Return to work: the value of the occupational therapy in upper extremity physical disability

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Abstract
The present case study discusses the occupational therapy intervention for a client seen in an outpatient clinical setting. The client had residual impairment after having a right forminotomy and microdisectomy in the cervical region of the spine. After surgery, the client continued to have weakness and decreased functional use of the right upper extremity secondary to nerve impairment. The client decreased active range of motion and weakness in the right upper extremity. Occupational therapy was referred to in this client’s case in order to help the client with return to work needs and further assist in functional rehabilitation of right hand use. The client worked both as a data-entry clerk and a cashier and the goal of occupational therapy was to return the client to both jobs. Intervention techniques employed both Mosey’s Role Acquisition and the biomechanical models of practice. Use of the Role Acquisition model of practice was seen as valuable and unique in the outpatient clinical setting where the focus is primarily on physical disabilities. The model of practice guided the intervention with specific focus on the teaching-learning process and simulated to naturalistic occupations. With the use of dynamic splinting, jobsite evaluation, and occupational interventions the client was able to return to working at both jobs. The value of the occupational therapist engaging in community-based practice and acting as a care coordinator is also discussed.
Introduction

The present case study will review the evaluation, intervention, and outcomes for a client participating in outpatient occupational therapy. The client chosen for this case study was a 58-year-old woman who underwent a foraminotomy and microdiscectomy in her cervical and thoracic spine. The client will be referred to as Grace. Grace’s primary areas of impairment were right upper extremity weakness and decreased active range of motion secondary to nerve impairment.

Intervention techniques were primarily based upon two occupational therapy models practice. The first model of practice used was the Role Acquisition frame of reference created by Mosey in 1986. This model is grounded in two primary skills, task and interpersonal, that inherently exist in all individuals (Mosey, 1986). Each individual also has four primary roles that she must fulfill. These roles include family, occupations of daily living, work, and leisure. Each role of Grace was carefully addressed and discussed at the initial evaluation through interview. According to Mosey, the successful interaction of the roles and skills will lead to a healthy individual (Mosey, 1986). At the heart of this particular model of practice is the teaching-learning process. It is the relationship of the occupational therapist who is the teacher and the client who is the learner that leads to occupational success.

Secondly, the biomechanical model of practice was used to determine underlying biomechanical functions of Grace. By addressing the biomechanical aspects of Grace’s movements, functional motion could be addressed in occupational performance.

Grace’s case is unique in nature due to the effects her injury and subsequent surgery had on occupational performance. At the time of evaluation, the exact scientific and medical extent of remaining deficits was unknown. She did not present with a common diagnosis, such as radial


nerve palsy. Instead, it was determined by the occupational therapist that Grace had both nerve damage to the ulnar, medial, and radial nerves in varying degrees. The nerve damage affected both sensory and motor aspects of the right upper extremity. She was very motivated from the onset of occupational therapy to return to work. Her case also provides the unique scenario of on-site job analysis, the role of the occupational therapist as care coordinator, as well as the value of interfacing with multiple health-care professionals outside of occupational therapy.

Evaluation

Grace was initially referred to occupational therapy by her neurosurgeon, per the recommendations of her physical therapist. The physical therapist, with whom Grace had been working, felt occupational therapy would be appropriate in order to help Grace return to work. Physical therapy had been focusing Grace’s cervical region, right shoulder, biceps, and triceps strengthening. More specifically, Grace’s physical therapy intervention focused primarily on strengthening the triceps, biceps, rotator cuff, levator scapulae as well as active range of motion in the humerus and scapula. Techniques were primarily based in increasing postural control.

Grace’s physical therapist believed Grace would benefit from occupational analysis regarding work tasks as well as a more in-depth evaluation and possible intervention for right finger function.

Grace was evaluated by the occupational therapist on January 14, 2009 at an outpatient occupational therapy setting. She is a 58-year-old Caucasian woman who underwent a right T7 and C8 forminotomy and a right C7-T1 microdisectomy on December 18, 2008. Prior to surgery, she had the diagnoses of right C7 foraminal stenosis and Right C8 disc herniation and radiculopathy.
Grace stated that early one morning in August of 2008, she was startled by a noise outside while sleeping in her bed. She quickly rose out of bed with her right upper extremity extended and shoulder internally rotated which she claims immediately went numb and tingled. Grace tried to continue with her daily occupations as normal for several weeks however, continued to experience ongoing right-sided weakness and numbness. Prior to onset, Grace was independent with all occupations of daily living and work-related tasks. She worked both full-time as a data-entry clerk in an accounting department and part-time as a cashier at a department store. Grace stated several times during the evaluation she was frustrated with the lack of use her right arm and hand had. She also stated her concern in returning to work.

At the initial evaluation, many standardized measurements were taken involving strength and range of motion (ROM). Right active ROM were as follows: Thumb MCP and DIP within normal limits, Index finger extension/flexion MCP = 0/90, PIP = 0/100, DIP = 0/90, Long finger extension/flexion MCP = 45/90, PIP = 20/100, DIP = 0/40, Ring finger extension/flexion MCP = 45/90, PIP = 0/100, DIP = 0/30, Small finger extension/flexion MCP = 0/90, PIP = 0/100, DIP = 0/30. Grace was unable to actively extend the right long and ring fingers off the table. Grace showed good opposition of her right thumb to all digits. Right wrist extension/flexion measurements were +52/50. Right upper extremity strength measurements were as follows: triceps 3-/5, biceps 4+/5, pronation 4-/5, supination 4+/5, wrist flexion 3/5, wrist extension 3+/5, thumb abduction 3-/5, thumb adduction, 3-/5, extensor carpi ulnaris 3-/5, extensor carpi brevis and longus 3+/5. Left upper extremity strength was within normal limits for all muscles aforementioned. It was also noted during the evaluation that there was muscle atrophy in the right 1st web space. Grip strength was measured with a dynonometer in the standard neutral position. Left grip strength was 46#, right grip strength was 22#. Normative data for left grip
strength for Grace’s age is 47.3#, whereas right grip strength is 57.3# (Mathiowetz, Kashman, Volland, Weber, Dowe, & Rogers, 1985). Lateral pinch strength for the right hand was 6# and the left hand was 12#. Tip pinch strength for the right hand measured 5# and the left hand measured 9#. Normative data indicates for Grace’s age and gender lateral pinch is 15.7# for the right hand and 14.7# for the left hand (Mathiowetz et al., 1985). Tip pinch normative data is 11.7# for the right hand and 10.4# for the left hand for Grace’s age (Mathiowetz et al., 1985). Grace claimed to write with her left hand however, stated prior to injury she completed the majority of tasks with her right hand, particularly tasks related to her job.

At the time of evaluation, Grace complained of no pain. She stated she frequently had tingling in all digits, including the thumb, of the right hand. Grace stated, “It feels like pins and needles almost all the time.” She also said the right dorsal forearm, “just feels different.” A test with Semmes-Weinstein monofilaments, revealed she had decreased light touch sensation yet protective sensation was still intact in the C-7 and C-8 dermatome distribution (Bell-Krotoski, 1990). In terms of occupational deficits at evaluation, Grace had difficulty reach overhead into cupboards, turning a key, buttoning, opening jars, turning door knobs, typing, and lifting. She was also on a leave from both employers however, was verbal in stating her eagerness and motivation to return to work.

In addition to the standard biomechanical based evaluation tools, an interview was also completed. The occupational therapist completed an interview with Grace in accordance to the Role Acquisition model of practice. Grace was queried about her roles in her family, occupations of daily living, work, and leisure. Grace stated she assists in the care of her granddaughter who lives with her. Grace is the one who takes her granddaughter to school each day. She also stated difficultly with completing everyday tasks due to problems with strength and range of motion in
her right arm. She stated the importance returning to work because her leave of absence terminated in less than two months. Finally, Grace reviewed her leisure interests which primarily consisted of scrapbooking and going to the movies. Throughout the interview process, Grace reiterated several times “my right hand just won’t work” and “I have to get back to work. My hand has to start working better so that I can to return to work.” Grace was realistic in her goal-setting process and open to any intervention techniques that would enhance her ability to return to work.

Goal-setting

Throughout the evaluation process, several long-term goals were set. The following goals were meant to be met within 8 weeks of participation in outpatient occupational therapy:

1. Grace will type with right hand without difficulty for a 15 minute period of time.
2. Grace will control a computer mouse with right hand for a 15 minute period of time.
3. Grace will independently fasten car seatbelt with right hand 3/3x’s.
4. Grace will grasp and control objects with right hand, without dropping, 2/3x’s.
5. Grace will be independent with a home program.
6. Return to work as data-entry clerk.

Both the first and second goals were appropriate due to Grace’s primary job requirements. One of Grace’s main responsibilities is inputting account and billing information for a medical company. Much of her eight hour day is spent in front of a computer entering account numbers while navigating the computer with a mouse. These goals are in accordance with the models of practice because it focuses on helping Grace to return to work. Returning to work will allow Grace to fulfill her worker role. Successful completion of the goals was based on both modifying environmental factors and utilizing occupational adaptation.
The third goal above is appropriate because Grace was having difficulty fastening her car seatbelt secondary to wrist instability. As stated above, in the evaluation section, Grace had overall weakness in her right hand. Particularly, Grace had decreased wrist stability which likely contributed to the inability to fasten her seatbelt. A person needs to have stability, which stems from the co-contraction of both flexor and extensor muscles originating from the forearm, in order to force or push an object forward with the hand. A good example of the co-contraction or stability needed is exemplified by fastening a seatbelt. Without co-contraction of the muscles, the wrist will buckle due to instability. She stated this particular inability when she talked about the things she was unable to do. Her ability to independently fasten a seatbelt is important to fulfill roles she has both in her family and at work because she is primarily relied on for transportation.

The fourth goal above focuses on the general inability for Grace to grasp and control objects. She stated throughout the evaluation process that she has difficulty grasping objects due to limited extension of the long and ring fingers. Grace also said that once she had a hold of objects she frequently would drop them due to weakness and lack of control. She said at the evaluation it was frustrating to her to occasionally drop objects and have “a feeling of no control.”

The fifth goal focuses on independence with a home program. Success in occupational therapy very much depended on what Grace achieved both in and out of the clinic. Therefore, providing Grace with handouts, demonstrations, and verbal ideas of things to complete at home was formed into a goal. Ensuring she understood her home program was an important component of therapy. Her home program focused on neuromuscular re-education, therapeutic exercises, and occupations.
The final goal focuses on returning Grace to work at her primarily place of employment. Returning to work was very important to Grace. The occupational therapist was also given the opportunity to complete an onsite job evaluation which offered great insight for intervention methods. Her case study offers a unique look at the potential role of the occupational therapist as care coordinator.

**Interventions**

A variety of intervention techniques were used to address the unique developmental structure of Grace. From the onset of participation in occupational therapy, Grace’s main goal was to return to her primary job, data-entry, and possibly her second job, a cashier. She repeatedly stated the need to return to work. Therefore, occupational therapy goals were compiled in order to help her achieve that goal. The focus in occupational therapy was to work with her in order to master adaptational and compensatory techniques. Mastery in these two techniques would help Grace to achieve a smooth interaction of both skills and roles, leading to a healthy developmental structure, according to Mosey (1986). It is through adaptation that Grace achieved internal changes in her developmental structures that ultimately impacted occupational performance (Nelson & Jepson-Thomas, 2003). Through occupational compensation, Grace worked around residual motor deficits. Grace’s unique experiences, led to change in her occupational performance. It was unknown at the time of the initial evaluation whether Grace would be permitted by her physician to return to work and at what capacity he would permit her to do so.

Initial occupational therapy forms utilized with Grace were based out of the outpatient therapy facility. Prior to the initial evaluation, Grace was actually screened by the occupational therapist. After surgery, Grace began participating in outpatient physical therapy. However, due
to Grace’s desire to return to work and nerve impairment affecting function, Grace’s physical therapist suggested she be screened by the occupational therapist. The screening consisted of active and passive range of motion and manual muscle testing of the right upper extremity. It was determined at this time that Grace could benefit from occupational therapy to focus more specifically on return to work needs. The physical therapist contacted Grace’s neurologist to recommend occupational therapy. One week later, Grace completed her initial evaluation in occupational therapy. However, prior to even beginning occupational therapy officially, Grace already had her physical therapist, the facility itself, and the occupational therapist as part of her occupational form. Throughout participation in occupational therapy, the occupational and physical therapists consulted with each other regarding Grace’s progress and plan of care. Both disciplines played an important role throughout Grace’s rehabilitation.

At the beginning of Grace’s occupational therapy participation, focus was primarily on increasing Grace’s overall strength through the use of both preparatory and purposeful activities. The use of these aforementioned methods was done using the following occupational forms: free weights on an elevated surface, hammer, digiflex, hand helper, and flexbar. Functional electrical stimulation was also use to increase extension of the long and the ring digits on the right hand and to help facilitate retraining of the muscles. The electrodes were applied over the dorsal surface of the right arm and repositioned if needed. Functional electrical stimulation was used because her injury involved healing nerves and the central nervous system had not been receiving feedback from the extensor muscles due to weakness. According to Kasch, nerve regeneration occurs at a rate of 1 inch per month (Kasch, 1996). Recall that her injury occurred only five months prior to beginning occupational therapy and compression of the nerve occurred at the spine. Settings on the stimulation unit were a pulse duration of 300 microseconds,
frequency of 40 pps, and a duty cycle with a 1:2 ratio or 5 seconds on and 10 seconds off. In order to make the electrical stimulation more functional, Grace was required to use a circular power grasp. Grace had to use a the circular power grasp to move weights, mugs, plastic cups, and aerosol containers from one end of a three feet long table to the other end. She approached objects from the top, which required her right hand pronated and the digits to extend. The approach movement occurred while the functional electrical stimulation was on for 5 seconds. Within five seconds her hand was in position. Once the electrical stimulation turned off, she eccentrically controlled finger flexion to grasp the object. She was allowed 10 seconds to grasp and move the object, by picking it up, across the table. The cycle repeated for a 10 minute time period per session. The occupational therapist used this technique because the potential meaning for Grace because it was embedded into functional task versus just using the electrical unit for rote muscular stimulation. The task likely had further meaning for Grace because it also simulated a component of her job requirements as a cashier. The occupational therapist hoped to use this technique to increase the stamina and interest of Grace in the task because it involved occupation. Involvement of clients in occupation is one of the foundational concepts to the field of occupational therapy. Previous studies have demonstrated the value to embedding occupation and purposeful activity into exercise for different medical populations (Steitsems, Nelson, Mulder, Mervau-Scheidel, & White, 1993; Zimmer-Branum & Nelson, 1995; King, 1993). Previous studies have found that functional electrical stimulation has helped in the rehabilitation of patients who had nerve impairment after cerebral vascular accident and spinal cord injury in terms of hand function, including grasp (Thrasher, Zivanovic, McIlroy, & Popovic, 2008; Mangold, Keller, Curt, & Dietz, 2005). A research review revealed no studies on the
implementation of neuromuscular stimulation for the intervention of cervical disc herniation or radiculopathy.

As therapy progressed, Grace talked more in-depth about her role as a worker. As previously stated, it was very important and meaningful for her to return to work for her own psychosocial well-being and to begin earning wages again to help support her family. In therapy, Grace discussed various roles and responsibilities she had at her data-entry job. After two weeks of attending outpatient occupational therapy in the clinic, an onsite job analysis was completed at Grace’s site of employment.

The therapist gained unique information from taking what was previously only talked about in the therapy sessions to the naturalistic environment. While on the jobsite, Grace walked through her typical day with the therapist in approximately an hour period of time. Grace’s supervisor was also part of the occupational form. She was primarily there just to watch and observe Grace and the therapist walk through the jobsite. Several times throughout the evaluation, Grace’s supervisor queried the therapist about Grace’s condition. Furthermore, Grace’s supervisor was concerned with the effect Grace’s condition would have on occupational performance. The therapist explained to Grace’s supervisor, with Grace present, a brief description of the injury and therapeutic goals. The therapist made a point to explain the healing process and the likely need for some type of compensation.

The majority of Grace’s day, approximately 80%, is spent looking up account numbers and entering data on her computer. Her typical work day is from 8:00 AM until 4:00 PM, Monday through Friday. She also is in a three week rotation with her co-workers in additional duties from solely data entry. The summary of the evaluation is as follows.

*Occupational form and work environment*
Grace works in a small cubicle, approximately six feet wide and three feet deep. There is an “L-shaped” desk that runs about half the distance of the width of the cubicle and the entire length of the depth. There also is a four drawer metal filing cabinet next to the longer end of the desk. Grace also has several family and friends pictures hanging on a bulletin board across from the filing cabinet. The computer station sits along the longer wall, near the apex of the “L” portion on the desk. The desk remains primarily free of any other objects, besides a stapler and filing bin, for Grace to place accounting papers. Dimensions of the computer station are as follows: the desk sits 31” from the floor, the top of the computer monitor measure 12” from the desk because it sits on the side lying computer tower, the edge of the desk to the keyboard measures 5”, the mouse pad was 4” away from the keyboard, the distance from the floor to the seat of the chair was 19”, and 7” was the distance from the seat to the armrest. Grace also sat with her eyes approximately 18” away from the computer screen. Grace’s cubicle schematic can be found in Appendix A.

As stated above, Grace was on a rotation with co-workers to complete additional work duties. Every three weeks, Grace would change between completing mail sorting tasks and scanning accounting materials. Both the scanning and the mail sorting work tasks take place off the larger office space that houses all of the employee cubicles. Upon entry into the smaller room, there is a table with piles of papers along a wall of mailboxes to the immediate left of the door threshold. The smaller room is approximately 9’ by 8’ in size. There is a long desk attached to a 6’ wall that has two computers and two scanning machines set up on it. Approximately half the width of the long wall has a large shelving unit with 64 open compartments. The entire wood shelving unit is 7” wide and 9” in height. The highest shelf if 72” high and the lowest self is on the floor. Nine inches separate each of the 8 shelves. In front of the shelving unit, 4 banker style
boxes sit on the floor. There is also a table that has boxes on top of it in front of the shelving unit. The table also houses many boxes both on top and under the table. See the Figure A for a schematic of the sorting and scanning room. The work room schematic can be found in Appendix B.

Required Occupational Performance

Grace spends the majority of her day in front of her computer. While she is working, she frequently has to get up from her computer station in retrieve account information. Retrieval of documents typically takes place in the smaller room discussed in the above section or from a co-worker in a nearby cubicle. She often needs to use a power grasp to pull open filing cabinets and a hook grasp to lift boxes for document retrieval. While at her computer, Grace is usually flipping through papers to get account numbers in order to input numbers onto her computer along with payments and balances. This task requires her to use the number key with her right hand and fingers almost continuously. Prior to injury, Grace stated she completed this task with ease and never needed to look down at the keyboard.

As stated above, Grace is required to complete either mail sorting or scanning on a three week rotation between the two occupations. The mail sort task requires Grace to stabilize papers with her right hand and use her left hand to sort through items. If there is a large stack of papers, she will set the papers down on a table in the scanning/sorting room and use both hands to sift through papers. Sorting through the mail also requires opening varying shaped and sized envelopes. She opens the envelopes with a letter opener, remove the papers, and sort them into the appropriate employee box. Sorting mail requires Grace to use both lateral and tripod pinch use. While on the mail rotation, Grace will have to complete this task two times each day. She
stated it requires a varying amount of time each day ranging from approximately 20 minutes to 60 minutes.

When Grace is on the scanning task rotation, she also is working in the smaller room. For this task, she is required to scan accounting papers using a machine connected to a computer. The scanning process allows for all accounting papers to be automatically dated. Once scanned, the stacks of dated materials are clipped together using varying sized binder clips. The stacks of clipped papers are then filed in the large shelving unit previously discussed. This task requires Grace to use one of the two scanning and computer combinations. The computer is used very minimally, Grace only has to turn it on and navigate with the mouse for a few clicks to pull up the scanning program. However, once items are scanned Grace is required to use one of three differently sized binder clips to clip scanned items together to be filed. Files either go into a box or into the expansive shelving unit. The task may require Grace to lift boxes off the floor and complete overhead reaching.

At the jobsite evaluation, Grace expressed concern on her ability to complete certain aspects of her job due to her injury. She was concerned about navigating her computer with the computer mouse, using the number pad, lifting overhead for shelving documents, sorting papers, and clipping papers. Her concerns about job performance were realistic. Therefore, some focus in the clinic was modified to address her concerns.

In addition to overall strength and conditioning, Grace’s time in the clinic began to focus on requirements for her job. Clinical simulation focused on the areas Grace was concerned with. The occupational therapist incorporated both compensatory and adaptational techniques with Grace. Grace was on a specific time schedule in terms of return to work. From the time of the jobsite evaluation, Grace had five weeks off before her medical leave from work officially
ended. Therefore, intervention methods focused on achieving successes in multiple areas of occupational performance that were job task specific. Due to time constraints in terms of return to work, mastery of all job tasks was simply not a viable undertaking.

Through occupational analysis, the occupational therapist and Grace worked together to figure out what types of simulation to complete. For example, one intervention method used focused on pinch strength. This area of occupational performance was addressed by Grace using a variety of sized binder clips and resistive clothes pins to clip papers together. The occupational therapist had Grace use the resistive clothes pins first, to appropriately grade the occupation using a tripod pinch. Over the course of six therapy sessions, Grace progressed from using 1 lbs. resistance to 7 lbs. resistance to clip papers together. Once Grace achieved the 7 lbs. resistance, the occupational therapist upgraded Grace to the actual job task simulation. There are three different sizes of binder clips that Grace used at work. The occupational therapist was able to obtain the three types of clips at the jobsite evaluation. Using a standard ream of paper, the occupational therapist created different sized stacks of papers for Grace to clip together using the appropriate size clip. This intervention method focused on adaptation. Through Grace’s memory of completing the clipping tasks, changes were made in the developmental structure. Change was also occurring as she increased her strength in order to complete these tasks.

One particularly important and interesting aspect of Grace’s intervention focused on the use of a functional custom dynamic extension splint. The dynamic splint that was custom made for her out of thermoplast material. Rubber bands, cloth, and Velco also were used. The splint was built for Grace to increase extension of the middle and ring fingers on her right hand. Therefore, outriggers made out of the rubberbands, cloth, and Velco were used for only the
middle and ring fingers. The splint was formed to end approximately two-thirds the way up the dorsal aspect of the forearm. It also held the wrist in a supported, yet neutral position.

The splint was made for Grace in order to better navigate a computer mouse and use her right hand for the number pad on the keyboard. In order to obtain assessment data, the occupational therapist created a series of ten “simulated” account numbers. Each account number had eight digits, the same number of digits used day to day by Grace at her data-entry job. Grace was set-up a computer station at the clinic, similar to the one she used at work. Components of the occupational form included: the computer monitor, the keyboard, mouse, mousepad, fabric covered padded desk chair on wheels, timer, a white 8.5” x 11” paper with ten printed sets of numbers each on a different line, and the occupational therapist. Using a simple Microsoft Word program, Grace typed in all of the numbers using the number keypad prior to the splint being made. The occupational therapist timed her using a timer.

At one point during the occupation, Grace stated, “Oh my gosh. This is so hard”. She outwardly displayed frustration, as she rested her left elbow on the desk and shook her head in her left hand. She was encouraged by the therapist, who said “It’s alright. Just do your best.” Throughout the occupation, Grace made about 20 errors that she corrected by punching the delete key. Errors were frequently made because she had difficulty extending her middle and ring finger. It took Grace 4 minutes and 39 seconds to complete the occupation. When Grace was finished with the task she said, “This is scary because I have to get back to work and I can’t even do this simple task.” The occupational therapist encouraged Grace by telling her, “This was just the first time you tried doing this. You have been off work for a couple months now. We’re also going to try it again with the splint. I think that will help you.”
The splint was then constructed for Grace. She took the splint home with instructions on the proper wear and care. Grace then brought the splint back several days later with no complaints regarding the wear. Upon re-examining the outriggers and angle of pull over the proximal phalanges of the middle and long fingers, the outriggers were readjusted with the Velcro and by tying another knot in each of the rubber bands. Since the proper fit was ensured, Grace completed the same typing account numbers occupation again. The re-synthesis of the occupation was used to measure the effectiveness of the splint. The set-up was exactly the same, except Grace wore the splint.

Grace’s occupational performance was different with the splint. She was able to type all of ten numbers in 2 minutes and 13 seconds. Her occupational performance improved significantly with the use of the compensation of the dynamic splint. She made approximately 9 errors. While Grace was completing the occupation she said, “This is a lot easier with the brace on.” Upon completion of the occupation Grace smiled and seemed satisfied with her performance. She told the occupational therapist, “I think this will get even easier.” The occupational therapist gave Grace the list of numbers and encouraged her to practice at home. At her next visit, the occupational therapist gave Grace a new list of simulated account numbers to practice.

The series of occupational syntheses used for Grace with the splint was very meaningful for her. She outwardly displayed her satisfaction with participating in the occupation through her words and facial expressions. Grace also brought to therapy copies of the work she completed at home, the 20 typed simulated account numbers, given to her by the occupational therapist. She even created her own simulated account numbers to continue working on typing. Grace seemed
happy with her progress because she stated several therapy sessions after assessment with the splint, “It’s getting much easier now.”

The dynamic splint made for Grace really became an important component of occupational therapy beyond addressing her computer-based goals. After a week of Grace receiving the splint, she told the occupational therapist she was still getting used to it “being an extension of my body.” She said on one occasion she had it on while she was doing things in the kitchen and totally forgot she had it on her arm. She reached into an overhead cabinet to get a jar and bumped the top of the splint, that holds the outriggers, on the shelf above the jar. The splint truly became integrated into Grace’s daily occupations. Grace also told the therapist she was able to complete a couple pages of scrapbooking while wearing splint. Scrapbooking was something Grace had not attempted since prior to her injury.

Outcomes

Fortunately, Grace was able to meet all of her occupational therapy goals. Prior to returning to work, Grace’s neurologist requested a list of proposed restrictions from both the occupational and physical therapists. The therapists interfaced with each other about what each professional considered would be the appropriate recommendations for the employer. Together the therapists recommended the following: limit right splint wear to “when needed” also during prehension and computer tasks, no overhead lifting, and no lifting greater than 7 pounds. The physician heeded all of the recommendations suggested by the therapists. The list of recommendations was given to the employer by Grace to communicate to them an understanding of her limitations. The employer, specifically her direct manager, told Grace she did not foresee any problems with the restrictions. Grace’s manager thought Grace may be in a situation where she would need to lift overhead or greater than 7 pounds, particularly during the shelving
scanned materials. However, the manager agreed it would be appropriate for Grace to leave all lifting tasks to co-workers.

Grace made several improvements from her initial evaluation assessment to when she was discharged from occupational therapy. In terms of strength, right grip strength increased by 13# to a total of 35#. Her right grip strength actually became stronger than her left grip strength that was taken at the onset of therapy. Grace’s right hand tip pinch strength increased by 4# to 9#, whereas lateral pinch strength increased by 2# to 8#. Overall, Grace’s right extremity strength in all areas measured was still below average for her age (Mathiowetz et al., 1985).

Active wrist range of motion in the right hand increased as well. Wrist extension measured 68 degrees for an increase of 16 degrees whereas wrist flexion measured 66 degrees an increase of 16 degrees. Ulnar deviation measured 26 degrees for an increase of 6 degrees and radial deviation measured 24 degrees for an increase of 4 degrees. Active range of motion at the index finger did not change from the initial evaluation. Active range of motion at the long finger increased by 5 degrees in extension to 40/90 extension/flexion at the MCP and by 20 degrees in extension at the PIP to 0/100 extension/flexion. Active range of motion in the ring finger increased by 25 degrees in extension and 5 degrees in flexion at the MCP to 20/95 extension/flexion. Active range of motion also increased in the DIP joint of the ring finger to 0/54 extension/flexion, which was an increase of 14 degrees of flexion. In the DIP joint of the little finger, flexion increased by 40 degrees to the total range at the joint being 0/70 extension/flexion. Diminished light touch sensation was still an area of impairment because Grace could not detect a monofilament finer than 3.62 (Bell-Krotoski, 1990).

The first week Grace returned to work, she only completed 20 hours over the course of five days at her primary job. After Grace had returned to work on a fulltime basis for two weeks,
the occupational therapist reduced her therapy down to one time per week in order to continue therapy sessions with Grace after she got off work. For the first couple of weeks after return to work, Grace reported being very exhausted after working. She stated, “It’s just going to take some time for me to get back into things.” Grace had to literally retrain her developmental structure in order to fulfill her role as a worker. Increasing her endurance, adjusting to new policies at work, and employing compensatory techniques were all vital aspects of Grace’s ability to be a successful worker. Though she stated she was tired after work, Grace smiled and laughed while talking about her work experiences. Grace said had discharge she was happy to be back at work and that her biggest therapeutic goal had been achieved.

She stated that her co-workers and supervisor were all very willing to help her. Per physician orders, Grace was not lifting greater than seven pounds. Occasionally, boxes needed to be moved and heavy items filed overhead which Grace’s co-workers completed for her. When queried by the occupational therapist about how Grace felt about her modified work, Grace responded she felt fine about it. She stated her co-workers seemed happy to help and also said they understood she couldn’t complete the lifting secondary to her neurosurgeon’s orders. A study by van Duijn and Burdorf examined workers who had modified job tasks at work versus those who returned to full duty following a leave of absence due to musculoskeletal impairment (2008). Individuals in the study who returned to modified job tasks, had a decrease in additional leaves of absence following their initial return to work start date (van Duijn & Burdorf, 2008). The occupational therapist’s hope was that Grace would return to work successfully over the long term as her body continued to heal. Fortunately, Grace was working with a team of health professionals who supported a healthy and safe return to work. Perhaps of equal importance is that Grace completed some modified job tasks with the help and permission of her co-workers. It
was the individuals on the jobsite who truly allowed Grace to return to work safely by not requiring her to complete tasks that were too taxing and unsafe.

One of the most interesting facets of Grace’s intervention was the integrated use of the dynamic splint. Grace stated she was wearing the splint virtually all the time at work. When she first started back working, Grace stated she frequently would “bump into things” with the splint. However, she said the more she wears it the better she is “re-learning how to move and do things at work.” After two weeks of working at her primary job, Grace decided to return to working two days a week at her part time job, as a cashier. The occupational therapist and Grace discussed concerns and issues surrounding return to work to Grace’s part-time job. Grace’s biggest concern was whether her dynamic splint would serve her needs at work. In order to address her concerns, the occupational therapist set-up variously sized items from around the clinic and break room that were similar to items Grace may have been required to pick up and scan at work. The occupational therapist then had Grace practice with her dynamic splint on moving the objects across the table. The set-up was very similar to what was used for the functional electrical stimulation however, no external muscle stimulation was used. After practicing with several items, the occupational therapist fit Grace with a prefabricated right wrist cock-up splint. Grace then practiced moving the same items again. Grace determined she preferred the dynamic splint because it allowed her to better use her fingers in flexion when picking up items. The therapist explained that Grace should see how using the dynamic splint as a cashier works, according to her personal assessment.

After her first day as a cashier, the occupational therapist called Grace on the phone to discuss how the previous night’s work went. Grace said wearing the splint worked well and she used the handheld price scanner for large items. She laughed over the phone and said, “I mostly
got a lot of questions and stares at the splint.” Grace said it will take some getting used to but the dynamic splint seemed to be good for her to use for the time being as a cashier.

Upon discharge from occupational therapy, Grace was asked about her thoughts on discharge. Grace stated she felt she had made good progress in therapy and was continuing to get better. She stated she would continue to use the dynamic splint at both work sites while also completing her home program. Grace said she was happy to be back at work and that working was her biggest goal achieved.

Grace stated that in general, she felt “more back to normal” than when occupational therapy first began. She exceeded the official occupational goal made for her because she was able to return to not only her primary job in data-entry but also as a part time cashier.

Two and a half weeks after Grace was discharged from occupational therapy, the occupational therapist followed up with Grace via a telephone call. Grace was asked how she was doing in terms of her rehabilitation. She said she was still participating in physical therapy and it was going well. Grace said she was still successfully working at both jobs and the splint was really helping. She said she was wearing the splint all the time at both jobsites. The splint was “a good conversation starter” said Grace. She said she could definitely tell a difference in her ability to grasp without the splint on her hand. She reiterated to the therapist how gracious she was to have participated in occupational therapy and said, “I could not be working right now if I had not had OT with you. I feel really good about things.”

Conclusions

Several recommendations were made at Grace’s discharge from occupational therapy. She was advised to continue wearing the splint as needed and to contact the occupational therapist if any problems arise. Grace was advised to continue with her home program in order to
maintain and increase overall wrist and digit strength in the right hand. She was given the therapist’s contact information on a business card. Information on the card included: the facility telephone number, address, and the occupational therapist’s e-mail address. Grace was also encouraged to use her right hand as much as possible both in the home environment and at work, both with and without the splint on her arm.

Grace provides unique insight to the practice of occupational therapy. Mosey defines the Role Acquisition model of practice as “appropriate for individuals who are experiencing difficulty with role transitions or individuals who, because of their current life situations, must learn how to participate in their social roles in a somewhat different manner” (1986). Grace was a perfect example of an individual who, due to the onset of disability in middle age, needed to relearn how to participate in her role as a worker in a novel way. She had been fulfilling this role successfully, with no outside intervention, until the time of her injury.

Inherent to Mosey’s model of practice is the concept of learning. Through learning, the basic skills, social roles, and temporal adaption can be successfully integrated for an individual to have a healthy developmental structure. Mosey outlines sixteen principles of learning (1986). Though many of the learning principles were followed in throughout the course of Grace’s participation in occupational therapy, only a few the therapist felt were most enlightening or significant will be highlighted for this discussion.

The first learning principle is taking into consideration the learner’s motivation (Mosey, 1986). The occupational therapist was able to hone in on Grace’s high motivation which allowed several intervention techniques to take place. Grace was very open to allow the therapist to complete the jobsite evaluation. Not only did Grace permit the therapist to travel to the jobsite but, Grace actually simulated for the therapist daily tasks required of her. Grace’s motivation was
evident not only in the clinical setting but outside as well. Her motivation provided the occupational therapist with opportunities to provide even more accurate and meaningful interventions.

Similar to the motivational concept is another learning principle which is active participation in the learning process. Not unlike the foundational learning process outlined by Dewey, Mosey emphasizes the importance of the learner participating in not only occupation but also the learning process itself. A good example of Grace’s participation was the trial and error method used with her dynamic splint. In order to get the best fit, the therapist and Grace had to try on the splint and use it in occupation and make adjustments along the way. Whether it was the therapist changing the line of pull of the splint on the digits or Grace stating, “This just doesn’t fit”, they had to work together to get the optimal occupational performance.

A final principle exhibited by Grace and the therapist was using the environment as a factor in the learning process. Instead of using rote exercise in the clinical environment, Grace and the therapist were able to simulate work-related task demands in the context of Grace’s actual working environment. The therapists jobsite evaluation gave the therapist unique insight into the physical demands of Grace’s primary job. Without the information and insight gleaned from the visit and actually seeing the environment, the therapist likely would not have used some of the valuable intervention techniques.

In the Role Acquisition model of practice, Mosey emphasizes several foundation aspects of occupational therapy that are of particular importance when using this model (1986). One important component in therapy is to “vary on a continuum from simulated to natural” (Mosey, 1986). The occupational therapist creatively simulated work-related job tasks in order for Grace to successful reenter the natural work environment(s). The hope in using this approach was to
help Grace better prepare for her role as a worker. Another hallmark aspect of occupational therapy is the act of “doing” occupation. Throughout the course of therapy, Grace was encouraged to complete continued learning outside the clinic by engaging in her prescribed home program. Grace was consistently engaged in occupation and purposeful activities throughout her occupational therapy participation.

Grace’s case reveals several opportunities for future research studies. Perhaps the most apparent area that needs to be researched is the role of the occupational therapist in return to work patients. In Grace’s case, the occupational therapist contributed a significant amount in getting Grace to a point of return to work “readiness.” Examining how occupational therapists can best prepare clients for work, particularly individuals with impairment at the cervical spine level with nerve damage, would be valuable to the profession. Also researching both client factors, such as motivation and level of impairment, and therapist factors, such as simulated to naturalistic environments techniques, could help further distinguish and define occupational therapy in role and learning based models of practice.

The present case study is valuable to the field of occupational therapy. Unique to this case study is the interactions the occupational therapist had with not only her client, Grace, but to other individuals as well. Also innovative to this case is the use of the Role Acquisition model of practice particularly as it applied to an individual with primarily motor impairment.

Often in the outpatient clinical setting, an occupational therapist does not have to opportunity to work with a client in a community-based setting. As face of healthcare continues to undergo reform and evolve, the importance of providing appropriate, timely, and accurate therapy becomes ever more important. Occupational therapists are not exempt to the rapidly
changing healthcare environment. Over the past several years community-based practices has gained increasing support from many healthcare professionals, including occupational therapists.

Community-based occupational therapy has been successful both in terms of clinical outcomes as well as cost effectiveness for caregivers, clients who have had a stroke, and older adults with difficulties performing functional tasks (Graff, Adang, Vernooij-Dassen, Dekker, Jonsson, Thijssen, Hoefnagels, & Rikkert, 2008; Pang, Harris, Eng, 2006; Gitlin, Hauck, Dennis, Winter, Hodgson, Schinfeld, 2009). Several studies have been published supporting the use of intervention methods in the community to help individuals return to work after an illness or disability (Rieker-Agranier & Golay, 2008; Sullivan, Ward, Tripp, French, Adams, & Stanish, 2005). Furthermore, the value of occupational therapists completing jobsite evaluations and interfacing with employers also been researched and documented as beneficial for both the employee, in reducing days missed, as well as the employer, in decreasing costs secondary to employee sick days (Weiler, Foeh, van Mark, Touissant, Sonntag, Gaessler, Schulze, & Kessel, 2009).

Grace’s case is a good example of the benefits of an occupational therapist can obtain from visiting a client’s jobsite. The therapist was able to actually gain and implement the knowledge on a jobsite evaluation. Even though Grace told the occupational therapist about her job requirements and occupational forms at work, it was through the actual site visit that truly enabled the therapist to understand the demands of Grace’s job. The educational background of an occupational therapist requires that the practitioner be competent in analysis of occupational performance (American Occupational Therapy Association, 2002). According to the American Occupational Therapy Association, a client’s “actual performance is often observed in context to identify what supports performance and what hinders performance” (2002). Only through being
on the jobsite with Grace was actual performance observed in context. The therapist could then teach Grace throughout the intervention process how to adapt and compensate occupational performance in order to be successful in her role as a worker.

Along with the aforementioned changes in healthcare, occupational therapists are already taking on leadership roles and more responsibility in the clinical setting. In Grace’s case, the occupational therapist served a dual role. Not only was the therapist working with Grace on the outlined occupational therapy goals, the therapist also acted, in part, as a care coordinator. The occupational therapist advocated for Grace in terms of return to work. Care coordinators often act within their means to provide information, resources, and assistance to the individuals they serve.

The occupational therapist, in Grace’s case, filled a gap in care that was missing. Had Grace been injured on the job, she would have been assigned a worker’s compensation case manager. The case manager would have been responsible for coordinating much of Grace’s rehabilitation for successful return to work. Since Grace did not have an assigned person to act in this capacity, the occupational therapist was responsible for answering many of questions concerning her employment as well and general rehabilitation. This was exemplified by the therapist working with the employer, with Grace present, to discuss job specific limitations due to Grace’s disability and supplying a general explanation of the surgery and healing process. Grace was supported in her wishes to return to work and the value of physical therapy was explained to her when she questioned whether it was still appropriate for her to continue. Grace was encouraged to discuss her concerns with the physical therapist and the occupational therapist accompanied Grace while she talked with the physical therapist. Her physician was contacted regarding specific safety limitations for return to work both rehabilitation professionals thought
were important. Grace was also given community resources at discharge, including the contact information for the Ohio Bureau of Vocational Rehabilitation and the contact information of the occupational therapist. She was advised to not hesitate contacting the occupational therapist if problems arise in the future.

Please refer to Appendix C for the annotated bibliography used during the completion of the Capstone experience.
References


UEMS European Board of Physical and Rehabilitation Medicine, 40, 576-581.


Appendix A: Grace’s Cubicle Schematic
Appendix B: Work Room Schematic
Appendix C: Annotated Bibliography


**Summary:**

The Occupational therapy practice framework is used to serve as the basis of language and constructs that describe the occupational therapy profession. The framework meets the professional need to more clearly affirm and articulate occupational therapy’s unique focus on occupation and daily life activities and the application of an intervention process that facilitates engagement in occupation to support participation in life. The purpose of the Framework is to describe the domain that centers and grounds the profession’s focus and actions and outline the process of occupational therapy evaluation and intervention that is dynamic and linked to the profession’s focus on and use of occupation.

The Framework was used while discussing the various tasks and performance components needed by the client chosen for my case study. It helped to organize therapeutic approaches used with the client in order to uniformly discuss treatment and evaluation processes.


**Abstract:**

Major topics included in this text Continuing Education Course include: understand the philosophy and theories upon which occupation-based practice are based, identify and define various components of the practice framework and the COPM, understand the relationship between evidence-based practice, occupation-based practice and the COPM. Significance:
This Continuing Education Course is important because it will teach tools and techniques to use in therapy that are occupation-based. Techniques are theory and evidence-based which will validate usage in the clinic. Incorporating a client-centered model of practice is also discussed which is very important to ensure client goals are being addressed in occupational therapy.

I took this continuing education course online to review occupation and client-centered models therapeutic intervention during my completion of my practicum. I found it helpful in ensuring the “occupation” is put into therapy practices as well as always considering functional deficits when working with upper extremity/hand injured patients.


**Summary:**

This article summarizes the occupational therapy practice framework and puts it in terms of use for application in hand therapy practices. It also discusses the history of hand therapy as a subspecialty area of practice within the domain of occupational therapy. The article discusses the specific terminology used in the practice framework as it applies to components of therapy intervention for individuals with upper extremity diagnoses. It also outlines a case study to demonstrate the use of Framework concepts in the area of hand therapy.

This article was valuable during my Capstone as I was also attempting to put the occupational therapy into treating individuals with upper extremity diagnoses. It was sometimes challenging to determine what types of interventions would be appropriate that were occupationally based.

**Summary:**

This chapter reviewed sensory testing as it relates to the upper extremity. Different techniques were reviewed, including two-point discrimination and monofilament testing. All techniques were reviewed in terms of testing reliability and validity and studies completed on testing techniques.

I used this as a reference for testing the client chosen for my case study. It reviewed proper technique to use with monofilament testing, which was what I used with my client. It was helpful in stating what different levels of sensitivity meant practically (i.e. diminished light touch versus diminished protective reactions).


**Abstract:**

This article reviews the appropriate management of common carpal fractures. The fundamental principles used by clinicians to choose appropriate stabilization and length of immobilization for these various injuries are discussed. The principles behind the progression of therapeutic intervention and the relation of progression to the stages of healing are emphasized.

Initially, I read this article when my site mentor and I thought an individual we were seeing at my practicum site may have a carpal fracture. The patient ended up not having a fracture however, this article was very helpful in reviewing all carpal bone fractures and management.
Abstract:

Hand therapists often assess, evaluate, and monitor the status of, and changes in the strength of, the intrinsic muscles of the hand. Some common indications are peripheral and central neuropathies and nerve lacerations and repairs. The therapist will often use a muscle chart that lists all the muscles innervated by the ulnar and median nerves, and all muscles will be tested. Not all muscles in the hand can be sufficiently isolated to grade their strength, nor is it always necessary to test all muscles innervated by a particular nerve to evaluate the presence or extent of motor function impairment or monitor changes. This paper discusses the tests by which changes in strength of the ulnar and median innervated intrinsic muscles can be assessed and the reasons that certain muscles cannot or need not be tested. Information about the reliability of muscle testing is also given.

This article was applicable because it reviewed some specific appropriate testing of intrinsic hand muscles. It reviewed nerve lesions and the effect those lesions can have on muscle function.


Summary:
The occupational therapists at The Indiana Hand Center jointly author a manual geared toward medical professionals who manage patients with hand and upper extremity medical conditions. Titled “Diagnosis and Treatment Manual for Physicians and Therapists”, this publication contains over 300 pages describing the non-surgical and postoperative rehabilitation for conditions relating to the shoulder, elbow, wrist and hand.

I referred to this book frequently while at my practicum site. I used it to review diagnoses at the clinic as well as at home. I used it to research various diagnoses I saw and to see the standard protocol typically used with those diagnoses. It was extremely helpful in steering me in the right direction with things I was not familiar with.


Summary:

The purpose of this OTD core textbook is to provide a useful educational tool for both clinicians and students. The book outlines, with pictures included, of many joint range of motion measurements as well as strength measurements. It includes reliability and validity of the assessment of joint range of motion using universal goniometers and manual muscle testing.

This book was very helpful for use during my practicum. I frequently needed to measure both joint range of motion and strength of the upper extremity throughout the course of my capstone. It was particularly helpful in given the normative data for range of motion as well as axis and arm placement with the goniometric measuring tool.


**Abstract:**

Occupational therapists specializing in hand therapy are challenged to provide care that reflects foundational concepts of occupation and holism. The researchers investigated cost containment influences on occupational therapists specializing in hand therapy to determine how therapists provide holistic care within cost containment constraints. Five hand therapists were chosen based on selection criteria of hand therapy and holistic care practice. Using a grounded theory approach, the researchers gathered data via interviews and clinical observations. Data were analyzed through open, axial, and selective coding, and critiqued by an expert panel for emerging theory and concepts. Occupational therapists developed new skills or refined existing skill through adapting, educating, and strategizing in response to environmental demands. Tenets of the occupational adaptation model matched the strategies used by the participants. Occupational therapists specializing in hand therapy adapted to cost containment constraints by modifying professional settings and skills, educating multiple consumers, and implementing innovative interventions.

This article interestingly discussed the conflict many occupational therapist working in hand therapy experience as they try to provide their patients with therapy that is at its core the practice of occupational therapy. However, due to other constraints (e.g. reimbursement) that is not possible. Frequently in my practicum setting, my mentor and I had to “no charge” some aspects of therapy either supplies or time simply due to insurance reimbursement constrictions.

**Summary:**

This is a very interesting article that was completed as a guest editorial in the Journal of Hand Therapy. The article is written by an Orthopedic Hand Surgeon in the Army. He provides a description of his personal experiences working with OTR’s and COTA’s during the Iraq war. He describes the resourcefulness and knowledge about post-operative care that the occupational therapists all provided. The surgeon goes on the commend the therapists for all of their selfless work and dedication to the profession.

This article was interesting to read because it discussed the specific role of occupational therapists practicing in upper extremity rehabilitation. The article eloquently describes the unique and beneficial role the occupational therapists played in the rehabilitation of so many wounded soldiers and civilians affected by the Iraq war.


**Abstract:**

This study examines which of three splint designs most effectively improved hand function in a patient with radial nerve palsy, and demonstrates the application of a single-subject experimental design. The static volar wrist cock-up splint (splint 1), dynamic tenodesis suspension splint (splint 2), and dorsal wrist cock-up with dynamic finger extension splint (splint 3) were evaluated. Each splint was worn for 3 weeks, and hand function was assessed by means of standardized measures of function and disability. Statistical significance was calculated using
the minimal level of detectable change (MDC) at the 95% confidence level. Only with splints 2 and 3 did a true change in function occur, compared with baseline scores (no splint). In addition, the patient completed all tasks while using splints 2 and 3 but did not complete three tasks while using splint 1. The hand therapists' goal is to fabricate a splint that improves function and that the patient will wear. Only splint 3 met these criteria. This experiment highlights the need to evaluate both the statistical and the clinical significance of treatment interventions.

This study is very appropriate and provides evidence for the use of a dynamic dorsal based wrist splint for use in an individual with radial nerve palsy. It was a well-designed single subject study design.


Abstract:

OBJECTIVES: To evaluate the long-term mortality effect of a home-based intervention previously shown to reduce functional difficulties and whether survivorship benefits differ according to initial mortality risk level. DESIGN: Two-group randomized trial with survivorship followed up to 4 years from study entry. SETTING: Homes of urban community-living elderly people. PARTICIPANTS: Three hundred nineteen adults aged 70 and older with difficulties performing daily activities. INTERVENTION: Occupational and physical therapy sessions to instruct participants in compensatory strategies, home modifications, home safety, fall recovery techniques, and balance and muscle strength exercises. MEASUREMENTS: Survival time was
number of days between baseline interview and date of death, as determined using data from the National Death Index or December 31, 2005. Participants were stratified according to baseline mortality risk (low, moderate, high) using a prognostic indicator. RESULTS: At 2 years, intervention participants (n=160) had a 5.6% mortality rate (n=9 deaths) and controls (n=159) a 13.2% rate (n=21 deaths; P=.02). Mortality rates remained lower for intervention participants up to 3.5 years from study entry. At 2 years, intervention participants with moderate mortality risk had a 16.7% mortality rate (n=16 deaths/96), compared with 28.2% for equivalent control group participants (n=24 deaths/85; P=.02). By 3 years, mortality rates were not statistically significantly different between the experimental and control groups. CONCLUSIONS: The intervention extended survivorship up to 3.5 years and maintained statistically significant differences for 2 years. Subjects at moderate mortality risk derived the most intervention benefit. Findings suggest that the intervention could be a low-cost clinical tool to delay functional decline and mortality.

I found this article helpful when I was researching occupational therapy effectiveness in home and community-based settings. It is a well designed study, a randomized controlled trial, which very clearly stated how the study was completed. The findings are very supportive of occupational therapy in the home and thereby supports the use of occupational therapy in the community.

Abstract:

OBJECTIVE: To assess the cost effectiveness of community based occupational therapy compared with usual care in older patients with dementia and their care givers from a societal viewpoint. DESIGN: Cost effectiveness study alongside a single blind randomised controlled trial. SETTING: Memory clinic, day clinic of a geriatrics department, and participants' homes. Patients 135 patients aged ≥65 with mild to moderate dementia living in the community and their primary care givers. INTERVENTION: 10 sessions of occupational therapy over five weeks, including cognitive and behavioural interventions, to train patients in the use of aids to compensate for cognitive decline and care givers in coping behaviours and supervision. MAIN OUTCOME MEASURES: Incremental cost effectiveness ratio expressed as the difference in mean total care costs per successful treatment (that is, a combined patient and care giver outcome measure of clinically relevant improvement on process, performance, and competence scales) at three months after randomisation. Bootstrap methods used to determine confidence intervals for these measures. RESULTS: The intervention cost 1183 euros (848 pounds sterling, $1738) (95% confidence interval 1128 euros (808 pounds sterling, $1657) to 1239 euros (888 pounds sterling, $1820)) per patient and primary care giver unit at three months. Visits to general practitioners and hospital doctors cost the same in both groups but total mean costs were 1748 euros (1279 pounds sterling, $2621) lower in the intervention group, with the main cost savings in informal care. There was a significant difference in proportions of successful treatments of 36% at three months. The number needed to treat for successful treatment at three months was 2.8 (2.7 to 2.9). CONCLUSIONS: Community occupational therapy intervention for patients with dementia and their care givers is successful and cost effective, especially in terms of informal care giving.
This article was also helpful in supporting the use of occupational therapy in community-based settings. My case study reviews the uniqueness of an occupational therapist completing a jobsite evaluation in the community however, many times insurers or other naysayers assume that therapy practice in the community will not be cost effective. Although, this is a home-based intervention the cost-effectiveness is clearly demonstrated.


Abstract:

Hand therapists often recognize that their patients are experiencing psychosocial distress following traumatic hand injury but may lack the time and training to determine whether referral for psychological assessment and treatment is warranted. The Injured Workers Survey (IWS) is a brief, effective self-report tool that screens for psychosocial distress, in particular for characteristic symptoms of post-traumatic stress disorder (PTSD). It also collects clinically relevant information about other psychosocial issues that have a major effect on treatment outcomes. A recent research study has validated the IWS as a screen for PTSD and supports its routine use in the initial assessment of all patients with traumatic hand injuries. To the extent that psychosocial distress interferes with recovery, its early identification and treatment can optimize overall treatment outcomes and facilitate successful in return to work.

This article was helpful when I was doing preliminary research on return to work individuals after a hand injury. Depending on the client chosen for my case study, I may have
had to deal with some psychosocial issues. Therefore, I wanted to have a good background understanding of this area.


Summary:

This chapter is in one of the core textbooks for the program. It outlines commonly seen hand diagnoses in the clinical setting, as well as appropriate intervention methods. The chapter reviews typical treatment/intervention techniques for nerve repairs, tendon injuries, edema management, and wound healing. It reviews splinting techniques and gives pictures of different splints available for use.

This chapter was very helpful to review during my Capstone practicum. I frequently had to refer to it as I completed various intervention methods. Some of the most useful information was about the edema management and scar/wound healing because I saw many clients at my practicum site who needed edema management intervention as well as scar management.


Summary:

This was a research study that examined the number of repetitions, using both grip and pinch grasps, completed in a purposeful versus non-purposeful activity. Participants completed grip and pinching while hooked up to a computer. They were randomized into two groups either completing the rote task first and the purposeful task second or vice versa. The study found that
participants, regardless of randomization, completed significantly more repetitions when in the purposeful activity than rote using both types of strengthening techniques.

This study demonstrates the importance of “occupationally-embedded” exercise versus rote exercise. This is an important concept to support because I primarily completed both rote exercise and occupationally-embedded exercises with the client I chose for my case study. This type of study supports the use of occupationally-embedded exercise for the specific purpose of hand strengthening.


**Abstract:**

The purpose of this study was to examine similarities and/or differences in the motivational constructs of hope and optimism for the future, attitude toward disability, goal setting, and perceived social support at work between hand-injured participants with and without work-related injury. A purposive sample of eight participants was interviewed to gather a qualitative “insider's perspective.” Interviews were conducted at three time points to identify any evolution of participants' motivational constructs over time. Motivational constructs between the two groups were found to be similar. Being optimistic, having a positive attitude toward the disability, setting goals in therapy, having supportive employers and colleagues at work, and having the desire to overcome dependency on others were found to promote participants' motivation for recovery. Findings contributed to the existing knowledge of patients' motivation in rehabilitation. Therapists could use these findings as facilitation strategies to promote patients' motivation for recovery in hand rehabilitation.
This article was used when research motivators for return to work clients with hand injuries. It was appropriate because the client I chose for my case study was a return to work client. It was also helpful in thinking about my own interactions with my patients in order to help them return to work, in terms of my own attitude.


**Abstract:**

Bones fracture frequently and often result in significant impairments, functional limitations, and disabilities, especially when the hand is involved. When fractures occur, there is a disruption of the skeletal tissue organization and a loss of mechanical integrity. The goal of fracture healing is to regenerate mineralized tissue in the fracture area and restore mechanical strength to the bone. Of equal importance is the reconstitution of the normal soft tissue gliding and movement about the fracture site. This article briefly reviews the history of fracture healing and the advances in mechanics and cellular and molecular biology, which should help the reader better understand the current mechanisms related to bone healing (primarily and secondarily). Fracture fixation modes also are described along with the temporal sequencing as to when to protect or move the fractured region.

This article was very helpful in reviewing the bone healing process as well as surgical techniques used with bone healing as they apply to the hand. A thorough understanding of bone and fracture healing was needed at my practicum site because I dealt frequently with individuals
who were in a bone healing stage. I saw clients with ORIF, closed reduction, and external fixators as a result of their fractures.


Summary:

This is one of the core textbooks for the OTD program. This specific chapter includes how to test somatosensation, electrodiagnostic studies, various sensory syndromes, and types of pain. It also reviews different types of perception and how to complete testing for those various types including: tactile thresholds, location of touch, bilateral simultaneous touch, joint movement, joint position, vibration, heat/cold. The chapter also discusses how various types of lesions in the nervous system can present themselves clinically.

This was helpful for my case study because I did sensory testing with my client chosen. I was able to review various types of sensory testing as well and the rehabilitation for deficits found.


Abstract:

Evidence-based practice (EBP) is a methodologic approach to clinical practice in which evidence is used to reach an informed decision when making a diagnosis, selecting a diagnostic test, picking an intervention, or determining a prognosis. Finding the best evidence through searching and critical appraisal of the methodologic quality of clinical evidence are essential
steps. Matching clinical recommendations to the level of supporting evidence is expected. Clinicians' expertise and patient values are also valued components of decision making in an EBP approach. Hand therapists can adopt an EBP approach but must be prepared to deal with the challenge of uncertainty when evidence is lacking.

This article was helpful in explaining the correct and clinical thought process one should go through when wanting to complete evidence-based practice. It walks the reader through the resources available to clinicians. It was also helpful for me as it described levels of evidence as it applies to research studies and the necessity of continuing well-designed research studies.


Summary:

This article and study reviews the common procedures and outcomes after an individual has a distal radius fracture. The purpose of the study was twofold (1) to gain descriptive data on scores for grip strength, ROM, pain and disability, upper extremity disability, and general health during the first year after distal radius fracture, and stratify the data according to age, sex, and compensation, status and (2) to describe the course of recovery from distal radius fracture over the year. Significant findings were found after one year from the onset of the fracture. Individuals had increases in grip strength as well as overall hand functioning.

I found this article interesting. At my practicum site, I frequently was working with patients who had distal radius fractures. Many of them fit the demographic information given in this study. It was interesting for me to read because I will not be seeing any of my patients one year after the onset.

**Abstract:**

The purposes of this systematic review were to examine the properties of clinical tests used in the diagnosis of carpal tunnel syndrome (CTS) and to provide estimates of their sensitivity and specificity. A literature search was conducted using two databases—PubMed and the Cumulative Index to Nursing and Allied Health Literature (CINAHL)—from 1986 to June 2003, and hand-searching reference lists of retrieved articles. Two reviewers evaluated the papers for quality using an evaluation tool developed by one of the authors. Estimates of sensitivity and specificity were determined by averaging values across studies weighted by sample size. Although 60 studies were reviewed in detail, many were of poor quality (mean quality score was 6.6 of 12, with only 15 of 60 obtaining a score of 8 or greater). The most frequently studied test was Phalen's, with an overall estimate of 68% sensitivity and 73% specificity. Next was Tinel's, with estimates of 50% and 77%, and then carpal compression, with estimates of 64% and 83% for sensitivity and specificity, respectively. Two-point discrimination and testing of atrophy or strength of the abductor pollicis brevis proved to be specific but not very sensitive. The estimates determined in this review should help therapists choose clinical tests with the appropriate balance of sensitivity and specificity required for diagnosing carpal tunnel syndrome in their specific clinical environments.

This article was very helpful and insightful for effective clinical diagnosis methods to use with individuals with carpal tunnel syndrome. Throughout my time spent at my practicum site, I
treated several patients with this diagnosis. This meta-analysis provided good evidence-based guidelines for using the testing I used at the clinic.


**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.

I found this article very helpful when determining the normative data for adults in terms of both grip and pinch strength. This study completed by Mathiowetz was one of the studies
cited frequently in other resources for the normative data. It was helpful when comparing the measurements I took with my client for my case study to what is normal for her age.


**Abstract:**

Study design: Case series. Objectives: To evaluate the benefit, shortcomings and acceptance of a new transcutaneous functional electrical stimulation (FES) technology aimed at improving the grasp function in tetraplegic subjects in acute and postacute rehabilitation. Setting: Spinal cord injury (SCI) centre, university hospital. Methods: Subjects (N=11) with complete or incomplete SCI at C4/5–C7 who started FES 1–67 months after their accident were included. Hand function tests, analysis of video recordings and of written documentation of FES sessions, status of muscle strength, and follow-up query were used as outcome measures. Results: Nine subjects used FES as a neuroprosthesis. Eight demonstrated improved grasp function and performance in activities of daily living. In one subject, no benefit from FES was observed. Two other subjects showed improvements in muscle strength and facilitation of active movement with FES. Four subjects successfully integrated FES as neuroprosthesis in everyday life within the rehabilitation centre. Three received the system for home use. The most relevant reasons for stopping the FES application were: (i) improvement of voluntary grasp function, (ii) physical and psychological problems, (iii) no available stimulator for home use, and (iv) insufficient assistance for electrode placement at home. Shortcomings related to the transcutaneous surface technology (eg pain or coactivation of neighbouring muscles) could usually be reduced, or did
not limit the efficiency or acceptance of FES. Individually designed digital or analogue control
devices were preferred. Conclusion: Tetraplegic subjects in acute and postacute rehabilitation
can profit from a new transcutaneous FES system with respect to functional use and
independence. It can be implemented in the rehabilitation programme for muscle strengthening
and facilitation of voluntary activity. For a successful application of FES, there is a need for
individual electrode placement, stimulation programmes, and FES control devices.

This article was helpful in justifying the use of the functional electrical stimulation for the
client chosen for my case study. Though the study compared the use of electrical stimulation for
people with spinal cord injuries, it was appropriate for my case study because she had cervical
damage. Electrical stimulation was supported for the use in muscle strengthening and voluntary
activity.

McOwan, C. G., MacDermid, J. C., Wilton, J. (2001). Outcome measures for evaluation of scar:
a literature review. Journal of Hand Therapy, 14, 77-85.

Abstract:

The number of interventions and the related costs of management of scar are increasing.
Despite increasing emphasis on evidence-based practice, there is little comparative data on
which to base treatment selection. The ability of a therapist to evaluate the natural progression of
a scar or treatment efficacy may be hampered by the nature of the particular scar, the lack of
conformity in descriptions of scar, and the lack of reliable standardized outcome measurements.
This literature review seeks to clarify the constructs measured for scar and present the measures
currently available for use.
This article was helpful because it is a review of literature that compared many studies with regard to measuring the progression of scar healing. It revealed both objective measurements and subjective measurements. It also discussed different scar management measurement tools to document scar change. It is not a meta-analysis so no statistics were run to compare the effectiveness of the various measurements. This was applicable to my time spent at my practicum site because I completed scar management techniques with multiple patients and there was no structured way to document scar change other than subjectively.


**Abstract:**

The authors conducted a systematic review of the published evidence on conservative interventions for loss of upper extremity joint range of motion following selected musculoskeletal conditions. Several databases (Medline, CINAHL, PEDRO, PubMed, and Cochrane) were searched for articles that met inclusion criteria. Two reviewers determined abstract selection; two reviews performed critical appraisal of 26 articles. Level of evidence and quality on a 24-item quantitative critical appraisal form were determined for all articles meeting selection criteria. The primary outcome considered was range-of-motion measurement. Overall, the quantity and quality of evidence were moderate to low. Sackett's levels 2b, 3, and 4 evidence has shown that joint mobilization, a supervised exercise program, and splinting can all increase joint range of motion. There were no studies found in the literature that examined techniques of physical agent or electrotherapeutic modalities. Future studies are needed to delineate selection of appropriate candidates for these techniques and effective dosage.
This article was appropriate for my practicum site completion. With many of the patients I worked with, I completed joint mobilizations and supervised both occupationally embedded and rote exercise programs to increase joint range of motion. Both of these techniques were found to be successful according to this review. I also did some splinting to encourage increase joint range of motion.


**Abstract:**

Identifying practice patterns for therapy interventions following distal radius fractures (DRFs) is necessary to define the most frequently used examination and intervention techniques. The purpose of this study was to identify preferred practice patterns and physical and functional outcome measures used during DRF management. Two hundred forty-two therapists (PTs, OTs, and CHTs) were surveyed by questionnaire at an annual hand therapy meeting. A descriptive analysis of data was performed. Preferred practice patterns during the immobilization and the post-immobilization periods were identified. More than 75% of the surveyed therapists used upper extremity range-of-motion exercises and compressive wrap with retrograde massage during the immobilization phase. More than 90% of therapists included range-of-motion exercises and heat/cold modalities in the post-immobilization treatment plans. Physical impairment measures of outcome were used much more frequently than functional outcome questionnaires in assessing progress during treatment. This study advances the evidence-based practice of therapy by establishing a foundation for future research.
This article was very helpful for identifying the common intervention methods used for treating distal radius fractures. It was interesting to see the ratio of therapists using different therapeutic interventions. Some themes certainly arose such as AROM, dexterity, and strengthening.


**Summary:**

This chapter outlines Mosey’s Role Acquisition model of practice. In it, themes inherent to the model are discussed including teaching-learning techniques and theories as well as examples of the model in use. It describes the four main roles that every individual has and all the skills that are required to have a healthy developmental structure. The model’s usage is described in terms of unique occupational therapy settings.

This chapter was helpful in the formation of my case study therapeutic interventions. I used Mosey’s Role Acquisition model to help formulate the way I worked with the client chosen for my case study. Embedded within the intervention methods are concepts outlined by Mosey.


Effectiveness of hand therapy interventions in primary management of carpal tunnel syndrome: a systematic review.

**Abstract:**

The purpose of this study was to determine the effectiveness of hand therapy interventions for carpal tunnel syndrome (CTS) based on the best available evidence. A
A qualitative systematic review was conducted. A literature search using 40 key terms was conducted from the earliest available date to January 2003 using seven databases. Articles were randomly assigned to two of five reviewers and evaluated according to predetermined criteria for inclusion at each of the title, abstract, and article levels. Included studies were independently scored by two reviewers using a structured effectiveness quality evaluation scale and also graded according to Sackett's Levels of Evidence. There were 2027 articles identified from the literature search, of which 345 met the inclusion criteria. Twenty-four studies were used to formulate 30 recommendations. Current evidence demonstrates a significant benefit (grade B recommendations) from splinting, ultrasound, nerve gliding exercises, carpal bone mobilization, magnetic therapy, and yoga for people with CTS.

This meta-analysis was very helpful in determining the effectiveness of various intervention techniques in the clinic for individuals with carpal tunnel syndrome. An important aspect of this study was the inclusion of individuals who had not undergone surgery for carpal tunnel. This was particularly appropriate for me because I saw many individuals who had not undergone surgery for carpal tunnel yet, were having occupational deficits due to the diagnosis. Therefore, it was very valuable to understand the research that had been done on conservative management of carpal tunnel.


Summary:
This chapter outlines the conceptual framework for therapeutic occupation. It is a framework that reviews occupational performance that each individual has and how form, impact, meaning/purpose, adaptation, and compensation all effect occupational success and failure. It also outlines the unique role of the occupational therapist in terms of therapeutic use of self and the process of rehabilitation.

I used this article several times when referring to my case study. It provides a sound theoretical basis and uniform terminology for me to discuss my client’s unique participation in occupational therapy. It is the framework that I am most familiar with and feel most comfortable with.


**Abstract:**

Many assessment devices and measures have been described to evaluate sensibility, with little consensus on the optimal measurement tool. The purpose of this paper is to review the assessment methods and devices used in the evaluation of hand sensibility. Consideration is given to the characteristics of each measurement tool, the information necessary for complete patient evaluation, and the battery of valid and reliable measurements that provide the most complete and accurate patient assessment.

This article reviewed several popular methods of evaluating hand sensation. It was helpful because it reviewed the evidence of certain techniques in terms of reliability and validity. It was appropriate for me because I completed some sensory testing with the client chosen for my case study.

**Summary:**

This article reviewed two case studies completed with dental hygienists. Based on complaints with musculoskeletal functioning, job analysis was completed with the two workers. The first hygienist had proximal upper extremity pain and the second had carpal tunnel syndrome. Occupational analysis was completed on the typical requirements of a dental hygienist. The article went on to further explain the individual observation of each of the hygienists. Based upon the jobsite observation and conversation with each client, specific suggestions such as stretching and ergonomic techniques were demonstrated and discussed.

The article was very helpful in the organization of my paper because it reviewed two case studies. I found it helpful because it described each individual in terms of task analysis and ergonomic positioning through an onsite job evaluation. It is not a true research article however, contributes to the knowledge of OT in terms of task analysis and overall discussion of a case study.


**Abstract:**

This study examines how acute hand injuries affect patients in their roles as spouse, caregiver, and/or worker. Qualitative data from patient interviews were used to analyze how these life roles were affected by the individuals' hand injuries. Data were extracted from
interviews of three hand patients who had one or more roles of spouse, caregiver, and/or worker affected by their injury. Data were then examined and categorized for each life role by participant. Participants' views of how hand therapy affected their recovery and resumption of occupational role performance were also examined. Results showed that the participants expressed profound degrees of change in their ability to perform satisfactorily in their various life roles.

This article was very applicable in terms of my particular case study. The research design was qualitative study where data were organized from information gathered during interviews with three patients. It was a good study for me to examine because my case was about role adaptation after injury.


Abstract:
A paucity occupational therapy evaluation tools exists for use with patients with multiple personality disorder. The Model of Human Occupation (Kielhofner & Burke, 1980), particularly the volition and habituation subsystems within this model, proved useful for the identification of the many facets of patients with multiple personality disorder on a short term treatment unit. The Role Checklist (Oakley, Kielhofner, Barris, & Reichler, 1986), a tool derived from the Model of Human Occupation, was adapted for use with this population and was found to be beneficial in the identification of common goals held by most of the personalities of each patient with multiple personality disorder. The use of the Role Checklist is illustrated with a case example.
This was a good example of using a role checklist for an individual in rehabilitation. I was able to use this article twofold (1) as a model case study and (2) to identify the importance and components of a role checklist in occupational therapy because the model I selected for my case study was based on the role acquisition model.


**Abstract:**

Recovery from brain injury is a long-term process spanning many years of a person's life. The subtle deficits experienced in the later stages of recovery might seem hidden for long periods, only to lead to severe occupational losses during a crisis. This case report describes occupational therapy services reinitiated for a young woman 5 years after she sustained a closed head injury. The client's vocational rehabilitation counselor observed a breakdown in her occupational functioning 55 months after discharge from therapeutic services and referred her back to outpatient occupational therapy services. Resumed occupational therapy services focused specifically on the interaction of cognition with everyday occupations.

This case study provided a good example and format to follow for completing a case study in occupational therapy. It provided a good foundation for me to model my case study after.

Abstract:

Objective: To assess the effects of a community-based exercise program on motor recovery and functional abilities of the paretic upper extremity in persons with chronic stroke.

Design: Randomized controlled trial. Setting: Rehabilitation research laboratory and a community hall. Participants: A sample of 63 people (≥50y) with chronic deficits resulting from stroke (onset ≥1y). Interventions: The arm group underwent an exercise program designed to improve upper-extremity function (1h/session, 3 sessions/wk for 19wk). The leg group underwent a lower-extremity exercise program. Main Outcome Measures: The Wolf Motor Function Test (WMFT), Fugl-Meyer Assessment (FMA), hand-held dynamometry (grip strength), and the Motor Activity Log. Results: Multivariate analysis showed a significant group by time interaction (Wilks λ=.726, P=.017), indicating that overall, the arm group had significantly more improvement than the leg group. Post hoc analysis demonstrated that gains in WMFT (functional ability) (P=.001) and FMA (P=.001) scores were significantly higher in the arm group. The amount of improvement was comparable to other novel treatment approaches such as constraint-induced movement therapy or robot-aided exercise training previously reported in chronic stroke. Participants with moderate arm impairment benefited more from the program. Conclusions: The pilot study showed that a community-based exercise program can improve upper-extremity function in persons with chronic stroke. This outcome justifies a larger clinical trial to further assess efficacy and cost effectiveness.

This was another study used to support the idea of community-based occupational therapy practice. Since no studies were found supporting the cost reduction and efficacy of
jobsite occupational therapy for upper extremity diagnoses, I used other populations and settings to support the use of community-based practice.


**Abstract:**

Musculoskeletal disorders are the most frequent health problem (24%) linked to work in Europe and in Switzerland. PMSE, a health prevention service dealing with health at work, has developed a new patient education approach. The objectives of this approach are to anticipate chronic disorders, prevent musculoskeletal disorders, and make workers aware of risk factors. The goals and strategies of this intervention as well as both individual and group workshops are described in this article. The results are convincing since, over a period of 3 years, a 58% decrease of absenteeism due to musculoskeletal disorders as well as a 93% reduction of disability have been observed. In conclusion, these very positive results emanate from this patient education approach, a close collaboration with employees and direction and, also, from the quality of the whole health network.

This article was helpful while completing my case study. Although it was completed in Europe, its contents discuss a health prevention specifically as it applies to individuals with musculoskeletal disorders. It helps support the idea of jobsite intervention, which was particularly relevant for my client.

Abstract:

The aim of the study was to evaluate the effectiveness of occupational therapy in rheumatoid arthritis patients with impaired hand function. Standardized Functional Independence Measure was employed in order to evaluate the functional status of the patients and impaired activities. A dynamometer was used for the measurements of muscular strength of hands and a goniometer, for the range of motion of the wrist. Totally, we have examined 120 rheumatoid arthritis patients. They were divided into two groups: 60 patients in each. Occupational therapy was applied only to the patients of the first group. The mean age of Group 1 patients was 53.4+/−1.8 years, the mean age of Group 2 patients was 52.0+/−1.9 years. The mean duration of the disease was 11.5+/−2.6 years and 12.1+/−2.4 years, respectively. The effectiveness of therapy was considered ineffective if, after the completion of the course of occupational therapy, no increase in Functional Independence Measure score for patients with rheumatoid arthritis was observed. When the score increased from 1 to 3, we considered this as moderate effectiveness; when the score increased to 4-6, we evaluated the effectiveness of occupational therapy as good, and when the score of 7 was attained, effectiveness of occupational therapy was considered as very good. In Group 1, the moderate effectiveness of occupational therapy was determined in 31.7% of patients; good effectiveness, in 61.7%; and very good effectiveness, in 3.3% of rheumatoid arthritis patients. In Group 2, the moderate effectiveness of treatment was determined in 48.3% of patients and good effectiveness, in 5% of rheumatoid arthritis patients. CONCLUSIONS. Hand function (the strength of fingers and hands, the range of motion of the wrist) significantly improved in patients with rheumatoid arthritis after completion of a course of occupational therapy (p<0.05). The improvement of hand functions in patients with rheumatoid arthritis led to increased ability to take food and drink, to wash themselves, to put the clothes on the upper and
lower parts of the body and take them off, to use the toilet, a bathtub or a shower, to walk, to manage a wheelchair, and to do personal hygiene (p<0.05).

The significance of this study relates to the functional gains that can be obtained by participation in occupational therapy. By looking specific functional gains through the outcome measurement of the FIM, the positive outcomes of occupational therapy could be seen. Not only did participants increase hand strength and range of motion, they also improvement functional outcomes. It is important for occupational therapist specializing in hand diagnoses to work towards occupational and functional gains.


*Scandinavian journal of plastic and reconstructive surgery and hand surgery*, 39, 104-108.

**Abstract:**

Treatment with a mirror gives an illusion of function in a missing or non-functioning hand. The method is based on the concept that the central representation of phantoms and body image can change rapidly, and has been described in the treatment of phantom pain and stroke. We show in three pilot cases new applications for the use of the mirror in rehabilitation after hand surgery.

The significance of these case studies is that it is a new method of doing therapy; however, the results of the study demonstrate it certainly may have a place in rehabilitation of the upper extremity. Although the concepts of this research has more thoroughly studied in clients with amputations, it may be useful for clients who sustain a severe hand trauma or have a serious infection which limits the hand functioning. The therapists places a mirror bilaterally
between the upper extremities clients progressed through various hand movements. As patients did various exercises, they watched the mirror from the non-effected side. All three clients make both strength and functional progress as a result of the mirror usage. At my practicum site I did encourage several patients to watch themselves complete exercises in the mirror to decrease compensatory techniques.


**Abstract:**

PURPOSE: Professionals who work with rehabilitation of the hand usually assess performance components as their main outcome measures. Intervention is aimed at normalization of deficits of these components, with the expectation that the integrity of the structures and functions of the body will revert to improvements in the client's functional performance. The objectives of this study were to describe changes in patients who received rehabilitation in a Brazilian public hospital after having suffered hand injuries due to workplace accidents, and to examine the relations between performance components and levels of functioning. METHODS: Observational cross-sectional study was used. A convenience sample was selected, including 42 patients assessed at service admission and at discharge. Assessed characteristics included grip strength, wrist and finger range of movement (ROM), sensitivity, and self-perceptions of functional performance (COPM). Statistical procedures included correlations between performance components and COPM scores and differences on selected variables at admission and discharge. RESULTS: Significant improvements in all assessed functional components.
COPM values increased more than 100% after intervention (effect size d = 1.996 for performance and d = 1.553 for satisfaction) demonstrating improvements in both domains. Low correlations between grip strength and COPM scores were found only at admission (r = 0.314; p = 0.045). When the relationship between gains in strength and COPM scores at discharge were examined, significant correlations were found with the performance (r = 0.324; p = 0.039) and satisfaction (r = 0.0326; p = 0.038) subscales. CONCLUSIONS: Results of this study provide evidence for functional gains in clients treated in a rehabilitation service and supply information about the relation between specific components and functional performance.

The results of this study provide some interesting findings for occupational therapists working with clients hurt on the job who sustained hand injuries. The article discusses the specific economic and psychological effects an injury like this can have. Interestingly, the article discusses that lack of correlation other studies have found between hand strength and functional outcomes. However, both increased in this study. This study also highlights the importance of remembering to involve the client with the goal-making process that way their goals are met as well.


**Abstract:**

The cases of two female patients who underwent reconstructive surgery using free vascularized fibular bone grafting of the proximal humerus are reported. Both patients were evaluated 1 year postoperatively for active range of motion, an Enneking evaluation and
activities-of-daily-living (housework) assessment were also done. Patient 1 regained flexion and abduction to 110°, and patient 2 regained flexion and abduction to 90°. On the Enneking test, the patients achieved scores of 23 and 25 points, respectively. On the activities-of-daily-living housework assessment, patient 1 performed at 91.0% and patient 2 at 60.6%. In both cases, neither active range of motion nor the Enneking scores accurately reflected the functional abilities of the reconstructed limbs. It is important that upper extremity therapists evaluate and consider functional abilities in activities of daily living, such as housework, in the early phases of rehabilitation.

This is an article printed off in order to help me with the structuring of my case study. It is one of several articles I used to get a feel of what some published case studies in the area of orthopedics were like. It is also important because it emphasizes the importance of assessing functional ability, not merely biomechanical deficits.


**Abstract:**

*Introduction:* One objective of the present research was to examine the degree to which psychological risk factors could be reduced through participation in a community-based psychosocial intervention for work-related musculoskeletal disorders. A second objective was to examine whether psychosocial risk reduction had an effect on the probability of return to work. *Methods:* Participants were 215 Workers Compensation Board claimants with work-related musculoskeletal disorders who had been absent from work for an average of approximately 7
months (M = 28.8 weeks, range = 4–100 weeks) and were referred to a community-based multidisciplinary secondary prevention program in Nova Scotia, Canada. Results: In the current sample, 63.7% of participants returned to work within 4 weeks of treatment termination. The percentage reductions in targeted risk factors from pretreatment to posttreatment were as follows: catastrophizing (32%), depression (26%), fear of movement/re-injury (11%), and perceived disability (26%). Logistic regression indicated that elevated pretreatment scores on fear of movement and re-injury (OR = 0.58, 95% CI = 0.35–0.95) and pain severity (OR = 0.64, 95% CI = 0.43–0.96) were associated with a lower probability of return to work. A second logistic regression addressing the relation between risk factor reduction and return to work revealed that only reductions in pain catastrophizing (OR = 0.17, 95% CI = 0.07–0.46) were significant predictors of return to work. Conclusions: The results of the present study provide further evidence that risk factor reduction can impact positively on short term return to work outcomes. Significance: Outcomes of rehabilitation programs for work disability might be improved by incorporating interventions that specifically target catastrophic thinking. Community-based models of psychosocial intervention might represent a viable approach to the management of work disability associated with musculoskeletal disorders.

This was a valuable study to read as I was comparing the effect psychosocial factors play in return to work. It was important for me to consider the psychological factors affecting my client’s successful return to work. The study also reveals the effectiveness of psychosocial interventions on successful return to work.


**Abstract:**

This study tested a principle of occupational therapy and motor learning theory in the context of neurodevelopmental treatment techniques. Ten trials of occupationally embedded intervention (playing Simon,™ a computer-controlled game) were compared with 10 trials of rote arm-reach exercise. A counterbalanced design was structured so that each subject experienced each condition one week apart. Subjects were 17 men and 3 women with traumatic brain injury who exhibited mild to moderate spasticity in the upper extremity. Maximum distance from hip to wrist during active reach of the affected extremity was measured by digitization of videotape with the Motion Analysis £V-3D system. Results indicated that the use of the game elicited significantly more range of motion than the rote exercise (t (19) = 5.77, P < 0.001). These results support the use of an occupationally embedded intervention for persons with traumatic brain injury and add to the theoretical base of occupational therapy.

This study provided further evidence of occupationally-embedded exercises. Although this study is with the TBI population, the same concept of embedded exercises was used with the client chosen for the Capstone dissemination case study.


**Abstract:**

**Objective.** The aim of this study was to establish the efficacy of a therapeutic intervention based on functional electrical stimulation (FES) therapy to improve reaching and grasping
function after severe hemiplegia due to stroke. **Methods.** A total of 21 subjects with acute stroke were randomized into 2 groups, FES plus conventional occupational and physiotherapy (FES group) or only conventional therapy (control group) 5 days a week for 12 to 16 weeks. A third group of 7 subjects with chronic hemiplegia (at least 5 months poststroke) received only FES therapy (chronic group) and pre—post training changes were compared. FES was applied to proximal and then distal muscle groups during specific motor tasks. At baseline and at the end of treatment, grasping function was assessed using the Rehabilitation Engineering Laboratory Hand Function Test, along with more standard measures of rehabilitation outcome. **Results.** The FES group improved significantly more than the control group in terms of object manipulation, palmar grip torque, pinch grip pulling force, Barthel Index, Upper Extremity Fugl—Meyer scores, and Upper Extremity Chedoke—McMaster Stages of Motor Recovery. The chronic stroke subjects demonstrated improvements in most categories, but the changes were not statistically significant. **Conclusions.** FES therapy with upper extremity training may be an efficacious intervention in the rehabilitation of reaching and grasping function during acute stroke rehabilitation.

This study further supported the use of functional electrical stimulation for therapeutic intervention. Since a literature review revealed no use of functional electrical stimulation for therapeutic intervention for some with cervical disc herniation, literature supporting its use was found for other diagnoses had to be used to support its use for the client chosen for the case study.

Abstract:

The purpose of this systematic review was to determine the effectiveness of conservative treatments for lateral epicondylitis and to provide recommendations based on this evidence. Five reviewers searched computerized bibliographic databases for articles on the conservative treatment of lateral epicondylitis from the years 1983 to 2003. A total of 209 studies were located; however, only 31 of these met the study inclusion criteria. Each of the articles was randomly allocated to reviewers and critically appraised using a structured critical appraisal tool with 23 items. Treatment recommendations were based on this rating and Sackett's Level of Evidence. This review has determined, with at least level 2b evidence, that a number of treatments, including acupuncture, exercise therapy, manipulations and mobilizations, ultrasound, phonophoresis, Rebox, and ionization with diclofenac all show positive effects in the reduction of pain or improvement in function for patients with lateral epicondylitis. There is also at least level 2b evidence showing laser therapy and pulsed electromagnetic field therapy to be ineffective in the management of this condition. Practitioners should use the treatment techniques that have strongest evidence and ensure that studies findings are generalized to patients who are similar to those reported in primary research studies in terms of patient demographics and injury presentation.

This article was very helpful and appropriate because I completed work with multiple patients at my practicum site who had lateral epicondylitis. Frequently, I used techniques mentioned in this article that showed positive outcomes.

Abstract:

Objectives: Workers who carry out modified work during sick leave due to musculoskeletal complaints seem to return to full-capacity work earlier than colleagues not given modified work. This study evaluates whether modified work during sick leave also influences the recurrence of a new episode of sick leave. Methods: Questionnaires on physical and psychosocial workload, musculoskeletal complaints, general health and sick leave were sent to 137 workers on sick leave for 2–6 weeks due to musculoskeletal complaints, shortly after full return to work, and 12 months after the first day of sick leave. Results: Approximately 45% of the participants experienced a recurrence of musculoskeletal sick leave within 12 months after the start of the initial sick leave. Subjects who performed modified work during initial sick leave reported significantly less recurrence than those who had started immediately at full capacity. Musculoskeletal sick leave prior to the start of the study also predicted the recurrence of sick leave. Many workers reported residual health problems at the time of return to work, which in turn influenced recurrence of musculoskeletal sickness absence. Conclusion: This study suggests that, although full recovery of musculoskeletal complaints was not established at the time of return to work, workers who had performed modified work had a lower risk of recurrence of musculoskeletal sick leave than those who had returned directly to full duties.

This study was helpful in discussing return to work with modified work. The client chosen for my case study was eventually able to return to work with some restrictions. It was very important that she return to work as she personally stated, however, her safe return to work was also paramount. Working with the physical therapist and physician this was made possible.

**Abstract:**

Current findings suggest that cumulative trauma disorders are multifaceted and have less predictable outcomes than trauma cases. The purpose of this study was to attempt to identify emerging patterns and predictive relationships in this diagnostic group that might be worthy of eventual prospective research. The data source was a comprehensive electronic database containing clinical information collected at point of care over a four-year period. A retrospective analysis was performed on 459 workers' compensation cases with upper extremity cumulative trauma disorders and a subset of 312 with carpal tunnel syndrome. The outcome criterion was return to work as a dichotomous variable. Only two significant correlations with return to work were found: the therapist's estimate of rehabilitation potential and the patient's outcome expectation of the ability to work. Further investigation of the role of beliefs and expectations in the therapeutic process would be a productive area for prospective study.

This article was helpful when I was completing some self-study during my mentored studies in the area of return to work. It was interesting that patient’s outcome expectations significantly correlated with return to work.

Abstract:

Objectives In most industrialized countries musculoskeletal disorders contribute considerably (25%) to illness induced work absence. A special interest to reduce worker absences exists in highly specialized industries such as jet manufacturing, where specific knowledge is hard to replace. We investigated the reduction and sustainability in sick leave days by a workplace oriented outpatient rehabilitation program based on structured information exchange between occupational physicians and therapists. Methods Sick leave days reduction and return-to-work-ratios were analysed for 79 male blue collar workers with musculoskeletal disease, who voluntarily participated in an outpatient rehabilitation treatment between 2002 and 2005. During rehabilitation therapy standardized workplace descriptions were given to the therapists and individual return-to-work (rtw) schemes were implemented. Therapy lasted from 3 to 4 weeks followed by workplace reintegration. Off-work-time was calculated from 0 to 6 years before and 0 to 3 years after rehabilitation from insurance and industrial medical reports. Results A total of 97% of the patients returned to their original job at the workplace, usually directly after the rehabilitation. Average sick leave days per year were reduced from 48.8 ± 32.8 days before to 34.2 ± 37.3 days after the rehabilitation. The therapy interrupted an increase in sick leave days over the years stabilizing absence at a low level for at least 2 years. Duration of illness related work absence was the only significant predictor for sick leave reduction (P < 0.05). Other common risk factors for musculoskeletal diseases like smoking or body mass index did not significantly influence the therapeutic effect. Conclusions Our results support evidence that information exchange for workplace description and rehabilitation
therapist may help to reduce sick leave days and achieve very high rtw-ratio. However it is important to observe the effects of this shared information for longer intervals.

This study was very relevant to the process I went through in order for my client to return to work. The study revealed that interfacing with employers, particularly to gain the job requirement information, was valuable to the rehabilitation of clients.


Abstract:

The purpose of this systematic review was to evaluate the available evidence on workplace rehabilitation interventions for work-related upper extremity disorders (WRUEDs). The literature search identified a total of 811 abstracts from Medline, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and EMBASE databases. The abstracts were independently assessed by four reviewers and 53 full-text articles were identified. Twenty-one studies were then randomly allocated to two pairs of reviewers. Using a 24-item critical appraisal form, the reviewers evaluated the articles for quality and level of evidence. During this process, an additional 13 articles were discarded, resulting in eight studies. The effectiveness of these studies was limited by small sample sizes, lack of standardized outcome measures, and inadequate reporting of interventions and results. The findings of this review indicate that the evidence for workplace interventions for WRUEDs has not been established. This systematic review provides a rigorous analysis of workplace interventions for WRUEDs and emphasizes the need for further research in this area.
This article was helpful when I was researching the overall effectiveness of workplace interventions. Although, the review did not reveal good evidence this programs work it did reveal the need for more research to be completed in this area.


Abstract:

Purpose: To evaluate the average time off work for patients with hand injuries as well as factors influencing the length of time off work for subjects who had returned to work. Methods: A total of 124 subjects were recruited and followed up 2 weeks after being discharged from therapy or until they resumed work. Factors affecting the time off work such as the severity of injury, number of operations, educational level, physical job demand, and presence of compensation claims, complications, and posttraumatic stress were also examined by multiple regression. The relationship between the severity of injury, time off work, and length of rehabilitation time was also examined. Results: In 124 subjects, 109 resumed their previous jobs, with an average of 8 weeks off work and 9 weeks in regular rehabilitation. The result shows that the severity of injury, number of operations, and presence of compensation claims were the predictors for the length of time off work in hand injury patients. In addition, the time off work and length of rehabilitation time increased with more severe injury. However, a cross-over was noted in the severe grade of severity of injury; that is, the time off work was shorter than the length of rehabilitation time for those with a less severe level of injury (minor to moderate level) and vice versa for those with major severity of injury. Conclusions: To a certain extent, the result enhances our understanding of prolonged time off work after hand injury and may help to
optimize rehabilitation after injury. For those who are in the high-risk group with factors that are not under control, early planning and retraining should be given to avoid prolonged time off work.

This was an interesting study that examined the length individuals not only participating in therapy after a hand injury but also days off from work. The study did a good job of reporting the results, indicating that more serious injuries required longer therapy and increased days off. It was also interested that individuals with heavier job requirements had more complications and lower rates of return to work. The article was appropriate for my case study because my client was on leave from both employers.


Abstract:

OBJECTIVES. The provision of options in the occupational form that encourages meaningful choices and subsequent purposeful occupational performances is a basic premise of occupational therapy. This study examines the preferences of elderly nursing home residents when presented with an occupationally embedded exercise versus a rote exercise and addresses the methodological problems identified in similar past research. METHODS. Fifty-two elderly nursing home residents were presented with a choice between an occupationally embedded exercise that involved unilateral dunking of a small, spongy ball into a basketball hoop and a rote exercise that involved moving the arm above the head in a simulation of the dunking exercise. Both exercises required flexion of the shoulder joint. Random assignment of the 52 subjects into
one of four groups controlled for the order of the presentation of the exercises and the order of
the choice statements. RESULTS. Sixty-nine percent of the subjects chose the occupationally
embedded exercise. Analysis with the significance of a proportion statistic revealed a statistically
significant difference ($z = 2.77; p$ (one-tailed) = .003). CONCLUSION. Results were consistent
with the hypothesis that elderly nursing home residents would tend to choose the occupationally
embedded exercise. To further confirm this basic premise of occupational therapy, future studies
that investigate therapeutic patterns of movement embedded in common occupations are
recommended.

This is another study used to support the idea of occupationally-embedded exercises
versus simulating the same movement. In this study, elderly women were given the choice
between the rote and occupationally-embedded exercise. The client I chose for my case study
was a near elderly woman who likely would also prefer the occupationally embedded versus the
rote exercise.