and functional status. Items not highly endorsed in a survey of content experts were also eliminated. Stage 2b, Further Item Reduction, will be based on results of field testing in which patients complete the 78-item questionnaire. This field testing, which is currently underway in 20 centers in the United States, Canada, and Australia, will generate the final format and content of the Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire. Future work includes plans for validity and reliability testing.


This information provides statistical support of the validity and reliability of the DASH so that I can be more confident that it is a good assessment to utilize with my case study. Limitations of the study are that 200 subjects were initially evaluated, but only 172 were able to follow-up.
Abstract: The Disabilities of the Arm, Shoulder and Hand (DASH) outcome measure was developed to evaluate disability and symptoms in single or multiple disorders of the upper limb at one point or at many points in time. PURPOSE: The purpose of this study was to evaluate the reliability, validity, and responsiveness of the DASH in a group of diverse patients and to compare the results with those obtained with joint-specific measures. METHODS: Two hundred patients with either wrist/hand or shoulder problems were evaluated by use of questionnaires before treatment, and 172 (86%) were re-evaluated 12 weeks after treatment. Eighty-six patients also completed a test-retest questionnaire three to five days after the initial (baseline) evaluation. The questionnaire package included the DASH, the Brigham (carpal tunnel) questionnaire, the SPADI (Shoulder Pain and Disability Index), and other markers of pain and function. Correlations or t-tests between the DASH and the other measures were used to assess construct validity. Test-retest reliability was assessed using the intraclass correlation coefficient and other summary statistics. Responsiveness was described using standardized response means, receiver operating characteristics curves, and correlations between change in DASH score and change in scores of other measures. Standard response means were used to compare DASH responsiveness with that of the Brigham questionnaire and the SPADI in each region. RESULTS: The DASH was found to correlate with other measures ($r > 0.69$) and to discriminate well, for example, between patients who were working and those who were not ($p<0.0001$). Test-retest reliability ($ICC = 0.96$) exceeded guidelines. The responsiveness of the DASH (to self-rated or expected change) was comparable with or better than that of the joint-specific measures in the whole group and in each region. CONCLUSIONS: Evidence was provided of the validity, test-retest reliability, and responsiveness of the DASH. This study also demonstrated that the DASH had validity and responsiveness in both proximal and distal disorders, confirming its usefulness across the whole extremity.


This article provides further support of the construct validity of the DASH. It was interesting to me to compare the DASH to the SF-36, as I am familiar with both assessments. I was not surprised to find that the DASH yielded fewer ceiling and floor effects than the SF-36 subscales. This study did have a low participation rate, with 90/862 participating. The possibility that the sample was not representative of the population was addressed through a nonresponder analysis, which helped to strengthen the study by showing that the participants are representative of a typical upper-extremity injured population. Overall I think this is a very beneficial study with good research design that supports the validity of the DASH assessment.
Form–36 (SF-36). The study sample was 90 patients seen at the upper-extremity clinic of a university-based orthopedic practice. Patients were asked to complete a packet that included the DASH and SF-36 questionnaires. Pearson correlation coefficients of the DASH questionnaire to the SF-36 subscales ranged from $-0.36$ to $-0.62$. The DASH questionnaire had fewer ceiling and floor scores than most of the SF-36 subscales. These results support the DASH questionnaire as a valid measure of health status useful in patients with a wide variety of upper-extremity complaints.


I read and took notes on this chapter prior to arriving at my capstone site for a general overview of burn injuries. I found it helpful in preparing for the semester because it provided me with a good base of knowledge that I have expanded upon. This chapter mentioned the use of hydrotherapy for the use of burn injuries. I found it interesting that hydrotherapy is not used at my facility due to infection control concerns. I may investigate the effectiveness and limitations of this particular treatment at a later date. I have found myself looking back on this chapter to review the purpose of compression garments. The amount of pressure needed to reduce the oxygen flow/collagen production of a scar is 25 mm Hg, which can be achieved with custom made garments.

Summary: This chapter discusses the factors that increase the risk of death in a burn injury and causes of burns. The anatomy and physiology of the skin is reviewed, as well as the function of the skin. The material also covers the primary factors that determine amount of tissue damage and the different zones of tissue damage. Factors that are influenced by the depth of the burn are explained. The different types of burns are described according to skin layers affected and general characteristics. A method for assessing the percent of body surface burned is provided to determine the extent of the burn. This chapter describes a general overview of medical management of a burn injury and what occurs in the body secondary to the injury. Fluid-resuscitation is described and the importance of this treatment. An overview of burn wound management is provided regarding debridement, cleansing, medication, hydrotherapy, dressings, topical antimicrobial agents, and grafting. The role of the occupational therapist in ODL’s, ROM, splinting, and coping with a burn injury are described.


Reginald Richard is the presenter of the course and is well known in the area of burn therapy. I am lucky enough to have him as a resource while at the ISR burn unit. I took notes as I watched these videos and was able to better understand the different stages of a burn as well as the role of the therapist in treatment during these different phases. These videos contained a tremendous
amount of information and cited related research in an easy to understand manner. Photographs of burn injuries and treatments helped to reinforce the material. I plan to review the notes from these videos in the future. Mr. Richard has reviewed some of these lectures with the staff during weekly meetings, which has been beneficial in reinforcing the information.

Detailed five videos. Discussed the skin anatomy and function, burn wound assessment, classification, and graft healing related to rehabilitation, burn pathology related to rehab and the biomechanics of skin and scar tissue. Positioning and splinting, as well as scar management was also included.


This video was helpful in providing me with a better understanding how the patient is transported from foreign territory and who is involved in providing treatment. I thought it was interesting to see the set-up of the aircraft. I feel that this video can be applied my goal of understanding the culture of the military.

Summary: Short video by the San Francisco Chronicle onboard a USAF C-17 aeromedical mission from Travis Air Force Base, CA to Bagram Air Base, Afghanistan, then to Ramstein Air Base, Germany, and return to the USA. Aeromedical evacuation teams have moved over 50,000 soldiers from evacuation zones. The on flight medical crew consists of a intensive care unit doctor, intensive care unit nurse, and respiratory therapist, allowing for up to injured people to be transported.


Although some information was repeated from some of my prior readings, I felt that this chapter provided another perspective on burn care. I think that by reading several different sources, information is better remembered. I also learned about other techniques and rationales that I had not heard of before. The pictures in this chapter were also very helpful in guiding the reading to allow for better understanding.

Summary: This chapter focused on the evaluation process, treatment goals, interventions (splinting, exercise, patient and family education, positioning, ADL, scar management, skin care), return to occupational activities. Specifics of splint parameters were provided, detailed patient education, and various methods of compression garments.

This chapter provided a helpful chart for anti-contracture positioning by location of burn. It had a picture of a claw hand as a result of hypertrophic scar on the dorsum of the hand, which was helpful to see. More in depth splinting was covered, specifically about a C-splint for radial abduction and options for different conditions.

Learning Objectives: 1.) Differentiate between superficial, superficial partial-thickness, deep partial-thickness, and full thickness burn injuries, 2.) Explain the rationale for splinting and positioning programs for patients with burn injuries 3.) Outline occupational therapy treatment techniques for each phase of burn recovery, 4.) Describe potential complications and treatment strategies for hand burns, 5.) Discuss the effects of a burn injury on a patient’s psychosocial functioning.


I want to conduct an occupational evaluation for a chosen case study patient and think the FIM would be an appropriate measure to do so. This article was helpful in that it provides support for the use of the FIM for patients who have a burn injury, as well as provides subjective data by associating greater FIM scores with discharge to home and associates lower FIM scores with the need for inpatient rehabilitation. Limitations of the study include being a single center study and retrospectively determined FIM scores based on discharge summaries. The sample size of 36 may also be seen as a limitation of this study.

Abstract: Determining burn patient’s need for inpatient rehabilitation at discharge is difficult and objective clinical indicator might aid in this decision. The functional independence measure (FIM) is a validated outcome measure that predicts the need for rehabilitation services. This study evaluated the utility of the FIM score for discharge planning in burn patients. A retrospective chart review and FIM score determination was performed on all major burn patients discharged from a regional adult burn center between July 1, 1999 and June 30, 2000. From 164 adult burn patients discharged, 37 met the American Burn Association criteria for major burns. One patient had insufficient data. Therefore, 36 patients were studied. All 17 patients with FIM scores greater than 110 were discharged home, and patients with FIM score of 100 or lower were discharged to another institution (rehabilitation hospital, acute care hospital, nursing home). A discharge FIM score of 110 or lower was strongly associated with the need for inpatient rehabilitation, while a FIM score greater than 110 indicates the patient is independent enough to manage at home. Further prospective studies will be necessary to validate these findings.

This chapter was relevant to my capstone experience because amputations have occurred in conjunction with burn injuries in multiple patients at the ISR facility. This chapter provided me with some ideas I would like to try with a particular patient regarding a universal cuff. It also provided me with a better understanding of the importance of wrapping the lower extremity to prepare for a prosthetic device.

Learning Objectives: 1.) Discuss prothetic components available and appropriate for upper limb amputation levels, 2.) State options for creating prosthetic prescriptions, 3.) Plan treatment programs for persons with transradial and transhumeral amputations, 4.) Design treatment for pre-prosthetic and prosthetic management of upper and lower limb amputation, 5.) Describe the psychological implications of amputation for the patient in social and other contexts and their impact on therapeutic management.


This study is applicable to my Capstone Practicum at the Intrepid, where virtual reality is used with patients with burn and/or multiple traumas as therapy. This article supports that the use of virtual reality for treatment of adults with burn injuries will report less pain during range of motion treatments. Periodically, patients will be given the option to participate in virtual reality at the ISR. Limitations of the study were that neither the subject or the therapist administering the range of motion treatment were blind to the study. This may have influenced the subject to rate the pain differently or the therapist to administer the treatment in a different way. I think the use of distraction during therapy should be a continued focus of study for burn rehabilitation.

Abstract: Objective: The pain experienced by burn patients during physical therapy range of motion exercises can be extreme and can discourage patients from complying with their physical therapy. We explored the novel use of immersive virtual reality (VR) to distract patients from pain during physical therapy. Setting: This study was conducted at the burn care unit of a regional trauma center. Patients: Twelve patients aged 19 to 47 years (average of 21% total body surface area burned) performed range of motion exercises of their injured extremity under an occupational therapist's direction. Intervention: Each patient spent 3 minutes of physical therapy with no distraction and 3 minutes of physical therapy in VR (condition order randomized and counterbalanced). Outcome Measures: Five visual analogue scale pain scores for each treatment condition served as the dependent variables. Results: All patients reported less pain when distracted with VR, and the magnitude of pain reduction by VR was statistically significant (e.g., time spent thinking about pain during physical therapy dropped from 60 to 14 mm on a 100-mm scale). Conclusions: Results provided preliminary evidence that VR can function as a strong nonpharmacologic pain reduction technique for adult burn patients during physical therapy and potentially for other painful procedures or pain populations.

Fauerbach, J., Engrav, L., Kowalske, K., Brych, S., Bryant, A. Lawrence, J., et. al. (2001).
Barriers to employment among working-aged patients with major burn injury. *Journal of Burn Care & Rehabilitation*, 22, 26-35.

This article supports that patients who were employed prior to a burn injury are less likely to report alcohol and drug abuse, receive psychiatric treatment, and have preexisting physical disabilities compared to those who were unemployed prior to a burn injury. Most of the patients I will be working with during my capstone will have been employed in the military. This article may be difficult to associate with the military population because of the differences in culture, increased risk of post-traumatic stress, and differences in how the burn occurred. Nonetheless, it is an interesting study that takes into account pre-burn injury status as an influence of employment barriers. The methodology of this study limited the risk for type 1 and type 2 error and there was a substantial sample size of n = 770.

Abstract: The purpose of this study was to examine the prevalence of preexisting and burn-related impairments and to describe their association with preburn employment status. Data gathered during the acute hospitalization were analyzed on a consecutive series of burn patients aged 16 to 64 years (N = 770) enrolled in a prospective, longitudinal, multicenter study. Patients who were unemployed before the injury were more likely than those who were employed to report being alcohol-dependent (36 vs 18%), abusing other drugs (22 vs 10%), having received psychiatric treatment in the past year (21 vs 6%), and having preexisting physical disability (23 vs 3%); all were significant at P.


The author, Reginald Richard, is a physical therapist at Brooke Army burn unit. This article will be helpful for my capstone experience because I will be expected to design splints for patients with burns. This article discusses different methods and strategies for clinical decision making with splinting for this population. Splinting design, timing of application, and duration of use are discussed. This article raised many questions about the timing, risk and benefits, design, and duration utilized for splinting. I thought it addressed key factors that need to be considered in a therapist's decision making when utilizing splints for a burn patient and pointed out the lack of research regarding splinting for burn injuries.

Abstract: Splinting is a common burn care intervention strategy based on logical anatomic and biomechanical principles. The persistence of scar contraction requires countermeasures, frequently splints, and most clinicians would concur that splints are valuable in opposing these contraction forces. Clinical decisions about splinting are often made on respected opinion, leading mainly to design and application options. Variables that affect splinting strategy include the risk-to-benefit ratio of the splint, the timing of the application, the choice of splint design, and duration of the splinting intervention. The most common of these variables reported in the literature is simply unique designs for splints. Although there are different splint designs for similar problems, no data exist to favor one design over another. Controversy about splinting in burn care is not based on the rationale for and success of splinting but exists because of the paucity of validation of its use.
Understanding how the patient with a burn injury will adjust after hospital discharge is important for my capstone site population. I will be able to apply this knowledge to better understand how to prepare patients during the recovery process for transitioning into the community. This article also provides helpful assessments that I can use. This longitudinal study did not provide a lot of detail about all the assessments utilized as independent variables. Also, forty-one people dropped out of the study from the time of the initial data collection where n = 110. This significant number of dropouts could have changed the results of this study. This subjects could be different then those that remained in the study. It was interesting to find out about the changes that occur in self-care, mobility, pain, community integration, emotional distress, and life satisfaction across time periods for people with burn injuries.

Abstract: To determine 1) change over time in Quality of Life (QOL) and 2) functional, community reentry, and psychosocial predictors of QOL, data were prospectively collected from adults with major burn injury 2 months after hospital discharge (n = 110) and 6 (n = 97) and 12 (n = 69) months after injury. The dependent QOL variable was the Burn Specific Health Scale (BSHS) and the predictor variables were Brief Symptom Inventory, Functional Assessment Screening Questionnaire, Functional Independence Measure, Pain Analog Scale, and Community Integration Questionnaire. BSHS global scores were unchanged across the measurement periods. Stepwise multiple-regression analyses resulted in statistically significant multiple R s of .79 at 2 months, .81 at 6 months, and .76 at 12 months. Variables predicting more favorable BSHS global score were less emotional distress and pain at 2 months, less emotional distress and pain and better community reentry at 6 months, and less emotional distress and better community reentry at 12 months.


This article discusses how my capstone site has experience and been involved with planning for burn disasters and relates it to Operation Iraqi Freedom. It is helpful to understand the level of preparedness of this site and how the medical care of many people admitted at the same time is managed. This article provides an analysis of two occasions that the mass casualty plan was implemented, including the hours of staffing necessary, number of hours of sleep for burn staff, and equipment necessary.

Abstract: While many burn centers have intricate disaster plans that they practice routinely with simulated exercises, few have ever had the opportunity to actually test them. This article describes some of the lessons learned when two different situations necessitated implementation of one unit's mass casualty plan.
This series of six videos portrays the burn unit at Brooke Army Medical Center and the Intrepid. It provides insight to the culture of the facility, which is an objective included in my proposal. The video discusses the family support provided at BAMC, as well as interviews of therapists, patients, and family members. It shows the facility, the Fisher Houses that provide a home for the family while that patient is going through treatment, and parts of treatment sessions. These videos depict the environment at this facility very well, including the amazing teamwork, the soldiers overcoming injuries and engaging in life, the support that the soldiers provide to each other, the feeling that the therapists feel honored to work with these people.


This article was helpful in supporting the importance of getting patient’s out of bed for ambulation, tilt table, or the Movejo. It feel it is important for me to explain to staff, patients, and families why I am doing a particular treatment. This article was beneficial in providing me the understanding of why I am getting patients out of bed and the importance of monitoring the blood pressure while the patient assumes a vertical position. This article discusses the affects of prolonged bed rest on the body. Cardiovascular effects include a decreased capacity of the heart, decreased plasma and blood volumes, and an impaired control of blood vessels. A decrease in hydrostatic pressure will cause patients to develop orthostatic intolerance, which is the inability of the circulation to adjust to an upright posture. If a patient has developed orthostatic intolerance and assumes a vertical posture, they will experience a sudden decrease in venous return of blood to the heart. As a result, the heart rate will increase rapidly to increase cardiac output. The blood pressure will fall causing the patient to feel dizzy or faint. A patient’s orthostatic tolerance can improve by spending more time in an upright position. Other effects of bed rest include decreased muscle mass and psychological effects. Bone demineralization and calcium loss will increase because of the decreased longitudinal stress on bones. Weight bearing bones are especially vulnerable.


The Code of Ethics is relevant to my Capstone, as well as my future career as an occupational therapist. It was beneficial to review this document to provide me with a base for ethical decisions I will have to make.

Preamble: The Code of Ethics is a public statement of principles used to promote and maintain high standards of conduct within the profession and is supported by the Core Values and Attitudes of Occupational Therapy Practice American Occupational Therapy Association (AOTA, 1993)…The specific purpose of the AOTA Occupational Therapy Code of Ethics
(2005) is to: 1) Identify and describe the principles supported by the occupational therapy
profession, 2) Educate the general public and members regarding established principles to which
occupational therapy personnel are accountable, 3) Socialize occupational therapy personnel new
to the practice to expected standards of conduct, 4) Assist occupational therapy personnel in
recognition and resolution of ethical dilemmas


*I reviewed this chapter to prepare for observation with the respiratory therapist. It assisted me
with generating questions regarding the profession’s role in burn care. I plan to ask questions
involving how to determine the need to intubate, how to diagnose an inhalation injury, when to
extubate, and equipment utilized.*

Summary: Chapter content includes bronchial hygiene therapy, mechanical ventilation, infection
control of respiratory equipment, late complications of inhalation injury.


*I reviewed this chapter to better understand the effect of a burn injury on different body systems.
Some of the information was difficult to understand, however I feel like I still obtained
information regarding general terminology and why the kidney can fail in response to a burn
injury. Key pieces of information included the importance of the glomerular filtration rate
(GFR) in diagnosing kidney problems, which is calculated by looking at the levels of creatinine
(breakdown product of muscle) in the blood. Decreased GFR in a burn injury can be due to
hypovolemia (decreased volume of blood plasma), depressed myocardium (cardiac output),
extrinsic compression, or denatured proteins (rhabdomyolysis). This information will help me to
better understand what is being discussed during medical rounds.*

Summary: Chapter content includes definition, etiology of acute renal failure, diagnosis of acute
renal insufficiency, and treatment of acute renal failure.

rehabilitation of the burn patient. In D. Herndon (Ed.), *Total Burn Care* (pp. 620-650).

*I found the pictures to be very helpful. This chapter offered practical information with detailed
instructions regarding compression garments. Coban for the hand and ace wrapping were
discussed. Each area of the body was discussed treatment interventions. I also liked how
prosthetic devices were discussed, as amputation is common at my site.*
Summary: Chapter content includes positioning and splinting of the burned patient for the prevention of contractures and deformities, skeletal suspension and traction, prosthetic and orthotic intervention, burn scar management, exercise for the outpatient.


I plan to use the biomechanical model for my case study. This text outlined the biomechanical model nicely by outlining the biomechanical approach to treatment. Research regarding the effectiveness of stretching, strengthening, and endurance occupations were cited which will support my rationale for using this model.

Learning objectives for this chapter included: 1) state the biomechanical and physiological mechanisms that underlie therapeutic exercise and occupation, 2) apply the methods of movement, positioning, and compression to prevent limitation of range of motion, 3) apply the principles of the biomechanical approach to increase range of motion, strength, and endurance as needed for occupational performance, 4) apply these principles to the selection of occupations as a means for treating range of motion, strength, and/or endurance problems, 5) design treatment goals and therapy for clients who have problems with range of motion, strength, and/or endurance to enhance occupational performance.


I administered the BSHS-B to my case study patient. This scale provides great psychosocial information, as well as information on how the patient’s skin regime effects their daily life. Ability to perform occupations of daily living are also addressed. This particular article determined that there are nine domains of the scale. This research had a large sample size and adequate factor analysis to determine nine domains for a scale utilized for patients with burn injuries.

Abstract: BACKGROUND: The Burn Specific Health Scale (BSHS) is an outcome scale designed specifically for burn patients. The scale has been abbreviated (BSHS-A) and revised (BSHS-R). We used a factor analytic approach to further improve the scale for clinical use. METHODS: Two hundred forty-eight of 350 former patients (70.9%) treated at the Uppsala Burn Unit between 1980 and 1995 responded to 94 questions from previous versions of the BSHS. RESULTS: Principal components factor analyses were used to derive an instrument with 40 items called the Burn Specific Health Scale-Brief (BSHS-B), resulting in nine well-defined domains with intercorrelations ranging from 0.11 to 0.56, and Chronbach’s factor alphas ranging from 0.75 to 0.93. The domains describe function with respect to Heat Sensitivity, Affect, Hand Function, Treatment Regimens, Work, Sexuality, Interpersonal Relationships, Simple Abilities, and Body Image. CONCLUSION: The BSHS-B is a valid but shorter alternative to the
previously described BSHS-A. Important domains of postburn distress are captured better in the BSHS-B than in the BSHS-R.


Willebrand and Kildal narrowed the BSHS-B down to four domains in this published research. I subsequently utilized four domains when calculating the scores for my case study patient. This study has well defined inclusion criteria, an adequate sample size, and detailed methodology regarding factor analysis. The results of this research support the BSHS-B as having both reliable and valid domain scores.

Abstract: Background: Injury-specific instruments with good psychometric properties are valuable in the assessment of health status after trauma. Previous studies of burn-specific health have attempted to create broad domains such as physical and psychological health, but these domains have not been validated. In this study, burn-specific health domains were explored and validated by a factor analytic approach. Methods: Participants were 334 former burn patients injured between 1980 and 2000. Data were collected from medical charts and by a postal questionnaire, the Burn Specific Health Scale-Brief (BSHS-B). The nine subscales of the BSHS-B were subjected to second-order factor analysis. The sample was split into two subsamples that were equal with respect to burn severity. Results: The factor structure was well replicated in each of the subsamples and in the total sample. Three internally consistent and well separated domains were derived: affect and relations (BSHS-B subscales interpersonal relationships, affect, sexuality), function (simple abilities, hand function), and skin involvement (heat sensitivity, treatment regimens, body image). The work subscale of the BSHS-B was excluded from the analysis because of consistent double loadings. The three domains had intelligible associations with injury-specific and sociodemographic variables. Conclusion: The underlying structure of the BSHS-B comprises three clinically meaningful health domains. The work subscale is not part of these domains and can be considered a separate outcome domain. The domain scores increase the understanding of outcome after burn injury and could prove useful in clinical use of the BSHS-B.


This reference was provided to me by Dr. Thomas in order to assist me with goal writing. The information was very helpful and there were several good examples of goals written in the appropriate format. Explanations were provided regarding each part of a goal as well as a list of examples of how to make a goal measurable.

I facilitated a cooking group with my case study patient. Some of the benefits that were reported in this study were also perceived by my case study patient, such as less anxiety in the kitchen and a way to meet other people with a similar injury. I feel that cooking groups are a great way to assess an individual's independence in the kitchen, improve standing tolerance, facilitate conversation with others, and problem solve through difficulties in the kitchen because of the burn injury. Responses to open-ended questions were listed in the article, which helps to support the benefits of the group. Limitations of this study are that subjects were taken from one collection site and that it is a self-report survey that may have allowed for bias.

Abstract: The purpose of this study was to evaluate the therapeutic efficacy of the cooking group from the burn survivors’ perspective. By incorporating concepts of kitchen skills, energy conservation, and desensitization techniques, the cooking group can assist patients with the functional use of their hands, standing tolerance, return to former vocational activities, and socialization with other patients. A questionnaire was developed based on commonly expressed benefits of cooking group. Areas of interest included decreasing anxiety in the kitchen, distraction from their burns, socializing with other burn survivors, and the physical benefits of participating in the group. The results of this study indicate that participants regard the therapeutic cooking group as a valuable treatment modality that effectively combines functional activities with socialization to decrease burn related anxiety and increase motion in a supportive environment for patients with burns.


I utilized the figure-eight method of measuring edema several times during my capstone practicum. It was informative to read this article and provided me with confidence that this method of measurement was a reliable and valid way of measuring edema. This research helps to support a method of measuring edema that is cost-effective and time efficient. It is also a more practical means of measuring a patient with burn injuries, especially while in the inpatient unit. The article describes the methodology well and also has helpful pictures to supplement the instructions for taking figure-eight measurements.

Abstract: The purpose of this study was to examine reliability and validity of a new method of measuring hand size in which a tape measure is wrapped around the hand in a figure-of-eight pattern. In the first experiment, two testers measured hand size in 60 individuals with no recent history of injury or surgery. Intraclass correlation coefficients of 0.99 and 0.97 indicated high intratester and intertester reliability. In the second experiment, concurrent validity of the figure-of-eight method was examined using volumetry as the criterion measure. Right hand size of 25 individuals with no recent history of injury or surgery was measured using the figure-of-eight method and volumetry. Pearson correlation coefficients of 0.94 indicated high concurrent validity. This study demonstrated reliability and validity of the figure-of-eight method of measuring hand size. To establish clinical usefulness, these findings must be replicated in individuals undergoing hand rehabilitation.

This book provided with explanation regarding burn scar contracture, the effects of prolonged stretch and the skin structures involved. I only referenced a chapter in this book, however plan to utilize this book in the future to further my understanding of burns.

Summary: This book provides comprehensive information on the anatomy and pathology of burn injury, care procedures, prevention of complications, discharge plan, and follow-up based on the clinical and teaching experience of the authors. The main purpose is to provide in-depth information for practicing occupational/physical therapists on the care of burn patients. Although the primary audience is practicing occupational/physical therapists and therapist assistants, it is also appropriate for residents in physical medicine and rehabilitation. Materials in the book can be used for patient/family education. The black-and-white illustrations in this book are sufficient, appropriate, and well presented for reinforcing the information discussed in the text. The authors organize the contents into four sections, with most of the discussion in "rehabilitation" and "concerns" stressing the important, but often overlooked, issues in burn care. This book appears to meet its goal in discussing the rehabilitation principles and practice of burn care suitable for many hands-on clinicians.


I was able to discuss this research with the first author, Reginald Richard. It was provided to me by the author after seeking out research that supported the use of passive range of motion for hand burns to support intervention performed with my case study. Passive range of motion is a well practiced treatment for hand burns, however there is little research that shows the effects. This article helps to support the use of passive range of motion and static wrapping, however has limitations. The main limitation is that the sample size of six does not allow for an adequate number of subjects to strongly support the results.

Abstract: A prospective study was undertaken to compare the use of passive exercise with that of static wrapping to increase finger flexion range of motion in burn patients. Six patients (four males and two females) with combined full- and partial-thickness dorsal hand burns were randomized to receive either treatment. Results showed that metacarpophalangeal (MCP) joint flexion improved an average of 7.46 degrees with passive exercise and 2.65 degrees with static wrapping. Proximal interphalangeal (PIP) joint flexion improved an average of 9.68 degrees with static wrapping and 4.28 degrees with passive exercise. The percentages of improvement in the MCP joint with passive exercise and static wrapping were 8.53% and 2.92%, respectively. In the PIP joint, the respective percentages were 3.69% and 8.09%. All differences were statistically significant at a P value of less than .001. It was concluded that in the rehabilitation of hands and/or fingers with recently healed burns, manual passive exercise is significantly better than static wrapping for increasing MCP joint flexion, while static wrapping is more effective for increasing PIP joint flexion.

This research supported the use of the Canadian Occupational Performance Measure with my case study client to increase his perception of active participation in the rehabilitation process. This study was interesting to read because I was able to see similar results with my case study client, which has made me a strong believer in the use of the COPM. The limitations of this study were that there was a large number of dropouts, two people completed the interviews, and the interviewers were not blinded.

Abstract: The aim was to evaluate whether the use of a client-centered instrument, the Canadian Occupational Performance Measure (COPM), affects the patients' perception of active participation in the rehabilitation process. The study included 155 patients in the experiment group and 55 in the control group, within geriatric, stroke, and home rehabilitation. The COPM was used in the experiment group. A structured interview was performed within 2-4 weeks after discharge with 88 patients in the experiment group and 30 patients in the control group. The results show significant differences between the groups. More patients in the experiment group perceived that treatment goals were identified, were able to recall the goals, felt that they were active participants in the goal formulation process, and perceived themselves better able to manage after completed rehabilitation compared with patients in the control group. The study indicates that the COPM improves client participation in the rehabilitation process.
Figure 1. Composite hand flexion. Note the limited left hand composite flexion secondary to scar contracture.
Figure 2. Client working on the mosaic table project during outpatient rehabilitation.
Figure 3. Community integration outing to Sea World.
Figure 4. Cooking occupation in the occupations of daily living apartment.