PREvention: preventing the re-injury of epicondylitis

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PREvention: Preventing the Re-injury of Epicondylitis

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Occupational Therapy Doctorate Program

Department of Occupational Therapy

The University of Toledo Health Science Campus

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Executive Summary

The goal of the Preventing the Re-injury of Epicondylitis (PREvention) Program at Heartland Rehabilitation is to prevent re-injury and increase the quality of life for those diagnosed with medial or lateral epicondylitis, through participation in occupational therapy intervention with a focus on work conditioning. In order to increase quality of life for those with epicondylitis, patients will experience a decrease in pain and demonstrate an increase in occupational functioning and knowledge regarding the etiology and treatment of epicondylitis.

The current program is a Carpal Tunnel Syndrome Treatment program: Tunnel Tune-Up. It will continue to be executed. An additional program to prevent re-injury of epicondylitis will also be implemented, due to the increasing diagnosis of both syndromes.

The objectives for the PREvention program focus on an increase in the patient’s occupational functioning, knowledge regarding epicondylitis and various environmental modifications that may be necessary to decrease symptoms, and a decrease in the patient’s pain. It is estimated that about 30 patients from Heartland Rehabilitation Services will be served during the first year. They will participate in an average of eight treatment sessions, similar to the Tunnel Tune-Up program, but focusing on epicondylitis. The PREvention Program will include formative, summative, and follow-up measures to determine success. This will be executed in the form of patient improvement as evaluated by patient objectives and a 6 month follow-up survey regarding the patient’s health status. It will also be measured by evaluation of the program by the therapist in charge of the program and other stakeholders at the facility. The program will take place at Arrowhead Park Physical/Occupational Therapy clinic in Maumee, Ohio, and will serve participants within Lucas County and parts of Wood County.
Introduction

Sponsoring agency

The PREvention Program will be implemented at Arrowhead Park PT/OT clinic in Maumee, OH and will include potential participants from each of the seven rehabilitation clinics within Toledo and the surrounding area operated by HCR Manor Care. Heartland’s Arrowhead Park location has had an outpatient occupational therapy program since February 2000, when it was developed by an occupational therapist who was an employee of Heartland/HCR Manor Care. The development of this outpatient occupational therapy (OT) program was due to an increased need and referrals for outpatient OT services within the facility (Debbie Warren, personal communication, 2/21/2008).

As a whole, HCR Manor Care is known for having over 500 facilities throughout the United States including skilled nursing facilities, assisted living centers, outpatient rehabilitation clinics, hospice and home health care. HCR Manor Care employees consist of over 61,000 people. HCR Manor care concentrates “not just on our quality of care; it’s our quality of caring” (HCR Manor Care, 2005a). The facility places emphasis on assisting clients to exercise as much independence as possible and attends more to strengths than limitations (HCR Manor Care, 2005b). It is obvious that this facility deeply cares for and respects each individual client. This is evidenced by annual training in guest relations in which each employee participates. The goal of the training is to exemplify teamwork and the delivery of meaningful, individualized care to each client (HCR Manor Care, 2005b). The PREvention Program matches this philosophy because it mandates individualized care by the very definition of the program. Not only will the PREvention Program provide resources including home care and patient education, it will also allow the OT to have a
direct impact on the environment where the injury occurred. This is specific to each individual patient, and helps to ensure that re-injury will be unlikely.

The mission of Heartland Rehabilitation Services, which is the division of HCR Manor care into which the Arrowhead Park facility is found, reads:

“At Heartland Rehabilitation Services, we’re dedicated to providing the highest quality rehabilitative therapy to our patients and the facilities we serve. Our professional team is committed to making a difference in the lives of our patients by helping them achieve their maximum functioning level.

We put our heart into quality performance. We pledge to provide service excellence, knowing that the highest quality of care can only come from the highest quality of caring” (Heartland Rehabilitation, n.d.).

The PREvention program also fits with this mission because this program will assist those with medial and lateral epicondylitis to reach the highest functioning level possible and will aid in the minimization of the probability for re-injury in the future.

Current Program

The current program employed through Heartland Rehabilitation Services is called the Tunnel Tune-Up program. It is designed as a treatment program for those diagnosed with Carpal Tunnel Syndrome (CTS). Its goal is to help decrease symptoms associated with the early onset of the syndrome. It is a non-surgical approach. This program aims for a patient to be seen for 3-4 treatment sessions with the intent of completing the following: initial evaluation, education on home exercise program, splinting (if necessary), and pain relieving modalities specific to the diagnosis of CTS. The program offers information to the patient regarding symptoms and causes of Carpal Tunnel Syndrome, and tips for modifying one’s daily routine in order to reduce the symptoms associated with the
syndrome. Its home exercise program includes exercises to relieve pain by stretching the surrounding muscles, tendons, and structures, and to reduce edema.

The layout of the PREvention Program will be similar to the Tunnel Tune-Up program because it will also include an initial evaluation, home exercise program, informational packet, splinting if necessary, and the use of specific pain relieving modalities which have been proven to decrease symptoms its respective diagnosis. It is similarly a non-surgical approach. In addition to what the Tunnel Tune-Up offers its participants, the PREvention Program will also include a job site analysis. This has great importance to those diagnosed with epicondylitis (Please see section entitled Re-Injury of Epicondylitis for rationale of job site analysis). The aim is for the occupational therapist to visit the patient’s work space (or the environment which is believed to contribute primarily to the patient’s development epicondylitis), and make recommendations for modifications to reduce the risk of re-injury. This component not only makes the program highly individualized, but it also adds occupation to the program. The PREvention Program will not be offered to those diagnosed and in the early stages of Carpal Tunnel Syndrome, rather, it will be offered for those with the diagnosis of medial or lateral epicondylitis.

Pre- and Post-Modification Program Goals

The pre-modification goal of the Tunnel Tune-up at Heartland Rehabilitation is to help decrease symptoms associated with early onset Carpal Tunnel Syndrome by reducing pain and swelling, and through patient education. The post-modification goal of the Preventing the Re-injury of Epicondylitis (PREvention) Program at Heartland Rehabilitation is to prevent re-injury and increase the quality of life for those diagnosed with medial or lateral epicondylitis, through participation in occupational therapy intervention with a focus on work conditioning. In order to increase quality of life for those
with epicondylitis, patients will experience a decrease in pain and demonstrate an increase in occupational functioning and knowledge regarding the etiology and treatment of epicondylitis. Not only is the new program designed to decrease symptoms associated with the disorder, it also stresses the importance of increasing the patient’s quality of life and preventing the possibility of the patient injuring him- or her- self again.

*Investigation of Needs*

The need for this program was determined by administrators at Heartland Rehabilitation’s Arrowhead Park PT/OT clinic through multiple interviews, e-mails, conversations, and observations. Most interviews have taken place with Debbie Warren, OTR/L at the Arrowhead Park location because she works with most patients with lateral or medial epicondylitis who are referred to the facility. The physical therapists at times work with patients with epicondylitis; however, the occurrence is rare, and the facility has a desire for all patients with epicondylitis to be treated by an occupational therapist rather than a physical therapist following the establishment of the PREvention Program (Debbie Warren, personal communication, 1/17/2009). A semi-structured interview was used during the first meeting with Mrs. Warren to determine the need for the program as well as to verify and find additional information regarding the facility in general.

There is a great need, however, to have input from those with the diagnosis of epicondylitis in order to determine what exactly the problem area(s) are and the specific problems with the current ergonomic set-up of their work spaces (Claiborne, Powwell, & Reynolds-Lynch, 1999). For this reason, additional methods were utilized to determine the need for a program such as this including a survey and interview with potential participants. Each method is representative of a way to locate different yet valuable information regarding the development of the medial and lateral epicondylitis re-injury
prevention program. The information provided by those directly impacted by the program will encourage them to have an active part in planning. This may increase their commitment to following the adjustments suggested following the job site analysis (Claiborne, Powwell, & Reynolds-Lynch, 1999).

A survey is considered an appropriate method of data gathering. The majority of the information provided by this method was quantitative, due to the nature of the survey. The population surveyed was patients who had been diagnosed with medial or lateral epicondylitis and who were currently participating in occupational therapy at one of the seven outpatient Heartland Rehabilitation facilities. A survey was particularly important because it allowed the agency to conclude the opinions of current patients. The goal of this method of data gathering for this section of the needs assessment was to gather information and outlooks regarding what current patients believe to be the cause of their elbow pain, what they have done to attempt to remedy their elbow pain, and willingness to participate in various aspects of this program including job site analysis, home exercise program, and learning about epicondylitis. Please see Appendix A for the survey issued to these participants.

An interview was also an important part of the needs analysis conduction. This setting allows current patients to supply qualitative information about what they would like to see in the program, and what each participant’s major concerns are with regard to his or her elbow pain. Some questions were answered in this environment that were unable to be addressed in the survey due to its quantitative nature.

Results of Needs Analysis

It is important to take into account the results of the needs analysis according to each stakeholder. Through an interview with one key stakeholder, Debbie Warren, OTR/L,
it was determined that Heartland Rehabilitation’s Arrowhead park location currently serves
about four patients with epicondylitis. When including Heartland Rehabilitation’s other 6
outpatient facilities, there are about eight total patients who are participating in
occupational therapy intervention who have been diagnosed with epicondylitis. The
average intake is about one new patient per month with this diagnosis within the
Arrowhead Park facility, and about four new patients per month with this diagnosis within
all of Heartland Rehabilitation’s outpatient facilities. Although these numbers may seem
small, there is a definite need within Heartland Rehabilitation for this program identified
by Mrs. Warren, since the facility has patients with this diagnosis that do not have the
availability of a program such as this. Mrs. Warren is confident that with the introduction
of this new program, the amount of referrals of patient with epicondylitis to the facility
will increase.

When investigating the results of the survey and interviews from current
epicondylitis patients at each of Heartland Rehabilitation’s outpatient facilities, it was
found that slightly more patients were men than women, and all resided in the Toledo,
Ohio area. All respondents but one were Caucasian. The other respondent was African
American. Over half of the patients surveyed have lived with elbow pain for a duration of
over two months. When questioned what methods participants have explored to decrease
elbow pain, most respondents consulted their physician and eventually received referrals
for occupational therapy. Other answers checked by survey respondents included applying
heat and/or ice, wore a brace available in a retail store, worked less, asked a friend with a
medical background, or independently researched ways to decrease pain. One respondent,
who has had elbow pain for greater than 8 months, reported doing nothing in an attempt to
decrease his pain. He revealed during further interview that if he knew about a program
offered to help him decrease pain, he would have “probably taken it up on its offer.” This shows the lack of awareness and knowledge of this disorder. With increased marketing, it is possible that therapy for him could have started earlier. If this would have happened, participants such as him would experience elbow pain for less time, which would increase their independence in daily life.

The primary environment believed to cause the respondents’ epicondylitis varied greatly. Options listed on the survey included each of the seven areas of occupation identified by the American Occupational Therapy Association (American Occupational Association, 2006): a) caring for self, b) caring for others/household management c) leisure involvement, d) social involvement, e) work, f) education, and g) play. Answers varied, but included all of the following: work, play, caring for self, and leisure involvement. During interviews, more specific answers were formulated. One respondent revealed that she believes it was a combination of her love for creating pencil drawings and her job as a hair stylist and nail technician. Another remarked that he believed the main source of his elbow pain was due to holding the phone to his ear for long periods of time at work. One other gentleman stated he worked constantly with vibrating tools, and even works on a train while it is in motion, which requires him to use more strength (in order to hold the tools safely) to get his work done. Before being diagnosed, each respondent was unaware that these components of their job and leisure interests increased their risk of epicondylitis. When provided with an informational packet when beginning in the PREvention Program, the participants will be aware of the risks and it is hoped that they will comply with the changes suggested in the informational packet as well as the job site analysis.

Those surveyed were asked what specific tasks are most difficult to complete with their elbow pain. Answers provided were computer work, lifting children, opening
containers, drawing, working, lifting objects that seem light (e.g., a gallon of milk), swinging a golf club, or making a fist around objects. One participant explained how detrimental it would be if she was unable to work; she owns her own business and would be “out of luck” if she couldn’t complete this particular job anymore. Another respondent explained during her interview how frustrating it is to be in so much pain when lifting her children. Two objectives for the PREvention Program are to decrease pain and to increase occupational functioning, which would help combat each respondent’s answers.

When asked if participants were aware of any program similar to this in the area in which they can participate (other than therapy through Heartland Rehabilitation), everyone replied that they were unaware of a program in which to participate. This shows that there is a need for a program such as this, as there is nothing like it offered in the surrounding area.

When participants were asked their opinions regarding willingness to participate in a home exercise program, reading an informational packet about epicondylitis, and participating in a job site analysis, answers varied. All respondents replied either “probably yes” or “definitely yes” when asked about participating in a home exercise program and reading an informational packet about epicondylitis. However, when asked about participating in a job site analysis, answers included “probably yes,” “uncertain/no opinion,” and “probably no”. When asked why respondents were uncertain or replied “probably no”, answers typically included that the respondent did not think that his or her employer would allow it. One respondent remarked that he did not think that anything could be changed at his job. He stated “I need to do things the way that I do them and there’s no way around it.” However, respondents who answered “probably yes” made a
connection between making changes in their work environment and an improvement in their elbow pain.

The PREvention Program is valuable to Arrowhead Park clinic because of the likelihood of re-injury following epicondylitis. When given this diagnosis, a person is often instructed to simply discontinue the targeted occupation that caused the initial diagnosis of epicondylitis, yet this is impossible in many situations. An occupational therapist is needed to assist in the modification of the occupation or environment. This program offers an outlet to decrease the amount of re-injury, therefore decreasing the amount of money wasted due to lost wages, lost productivity, administrative expenses, health care, and other expenses. The program will also increase the quality of life of the participants involved because it will decrease the pain involved with their injuries, increase their knowledge when it comes to the diagnosis, and increase the functional ability of each participant.

*Literature Review*

*Explanation of Terms*

Epicondylitis is defined as cumulative damage and/or pain on either side of the elbow and/or forearm where the muscles for the finger and wrist originate. Medial epicondylitis occurs when the side of the elbow that is damaged is the side closest to the body. Pain at the medial epicondyle and flexor wad (where the muscle bellies are located for these flexor muscles) is present when flexing at the wrist and/or fingers and pronating the forearm. Lateral epicondylitis occurs when the side of the elbow that is damaged is the side farther from the body. Pain at the lateral epicondyle and extensor wad (where the muscle bellies are located for these extensor muscles) is present when hyper-extending at the wrist, extending the fingers, and supinating the forearm (Hajic, 2008).
Work conditioning can be described as an aspect of work hardening which focuses on the physical conditioning aspect including strength, fitness, flexibility, coordination, and endurance. It is generally carried out by only one discipline, such as occupational therapy, in contrast to the multidisciplinary component of work hardening which usually includes some or all of the following: occupational therapists, physical therapists, psychologists, vocational evaluators, exercise physiologists, dietitians, and counselors (Haruko Ha, Page, & Weitlisbach, 2006). The goal of work conditioning is to rehabilitate workers who are injured, assist them to achieve the highest level of functioning possible, and return them to work as quickly and safely as possible (Haruko Ha, Page, & Weitlisbach, 2006). Programs such as this often have an evaluation component, and specialized protocols including job simulations, appropriate educational components such as body mechanics, simple anatomy review, information regarding the injury ergonomics, and appropriate frequencies and durations of interventions (Crepeau, Cohn, & Boyt Schell, 2003).

*Etiology of Epicondylitis*

Epicondylitis is referred to in the literature under many different headings such as cumulative trauma disorder, repetitive motion disorder, repeated trauma, musculoskeletal disorder, and others. The most common term found is work related musculoskeletal disorder (WMSD) of the upper extremity. Its etiology includes five physical factors: “repetitive motions, forceful motions, mechanical stresses, static or awkward postures, and hand-arm vibration” (Levy, Wegman, Baron, & Sokas, 2006, p.492). Those diagnosed with either medial or lateral epicondylitis are likely to endure pain on either side of the elbow and/or forearm that worsens with resisted movement. Both the lateral and medial epicondyle (identified as the bony prominence at either side of the elbow) serve as
attachment points for muscles of the wrist and hand; the lateral epicondyle for extensor and supinator muscles and the medial epicondyle for the flexor and pronator muscles (Sanders, 2004).

In laymen’s terms, lateral epicondylitis is generally referred to as “tennis elbow,” although less than 20 percent of people who develop this condition actually acquire it from playing tennis (Hajic, 2008). Other implications include typing, gardening, repetitive work, or a traumatic tear resulting from a forceful injury (Sanders, 2004). Medial epicondylitis is generally referred to as “golfer’s elbow,” yet the majority of diagnoses are not from golfing, either. This type of epicondylitis may result from typing, golfing, or acute forceful injury (Sanders, 2004).

*Re-Injury of Epicondylitis*

There is always a chance of re-injury for people diagnosed with epicondylitis. Some sources even determine that part of the definition of epicondylitis is a recurring pain with repeated movement (Tennis Elbow Information, 2008). It is also identifiable as a chronic pathology (Burke, Higgins, McClinton, Saunders, & Valdata, 2006). Epicondylitis is initially caused by minute tearing or damage to the muscle. This area accumulates increased tearing with time and over usage. The body is eventually unable to heal following repeated daily injury, and the issue of the initial injury turns from inflammation to deterioration of the muscles (Hajic, 2008), which leads to the likelihood that the disorder becomes chronic (Saidoff & McDonough, 1997). This supports the belief that re-injury is common with epicondylitis because of the difficulty in regenerating the muscles involved following healing and the improbability of requiring total rest of the upper extremity (Saidoff & McDonough, 1997). Re-injury is seen when the “patient continues to perform [occupations] that aggravate the condition, [and] the immature collagen produced by an
attempted repair is broken down before it has a chance to mature and the chronic inflammatory process continues” (Saidoff & McDonough, 1997, p. 74). The patient returns to the occupation(s) that encouraged overuse of the muscles and increased the initial susceptibility of the patient, and he or she neglects to modify the occupational form that caused the initial development of the epicondylitis. Without intervention, the patient is likely to continue to re-injure the elbow due to the continuance of occupations that are carried out which caused the primary epicondylitis.

A common strategy to prevent re-injury is the recommendation to discontinue the action that causes tension to be placed on the elbow joint (Tennis Elbow Information, 2008); however, this is rarely possible, especially if the injury is brought on by some aspect of the person’s employment. It is necessary then to modify the occupation and/or environment in which the injury occurred through an occupational therapist’s site analysis and evaluation. Research has shown that industrial companies are likely to hire workers who already have experience with hand-intensive labor, which is a large part of the population who may already have developed symptoms of a musculoskeletal disorder (Sanders, 2004). For workers who continue to work in this type of setting, King (1990) developed a term: “cumulative trauma roulette.” By continuing to work a setting that requires this intensive labor, workers continuously increase the chance of acquiring a WMSD. It has also been identified that following therapy or medical intervention, workers who have been diagnosed with a cumulative trauma disorder often return to the same job (Sanders, 2004). This increases the risk for re-injury, and demonstrates the need for one’s environment at work to be modified to minimize the chance for re-injury. Part of one’s treatment goal following the initial diagnosis would be preventing recurrence “through improved technique, training, or equipment” and returning slowly to one’s previous
occupation(s) (Burke, Higgins, McClinton, Saunders, & Valdata, 2006, p. 401). Examples of methods to carry out this goal would be patient education including: adaptation and postural positioning and pain reduction techniques; general health promotion including increased endurance, flexibility, stretching and warm-ups; and an ergonomic analysis of conditions and tools, and equipment being used (Burke, Higgins, McClinton, Saunders, & Valdata, 2006).

Demographic Information

Although it is common for this type of injury to occur in the work place, it is important to note that injuries that result from repetitive motions, such as lateral and medial epicondylitis, are not always a direct consequence from one’s job but can be caused by occupations encountered during any of the seven areas of occupation as defined by the Occupational Therapy Practice Framework which include occupations of daily living (ODLs), instrumental occupations of daily living (IODLs), education, play, leisure, social participation, and work (American Occupational Association, 2006). However, diagnoses of epicondylitis that are unrelated to work are not differentiated clinically than those that are work related (Palmer, Harris, & Coggin, 2007). Demographic and background information that was able to be located regarding this type of injury originates almost entirely from statistics regarding the work place. The PREvention program will be available for all those who experience this type of injury and will not be dependent on the type of physical environment where the injury occurred.

The U. S. population of people diagnosed with epicondylitis is unique and difficult to describe due to the great demographical variety of those who report occupational illness or injury due to repetitive motion. Limited information was found to link the incidence of occupational injury due to repetitive motion with factors related specifically to gender,
genetic makeup, culture, or literacy (United States Department of Health and Human Services, 2000). In the small amount of demographic research that has been done, it has shown that a typical person diagnosed with lateral epicondylitis is a man or woman in his or her 40’s or 50’s, and the injury most commonly occurs in his or her dominant arm (Calfee, Patel, DaSilva, & Akelman, 2008). In 2004, chronic illness and/or disability was cited for being the focal reason that 25 percent of people aged 20-64 and 15 percent of people over the age of 15 do not work (Dalirazar, 2004). This would be the category under which illness due to a repetitive motion injury would fall. Among those who reported inability to work due to chronic illness or injury, 25% were White, 36% Black, 18% were Hispanic origin, and 18% of respondents were described as other (Dalirazar, 2004).

An additional reason that the population affected by epicondylitis is difficult to describe is because there is no national occupational disease reporting system currently in the United States (United States Department of Health and Human Services, 2000). Although estimates are available, there is a good chance that reported cases underrate the actual number of occupational illnesses.

*Epicondylitis in the Workplace*

It is evident that the impact of injuries and illnesses in the workplace is present. In 1995, it was estimated that a worker in the United States was injured in some way every 5 seconds and a worker was either temporarily or permanently disabled at an average of every 10 seconds (Centers for Disease Control and Prevention (CDC), 1995). A work related or occupational illness or injury can be identified as any illness or injury acquired by a person engaged in a work-related occupation, while on or off the work site, and includes students, volunteers, apprenticeships, and other statuses considered work related (United States Department of Health and Human Services, 2000). There has been a tenfold
increase in work related musculoskeletal disorders (MSDs) from the early 1980’s until 1994. From 1995 through 1997, rates of reported MSDs in the work setting have slightly declined, yet are still a persistent problem (Tanaka, Petersen, & Cameron, 2001). The rate of incidence of this type of work related injury is increasing far greater than other work related injuries. While the rate overall of occupational injury and illness cases (excluding repeated trauma disorders) increased by only 3 percent from 1988 to 1992, repeated trauma disorders including epicondylitis increased by 144 percent over the same time period (United States Department of Labor, 1993).

As a whole, work related injuries cost society an average of $121 billion due to lost wages, lost productivity, administrative expenses, health care, and other expenses in 1995 (King, Jeffery, & Fridinger, 1995). Regarding workers compensation alone, these MSDs cost the United States between $13 and $20 billion annually (Levy, Wegman, Baron, & Sokas, 2006). In 2001, workers in Washington State missed about 73 days of work due to repetitive trauma disorders which equated to a median cost of about $883 in direct costs; and although it was not reported, indirect costs are projected to be anywhere from 2 to 5 times the amount of direct costs (Levy, Wegman, Baron, & Sokas, 2006). It is important to keep in mind the rate of underreporting that is assumed as well as lost time and decreased productivity that occurs in the following days after the worker does return to his or her job.

In terms of overexertion and repetitive motion injuries specifically, it was estimated that 675 full time workers were injured per 100,000 in 1997 (United States Department of Health and Human Services, 2000). Out of 507,500 total cases that resulted in days off work in 1997, 32 percent resulted from overexertion or repetitive motion. Over 75,000 of those cases were specifically attributed to repetitive motion occupations, such as “typing or key entry, repetitive use of tools, and repetitive placing, grasping, or moving objects other
than tools” (United States Department of Health and Human Services, 2000). The PREvention Program intends to assist participants in lowering the amount of days needed off work by carrying out interventions to decrease the likelihood of re-injury in the specific repetitive motion injury of epicondylitis.

**Occupation-Based Programming**

Work as therapy has been an included aspect since the beginning of the profession of occupational therapy, although work was originally geared toward the mental health population (Harvey-Krefting, 1985). Occupational therapists are able to make a distinct input within work rehabilitation in general due to the holistic nature in which OT’s are trained. This includes studies of biological and behavioral sciences, human development, and occupational performance evaluation (Haruko Ha, Page, & Wietlisbach, 2006).

The fit between PREvention and occupational therapy at Heartland Rehabilitation’s Arrowhead Park facility is apparent. An occupational therapist is the most common professional to work with a client in terms of functional ability in relation to his or her occupation. If an occupational therapist can incorporate the appropriate fit between the individual’s functional level and the occupational form, it “enables the worker to feel productive while providing a sense of connectedness” (Crepeau, Cohn, & Boyt-Schell, 2003 p. 343). One’s employment status involves meaning and purpose, and is intertwined with other major aspects of one’s life, such as time management, mood, and motivation within the context of being a contributing member of society by working. An occupational therapist has special training in taking into consideration aspects of the client’s developmental structure which include the client’s mental, emotional, and physical status, in conjunction with the aspects of the occupational form including the physical and socio-cultural dimensions (Crepeau, Cohn, & Boyt Schell, 2003). This implies that a holistic
approach should be considered. As stated in the literature review, it is common for epicondylitis to be attributed to some aspect of one’s employment. Employment is outlined as one of the seven areas of occupation as identified by the American Occupational Therapy Association (American Occupational Association, 2006).

The occupational therapist is unique in his or her evaluation of all aspects of occupation: the worker, the workplace, and the demands of the worker within the workplace. He or she has special training in the modification of the workplace by breaking down the demands of the job, and adaptation of the worker by determining what elements of the job that he or she may find problematic (Crepeau, Cohn, & Boyt-Schell, 2003). As an occupational therapist, one has more specialized training of the hand and upper extremity than most other disciplines that may take on a program such as this, for example a social worker, physical therapist, or ergonomist. The concept that it is not solely an issue of strength, but also endurance, stability, mobility, and range of motion, is intimately studied and understood by an occupational therapist.

*Rationale for Major Program Modification*

The PREvention Program should be classified as a major program modification versus a minor ‘tweaking’ of the Tunnel Tune-Up Program. The modified program serves an entirely different population with a very different diagnosis. Although the two programs both incorporate a reduction of pain and an increase in patient education, the PREvention Program will serve patients with the diagnosis of medial and/or lateral epicondylitis, and the Tunnel Tune-Up Program will serve patients with the diagnosis of Carpal Tunnel Syndrome. This requires knowledge of the OT of a different population and treatment options for that patient. While the quality of life for both populations should improve, that is where the similarities end for these two programs. These populations will have different
intervention methods for improvement including the media used during therapy, the types of splints fabricated, patient knowledge gained, and home exercise programs. Those with the diagnosis of epicondylitis will participate in a job site analysis, which is a novel aspect of the programming. Additional staff will be necessary to accommodate for time consuming aspects of the program, specifically the job site analysis. This will then lead to the need for many new costs, including salary, benefits, and tangible materials needed.

*Models of Practice*

Two primary models of practice will be utilized to ensure the success of the PREvention Program. The models to be included are the biomechanical model and the rehabilitation model of practice.

The biomechanical model draws from biomedical sciences and knowledge and understanding of precautions and prognoses are necessary for setting appropriate goals regarding re-establish occupational performance (Crepeau, Cohn, & Boyt Schell, 2003). The biomechanical model is used specifically when a patient has physical limitations due to impairment of a particular body structure or function, such as epicondylitis. Within this model, assumptions that apply to the PREvention Program include: patients with physical limitations may have trouble with occupational performance (Kielhofner, 1997); physical limitations can be improved by modalities that are adjunctive to therapy (such as passive range of motion or physical agent modalities), and other occupations that are not meaningful but allow practice of skills necessary for occupational performance (Pedretti & Early, 2001); and realistic goals must be set (Crepeau, Cohn, & Boyt Schell, 2003).

Concepts that form the rehabilitation model derive from: the medical sciences in order to understand the process of the injury or illness in relation to his or her physical functioning; the physical sciences aid in understanding body mechanics, assistive device
fabrication and selection, and modification of the occupational form; and the social sciences provide information regarding a worker’s response to acute and chronic illnesses or injuries (Crepeau, Cohn, & Boyt Schell, 2003). These models are deemed to be necessary because the theoretical background for both lies within a rehabilitation perspective, meaning that restoration is emphasized. This process can be defined as “the combined and coordinated use of medical, social, educational, and vocational measures for training and retraining the individual to the highest levels of functional ability” (Hagedorn, 1997, p. 42).

Within the rehabilitation model of practice the philosophy is to facilitate the highest amount of function possible for a person with a physical or mental disability or chronic illness (Crepeau, Cohn, & Boyt Schell, 2003). This model, like the philosophy of HCR Manor care, is to concentrate on strengths, not limitations of the patient, and usage of assistive devices and compensatory methods are at times put into place. The PREvention program follows this model by altering the occupational form within the job site (or injury site) to minimize the potential for re-injury. Assumptions for this model that apply to the PREvention Program include: an individual can achieve higher independence with the use of adaptation and compensation when the previous functional status cannot be achieved; independence is reliant upon the amount of motivation the patient exhibits; one’s occupational form influences his or her performance; and rehabilitation involves adaptation in the form of learning (Dutton, 1995).

Objectives

Pre-Modification Objectives

1. As a result of the Tunnel Tune-Up education packet, 90% of participants will demonstrate an increase in knowledge regarding the etiology of Carpal Tunnel
Syndrome by the time of the patient’s discharge, measured by discussion with therapist regarding the syndrome.

2. As a result of the Tunnel Tune-Up program, 90% of participants will demonstrate an increase in knowledge regarding the proper positioning when sitting at a desk and/or using a computer by the time of the patient’s discharge, measured by discussion with the therapist regarding proper positioning.

3. As a result of the Tunnel Tune-Up program, 80% of participants will experience an increase in occupational functioning by the time of the patient’s discharge, measured by patient reports at his or her initial evaluation and discharge summary.

4. As a result of the Tunnel Tune-Up program, 80% of participants will experience a decrease in pain by the time of the patient’s discharge, measured by comparing patient reports at his or her initial evaluation and discharge summary.

Post-Modification Objectives

1. As a result of the PREvention Program education packet, 90% of participants will demonstrate an increase of knowledge regarding the etiology and treatment of epicondylitis by the patients’ discharge, through the completion of a questionnaire before and after participation of the program.

2. With the assistance of the occupational therapist, 70% of participants will report an increase in occupational functioning (e.g., less difficulty with ODLs, IODLs, employment, or leisure occupations previously identified as problematic) by the patients’ discharge.
3. By the patients’ discharge and with the assistance of the occupational therapist, 70% of participants will demonstrate an increase in strength and range of motion without pain of the upper extremity with epicondylitis.

4. Through occupational therapy intervention and education, 75% of participants will report a decrease in pain in the affected upper extremity with epicondylitis by the patients’ discharge, as judged by a report of the amount of pain at the beginning of the program vs. the amount of pain at the end of the program.

5. By the patients’ discharge from therapy and through the PREvention program, 75% of participants will be able to identify to his or her occupational therapist at least two aspects of the usage of proper body mechanics, and at least two modifications that can be made to the occupational form that contributed to the patient’s epicondylitis.

Each objective’s percentage of participants was determined following a conversation with Debbie Warren, OTR/L, regarding an appropriate estimated margin of success for the objective. Objectives were deemed appropriate by the site mentor, Debbie Warren, OTR/L, as well as through the following documented symptoms of epicondylitis as referred to in the Literature Review.

Symptoms of medial epicondylitis include pain in the medial epicondyle and flexor wad (where the muscle bellies are located for these flexor muscles) when flexing at the wrist and/or fingers and pronating the forearm. Symptoms of lateral epicondylitis occur at the side of the lateral epicondyle and extensor wad (where the muscle bellies are located for these extensor muscles) when hyper-extending at the wrist, extending the fingers, and supinating the forearm (Hajic, 2008). Those diagnosed with either medial or lateral epicondylitis are likely to endure pain on either side of the elbow and/or forearm that
worsens with resisted movement (Sanders, 2004), so it is appropriate for a program participant to increase his or her strength and range of motion without pain during the program.

The etiology of epicondylitis includes five physical factors: “repetitive motions, forceful motions, mechanical stresses, static or awkward postures, and hand-arm vibration” (Levy, Wegman, Baron, & Sokas, 2006, p.492). When program participants are able to identify some of these factors, they will have the opportunity to make changes in their lifestyle in addition to the modifications suggested by the OT.

Aims of Program Modification

Several aims can be identified for the PREvention Program. One aim is that there will be an increase of referrals from surrounding area physicians once they are aware of the program offered by Heartland Rehabilitation’s outpatient facilities. An additional aim is that with increased marketing of this program, Heartland Rehabilitation facilities in general will also be marketed. The facility is hopeful that with the introduction of this program, physicians would increase referrals of patients of multiple diagnoses, not just epicondylitis. A third aim that can be identified is that Heartland Rehabilitation will have the opportunity to build a new relationship with various industries around the city of Toledo. Administrators of a particular industry would see the value of a job site analysis and understand the rationale for the changes being suggested. This could create an open forum where administration could use the occupational therapist on a consultation basis to make compensations to various other stations in the facility.

There is a direct relationship between each aim of the PREvention Program and the enhancement of the program’s goal and objectives. By marketing the program out to physicians and gaining additional referrals, there would be an increase in patients
participating in the program. When looking at the goal of the PREvention Program, an increase in participants of the program would increase the number of people with this diagnosis whose quality of life would be improved through a reduction of pain, an increase in occupational functioning and knowledge regarding the etiology and treatment of epicondylitis.

Patients

Post-modification potential participants and inclusion criteria

The primary target audience of the PREvention Program includes both males and females of all ages diagnosed with medial and/or lateral epicondylitis. The diagnosis of epicondylitis is a new inclusion criteria for the participation in this program post-modification. An expected geographical area includes Toledo, Ohio, and its general vicinity. Since there are seven outpatient therapy centers involved with Heartland Rehabilitation that are all located near Toledo, Ohio, it is likely that participants may come from all parts of the Toledo area. It is possible for a participant to live outside Lucas County. As stated in the introduction, the environment in which a person generally develops this disorder is in the work place. Common types of jobs include manufacturing, private industry, transportation and utilities, retail trade, and service industry (U. S. Department of Labor, 2003). However, it is not a criterion for inclusion that the trauma accumulated in the work place. Participants must have a prescription from a physician to be treated for the diagnosis of epicondylitis.

Implementation to Achieve Aims

Program modification implementation and future implementation

There are many aspects of planning regarding the PREvention Program that must take place prior to the intake of program participants. It is important for a one-page
program flier and brochure to be prepared to provide for physicians around the Toledo, Ohio area. The final version of these documents will be finished by the occupational therapy student, in conjunction with Courtney Meyer, PTA (for marketing, design, and formatting assistance) and with the approval of Debbie Warren, OTR/L by April 1, 2009. Please see Appendix B and C for a copy of these documents. The creation of an informational packet for program participants regarding the etiology of the disorder, and the creation of materials for a home exercise program will also be finished on this date due to the similarity of the products. Please see Appendix D for this document. The physician will also receive a patient information pack in order for him or her to see the programming plan for his or her patients. The distinction of appropriate assessment instruments were decided and determined appropriate and necessary by January 30, 2009. Materials needed for purchase before the beginning of the program including job site analysis forms will be obtained by the end of April 2009, in order to ensure that they are compatible with the program before the start of the program. The marketing and recruitment for the occupational therapist will occur during the month of April 2009, and an anticipated start date for the new therapist will in the beginning to middle of May 2009. When the new OT is hired, he or she will participate in orientation and training (to be described later) in the latter part of May 2009. Along this time, the occupational therapist in charge of the PREvention Program would also be spending time familiarizing him- or her- self with Arrowhead Park PT/OT clinic and its staff. Courtney Meyer, PTA, and Jim Berger, Assistant Manager for Northwest Ohio, will participate in the Educational Workshops for physicians in the Toledo area with whom a close relationship has been established in previous years. Typically, the new program is presented to a “core” of five or six physicians at the beginning of the program, and following the beginning of the program,
additional educational workshops occur as needed (Courtney Meyer, personal communication, 3/02/09). Planning for these workshops, including determining dates to speak with physicians, happen during the month of April. Dates for educational workshops with physicians will be in place by the end of April. All Educational workshops with the “core” of five or six physicians will take place during the month of June. Materials that will be presented along with the presentation itself, were completed during the month of March 2009 by the occupational therapy student and Courtney Meyer, PTA. Other outpatient Heartland Rehabilitation clinics in Toledo are continuously informed about the program which will be based out of Arrowhead Park during staff meetings beginning in January 2009. In following years, modifications and evaluations will also take place during the month of January, as this is the time identified as the slowest during the year for new patients at Heartland Rehabilitation (Debbie Warren, personal communication, 1/29/08). It is planned that the program will begin in June 2009. It is assumed that referrals will come in beginning in June, and will carry on throughout the year. Formative evaluations and outcome measures will take place following the discharge of each patient. Summative evaluations will take place in December each year.

Post modification programming

The origination of the PREvention programming was completed following thoughtful consideration of many factors with regard to the population of those with medial and lateral epicondylitis who participate in occupational therapy intervention at Heartland Rehabilitation, along with Heartland Rehabilitation itself. As stated in the introduction, the Rehabilitation and Biomechanical models of practice with a concentration on work conditioning will be used as guiding principles for occupational therapy intervention. Although these models will be incredibly accommodating to occupational
therapy intervention, such as the job analysis, improved strengthening and range of motion, and an increase in occupational function, much of the actual programming for the PREvention Program is left unguided by these models. By the nature of the program and the diagnosis of epicondylitis, the goals for each participant (i.e., the modifications made to the occupational form following analysis, the degrees of motion that will be increased, the pounds of weight increased in the patients grasp) will be highly individualized.

For the PREvention Program, participants will commence and conclude the program at varying times throughout the year, as there will be no set dates or duration for the program. It is assumed that the patient will also be a participant of the PREvention Program for a duration of 8 sessions at the rate of 2-3 sessions per week, yet it could be a longer duration as judging by the severity of the epicondylitis, time constraints, or other factors. Modifications to the schedule of sessions will be considered on a case-by-case basis.

For the current Tunnel Tune-Up program, participants also begin and end the program at various times throughout the year, and typically participate in 3-4 sessions, yet it could be more depending on the severity of the diagnosis. The Tunnel Tune-Up program includes an initial evaluation including: a) a brief medical history form, b) chief complaints, c) pain rating, d) work status, e) mechanism of onset, f) current functional status, g) medications taken, h) grip and pinch strength testing (Mathiowetz, Weber, Volland, & Kashman, 1984), i) Finkelstein’s test (Finkelstein, 1930), j) Tinel’s test over the median nerve (Tinel, 1915), k) sensory testing using Semmes-Weinstein monofilaments (Bell-Krotoski & Buford, 1997), and l) various ROM tests for the involved upper extremity (Clarkson, 2000). Other aspects of the program include splinting when
necessary and pain relieving modalities that have been shown to be effective for the
diagnosis of Carpal Tunnel Syndrome.

A review of the process that would be experienced by a participant of the
PREvention Program is described subsequently. The first step for a person diagnosed with
epicondylitis is to be referred to the program by his or her physician. The occupational
therapist will schedule an appointment for the participant to come to the Arrowhead Park
facility or one of the other outpatient rehabilitation clinics in the area that provide
occupational therapy and participate in completing various paperwork and assessments.

During this first appointment, an initial evaluation will take place. The evaluation
consists of a variety of assessments. The assessments which will be completed by each
participant of the program include: a) a brief medical history form, b) chief complaints, c)
pain rating, d) work status, e) mechanism of onset, f) current functional status, g)
medications taken, h) range of motion testing regarding pronation/supination, wrist
flexion/hyperextension, and wrist deviation: ulnar and radial (Clarkson, 2000), i) manual
muscle testing regarding pronation/supination and wrist flexion/hyperextension (Clarkson,
2000), j) grip strength (Mathiowetz, Weber, Volland, & Kashman, 1984), k) pinch
strength (Mathiowetz, Weber, Volland, & Kashman, 1984), and l) long finger extension
test (Fairbank & Corlett, 2002). The medical history form also includes two questions
regarding how the patient rates his or her ability to complete occupations of daily living
and aspects of his or her employment and current pain level. Pain level is assessed by
providing a number between 1 and 10 (1 = no pain, 10 = excruciating pain). The
participant will also be requested to complete an informational packet regarding
demographic information, including age, gender, religion, job title, general tasks that cause
elbow pain, and current physical restrictions. During this time, the participant will also be
asked to complete a questionnaire regarding the etiology and causes of epicondylitis, as well as general body mechanic principles. Please see Appendix E for this questionnaire. This questionnaire will be used as a baseline and again at the conclusion of the program to determine if knowledge was gained by the participant concerning these topics. Participants will also be asked what specific occupations they currently have trouble completing during their daily lives, such as self care, taking care of children or pets, driving, etc.

The participant will be given an informational packet that explains the etiology, symptoms, causes of the disorder, options that one may have while living with the disorder (e.g., splinting, medicine, therapy), a home exercise program, and a treatment program outline and some suggestions regarding changing one’s occupational form and adaptations that one may make to his or her developmental structure. A wrist cock-up splint will also be made for the participant during this time, and a wearing schedule will be determined. In regard to the splint, the occupational therapist will explain to the patient that the splint should be worn during sleeping hours and also during waking hours when possible. Following discharge of the program, the participant may be able to wear the splint only at night time or only during flare-ups depending on the severity of the diagnosis. Because the wrist cock-up splint is not functional and it requires for the patient’s hand and wrist to be in a static position, the patient will also be recommended to purchase a counterforce brace to wear while completing various occupations throughout the day. This brace is worn on the upper forearm of the patient and compresses the muscles in the forearm. This brace should reduce pain and prohibit overloading of the tendon (Sanders, 2004). However, it compresses the muscle bellies and decreases circulation to the area, so the patient is instructed to take the brace off at least every 2-3 hours for a short rest period of about 15 minutes. The patient will be recommended to wear this brace during work (or in the
primary environment contributing to the epicondylitis) even after discharge. A manual
massage of the forearm will take place. This is done to increase circulation to the area and
also to preserve the extensibility of the muscle and tissue (Sanders, 2004). The way this
massage should be carried out is for the therapist to use his or her fingers and thumb to
massage perpendicular to the muscle bellies of the wrist extensors at the proximal forearm.
Pain relieving modalities may also be implemented if time allows. A description of each
pain relieving modality that may be used will be described following the conclusion of the
programming section. The first session is designed to take anywhere between 1.5 to 2
hours. This information will be documented in the patient’s electronic chart on the Rain
Tree system employed by Heartland Rehabilitation.

The second session, which will occur no more than one week following the initial
session, will consist of the OT traveling to the environment where the participant’s
disorder accumulated, which will most commonly be the work place of the participant to
complete a job analysis (Rice & Luster, 2002). Although the work place is not necessarily
where the disorder originated, the environment will be referred to as such during the
remainder of this paper. The analysis will be carried out in the environment where the
injury accumulated, however the assessment used will still be the job analysis. The
analysis consists of the occupational therapist being able to identify the following aspects
of a patient’s job: a) pertinent information regarding the worker, b) major job tasks, c)
modifications to the occupational form that are required/ideal, and d) rational for
modifications. The information gained from the job analysis will be used in order to
distinguish mismatches between the participant’s abilities and the demands of the job
requirements. In this way, individual goals and environmental modifications will be
developed. This session is designed to take about half a day of the therapist’s time from
start to finish, but the time that the program participant will be involved should last between 2 and 4 hours, depending on the amount of requirements of the participant’s job. Results from the job analysis will be recorded into the patient’s electronic chart.

During the third session, the OT and the program participant will discuss the suggested modifications that were found following the job analysis, along with the rationale for the modifications. This discussion session will allow for any questions that the participant may have to be answered. Modifications may be made to the participant’s splint if necessary. A review of the home exercise program will be included in this session as well. AROM, PROM, and a massage of the forearm will occur. Pain relieving modalities will be employed if necessary. This session is designed to take between 1 and 1.5 hours. If the patient’s epicondylitis is continuing to improve following these sessions, the participant will be encouraged to continue coming to participate in occupational therapy intervention. Sessions 4-7 will be programmed most similarly to this session, not including the job site analysis discussion. Progress will be documented into the patient’s electronic chart.

During the final session, range of motion (Clarkson, 2000), manual muscle testing (Clarkson, 2000), grip and pinch strength (Mathiowetz, Weber, Volland, & Kashman, 1984), long finger extension test (Fairbank & Corlett, 2002) occupational functioning, pain level, and patient knowledge will be assessed again. Modifications will be made to the participant’s splint if it is necessary, and the home exercise program will be reviewed a final time. The participant will receive notice that a 6-month follow up questionnaire will be sent to them regarding occupational functioning in order to track outcomes of the PREvention program. This session is designed to take between 1.5 and 2 hours. Results from this session will be recorded into the patient’s electronic chart. The plan of care
following discharge is that the patient follows up with his or her family physician. It is expected that the participant will return to his or her daily life as it was before the diagnosis of epicondylitis while employing the compensations provided following the job site analysis and with the two splints in their possession. The participant will be encouraged to contact the occupational therapist if he or she needs modifications to his or her splint or has questions regarding epicondylitis in general, body mechanics, or specific aspects of his or her environment in relation to the epicondylitis. The need for care coordination is not present during the program or at discharge.

Post modification documentation system

As mentioned previously, the documentation system that will be used to track progress of patients in the PREvention program will be the Rain Tree documentation system that is currently used by all Heartland Rehabilitation facilities. This system is kept confidential by therapists using passwords to access their patients’ information. The only users who have access to the Rain Tree network are those who are employed by Heartland Rehabilitation, and those who have accounts can access patients’ information specific to their discipline (e.g., occupational therapists are the only ones who may look at documentation of a patient coming for occupational therapy).

Pain relieving modalities

Much research has been completed regarding the effectiveness of certain pain relieving modalities in regard to epicondylitis. Often times, one must try various modalities before finding what is the most helpful. Modalities that have proven to be beneficial and that will be attempted for the PREvention Program include: Ultrasound, Iontophoresis with dexamethasone, Electrical Stimulation, and Infrared light. Any of these modalities may be attempted during the patient’s participation in the PREvention Program. Research has
shown that the four following modalities have proven to be most beneficial for the
treatment of epicondylitis (Sevier & Wilson, 1999, Altan & Kanat, 2008, Calfee, Patel,
DaSilva, & Akelman, 2008). It is assumed that a patient who is participating in the
PREvention Program would be treated with the following modalities by an occupational
therapist who has had training with these modalities and who implements this program.

Ultrasound: Ultrasound may be utilized for two different techniques. ‘Continuous’
ultrasound is used to deliver head to deep structures within the elbow. This is typically
used for 5-7 minutes, and its benefit is to increase blood flow to the area to stimulate
healing and tissue extensibility, as well as a decrease in pain (Sevier & Wilson, 1999). The
other method of ultrasound is called ‘pulsed’. This method does not use heat, however it is
also used to decrease pain (Sevier & Wilson, 1999), increase protein synthesis, and
increase fibroblast activity (Collier, 2008b). This modality should not be included in the
treatment plan of a patient with cancer, patient who is pregnant, over a pacemaker, over the
eyes or heart, or over reproductive organs (Collier, 2008b). It is necessary for the treating
therapist to be trained in the usage of this modality before attempting.

Iontophoresis: This modality uses low voltage to drive medication to the elbow by
using positively or negatively charged patches (Sanders, 2004). This method follows the
physics theory that like charges repel each other. Dexamethosone, a steroid with a negative
charge, is injected into a negatively charged medication patch. It is then pushed into the
skin to be distributed directly over the inflamed area. This modality should not be planned
for the patient if she is pregnant, over an area of decreased sensation, if an allergy to the
medication is present, over cancer, over a pacemaker, or over metal (Weidner, 2009). It is
necessary for the treating therapist to be trained in the usage of this modality before
attempting.
Electrical Stimulation: This modality may be used in several different ways to reduce and control pain. High voltage galvanic stimulation (HV) is used to decrease pain, relieve muscle spasms, and prevent atrophy of muscles affected (Sevier & Wilson, 1999). Interferential current is another form of electrical stimulation that is used to relieve pain (Sevier & Wilson, 1999). This form of electrical stimulation incorporates to interfering alternating currents using 2 sets of patches to create a sweeping motion with the electrical current (Collier, 2008a). Electrical stimulation should not be included in a intervention plan for a patient who is pregnant, who has a pacemaker, cancer, blood clots, or active TB (Collier, 2008a). It is necessary for the treating therapist to be trained in the usage of this modality before attempting.

Infrared light: Infrared light has been shown to have effects to tissue and organisms by increasing circulation by stimulating the formation of capillaries (John’s Dental Laboratories, 1999). Additional benefits include: a) the stimulation of collagen production, which is a protein required in order to repair damaged tissue, b) release of ATP, an energy carrier to the body’s cells, c) increase of lymphatic circulation, and d) pain relief (John’s Dental Laboratories, 1999). Contraindications for this method of treatment include infection, due to the increase of circulation caused by the infrared light (Erin Raitz, personal communication, 4/01/09). It is necessary for the treating therapist to be trained in the usage of this modality before attempting.

Implications for Budgeting and Personnel

Program Modification Approval Process

The idea for program development that was initially introduced by the occupational therapy student was a program similar to what was actually developed for those with the diagnosis of Carpal Tunnel Syndrome. After presenting the idea to Debbie Warren,
OTR/L, she agreed that it was a great idea, however, she also explained that at that facility, they were almost finished putting together a program for the exact same purpose. This program is now known as the Tunnel Tune-Up Program. Mrs. Warren then identified the need and desire at the facility to create a program for patients with the diagnosis of epicondylitis. The idea for a student to create a program to prevent the re-injury of epicondylitis was presented to Jim Berger, Assistant Manager for the Northwest Ohio division of HCR-Manor care. Mr. Berger approved the idea. It was then presented to Dr. A. T. Dalagiannis, who serves as the medical director of Heartland Rehabilitation. Dr. Dalagiannis also approved the program. The PREvention Program was welcomed by the staff at Heartland Rehabilitation’s Arrowhead Park facility.

**Budgeting**

For the PREvention Program, the following budgeting details are estimated for the first year.

**Staffing**

<table>
<thead>
<tr>
<th>Position</th>
<th>Hours Per Week</th>
<th>Salary</th>
<th>Fringe Benefits</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Occupational Therapist</td>
<td>30 (6)</td>
<td>36,000</td>
<td>$10,080</td>
<td>$46,080</td>
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<tr>
<td></td>
<td></td>
<td>($7,200)</td>
<td>($2,016)</td>
<td>($9,216)</td>
</tr>
</tbody>
</table>

*Total cost for PREvention Program budget: $9,216*

The PREvention Program will require the services of an additional occupational therapist to fulfill the requirements of the position. The opening is for a full time position at 30 hours per week. The salary of $36,000 was determined through personal communication with Jim Berger, Assistant Manager of the Northwest Ohio division of Heartland Rehabilitation. Although a full time position is being created, this is due not only to the establishment of the PREvention Program, but also due to a need at the
Arrowhead Park facility of an additional occupational therapist. There is currently an increase of various referrals from a growing number of physicians. Following a discussion with Debbie Warren, it was determined that the new occupational therapist would spend about 20% of his or her time working on the PREvention Program, and devote the other time to various tasks throughout the week. With regard to the cost of the program versus financial gain, only 20% of the occupational therapists wages will be considered. Twenty percent of the new occupational therapist’s wages is $7,200. Fringe benefits, including healthcare, disability, workers compensation, Social Security, and a 401k/403b, account for an additional 28% of the total salary, which is $10,800. Twenty percent of the new occupational therapist’s fringe benefits is $2,016. The position is open to a certified entry level occupational therapist. Please see the section entitled New Personnel for job description and required credentials.

*Items needed to purchase*

<table>
<thead>
<tr>
<th>Item</th>
<th>Justification</th>
<th>Quantity</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel Expenses</td>
<td>It will be necessary to travel to the program participants’ job site or site where injury accumulated, as well as when speaking with physicians and corporations.</td>
<td>n/a</td>
<td>$1,050</td>
</tr>
<tr>
<td>Day Planner</td>
<td>To keep an organized schedule of appointments and job analyses</td>
<td>1</td>
<td>$39</td>
</tr>
<tr>
<td>Business Cards</td>
<td>To provide for physicians, corporations, and program participants</td>
<td>1 (250 cards in one pack)</td>
<td>$8</td>
</tr>
<tr>
<td>Work Environment Scale Bulk Permissions</td>
<td>The permission allows the purchaser to reproduce from 150 to 500 copies of the</td>
<td>1 (150 copies)</td>
<td>$120</td>
</tr>
</tbody>
</table>
Travel expenses were determined by using an equation regarding the average number of miles traveled, how many times travel would be necessary, and a specific monetary wage for each mile traveled. It was estimated that the furthest distance that would be traveled would be 60 miles. The average distance that will be traveled is 30 miles. This total can be doubled to compute a round trip average of 60 miles. Traveling would take place an estimated 35 times (one job analysis for each participant, and 5 trips to physician’s offices for educational workshops). Each mile traveled will be reimbursed at the rate of $.50. The total for reimbursed travel amounts to $1,050. The above table further explains the additional miscellaneous expenses.

_In-Kind Support_

The following items will be provided by Heartland Rehabilitation’s Arrowhead Park Physical/Occupational Therapy clinic: office space, desk, chair, landline telephone with voicemail capabilities, internet, laptop computer, digital camera with video recording capacity, computer printer, copy paper, pens, cardstock for printing fliers and brochures, laser ink cartridges (color and black) for printing fliers, brochures, and home exercise program, measuring tape, various goniometers, pinch gauge, and a Jamar Hydraulic Hand Dynamometer.

_Indirect Costs_

Indirect costs include heat, air conditioning, electricity, and bathroom facilities, and are estimated to be 25% of the total direct costs.
### Total Costs

<table>
<thead>
<tr>
<th>Types of Expenses</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staffing</td>
<td>$9,216</td>
</tr>
<tr>
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### Training procedures for Staff

When a new occupational therapist is hired for Heartland Rehabilitation’s Arrowhead Park facility, various trainings take place. In general, the new OT will have training in Rain Tree, which is the electronic documentation system designed and used by the therapists at all Heartland Rehabilitation facilities. The OT will also have orientation to Heartland Rehabilitation, as well as the Arrowhead Park facility itself. Following orientation, additional training in outpatient rehabilitation and the upper extremity will take place, and the length of time that the new OT would be paired up with another practicing therapist would vary depending on the amount of experience he or she has. Taking the PREvention Program into consideration, the OT will have training needed on the facility’s evaluation process, location and usage of various modalities and splinting, and will be oriented to the patient information pack and home exercise program. With regard to training for the job analysis, the occupational therapist will be encouraged to take initiative to study and locate various resources to assist with carrying out the analysis. It may be
beneficial for the occupational therapist to purchase the book *Ergonomics for Therapists*, 2nd ed. written by Karen Jacobs (1999), however it will not be paid for by Heartland Rehabilitation. It includes information on job site analysis to assist with the OT’s training.

**Revenue**

There will be new revenue generated by this program modification. Since the Tunnel Tune-Up program will still be in effect, all revenue produced will be in addition to that program. Although Heartland Rehabilitation charges an average cost of $150 per visit, they are usually paid about $65 per visit from insurance companies. The smaller number will be used when figuring revenue. The initial evaluation cost is $150, however various insurances usually reimburse for about $100. Following the initial evaluation, the patient is expected to participate in about 6 visits at Heartland Rehabilitation, in addition to one job site analysis. With each visit at a cost of $65, the total cost is $390. The job site analysis is billed differently from a visit, and is significantly more expensive due to the amount of time and resources needed. The average payment of insurance for a job site analysis is $800. The total amount of revenue generated per patient is $1290. It was previously estimated that there will be 30 participants that take part in the PREvention Program during the first year (Minich, 2008). The revenue gained will be $38,700 if there are 30 patients in this program during the first year.

**Financial Gain for Facility**

The establishment of this program will bring about a financial gain for the facility during the first year it is in effect. The total revenue thought to be gained during the first year is $38,700. When the total cost for the first year of this program is subtracted from this amount, a financial gain is shown in the amount of $29,484.
New Personnel/Job Description

The position that is open is for the PREvention Program at Heartland/Arrowhead Park Physical/Occupational Therapy clinic is to be a program leader for the PREvention Program, as well as providing occupational therapy interventions for other patients with varying diagnoses. The position will be offered to an occupational therapist who has obtained at least a Bachelor’s degree in Occupational Therapy and who is a graduate of an accredited occupational therapy program. He or she must be registered and licensed as an Occupational Therapist (OTR/L) with the National Board for Certification in Occupational Therapy (NBCOT).

It is preferred that the occupational therapist have experience in an outpatient rehabilitation setting, especially with the upper extremity. He or she must be knowledgeable in the treatment of post-operative and non-operative hand and general upper extremity conditions, including lateral and medial epicondylitis. Educational and/or clinical experience is necessary in the areas of splint fabrication, manual therapy, job analysis, body mechanics, and ergonomics. It is strongly preferred that the occupational therapist have some experience with the application of physical agent modalities.

The occupational therapist will be expected to undertake a variety of responsibilities, and therefore must be organized and a team player. He or she will need to become proficient in an electronic charting system. He or she will be involved in recruiting new participants for the PREvention Program, including traveling to physician’s offices and corporations for which educational workshops will be provided. (Traveling expenses are reimbursed). Travel will also be completed when completing a job analysis for the program participant, so it is necessary for the therapist to have a vehicle to drive. The therapist will be required to complete a variety of assessments, and will be expected to
develop a treatment plan based on the data collected regarding the participant’s range of motion, strength, and occupational functioning. The therapist will be responsible for keeping daily notes for all program participants, as well as monitoring the participant’s home exercise program. He or she may need to modify goals or treatment sessions in the process.

The therapist will be expected to assist in treatments of all patients at Arrowhead Park PT/OT clinic during work times that he or she does not have PREvention Program treatment sessions scheduled, for a total of 30 hours per week.

When recruiting an occupational therapist for this position, the facility utilizes two methods for recruitment. The facility participates annually in a job fair at the University of Toledo’s Health Science Campus. The facility also utilizes a recruiter through Heartland Rehabilitation in order to find potential applicants.

Program Evaluation

Evaluation Procedures

As stated in Fazio’s (2008) text, a program’s effectiveness must be able to be evaluated in order for the continuation of the program. The PREvention program incorporate both formative and summative evaluations with the intent of discovering modifications needed, as well as determining the success of the program. When considering the Tunnel Tune-Up Program, success is gauged by the following: an increase in doctor referrals and patient satisfaction surveys (Debbie Warren, personal communication, 3/18/2008). The methods for program evaluation of other programs offered by Heartland Rehabilitation are fairly vague. The methods for program evaluation employed for the PREvention Program will be more in-depth and detailed, and could be
used as a model for other programs in place at the facility in order to construct more
detailed outcomes measures.

One method of outcome evaluation will occur through the progress made by
program participants determined via the program objectives. The procedure for the
evaluation of each objective is listed underneath the following objectives. Although the
progress from some of the objectives will be measured at each session, the objectives will
be utilized only as outcome, not process evaluations.

1. Through the PREvention Program education packet, 90% of participants will
demonstrate an increase of knowledge regarding the etiology and treatment of
epicondylitis by the patient’s discharge, through the completion of a questionnaire before
and after participation of the program.

   a. The therapist will create a small questionnaire that includes questions
     regarding the etiology and treatment of epicondylitis, which will be
     completed at the start of the first session and then at the end of the last
     treatment session. The amount of questions answered correctly at both
     sessions will be documented in the patient’s electronic chart. The record
     will show that through participation in the program, including the
     educational component, the patient’s knowledge will improve
     throughout the program. One exception would be if the patient answered
     all questions correctly in the first session, in which case, it would be
     expected that the patient would maintain this knowledge throughout the
     program.

2. With the assistance of the occupational therapist, 70% of participants will
   report an increase in occupational functioning (e.g., less difficulty with ODLs,
IODLs, employment, or leisure occupations previously identified as problematic) by the patient’s discharge.

a. This will be documented in the patient’s electronic chart. The method to show progress will include a semi-structured interview regarding difficulties at the beginning and the end of the program. Occupational functioning will be increased due to a reduction in pain, and an increase in range of motion and strength (without pain), as explained in other objectives.

3. By the patient’s discharge and with the assistance of the occupational therapist, 70% of participants will demonstrate an increase in strength and range of motion without pain of the upper extremity with epicondylitis.

a. The occupational therapist will record each participant’s strength using a Jamar Hand Dynamometer and range of motion using a goniometer during each session. He or she will record the outcomes of each assessment into the participant’s electronic chart.

4. Through occupational therapy intervention and education, 75% of participants will report a decrease in pain in the affected upper extremity with epicondylitis by the patient’s discharge, as judged by a report of the amount of pain at the beginning of the program vs. the amount of pain at the end of the program.

a. The occupational therapist will ask each participant to rate his or her level of pain in his or her elbow during the time of day which it feels the worst. This will be asked at each session, and the participant’s answer will be recorded and documented in his or her electronic chart following
each session. Pain will decrease following splinting and education regarding positioning.

5. By the patient’s discharge from therapy and through the PREvention program, 75% of participants will be able to identify to the program director at least two aspects of the usage of proper body mechanics, and at least two modifications that can be made to the occupational form that contributed to the patient’s epicondylitis.

a. The therapist will ask the participant about proper body mechanics and possible modifications that may be made to the participant’s occupational form when he or she is in the environment that the injury accumulated. This question will be asked at the start of the first session and also at the end of the last session following an educational packet and after explaining the results, recommendations, and rationale derived from the participant’s job analysis. This will be documented in the participant’s electronic chart.

An additional method of an outcome evaluation will be a 6 month follow-up survey regarding the participants’ pain level, strength, range of motion, and level of follow-through with the recommendations made during the job analysis. The survey will be sent to each participant 6 months following the last treatment session, and participants will be notified during the first treatment session that they will receive this survey 6 months after completion of the program. See Appendix F for this survey.

In addition to outcome evaluation, process evaluations are also necessary. This evaluation can be considered ongoing throughout all sessions. One method of a process evaluation that will take place is simply asking program participants if they have any
comments regarding the program in general or any specific aspect of it at the end of each session. This method is important because the program participants are some of the key stakeholders of the program, and the vitality of the program depends on their progress and desire to participate in the program. As stated earlier, progress notes will be recorded on an electronic chart and will be determined by the occupational therapist that develops the program, so improvements noted throughout the sessions will be considered when ensuring the success of the program as well. Every other month, the occupational therapist will be expected to review the materials used specifically for the home exercise program and education packet, as well as participant’s progress as a whole (progress made by all participants together). The occupational therapist will be expected to make modifications as needed and as necessary during his or her monthly evaluation. Using the every other month time scale, it will also be necessary to discuss the program with Debbie Warren. She can also be considered a key stakeholder since she assisted in making the program possible. Her opinion and recommendations are important to the continuation of the program. She will be briefed on the status of the program regarding the amount of participants and their progress, and will be shown the most recent copies of the home exercise program and the educational packet. She will be encouraged to ask questions about the program and recommend modification.

In addition to evaluating program objectives, it is also necessary to evaluate the program modification aims. Each aim will be evaluated both formatively and summatively.

The first aim (increasing physician referrals for the PREvention Program from surrounding area physicians) will be evaluated by keeping track of the amount of referrals for each physician on a monthly basis. In January of each year when modifications are made to the program, the list of physician referrals will be examined more thoroughly,
including examining what times more referrals were made (e.g., following educational workshop, following a new shipment of flyers or brochures to a physician’s office).

The second aim of the program of an increase of referrals for various diagnoses due to the marketing of the PREvention Program and Heartland Rehabilitation as a whole, will be evaluated very similarly to the first. The leader of the PREvention program will keep track of physician referrals continuously, as well as examining the year’s referrals during the month of January.

The third aim includes building a relationship with various industries around the city of Toledo. This will be measured by keeping track of the industries that job site analyses have taken place for the PREvention Program, and also tracking the amount of times that the occupational therapist at Heartland Rehabilitation is contacted by various companies around Toledo to complete job site analyses on other positions within their company aside from those with the diagnosis of epicondylitis. No program evaluations have taken place at this time.
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References


PREvention Program: Preventing the Re-Injury of Epicondylitis

Appendix A / Needs Assessment Survey

Date of Birth: _______________________ Gender: (  ) Male (  ) Female

Occupation: ________________________ Zip Code: ____________

Ethnicity/Race: (  ) White, non-Latino
(  ) White, Latino (Hispanic)
(  ) Black, African American
(  ) Asian
(  ) Pacific Islander
(  ) Native American
(  ) Other (specify) _________________

1. What is the length of time you have had elbow pain? (check only one)
   (  ) Less than 2 months  (  ) 2 - 4 months
   (  ) 4 – 6 months  (  ) 6 – 8 months
   (  ) longer than 8 months

2. Since you began having elbow pain, what have you done in an attempt to decrease the pain? (check all that apply)
   (  ) Consult your physician
   (  ) Talk to friend/family member with a health/medical background
   (  ) Research what is causing your elbow pain
   (  ) Research ways to decrease your elbow pain
   (  ) Work less
   (  ) Wear brace/splint available at retail pharmacies
   (  ) Applied heat
   (  ) Applied ice
   (  ) Nothing
   (  ) Other (please specify) ________________________________

3. In the last 5 years, how many different occurrences of elbow pain have you experienced? (check only one)
   (  ) 1  (  ) 2  (  ) 3  (  ) more than three
4. What primary environment do you think contributed to your elbow pain? (check only one)

(  ) Caring for self  (  ) Caring for others/household management

(  ) Leisure involvement  (  ) Social involvement

(  ) Work  (  ) Education  (  ) Play

5. What specific tasks do you find difficult to complete with your elbow pain? (ex: dressing, typing, opening containers, etc.)

________________________________________________________________
________________________________________________________________

6. Are you aware of a specific program in the community in which you can participate in treatment to decrease your elbow pain and prevent re-injury?  
(  ) yes  (  ) no

If yes, what program? ____________________________________________

7. Would you be willing to allow an occupational therapist to visit your workplace (or the place which most contributed to your elbow pain) and make suggestions to decrease your elbow pain and help to prevent re-injury?  
(  ) definitely yes  (  ) probably yes  (  ) uncertain/no opinion

(  ) probably no  (  ) definitely no

8. Would you be willing to follow a home exercise program designed for you to decrease your elbow pain and help to prevent re-injury?  
(  ) definitely yes  (  ) probably yes  (  ) uncertain/no opinion

(  ) probably no  (  ) definitely no

9. Would you be willing to read an informational packet about the anatomy and physiology of the elbow, background information about epicondylitis (inflammation of the muscles around the elbow), and tips for decreasing pain?  
(  ) definitely yes  (  ) probably yes  (  ) uncertain/no opinion

(  ) probably no  (  ) definitely no

Thank you for your participation in this survey!
Heartland Rehabilitation Services

PREvention: Preventing the Re-injury of Epicondylitis

Lateral and Medial Epicondylitis Treatment Program

Session 1:
The estimated duration of this program is for patients to attend about 8 treatment sessions, yet that may be longer due to severity of symptoms.
- Initial evaluations
- Educational handout presented
- Education on Home exercise program
- Splint fabrication
- Pain relieving modalities

Session 2:
- Job site analysis (if necessary/appropriate)
- Continued education on HEP
- Pain relieving modalities

Session 3:
- Discussion of job site analysis results
- Review of home exercise program and patient education
- Pain relieving modalities

Session 4 to Session 8:
- Modify splint (if necessary)
- Review of home exercise program
- Pain relieving modalities (if necessary)

*Following discharge from this program, please be sure to consult with your physician.

Pain relieving modalities that may be implemented include:
- Iontophoresis
- Electrical Stimulation (IFC, HV)
- Ultrasound
- Infrared light

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Heartland Rehab @ Oregon 419.697.8000
Heartland Rehab @ Perrysburg 419.874.2657
Heartland Rehab @ Westgate 419.356.8030
What is Epicondylitis?

Epicondylitis (tennis or golfer’s elbow) is a repetitive pain injury. It is pain on either side of the elbow or forearm where the muscles for the finger and wrist originate.

Golfer’s elbow (medial epicondylitis), occurs when the side of the elbow that is damaged is the side closest to the body. Tennis elbow (lateral epicondylitis) occurs when the side of the elbow that is damaged is the side farther from the body.

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Heartland Rehab @ Oregon
419.697.8000
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419.874.2657
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419.356.8030

Call Today!!

PREvention:
Preventing the Re-injury of Epicondylitis

Medial and Lateral Epicondylitis Treatment Program
www.healtheast.com

You please visit us at
To find the location nearest

Occupational Therapy
Physical Therapy
Wellness
Vealbular Rehabilitation
Osteoneurosis Program
Living Well
Hand Therapy
Fall Prevention Balance
Cancer Related Fatigue
Carpal Tunnel
Aquatic Therapy

www.healtheast.com

Duing activities, ** present at rest as well as
** In either case, pain may be

or when the pain is facing up.

When straightening the

the elbow and is present

Pain is felt on the outside of

Epicondylitis (Lateral Elbow Pain)

Epicondylitis (Calf)

Epicondylitis

What are the symptoms of

Epicondylitis?

Prevention:

The prevention program is designed

Preventing the Re-Injury

Prevention Services

Heartland Rehab
PREvention Program
Program Modification Plan
Minich 62

Appendix D/Patient Information Pack for Participants of PREvention Program

Heartland
Rehabilitation Services

PREvention:
Preventing the Re-injury of Epicondylitis

Lateral and Medial Epicondylitis Treatment Program

- A treatment program designed to decrease symptoms associated with Medial and/or Lateral Epicondylitis

Ideas to protect the elbows of those affected by Tennis or Golfer's Elbow

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Heartland Rehab @ Oregon 419.697.8000
Heartland Rehab @ Perrysburg 419.874.2657
Heartland Rehab @ Westgate 419.536.8030
**Locations**

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<td>1787 Indian Wood Circle, Maumee, Ohio 43537</td>
<td>419.897.9822</td>
<td>419.897.9824</td>
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<tr>
<td>Oregon</td>
<td>3150 Dustin Road Suite 2, Oregon, Ohio 43616</td>
<td>419.697.8000</td>
<td>419.697.9495</td>
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<tr>
<td>Perrysburg</td>
<td>900 W. S. Boundary Bldg. 7B, Perrysburg, Ohio 43551</td>
<td>419.897.8756</td>
<td>419.874.9176</td>
</tr>
<tr>
<td>Westgate</td>
<td>3234 Executive Parkway, Toledo, Ohio 43606</td>
<td>419.536.8073</td>
<td>419.536.8073</td>
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</tbody>
</table>

The goal of the PREvention Program at Heartland Rehabilitation is to prevent re-injury and increase the quality of life for those diagnosed with medial or lateral epicondylitis, through participation in occupational therapy intervention. In order to increase quality of life for those with epicondylitis, patients will experience a decrease in pain and demonstrate an increase in daily functioning and knowledge regarding the etiology and treatment of epicondylitis.

**Disclaimer**

It is necessary that a qualified health care professional be consulted to properly diagnose Medial and Lateral Epicondylitis. There are other conditions, some potentially serious, which can resemble symptoms of Epicondylitis. If problems persist, additional medical intervention may be necessary to prevent further damage.

No exercise or therapy should be undertaken without consulting a qualified health professional.

**This Program was developed by Carl Minich, OT/S in conjunction with Deborah Warren, OTR/L for Heartland Rehabilitation.**

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Heartland Rehabilitation Services
PREvention
Medial and Lateral Epicondylitis Treatment Program Outline

Session 1:
The estimated duration of this program is for patients to attend about 8 treatment sessions, yet that may be longer due to severity of symptoms.
- Initial evaluations
- Educational handout presented
- Education on Home exercise program
- Splint fabrication
- Pain relieving modalities

Session 2:
- Job site analysis (if necessary/appropriate)
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- Pain relieving modalities

Session 3:
- Discussion of job site analysis results
- Review of home exercise program and patient education
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Session 4 to Session 8:
- Modify splint (if necessary)
- Review of home exercise program
- Pain relieving modalities (if necessary)
*Following discharge from this program, please be sure to consult with your physician.

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What is Epicondylitis?

Epicondylitis is a repetitive injury. It is pain on either side of the elbow or forearm where the muscles for the finger and wrist begin. Medial epicondylitis is often called golfer’s elbow and lateral epicondylitis is often known as tennis elbow. Those diagnosed with either golfer’s or tennis elbow are likely to endure pain on either side of the elbow and/or forearm that worsens with resisted movement. Both sides of the elbow (the lateral and medial epicondyle) serve as attachment points for muscles of the wrist and hand. Golfer’s elbow (medial epicondylitis), occurs when the side of the elbow that is damaged is the side closest to the body. Tennis elbow (lateral epicondylitis) occurs when the side of the elbow that is damaged is the side farther from the body.

What are the symptoms of Epicondylitis?

Pain is the number one symptom in both types of epicondylitis. In either case, pain may be present at rest as well as during activities. Golfer’s elbow (medial epicondylitis): Pain is often felt on the inside of the elbow and occurs when bending the wrist or when the palm is facing down. Tennis elbow (lateral epicondylitis): Pain is felt on the outside of the elbow and is present when straightening the fingers, extending the wrist, or when the palm is facing up.
What causes Epicondylitis?

Epicondylitis is initially caused by minute tearing or damage to the muscle. Tearing increases with time and over-usage. The body is eventually unable to heal following repeated daily injury, and the issue of the initial injury turns from inflammation to breakdown of the muscles.

Causes Include:
- Repetitive motions
- Mechanical Stresses
- Static or awkward postures
- Forceful motions
- Hand-arm vibration

What are my treatment options?

A common strategy to prevent re-injury is to stop the action that causes tension to be placed on the elbow joint. This is rarely possible, especially if the injury is brought on by some aspect of the person’s employment.

Your physician may recommend therapy, various splinting techniques, light duty at work, injections of various medicines into the elbow area, and anti-inflammatory medications.

If you are planning to return to the activity that caused your epicondylitis, re-injury is likely to occur if no changes are made. The following information in the PREvention program will help to manage your symptoms and reduce the likelihood of re-injury.
Epicondylitis Protection Techniques
Do’s and Don’ts

DO: Stand close to the activity you are completing and try to keep elbows at your side.
DON’T: Work with your arms out straight and with your wrist angled up.

DO: Move arms at a steady, slow motion
DON’T: Forcefully and/or quickly extend arms out straight.

DO: Try to carry objects close to your body with elbow bent and wrist in neutral position
DON’T: Carry objects with arms out straight.

DO: Try to alternate arms when completing tasks that are repetitive.
DON’T: Incorporate movements of repetition with the wrist and/or elbow.

ADDITIONAL NOTE: If it is necessary for work to turn your palms up and down, do this for shorter amounts of time more frequently vs. holding in a sustained position. Avoid forcing the arms to extreme end range of motion when turning palm up and down.
PREvention Exercise 1
Flexion Stretch (Passive)

How do you do this? Straighten elbow completely. With palm facing up, grasp the middle of the hand and thumb. Pull your wrist down until you feel a slight stretch. Hold for 5 counts. Release and repeat 5 times.

What does this do? This stretch helps to decrease tightness in the muscles that bend your fingers. Many of these muscles originate near your elbow on the side closest to your body.
PREvention Exercise 2
Extension Stretch (Passive)

How do you do this? Straighten elbow completely. With palm facing down, grasp the back of the hand and pull the wrist down until you feel a slight stretch. Hold for 5 counts. Repeat 5 times.

What does this do? This stretch helps to decrease tightness in the muscles that extend your fingers. Many of these muscles originate near your elbow on the side farthest from your body.
PREvention Exercise 3

Extension Stretch (Active)

How do you do this? Hold your arm out straight. Bend wrist down. Hold for 5 counts. Release and repeat 10 times.

What does this do? This exercise will help to decrease the presence of extra fluid or swelling in the forearm and around the elbow. This will also help with overall flexibility and strengthening.
PREvention Exercise 4

Flexion Stretch (Active)

How do you do this? Hold your arm out straight. Bring your wrist up. Hold for 5 counts. Release and repeat 10 times.

What does this do? This exercise will help to decrease the presence of extra fluid or swelling in the forearm and around the elbow. This will also help with overall flexibility and strengthening.
PREvention Exercise 5

Supination/Pronation

How do you do this? Begin with thumb facing up. Turn palm upward for full available range. Hold 5 counts. Turn palm downward for full available range. Hold 5 counts. Repeat 10 times.

What does this do? This exercise will help to decrease the presence of extra fluid or swelling in the forearm and around the elbow. This will also help with overall flexibility and strengthening.
PREvention Exercise 6

Deep Friction Massage

How do you do this? This technique of massage involves rubbing perpendicular to the direction of the muscle (side to side for this area). You can do this using the thumb and fingers of the opposite hand, massaging the muscles on each side of the elbow/upper forearm, especially where the soreness is felt.

What does this do? Massage can assist to relax the muscles around the elbow. It can also increase circulation to the area, break up adhesions and scar tissue, and increase healing.

How often? It is suggested to complete this massage one to two times daily, either in the morning, at night time, or both.
Now What?

We’ve reviewed what Epicondylitis is and what causes it. You have been shown exercises to help decrease symptoms, but without changing what you are doing, the program will not work. Be aware that good nutrition, sufficient rest, and exercise impact all aspects of your life—including your hands. Here are some additional suggestions:

Warm up: Like doing any exercises, warming up your hands and wrists before any time of extended work or use is recommended. This can include one or more of the PREvention exercises, running warm water over your hands and wrists or using a hot pack.

Take Rest Breaks At Work: When doing repetitive tasks, resting every 30 to 45 minutes is recommended. For maximum benefit, try the passive stretching exercises provided. Just resting will help but putting techniques in place that decrease symptoms is what is really important. Remember that working through pain will only aggravate symptoms.

Drink Water: Our bodies are sensitive to hydration. It is recommended that you drink at least 8 glasses of water each day. Remember this does not include caffeine intake, which causes fluid loss.
Now What? (continued)

Be aware of positioning. Repetitive activities with the wrist extended or flexed will increase symptoms. Changing hand and forearm placement will help decrease these symptoms. Other areas include:

- Notice how you are positioned when you wake up. Sleeping in the “fetal position” will increase your symptoms. A wrist splint at night will help decrease symptoms in this area (this will be provided by your therapist).
- Avoid activities requiring static position for long periods of time. If this must be done for work, try to use larger handles whenever possible and remember to take rest breaks at work!
- Use of a counterforce brace may decrease pain and increase grip strength. It may be worn during activity and is small and may be covered by a shirt sleeve (this will be provided by your therapist).
- Be careful to use proper body mechanics while at work and completing other activities of daily living.

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Heartland Rehab @ Oregon 419.697.8000
Heartland Rehab @ Perrysburg 419.874.2657
Heartland Rehab @ Westgate 419.536.8030
Positioning techniques

Often times, poor positioning contributes to the development of epicondylitis. Here are some suggestions for utilizing proper body mechanics and ergonomic principles when working.

**Utilize friction**: Surfaces with low friction glide over each other, causing increased strength for usage. Adding texture like suede or adhesive tape when working increases friction, which decreases the amount of strength needed for holding objects.

**Proper Posture**: Neutral posture has been shown to have a protective influence on employee health and productivity. Postures to *avoid* for long durations include:

- extreme elbow flexion
- extreme supination (palm facing up) and pronation (palm facing down) with grasp
- extreme wrist flexion or extension
- pinching or pressing with the fingertips
- thumb extension

**Mechanical Compression**: Compressive forces can be either internal (swelling), or external (tools or workstation components). These pressures can contribute to tendon, nerve, and other soft tissue injuries. It is important to rest while working and complete stretches while resting.
Avoid Vibration: Prolonged exposure to vibration from power tools, grinding wheels, or other sources have been known to have a negative effect on worker’s health. Over time a worker becomes accustomed to the vibration. This results in the worker needing to use a higher grip force to compensate for the decrease in sensation. You can combat this by:

- using handgrips or proper fitting gloves to decrease the transmission of vibration to the body
- alternating work tasks to reduce prolonged vibration exposure

Protect your joints: To maintain the most functional use of the upper extremity, take these joint protection principles into consideration:

- Distribute the load over as many joints as possible
- Use larger and stronger joints to accomplish the task
- Use each joint in its most stable position to reduce pressure on the joint
- Ensure correct patterns of movement
- Avoid deforming positions and stresses that contribute to deformity
- Avoid staying in one position for long periods of time
- Balance between moving a joint and resting a joint.

(adapted from M. J. Sanders *Ergonomics and the management of musculoskeletal disorders*)
References for Patient Info Pack


Appendix E/Questionnaire for PREvention Program Participants

**PREvention:**

**Preventing the Re-injury of Epicondylitis**

Thank you for your participation in this questionnaire! It is used to track the effectiveness of the PREvention program. You will be asked to fill this out during your initial visit and at discharge.

What are two causes of epicondylitis?

________________________________________________________________________

What is another name for Lateral Epicondylitis?

________________________________________________________________________

True or False: It is beneficial to take rest breaks during work.

How many glasses of water should you drink daily? ______________

What are two positions to AVOID and that might cause an increase in elbow pain?

________________________________________________________________________

True or False: When carrying something, you should try to distribute the load over as many joints as possible.

True or False: Awkward positioning and prolonged vibration can increase your elbow pain.

True or False: You should force your arms into extreme flexion and extension when working.

True or False: An effective strategy is to alternate arms when working.
Heartland
Rehabilitation Services

PREvention:
Preventing the Re-injury of Epicondylitis

Lateral and Medial Epicondylitis Treatment Program

Six Month Follow-Up Survey

1. In the last six months, have you continued to experience symptoms of epicondylitis? Yes / No (circle one)

2. In the last six months, have you been diagnosed with epicondylitis? Yes / No (circle one)

3. Do you feel that the education regarding the etiology and treatment of epicondylitis assisted in your progress of decreasing the symptoms of epicondylitis? Why / Why not?

4. Are there occupations that you are currently having difficulty completing due to your epicondylitis? Yes / No (circle one)
   If yes, what occupations?

5. If you answered yes to question 2, are you experiencing more difficulty with the occupations now than prior to your participation in the PREvention Program? Yes / No (circle one)

6. How often do you utilize the home exercise program provided for you during your participation on the PREvention Program? Never Monthly Only when I have elbow pain
   Weekly Daily

7. Do you currently find the home exercise program helpful? Yes / No (circle one)

8. Do you have any additional comments about the home exercise program?

Please Turn over to complete
Heartland Rehabilitation Services

PREvention:
Preventing the Re-injury
of Epicondylitis

Lateral and Medial Epicondylitis Treatment Program

10. Do you currently utilize proper body mechanics regarding your epicondylitis? **Yes/No (circle one)**

11. Do you continue to utilize the recommendations and suggested modifications that were provided for you during the job analysis? **Yes/No (circle one)**
   Why/Why not?

Any additional comments:

Thank you for your participation!
Appendix G/Written Evaluation of Program Implementation

April 29, 2009

To Whom It May Concern:

I am pleased to evaluate the PREvention program at this point. It contains a marketing component and an education component. I feel both portions are well organized and easy for clients to understand. Two clients have been given the program and responded positively to the education packet.

We have had one physician discuss the program with us. His response was very positive stating this program was needed in this market.

The research on the exercises and current treatment available is well done. I believe this program will be beneficial for years to come.

Sincerely,

Deborah Warren, OTR/L

Abstract: We investigated the effectiveness of braces in the treatment of lateral epicondylitis and compared the effects of two different types of most frequently used braces. A total of 50 patients (seven males and 43 females) with an age range of 34 to 60 who had the diagnosis of lateral epicondylitis were included in the study. The patients were distributed into two groups. In group I, 25 patients (21 females and four males) were given a lateral epicondyle bandage. In group II, 25 patients (21 females and three males) were given a wrist resting splint holding the wrist in slight dorsiflexion. Evaluations of patients were done before treatment and at the second and sixth weeks of treatment. Evaluation parameters were pain during rest and movement, sensitivity, algometer score, hand grip strength, and evaluation of the response to treatment. The response to treatment was evaluated according to the following categories: excellent, good, medium, and bad. In group I, only pain during rest and movement significantly decreased at 2 weeks while significant improvement was obtained for all parameters at 6 weeks. In group II, all parameters except for algometric sensitivity showed significant improvement at 2 weeks. Significant improvement was obtained for all parameters at 6 weeks in this group. Comparison of the two groups showed significantly better improvement in resting pain in groups II at 2 weeks while there was no difference for other parameters including response to treatment at either evaluation stage. Braces might be a good strategy to help wait out the natural course of tennis elbow complaints. Although epicondyle bandage was not found to be superior to wrist splint in our study, we may suggest that it could be favored over splint since it is more practical and cosmetically acceptable.

This article is helpful for me to decide on what methods of treatment to include within the PREvention Program. This is determined by reading the results of the various treatments included in this article. Treatments described in this article that were included in the programming section of the PREvention Program include: counterforce brace, and splinting. It also assisted in determining assessments to include in the initial evaluation and discharge note, including pain, hand grip strength, and patient’s evaluation of the result of treatment.


Since 1980, the American Occupational Therapy Association (AOTA) has collected its official documents—must-have information for the occupational therapy practitioners, educators, and students—into one handy, frequently updated reference work. The 11th edition continues that tradition, adding for the first-time an easy-to-use, searchable CD-
ROM of concept papers, guidelines, position papers, roles papers, specialized knowledge and skills papers, standards, and statements.

This text is especially important to review during with regard to the practicum section of the capstone semester at Heartland Rehabilitation in order to be sure to follow ethics, guidelines for supervision, and physical agent modalities.


The extension fracture occurring 2 cm below the radioulnar joint is referred to as Colles’ fracture. It is a very common injury, where the styloid of ulna is broken in approximately 50% of the patients. The X-rays reveal fork-back deformity on the lateral view, whereas the distal part of the joint is laterally displaced on the dorsal aspect. Pronation and supination of the wrist is very restrictive and painful.

The conservative treatment consisting of closed reduction and application of circular cast brace below elbow to metacarpal joint for a period of 6 weeks gives promising results. Operative treatment is indicated for patients with widely displaced fractures or with loss of reduction and mobility to reestablish joint congruity by closed treatment. Cast bract of forearm is applied for 6 weeks. Reflex sympathetic dystrophy, lesion of the median nerve and abductor pollicis longus, luxation of the radioulnar joint are the complications of both types of fractures. Rehabilitation is of spectacular importance in Colles’ fracture.

The aim of the present study was to evince the importance of the early rehabilitation program in patients with Colles’ fracture.

This article was beneficial to my studies when realizing the varying techniques incorporated and results found through active range of motion, exercise, and the use of thermal modalities. Limitations of the study include that the article was not specific with regard to exactly how improvement was measured, and what types of exercise was used.


This book includes information about dilemmas typically faced by professionals in the field of occupational therapy, including students, therapists, and managers. It includes cases in which an ethical or legal dilemma is introduced, along with commentary from experts in various fields. The authors also cite many parts of legislature that can assist in guiding ones decision. In some cases, ethical and legal ramifications are provided depending on the choice made in the case study.

The benefit of this article comes through reading the case studies and determining what action(s) I would choose to take if I were placed in similar situations during the capstone semester. It is a great reference when one is placed in a situation that provokes ethical uncertainties. The commentary is helpful because I have advice from experts on the various cases.

The variations which occur in the medial and lateral ligament complexes of the elbow were investigated. These occurred frequently with the standard appearances occurring in nor more than half of the specimens on the medial side and one quarter of those on the lateral side. Surgeons who regularly perform elbow arthroplasty must be aware of these considerations, especially with the introduction of unconstrained prosthesis which rely upon the ligament complex for their postoperative stability.

This article is helpful when determining the anatomy and physiology of the elbow, and variations that may be present. Specifically, the most beneficial part was the diagram that provided four pictures of the most to least common placement of the location of the lateral and medial collateral ligaments, the oblique band, and the annular ligament that make up the stability of the elbow joint.


Packed with more than 450 sample questions, *Acing the Interview* gives you candid advice on answering even the trickiest and most unexpected interview questions. Written by the employment expert Dr. Phil called “the best of the best,” this unique and powerful book helps you take charge of any interview situation. Having heard just about every conceivable interview questions and answer since joining the placement and recruitment field in 1973, Tony Beshara knows firsthand what responses will get you hired. In this book, he arms you with the surefire answers that will keep you from getting weeded out from the large pool of eager applicants.

This book is very advantageous to the reader who is searching for a job to begin his or her career. The most helpful sections included teach the reader much about him or her- self, such as identifying features of the person which can prove to be advantages and benefits as an addition to the company for whom he or she is interviewing. It forces the reader to be able to identify many positive assets to point out in an interview. It was helpful for my development as a professional in the field of occupational therapy.


The metacarpophalangeal (MCP) joints bestow important strength to the longitudinal and transverse arch systems of the hand. In addition, these joints guide active movements of the fingers in 2 degrees of freedom, while allowing sufficient laxity for passive accessory motions. Both stability and mobility functions are attained in the health hand by a complex interaction among the muscles and the joints’ periarticular connective tissues. Rheumatoid arthritis (RA) often causes destruction of the MCP joints’ connective tissues, which leads to weakness of the tissues and an imbalance of active and passive forces, and subsequently, instability, pain, and deformity. The 2 most common deformities of the MCP joints associated with RA and instability are palmar subluxation and ulnar drift. Therapists and physicians often collaborate to treat these conditions through a
combination of surgical and nonsurgical interventions. Two of the more conservative
nonsurgical interventions typically involve a combination of splinting and education on
joint protection. Additional nonsurgical treatment may include the judicious use of
exercise and methods for relieving pain and reducing inflammation. Surgical intervention
is often indicated when the more conservative treatments fail to arrest the progression of
the pain or deformity. Regardless of the specific approach, effective intervention for
instability of the MCP joint requires that the clinician possess a sound knowledge of the
anatomy and the pathomechanical influences that predispose or cause the instability. This
clinical commentary is intended to provide this information, as well as offer treatment
guidelines based on our clinical experience. This paper is especially geared to the
therapist who may not currently specialize in the treatment of instability of the MCP joint
but may require basic information on this important topic.

This article provided some very useful information that can be put to use while
completing the practicum portion of the Capstone semester at Heartland Rehabilitation.
There are many patients with various forms of arthritis, including RA. This article
discusses splint wearing, various types of splints, their benefits and disadvantages. It also
briefly describes procedures for surgical procedures, along with a sample of a
postsurgical hand rehab protocol for the MCP joint arthroplasty. There is a current patient
at Heartland Rehabilitation who recently had this exact surgery and is going through this
protocol.

and applications. New York: Marcel Dekker, Inc.

This book examines occupational issues in relation to ergonomics. It provides examples
concerning how a person is affected by the work they do, as well as how ergonomic
principles can be used to reduce hazardous outcomes in the workplace. There are six
identified parts of this text: 1) principles of ergonomics, 2) application of ergonomic
principles, 3) medical surveillance for ergonomics programs, 4) ergonomic case studies,
5) current topics, and 6) international perspective on ergonomics. Each section includes
several chapters regarding its respective part.

This text includes information regarding anthropometry, which is unique among
other sources identified. Eleven chapters are devoted to various types of ergonomic
assessments, including job analysis, worker assessment, and tool usage assessment. The
chapters which were the most beneficial for the capstone semester’s goals include:
Biomechanical Models in Ergonomics (5), Worker Participation (10), Job Analysis (11),
Workstation Evaluation and Design (12), and Upper Extremity Cumulative Trauma
Disorders: Current Trends (29). The text also includes a section for published case
studies, and a section for current (in 1996) hot topics regarding work place injuries.


This article discusses the physiology of connective tissue and it’s susceptibility to injury
through not only exercise, but accidents and daily life. The article describes Prolotherapy,
an alternative medicine technique, which promotes tissue repair even years after damage
may have occurred. This technique consists of a series of injections to promote inflammation to the area which was injured. In this way, it tricks the body into beginning a healing response to the area.

Although this technique is not used by physicians in this area, it was a great article to read in terms of where medicine may go in the future. It was interesting to go through patients’ diagnoses and determine who may or may not benefit from this technique.


Lateral epicondylitis, or tennis elbow, is a common cause of elbow pain in the general population. Traditionally, lateral epicondylitis has been attributed to degeneration of the extensor carpi radialis brevis origin, although the underlying collateral ligamentous complex and joint capsule also have been implicated. Nonsurgical treatment, the mainstay of management, involves a myriad of options, including rest, nonsteroidal anti-inflammatory drugs, physical therapy, cortisone, blood and botulinum toxin injections, supportive forearm bracing, and local modalities. For patients with recalcitrant disease, the traditional open debridement technique has been modified by multiple surgeons, with others relying on arthroscopic or even percutaneous procedures. Without a standard protocol (nonsurgical or surgical), surgeons need to keep abreast of established and evolving treatment options to effectively treat patients with lateral epicondylitis.

The benefit of this article lies within the descriptors of the causes of epicondylitis, and also documented effects of various treatment. Specifically, I used this text to help guide me with the splinting portion of this programming, as it included a comparison of two different types of splints that may be used for people with this diagnosis. It also mentioned and confirmed the benefit of using infrared therapy. This is a great asset when determining what the best treatment methods were to include for the PREvention program.


Objective: The purpose of this study was to measure functional outcomes after outpatient occupational therapy for clients who had upper-extremity injury and surgery or both. Methods: A sample of 33 clients referred to occupational therapy outpatient intervention was recruited from five clinics in Ohio. The Canadian Occupational Performance Measure (COPM) was used to guide the occupational therapy sessions to measure outcomes. The Disability of Arm, Shoulder, and Hand (DASH) questionnaire and the Short Form 36 (SF 36) were also administered to the clients pre and post 6 to 8 weeks of hand rehabilitation services. Two to three months after discharge, the clients responded by the telephone to the Community Integration Questionnaire. Results: The clients received a mean of 13 hours of outpatient occupational therapy services and received no other rehabilitation service. Functional performance gains following 6 to 8 weeks of services were significant. Effect sizes on the COPM and DASH
ranged between 1.43 and 2.52. Progress in the clients’ goals was moderately correlated to progress in functional measure.

Conclusion: Clients with upper-extremity injury or surgery made strong, positive gains in functional measures following client-centered occupational therapy services. The COPM was the most sensitive to client change, followed by the DASH, and then the SF 36.

This article was a great confirmation of the effect that occupational therapy intervention has for patients in need of hand rehabilitation, despite the common factor of using majorly “rote” types of intervention. It introduced the idea of using an occupation based assessment in order to guide intervention, which is something that I should take into consideration when completing practicum hours at Heartland Rehabilitation.


This book introduces ergonomics and cumulative trauma disorders in an easy to understand way. It includes a chapter solely dedicated to prevention programs for cumulative trauma disorders, and ergonomics and the occupational therapist.

This text will be put to use the most during the creation of the informational packet for program participants. Its straight-forward style makes it easy to understand. It addresses program implementation in the work place regarding cumulative trauma disorders, and why it is necessary to involve an occupational therapist, versus another discipline.


In a single volume, this text presents the principles and methodology of assessing both joint range of motion (ROM)/goniometry and manual muscle strength for the head, neck, trunk, and extremities. Joint range of motion measurement is described using the universal goniometer, tape measure, and OB “Myrin” goniometer. Joint ROM and muscle strength evaluation are described with standard and alternate testing positions.

This text is most helpful when determining the correct placements for the axis of the goniometer and positioning of the patient for ROM and strength testing. This is very important for initial evaluation as well as when documenting progress and at discharge of patients seen at Heartland Rehabilitation. It is also helpful when deciding programming for the PREvention Program, as ROM and strength testing are included in the initial evaluation, daily notes, and discharge information for those diagnosed with epicondylitis.


This document describes the multiple uses and background information of various types of electrical stimulation for using of a physical agent modality. This document is extremely helpful when studying contraindications and precautions of this modality. Although it is very informational, one must be trained further and cannot use this
modality after only reading this text. Electrical stimulation is used often at Heartland Rehabilitation for patients with various diagnoses so it is a great reference. This text was also used in the development of the PREvention Program programming when examining electrical stimulation for pain relief.


This document reviews the physics of ultrasound, rationale behind using ultrasound as a physical agent modality including application and dosage, as well as precautions and contraindications. Although it is very helpful in terms of learning the theory behind the usage, contraindications and precautions, further training must occur prior to the usage of this modality. This text was beneficial for both, when working with patients at Heartland Rehabilitation and when developing the PREvention Program programming for using ultrasound as a pain relieving and inflammation reducing technique for those with epicondylitis.


Purpose: Injury patterns of occupants in motor vehicle crashes are changing, with upper extremity injury becoming more common in patients treated at trauma centers. Although not life threatening, upper extremity injuries may result in long term disability, including chronic deformity, neurovascular compromise, and degenerative arthritis. The purpose of this study was to compare upper extremity injury in drivers and passengers using the Crash Injury Research Engineering Network (CIREN) database.

Methods: CIREN data were used to compare upper extremity skeletal injury patterns and sources for drivers and passengers in frontal and side impacts. Occupant variables and crash variables were considered in the analysis.

Results: Only 24.8% of all occupants in the CIREN database had upper extremity injuries. One half of upper extremity injuries to drivers were forearm fractures compared to one third of passengers. Occupants in side impacts were more likely to have clavicle fractures, even while controlling for driver versus passenger status and safety belt use. Air bags were more likely to be a source of forearm fracture when controlling for driver versus passenger status, direction of force, sex and age compared to other sources. Only 10% of driver fractures with air bag deployment in frontal impacts were associated with air bag fling.

Conclusions: This study found that drivers and passengers have different upper extremity injury patterns, but the direction of impact also pays an important role.

This article was interesting to read in finding the commonalities of various accidents. A very good point was made in that there has been an increase in upper extremity injury as the safety ratings of cars has increased. This is due to the decrease of more serious, fatal injuries.

This comprehensive text provides the most current presentation of occupational therapy concepts and practice, and can be used as a practitioner reference as well as a student resource across the OT curriculum. An occupation-based, client-centered and evidence-based approach to practice is described across a variety of community education, and medical-based practice arenas.

The most beneficial sections that I have read during the capstone semester to apply to the practicum portion are (12) Professional Development, (19) Theories derived from rehabilitation perspectives (this chapter focuses on the rehabilitation model of practice and the biomechanical model of practice, and (31) Contextual modification and assistive technology (including manual wheelchair seating and mobility and splinting & orthotics). Debbie Warren has been trained to complete wheelchair evaluations and has completed them occasionally during this semester that I have been working with her at Heartland Rehabilitation. The wheelchair seating and mobility chapter answered many of my questions, as well as the splinting section.


“`We should regard the hand as a mobile organ and never let it stiffen. It must move to survive.”’ Sterling Bunnell. That’s what this course is about. It is tips, tricks and trivia of the stiff hand, elbow, or shoulder to get it moving. That’s critical. The joint must move to survive. The hand or other joint can become stiff due to a number of diagnoses or events. This video presents much information about exercises, various types of splinting, and incorporating the stiff joint into daily occupations.

This text is very helpful when coming up with treatment ideas for the upper extremity for patients at Heartland Rehabilitation for the practicum section of the capstone semester. There is background information provided for splinting, various modalities, as well as many exercises that may be completed to improve occupational functioning. The limitation of this compact disc is that there is a course that goes with it that was referred to multiple times in the content that was not available for me. It seems that this text would have been necessary to gain more learning from this disc.


An excellent introductory tool for occupational therapy students and practitioners, this second edition continues to prepare readers to expand their practice into community settings, but with new and more comprehensive information to ensure program viability. The book presents practical information on everything from assessing community needs, to developing a program, to locating and accessing funding sources, to marketing and promotion.
This text is most important for me to read when writing up a needs assessment in an easy to understand way. It helped with providing rationale for methods used when identifying a need, and during PREvention Program development in terms of identifying exactly how to explain the programming of the PREvention Program.


This book is the second volume of a survey kit. The purpose of the kit is to assist and prepare readers to conduct surveys and become able to use survey results in the most effective way. In order to complete a survey appropriately, questions must be asked in a particular way to ensure understanding and validity for those involved. This text was beneficial when determining how to word questions included in a survey in an easy to understand way, as well as determining what questions were the most important to ask. This was very important to me for the development of the PREvention Program survey for completion of the needs assessment.


Objective: We examined the use of occupational therapy services in a sample of people aging with multiple sclerosis (MS).

Method: A total of 1,282 people with MS, ages 45 to 90, participated in telephone interviews to identify unmet health-related service needs. Occupational therapy was 1 of 22 services examined. Proportional odds models were used to examine factors associated with how recently services were used.

Results: Four hundred eighty-four participants (38.2%) had used occupational therapy services at some point since their diagnosis; 211 had used these services in the year before the interview. Recent users identified occupational therapy services as important to health and well-being. Satisfaction with services was high. Greater activity limitations and living in an urban or suburban area were associated with more recent use of occupational therapy services.

Conclusion: The results raise questions about what constitutes appropriate levels of occupational therapy service use and how to ensure that these levels were achieved. This article was particularly important to read for knowledge regarding the practicum hours at Heartland Rehabilitation during the capstone semester for one patient with the diagnosis of MS. He had several flare-ups through the years, and was coming to Heartland Rehabilitation for a home exercise program and to attempt to strengthen his hands and arms. The patient had lived with MS for most of his life, and was currently in a power wheelchair. Limitations of the study included the limited geographical area of the study completion.

There is a story that is usually told about extremely successful people, a story that focuses on intelligence and ambition. In *Outliers* Malcolm Gladwell argues that the true story of success is very different, and that if we want to understand how some people thrive, we should spend more time looking around them – at such things as their family, their birthplace, or even their birth date. The story of success is more complex—and a lot more interesting – than it initially appears.

*Outliers* explains what the Beatles and Bill Gates have in common, the extraordinary success of Asians at math, the hidden advantages of star athletes, why all top New York lawyers have the same resume, and the reason you’ve never heard of the world’s smartest man – all in terms of generation, family, culture, and class. It matters what year you were born if you want to be a Silicon Valley billionaire, Gladwell argues, and it matters where you were born if you want to be a successful pilot. The lives of outliers – those people whose achievements fall outside normal experience – follow a peculiar and unexpected logic, and in making that logic plain Gladwell presents a fascinating and provocative blueprint for making the most of human potential. *Outliers* will transform the way we understand success.

This book was extremely helpful when considering professional development. It helped to motivate me and make me understand that it is possible to complete my goals. I would read it mostly after a challenging day at Heartland Rehabilitation or when completing the program modification paper. I believe this text assisted me for preparing for interviewing and a future career.


Approaching the subject of kinesiology from the perspective of occupational therapy, this unique text, written by occupational therapists for occupational therapists, examines the everyday occupations of people using the principles of biomechanics to adapt to changes in their functional abilities.

This edition stresses applicability to clinical practice with the inclusion of case studies throughout the text, making it easier for the reader to grasp concepts. An interactive CD-ROM containing a Lab Manual and Lab Key, as well as comprehensive multimedia components, including over 20 animations and video clips that bring biomechanics to life, make this text not only comprehensive but also completely state-of-the-art.

This text was advantageous to my learning when studying the biomechanical model of practice as well as the rehabilitation model of practice. This was necessary particularly for formulating the rationale for the usage of these models for the PREvention Program in the Project Modification Paper. It was a great book to use when determining physiology of the body, especially the upper extremity in terms of the capstone practicum section as well.


The license to a successful career begins with a solid foundation in medical terminology. This text is now completely updated and revised to reflect the state of the art in health
care delivery. It outlines medical terminology with five introductory chapters to cover combining forms, prefixes, suffixes, and terminology pertaining to the body as a whole, as well as many chapters describing specific body systems.

The most useful part of this text was the appendices which supplied a chart of commonly used abbreviations in the medical world, as well as a quick reference chart of common prefixes and suffixes. The limitation of this text is the majority of its contents being extremely brief and not in-depth. This was important to read and apply to doctor’s notes received to decipher exactly what various terms mean.


The 3rd edition of Hand Secrets is intended to be a reader-friendly study guide to be used by medical students, residents, practicing physicians, and occupational therapists as they care for patients within the discipline of hand surgery. Dr. Morton Kasdan and Dr. Peter Jebson have assembled a diverse but dedicated group of professionals who have contributed chapters on a wide range of topics. The addition of Key Points and Top 100 Secrets and the many new illustrations and images are meant to be enjoyed in the new edition.

The most helpful part of this text was the chapters that identified specific diagnoses such as Duputryn’s contracture, Carpal Tunnel Syndrome, and lateral and medial epicondylitis, all of which I have had experience with since beginning the Capstone Semester. Although the book was geared towards medical doctors, it was helpful to read about the various diagnoses.


Light therapy has been shown in over 40 years of independent research worldwide to deliver powerful therapeutic benefits to living tissues and organisms. Both visible red and infrared light have been shown to effect at least 24 different positive changes at a cellular level. Light radiation must be absorbed to produce a biological response. All biological systems have a unique absorption spectrum which determines which wavelengths of radiation will be absorbed to produce a given therapeutic effect. The visible red and infrared portions of the spectrum have been shown to be highly absorbent and produce unique therapeutic effects on living tissues.

There was a great benefit of reading through this excerpt from John’s Dental Laboratories. It was helpful in its rationale and proven findings of the benefits of this modality because it helped me to explain to patients what this modality entails and why it is used. This is beneficial during the practicum portion of the Capstone Semester as well as when discussing infrared therapy as a beneficial modality to be used for patients with medial and/or lateral epicondylitis in the Project Modification formal paper.

Professional behaviors must be developed and nurtured because they embody what it takes to be successful as a professional. Developing Professional Behaviors provides a focused approach for the development of professional behaviors. The issues of professional behavior are defined as they related to the health care professional. The qualities necessary to be successful are developed through the recognition of skills, practice, experience, role mentorship, and evaluative feedback. Developing professionalism and professional behaviors needs to be conscious, active and deliberate process on the part of students, practitioners, and educators. Emphasizing the importance of these behaviors in developing health care practitioners will help to strengthen them for professional roles.

This text was beneficial by way of professional development. It gave me confidence in terms of being vocal about my own skills, accepting feedback, and identifying general behaviors that are necessary to be exemplified by any professional in the health care field. This was put to use the most during the practicum portion of the capstone semester. This text helped to build my confidence when explaining rationale for various treatments, anatomy, and physiology to patients.


Objective: To analyze research literature that has examined the effectiveness of various physical therapy interventions on lateral epicondylitis.

Data Sources: Evidence was compiled with date located using the PubMed, EBSCO, The Cochrane Library, and the Hooked on Evidence databases from 1994 to 2006 using the key words lateral epicondylitis, tennis elbow, modalities, intervention, management of, treatment for, radiohumeral bursitis, and experiment.

Study Selection: The literature used included peer-reviewed studies that evaluated the effectiveness of physical therapy treatments on lateral epicondylitis. Future research is needed to provide a better understanding of beneficial treatment options for people living with this condition.

Data Synthesis: Shockwave therapy and Cryiax therapy protocol are effective physical therapy interventions.

Conclusions: There are numerous treatments for lateral epicondylitis and no single intervention has been proven to be most efficient. Therefore, future research is needed to provide a better understanding of beneficial treatment options for people living with this condition.

The benefit of this text lied in the comparison of various treatments and the variance of results. It compiled many resources together and determined the interventions that yielded the best results for patients with lateral epicondylitis. Epicondylitis has been known as a diagnoses that is treated with many “try-it-and-see” methods for treatment, as some techniques work with some patients and don’t work for others. This text provided results from many studies as well as including their interventions. From this text, I was able to include more treatment methods in the programming portion of the PMP formal paper as modalities that would be attempted.

Abstract: After upper extremity injury, pain on exposure to cold (cold sensitivity) is a significant problem. This cross-sectional observational study (1) assesses the incidence and prevalence of cold intolerance, (2) evaluates the relationship between functional status and degree of cold intolerance, (3) correlates health-related quality of life (HRQL) with symptoms of cold intolerance. Patients in a tertiary care center completed questionnaires to document (1) cold sensitivity, (2) upper extremity pain, symptoms, and function, and (3) HRQL. Cold sensitivity was found to be associated with more functional limitations, greater pain, and reduced HRQL. As the severity of cold intolerance increased, functional limitations and pain increased and HRQL decreased. Cold intolerance has a profound effect on HRQL.

This article was applicable to many patients seen at Heartland Rehabilitation, especially those with injuries to the wrist and hand. Many patients report of sensitivity to cold, and were recommended to wear extra gloves/long shirt sleeves when outside. While talking to these patients now, there is a basis for comparison, and rationale to support their intolerance to the cold weather, especially on windy days.


This book focuses on the need for an integration of occupational and environmental health, along with other health services, health promotion, and also prevention. It addresses the future trend that an increasing amount of people with disabilities are among the working population. The sections of the book include: 1) environment and health, 2) recognition, assessment, and prevention, 3) hazardous exposures, 4) adverse health effects, and 5) an integrated approach to prevention.

This text includes major sections reviewing specific pathologies possible within the workplace, and tackles disease prevention in a proactive way. A section specifically mentions ethical considerations in this setting, which is unique to this text among all located for this review. It also addresses early recognition of disease and injury within occupation in general. The chapters identified that were most helpful for the capstone experience include: ethics in occupational and environmental health (5), preventing occupational and environmental disease and injury (7), occupational ergonomics (11), and musculoskeletal disorders (23).


This classic text presents a comprehensive, in-depth overview of occupational therapy history and theory, the occupational therapy process and practice, evaluation, and
intervention in the occupational performance areas, performance skills and client factors, and implementation and intervention, and intervention applications.

This text was helpful in learning about specific intervention techniques for patients seen for occupational therapy interventions during the practicum class of the capstone semester. Particularly important were the arthritis chapter (38), the hand and upper extremity chapter (39), and the chapter about orthotics (29). This text is especially useful for learning particular intervention techniques, including joint protection, energy conservation, and using correct biomechanics when completing various occupations.


*Essential Clinical Anatomy, Third Edition,* presents the core anatomical concepts found in *Clinical Oriented Anatomy, Fifth Edition,* in a concise, easy to read, and student friendly format. This streamlined book is the ideal primary text for health professions courses with brief coverage of anatomy and functions as a convenient review for medical students. This updated edition features new full color surface anatomy and new diagnostic images. All of the artwork has been updated to provide greater clarity and understanding.

The most beneficial part of this text was in reading about the anatomy and physiology of the upper extremity and was used when developing the PREvention Program as well as when working with patients with various diagnoses on a daily basis to improve occupational functioning. In particular, this book has a great explanation of the extensor mechanism of the fingers, which is essential to know when working with people with injuries in this area. It was limited in that it does not provide helpful intervention tips or techniques.


Loss of grip strength is a factor used in some states to determine disability. Stokes (1983) proposes a method to distinguish between weakness of grip due to injury as opposed to that which is psychogenic or due to malingering. The method utilizes the sealed hydraulic Jamar hand dynamometer which is adjustable to accommodate different size hands.

The purpose of the present study was to determine if results similar to those of Stokes (1983) can be obtained from normal, uninjured subjects to have been instructed to voluntarily demonstrate weakness of grip. If such results can be obtained they would support Stokes assertion that voluntary weakness of grip can be reliably and validly detected.

The following specific hypotheses were tested: 1) When the subjects use the dynamometer correctly, a) strength will be the greatest for the middle handle positions, dropping for the wider and narrower positions, and b) overall strength will be greater for the dominant hand than the nondominant hand at each handle position. 2) When subjects are instructed to demonstrate weakness of grip, a) strength will be equal at each handle position and b) will be less than strength assessed for correct use of the dynamometer.
This text was beneficial for me and can be put to use while completing practicum time at Heartland Rehabilitation. At times, an OT there completes functional capacity evaluations. There are a series of tests to measure one’s sincerity when completing testing, including grip strength. This paper showed that when the testing subject is faking grip strength, the curve of grip was not the usual “bell curve,” but was almost the same grip across the different sized handles.


Tennis elbow is a painful condition that involves damage to the forearm muscles and tendons. Two types of exercise for regaining strength—exercises with weights and exercises without—are featured. The provided exercises were the most beneficial part of this text. It was helpful when designing the home exercise program for participants of the PREvention Program. Some of the exercises provided in this article were used in the patient information packet for participants of the program.


Objective: To investigate the effect of noxious level electrical stimulation on pain, grip strength and functional abilities in subjects with chronic lateral epicondylitis.
Design: Randomized, placebo-control, double blinded study.
Setting: Physical Therapy Department, North Georgia College and State University.
Subjects: Eighteen subjects with chronic lateral epicondylitis between the ages of 24 and 72 years participated in this study. Subjects were randomly assigned into treatment or placebo groups.
Interventions: Subjects received six sessions of low-frequency electrical stimulation over the palpated tender points. The intensity of electrical stimulation was set at 0 in the placebo group.
Main measurements: Grip strength, functional status, pain intensity and limited activity due to pain were assessed before and after treatment. Six-month follow-up data were collected in treatment group only.
Results: Both clinically and statistically significant improvements in average grip strength were found, functional activity, pain intensity, and activity limitation due to pain between the treatment and placebo groups. Follow-up data showed that 100% of subjects maintained the improved function, and 83% remained pain free for at least six months post treatment.
Conclusion: The results of this study indicated that symptoms of chronic lateral epicondylitis could be effectively treated by noxious level low-frequency electrical stimulation.

This text was very helpful when providing rationale for the use of electrical stimulation for patients with epicondylitis. This article showed that all subjects had improved occupational functioning, and most did not have pain following discharge. This modality
is used often on patients at Heartland Rehabilitation who have been diagnosed with epicondylitis.


Objectives: To assess occupational associations with tenosynovitis and epicondylitis, we conducted a systematic literature review. We focused particularly on evidence that might support compensation of these disorders ‘on the balance of probabilities.’

Methods: We searched the MEDLINE and EMBASE electronic biomedical databases to 1 January 2005 using combinations of keyword and medical subject headings, and also the references cited in two state-of-the-art reviews from the 1990s. Primary research reports were retrieved and checked for further relevant citations. From each paper, we abstracted a standardized set of information on study populations, exposure contrasts, and estimates of effect.

Results: We found and summarized 18 papers. In the main, these based analysis on job titles rather than on directly assessed physical activities. Few occupations were studied more than once, however, and there was little consistent evidence of jobs or work activities that carried more than a doubling of risk for either disorder.

Conclusion: Compensation of occupational illness can be problematic for disorders that are not specific to work and for which there are no distinctive clinical features in occupationally related cases. Attribution can, however, be made on the balance of probabilities, if there is convincing evidence that risk is at least doubled in an occupational group. Our review highlights the relative lack of data to support such attribution for tenosynovitis and epicondylitis, and discusses the difficulty of compensating upper limb disorders.

Key words: compensation, epicondylitis, risk factors, tenosynovitis.

This article explained through its systematic review that cases where cumulative trauma is involved, cases that are related to and unrelated to work are clinically indistinguishable, which was important to point out during the literature review of the Project Modification Plan formal paper. Although the study also concluded many other important things, this is important for my capstone because the program will be used by people diagnosed with medial or lateral epicondylitis, regardless of the occupational form of the accumulated disorder, although it does have a work conditioning component. It was also concluded in the study that risk factors for developing epicondylitis include repetitive use of the arm and hand in a repetitive motion.


This text is a good source of information. It introduces the reader to the concept of interprofessional collaboration, its benefits, barriers, and strategies for developing such collaboration. It presents a series of research studies that show the value of interprofessional collaboration to achieve outcomes at different levels and within different service delivery models.
It was most helpful for me when learning to work with others and collaborate treatment among various professionals. The most beneficial section of this text explained the partnership between an occupational therapist and a physical therapist. There is currently one patient who was in a MVA at Heartland Rehabilitation’s Arrowhead Park facility who participates in both therapies throughout the day, and there is not much collaboration present. However, there is a pediatric patient with CP who participates in both therapies but gets too fatigued to have them both in one day. The OT and PT must work together to determine the best treatment schedule for him.


Orthogate is dedicated to providing ways to improve access to the information needed to make informed decisions about healthcare in orthopedics and sports medicine. The patient resources section provides educational materials to help in understanding orthopedic problems and what options for treatment may be available from musculoskeletal health care providers including surgeons and therapists.

There are many handouts that are beneficial to my studies. Many topics provided include information about many patients’ diagnoses seen at Heartland Rehabilitation, including MCP joint replacement, carpal tunnel release, mallet finger, boutonnière deformity, and many others. This has been beneficial to study when discussing specific diagnoses with patients.


Objective: To examine the relationships between self-reported and performance-based hand function.
Method: Thirty participant with hand function limitations completed the Manual Ability Measure (MAM-36) and the Upper Extremity Performance Test for the Elderly (TEMPA). Participants were categorized into two groups: (1) dominant hand affected and (2) nondominant hand affected. Correlations between the two assessments were examined. The speed of task execution and TEMPA scores were compared between the two groups.
Results: A significant correlation was found between the MAM-36 and the TEMPA Total Functional Rating. Significant differences were found in the speed of execution of unilateral tasks and the Unilateral Functional Ratings between the two groups.
Conclusion: The MAM-36 is a promising assessment tool for measuring a client’s perceived hand function. However, a performance-based assessment can supplement information about the quality and speed of hand-task performance.
This article was beneficial for me to read to determine the value of using both, questionnaire and assessments during therapy intervention. Each tool has advantages and disadvantages; however results from both types of assessments correlated significantly.
A Mandarin speaking woman is rushed to the hospital emergency room with a high fever and chest pains, yet refuses to let the doctor examine her. What does the hospital staff do? As patient populations grow more diverse, thousands of similar situations confront health care providers each day as they provide care to our country’s newest residents. Cultural Competence in Health Care is an indispensable manual for health care professionals. Sponsored by Children’s Hospital in Boston (the hospital voted number one in pediatrics nine years in a row by U.S. News and World Report) this essential guide contains detailed, practical information about dozens of religious and cultural groups. This unique resource is also designed to help providers best meet stringent new regulatory standards for culturally sensitive care.

Drawing on many case studies from the Children’s Hospital patient population, the authors help clinicians and other professionals expand their knowledge of customs and beliefs concerning illness, death, and religious observances in the hospital setting. They provide insight into how people from a wide variety of cultures and religions respond to the U.S. health care environment. Cultural Competence in Health Care provides indispensable suggestions for meeting Joint Commission on Accreditation standards.

This text was most helpful for me to remember to take into consideration various cultures and their rituals or rules lived by, and to take that into consideration during OT interventions. It had a section provided in each chapter that discussed diversity and what you might expect to see when working with specific cultures. During my experience at Heartland Rehabilitation, there have not been any patients with requests or refusals for particular intervention based on cultural reason. However, it was a good text to make me aware of the possibility.


The second edition of this comprehensive resource provides a strong medical, ergonomic, and industrial foundation for understanding and managing musculoskeletal disorders (MSDs) in business and industry. Addressing multiple perspectives – including the individual worker, insurance companies, regulatory agencies, industry, and the medical community – this practical text provides an integrated approach to understanding and managing these conditions.

This text was helpful because it provided information and tips for patients with various diagnoses in changing the occupational form in which they work. It provided much information about various diagnoses commonly seen at Heartland Rehabilitation. It was beneficial when putting together the patient information pack for the PREvention Program with regards to the “proper positioning” section provided in the packet.

Lateral epicondylitis is sometimes referred to as tennis elbow—not because only tennis players get the problem, but because the backhand swing in tennis is a common activity that can cause the problem. There are many other activities that can result in lateral epicondylitis—such as painting with a brush or roller, running a chain saw, and using many types of hand tools continuously. Each of these activities use the same muscles and can result in lateral epicondylitis when these muscles are overused.

This was helpful because it provided information about the diagnosis of epicondylitis in an easy to understand way. It is a helpful text to refer patients with this diagnosis because it does not incorporate medical jargon and can be helpful to those without education in the medical field. This text was helpful when putting together the patient information pack for the PREvention Program.


Lateral epicondylitis is a common problem among physically active individuals. One of the most important roles of the clinician is to provide the most effective rehabilitation intervention for the injured athlete and the physically active individual. Over 40 treatment methods for lateral epicondylitis have been reported in the literature. Initially, lateral epicondylitis can be treated with rest, ice, tennis brace and/or injections. Injections are one of the most popular methods utilized, with a high success rate. However, when the condition is chronic or not responding to initial treatment, physical therapy is initiated. Common rehabilitation modalities utilized are ultrasound, phonophoresis, electrical stimulations, manipulation, soft tissue mobilization, neural tension, friction massage, augmented soft tissue mobilization (ASTM) and stretching and strengthening exercises. ASTM is becoming a more popular modality due to the diction of changes in the soft tissue texture as the patient progresses through the rehabilitation process. Other resistance cases, lateral epicondylitis may undergo surgery. Scientific research has found that all these methods have been inconsistently effective in treating lateral epicondylitis. Therefore, further research efforts are needed to determine which method is more effective.

This text explained specifically the type of massage used for patients with the diagnosis of epicondylitis, which was very helpful when learning what techniques are the most beneficial and rationale behind it. This article provided me with information about the counterforce brace, injection, massage, and pain relieving modalities including ultrasound and electrical stimulation, which were included in the programming portion of the Project Modification Plan formal paper as well as the patient information packet for participants of the PREvention Program.


This book provides clear, concise information on musculoskeletal anatomy for persons seeking a review reference as well as the beginning anatomy student. Many texts offer detailed anatomical information; however, for the novice anatomy student, the essentials are sometimes difficult to abstract. This manual was created to indicate the basic
anatomical information which the student therapist and health professional should learn about musculoskeletal anatomy.

Designed to present the essentials of musculoskeletal anatomy, the scope of the information reflects this intent. This manual features separate illustrations and descriptions of individual skeletal muscles, bones, and nerves of the upper and lower extremities. Also included are: muscle groups which perform the motion of the joints, major muscle groups of the head, neck and trunk, and locations for muscle and bone palpation on the living body. This book is appropriate for the reader seeking simplified information about individual muscle location, innervation, and function, as well as the muscle groups which provide the elements of motion needed to perform everyday human activities and occupations.

The most advantageous part of this text is the pictures provided of isolated muscles. It provided information regarding the attachments for each muscle, its job, and how it is innervated. This book is a good starting point when studying the anatomy of the body, however, a more in-depth discussion is needed as a supplement to this text.


*Phantom Limb* is a wise and courageous memoir that moved between past and present, chronicling an adult daughter’s journey through the final years of her parents’ lives. A story of discovering love through adversity as well as an inquiry into contemporary neurology and spiritual life, *Phantom Limb* is a moving meditation on the struggle to make peace with physical and emotional ghosts of the past. Janet Sternburg writes with such warmth and honesty that loss itself becomes luminous: “This is the grace of the last years; the children coming to understand the contradictions in their parents, not to reconcile them but encompass them in a larger love.”

This text is helpful when learning to have empathy for patients and see the world from another’s point of view. I thought it was a strong advocate for the patient and it made me think about patients that I work with in a different way. I read this book to get a perspective from a patient’s caretaker’s point of view. The limitation of this text from my point of view in terms of this semester was that this patient was dying, where as none of the patients with whom I work currently are in that serious of a condition.


Background: National estimates of tendonitis and related disorders of the distal upper extremity among U.S. workers have not been available with the exception of carpal tunnel syndrome.

Methods: The Occupational Health Supplement Data of the 1988 National Health Interview Survey were analyzed for tendonitis and related disorders of the hand/wrist and elbow (distal upper extremity) using the Survey Data Analysis (SUDAAN) software.

Results: Among the 30,074 respondents (statistically weighted population of 127 million) who had worked anytime during the previous 12 months, 0.46% (95% CI: 0.36, 0.56)
reported that they experience a “prolonged” hand discomfort which was called tendonitis, synovitis, tenosynovitis, deQuervain’s disease, epicondylitis, ganglion cyst, or trigger finger, by a medical person. This corresponds to 588,000 persons (95% CI: 457,000; 712,000) reporting one of these disorders, 28% (or 164,000) of which were thought to be work-related by the medical person. Among various risk factors examined by multiple logistic regression analysis, bending/twisting of the hands/wrists at work and female gender were significantly associated with reporting these disorders.

Conclusions: By combining these cases with the previously reported cases of work-related carpal tunnel syndrome, we estimate that there were approximately 520,000 cases of work-related musculoskeletal disorders of the distal upper extremity among US workers in 1988.

Key words: tendonitis; synovitis; tenosynovitis; deQuervain’s disease; epicondylitis; ganglion cyst; trigger finger; health interview survey

This article was a key article in discussing the frequency of tendonitis and related disorders. It also estimated the rates of the disorder being related to work. It provided an extremely helpful table regarding the frequency and prevalence of tendonitis (in which epicondylitis is included) in relation to risk factors such as bending/twisting, vibration, gender, race, age, and others, which was imperative to include within the literature review of the PMP formal paper. This article draws attention to the need for research on other common work related upper extremity disorders in addition to the research that has been completed on Carpal Tunnel Syndrome.


Injuries to the upper extremity cause impairments that often contribute to significant disabilities and functional limitations. Rehabilitation professionals who properly apply manual therapy techniques and neuromuscular facilitation exercises are giving their patients the best opportunity to rehabilitate their injuries. This informational packet will enable the participant to understand the role of manual therapy in rehabilitation of the upper extremity and apply manual exercise techniques appropriately. This will provide the optimal continuing education experience equipping the participant to apply these techniques immediately when they return to the clinic. Additionally, they will be able to use the anatomical, biomechanical, and neuromuscular basis to further develop their manual therapy skills.

This text is helpful when considering various types of modalities and provides contraindications for them. It was beneficial in understanding the importance of this passive intervention technique, as it is at times difficult to defend the passive nature of some modalities. This text was great when determining appropriate methods to try for patients at Heartland Rehabilitation, as well as extremely beneficial for the programming part of the PREvention Program development.

This is designed for rehabilitation specialists of all skill levels who have exposure to the orthopedic population. The first portion focuses on a comprehensive overview of the anatomy and biomechanics of the shoulder complex followed by evaluation considerations and treatment intervention strategies for nonoperative and postoperative management of commonly seen orthopedic conditions.

The beneficial part of this text was in the provision of intervention techniques for patients with diagnoses containing the shoulder. At times, it is difficult to incorporate new interventions for strengthening and range of motion, and this text provided many detailed images and descriptions of intervention strategies. This text was used most specifically for one patient at Heartland Rehabilitation who had been in a car accident and was working on strengthening her shoulders. This text provided some isometric exercises which were beneficial because of her inability at the time to complete isotonic exercise.


Occupational Therapy Models of Practice I provides the musculoskeletal and kinesiological foundations for the biomechanical model of practice in occupational therapy, including assessments and interventions for prevention, adaptation, and compensation.

This text was very helpful when studying the anatomy and physiology of the upper extremity, as well as when testing strength and range of motion. This is applicable to the practicum portion of the capstone semester for each patient, as well as when developing the PREvention program for learning about the anatomy and physiology of the elbow, in addition to various assessments. Its limitation was that other texts are required for further reading and teaches only from a biomechanical point of view, which is considered to be reductionalistic. However, many other texts are recommended within the syllabus for this course to supplement for this limitation.


Continuation of OCCT.701 (Part I) and an introduction to neural systems as the foundation for models of practice based on functions of the nervous system (Part II). Related assessments and intervention technologies for prevention, adaptation, and compensation are included.

This text was beneficial when learning about various assessments used during the practicum portion of the Capstone semester at Heartland Rehabilitation, as well as when determining which range of motion assessments to include in the initial and discharge assessments for participants of the PREvention Program. It provided instructions for implementing assessments in a standardized way, which is imperative when assessing.

The 8th volume of *Orthopaedic Knowledge Update* (OKU) includes a comprehensive review of current knowledge as well as of recent advances in musculoskeletal care. Is it also intended to function as a bridge between the findings of the past and present to those of the future. The primary purpose of this text is to serve as a user-friendly reference guide for all levels of learning so students, residents, fellows, and practitioners can confidently care for patient with orthopaedic problems in a safe and effective manner. The OKU series is, and always will be, the official reference book for information necessary to prepare for an in-service or board examination. The knowledge within this test will undoubtedly become partially obsolete over the ensuing years in time for subsequent editions of Orthopaedic Knowledge Update.

This text was very wordy and specific. Originally designed for hand surgeons, it was more in depth than necessary. It was beneficial to see what is provided within texts such as this one for surgeons about therapy subsequent to surgery. It was also helpful to read about what occurs during surgery, and what can be expected when observing a surgery, since patients are prescribed occupational therapy at Heartland Rehabilitation very soon after surgery. Although most of the information provided in this text was more in-depth than what I needed, it helped me to be able to talk to patients about what happened during their surgeries.