

EFFECTS OF A SIX-WEEK INTERDISCIPLINARY PROGRAM ON DEPRESSION,  
ANXIETY AND PAIN IN PATIENTS WITH FIBROMYALGIA

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## ACKNOWLEDGMENTS

There are several people who have supported and helped me in completing this study. First, I would like to express my sincere gratitude and thanks to my committee, Gerald Casenave, Ph.D, Claire Korman, Ph.D and Cammie McAda, M.S. I would like to thank Dr. Casenave for his guidance and understanding. I appreciate his time, his constructive criticism and supportive commentaries which made writing this thesis possible. I wish to thank Cammie McAda for her expertise, energy and enthusiasm. This project would not have been possible without her. It was under her guidance during my internship at HealthSouth that I first started working on this project. Her encouragement, interest and support are greatly appreciated. I also wish to thank Dr. Korman for her additional guidance, helpfulness and time. I have learnt a great deal from them and it was a great pleasure working with them.

In addition, I wish to thank Bruce Grannemann, M.A. for his understanding of statistics and for his help with data analysis. I would also like to thank the staff at HealthSouth Medical Center, Dallas for their assistance in data collection. I also wish to thank the staff at the university, Wanda Madyun and Jan Harrell who have been of great help and assistance.

I also thank my friend Emily George for her friendship and advice. I would like to thank my husband for his love, support and encouragement. Finally, I thank my parents and my brother for their love and encouragement throughout my entire academic life.

EFFECTS OF A SIX-WEEK INTERDISCIPLINARY PROGRAM ON  
DEPRESSION, ANXIETY AND PAIN IN PATIENTS WITH FIBROMYALGIA

by

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THESIS

Presented to the Faculty of the Graduate School of Biomedical Sciences

The University of Texas Southwestern Medical Center at Dallas

In Partial Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

The University of Texas Southwestern Medical Center at Dallas

Dallas, Texas

December, 2005

EFFECTS OF A SIX-WEEK INTERDISCIPLINARY TREATMENT PROGRAM ON  
DEPRESSION, ANXIETY AND PAIN IN PATIENTS WITH FIBROMYALGIA

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The University of Texas Southwestern Medical Center at Dallas, 2005

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Fibromyalgia is a chronic pain condition characterized by widespread pain and tenderness. Patients with Fibromyalgia report pain, fatigue, emotional distress, depression and disability. Because the etiology is unknown, the treatment of Fibromyalgia is mostly symptomatic and various pharmacological, physical and interdisciplinary treatments are used. The present study evaluates the effect of a six-week interdisciplinary group therapy program on the treatment outcome of patients with Fibromyalgia. The study hypothesized a decrease in levels of pain, depression and

anxiety following participation in the program. In addition, the study also evaluates the effect of duration of time between diagnosis and treatment outcome.

Fifty patients with Fibromyalgia were administered three self-report measures – Beck Depression Inventory (BDI-II), Burns Anxiety Inventory and Wong-Baker FACES Pain Rating Scale before and after program participation. Paired t-tests between the pain ratings, level of depression and anxiety showed a statistical difference between the two scores (pre-treatment and post-treatment). Repeated measures analysis of variance revealed a significant decrease in level of anxiety in patients who received treatment within six months of diagnosis compared with those treated greater than six months post diagnosis. However, no significant difference was found between patients who received treatment within six months of diagnosis and patients treated greater than six months of their diagnosis on pain and depression. Even though there was a decrease in pain and depression ratings in both the groups, the difference was not found to be significant. The study illuminated the fact that therapy helped alleviate symptoms of pain, depression and anxiety in patients with Fibromyalgia. In addition, “early” treatment of Fibromyalgia appears to be more effective in reducing symptoms of anxiety in patients.

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## LIST OF DEFINITIONS

Balneotherapy: It is also called spa therapy and is a type of treatment of bathing and soaking in mineral waters or hot springs. The hydrostatic force of water is believed to bring about pain relief, taking the stress off of the affected joint, thus resulting in a relaxing effect.

Catastrophizing: Albert Ellis, the founder of rational emotive therapy, first used the term catastrophizing almost four decades ago. Later, Beck discussed catastrophizing in terms of dwelling upon the worst possible outcome of any situation where there is a possibility for an unpleasant outcome. Therefore, catastrophizing is conceived as an exaggerated negative “mental set” brought to bear during actual or anticipated pain experience.

Cerebrospinal fluid: It is the fluid surrounding the brain and the spinal cord. It is a the colorless liquid, consisting partially of substances filtered from blood and partially by secretions released by brain cells, that circulates around and through the cavities of the brain and spinal cord. Physicians use a variety of tests--electrophoresis, isoelectric focusing, capillary isotachopheresis, and radioimmunoassay--to study cerebrospinal fluid for abnormalities often associated with MS.

Dolorimetry: Dolorimetry is a pressure algometer. It is a spring-loaded gauge attached to a rod with a soft rubber stopper at one end. The other end of the rod is attached to the spring. The patient undergoes testing by having certain anatomic areas placed in contact with the rubber stopper. The shaft of the instrument is then advanced slowly (about one kg. per second) by the examiner, and progressively greater pressure is applied until the patient complains of pain. At that point a numerical value is assigned to the area tested.

Higher numbers (e.g. five kg. or greater) indicate that the particular anatomic area is relatively insensitive to the pressure. Lower numbers (typically two kg. or less) suggest tenderness or sensitivity to pressure.

Nociception: Nociception is registration, transmission and processing of noxious stimuli by the nervous system. It is one of the physiological senses and it is used to refer to the perception of pain. Nociceptive stimuli are damaging or potentially damaging, and in humans are described as being painful.

Occupational therapy: According to the American Occupational Therapy Association, occupational therapy is skilled treatment that helps individuals achieve independence in all facets of their lives. It gives people the "skills for the job of living" necessary for independent and satisfying lives. Services typically include customized treatment programs to improve one's ability to perform daily activities, comprehensive home and job site evaluations with adaptation recommendations, performance skills assessments and treatment, adaptive equipment recommendations and usage training, and guidance to family members and caregivers.

Physiotherapy: Physiotherapy or physical therapy is treatment consisting of exercising specific parts of the body such as the legs, arms, hands or neck, in an effort to strengthen, regain range of motion, relearn movement and/or rehabilitate the musculoskeletal system to improve function. It is the treatment of muscular or skeletal conditions by using massage, exercise, water, light, heat, etc. Although physical therapy is a licensed allied health profession, its practitioners may use techniques that are either traditional or modern.

## **CHAPTER - I**

### **INTRODUCTION**

Fibromyalgia is a common clinical syndrome characterized by widespread musculoskeletal pain and tenderness for at least three months. Although the hallmark symptom of Fibromyalgia is chronic, unrelenting pain, fatigue constitutes one of the most common problems. Sleep disturbance and morning stiffness are the other characterizing features of the condition. Research suggests that psychiatric distress occurs at significantly higher rates in Fibromyalgia patients compared to other patients with chronic pain. In addition, other symptoms and syndromes coexist with Fibromyalgia. Problems such as irritable bowel syndrome, migraine headaches, depression, restless leg syndrome and cold intolerance are some of the distinctive syndromes which exist in patients with Fibromyalgia. Unfortunately, there is no known cause or one single physiologic aberration to account for the constellation of symptoms presented in the Fibromyalgia syndrome. There is also no clinical laboratory test for diagnosis, making it difficult for primary care physicians to diagnose Fibromyalgia. Consequently, patients are often misdiagnosed or visit numerous physicians before they are diagnosed with Fibromyalgia.

The economic impact to society from Fibromyalgia – related to lost productivity, psychological damage and disability – is significant. The American College of Rheumatology (ACR) calculated the cost to society of Fibromyalgia and it was revealed that nearly six million people in the United States have Fibromyalgia and they see an average of four doctors before being diagnosed. ACR reported that \$85 billion is spent annually to diagnose pain, including the litigation fees and \$13 billion is spent annually on alternative

therapies (Wallace, D. J., 2005). In the United States, 6% to 15% of employed patients with Fibromyalgia are on some form of disability (cited in Wallace, 2005).

The clinical complexity and lack of a well defined pathogenesis make the treatment of patients with Fibromyalgia frustrating. Strategies for management of Fibromyalgia must take into account that the condition is chronic and expectations for improvement are more palliative than curative (Bennett, 1996). Due to the multifaceted nature, treatment for Fibromyalgia is eclectic in nature and addresses the biological, psychological and social aspects. The interdisciplinary treatment program includes physicians, physical therapists, occupational therapists, nurses and psychologists to provide a comprehensive and a holistic treatment for patients. The goal of interdisciplinary treatment programs include improved functional activities of daily living, return to gainful employment, discontinued use of the healthcare system and pain control (Sprott, 2003). Interdisciplinary programs are equipped to provide therapy which improves overall functioning of patients with Fibromyalgia. Thus, a treatment program based on the biopsychosocial model should be effective in managing the symptoms of Fibromyalgia. The Fibromyalgia Program at HealthSouth Medical Center, Dallas is a six-week interdisciplinary program treated by Physical Therapy, Occupational Therapy and Behavior Medicine. The aim of the program is to teach skills to manage the symptoms of Fibromyalgia and also assist the patient in making lifestyle changes.

Several studies have demonstrated the effectiveness of interdisciplinary programs in improving the quality of life, decreasing number of trigger points and having an overall positive effect. However, the effects of interdisciplinary treatment program on levels of depression and anxiety are unclear. Since approximately 20% to 40% of patients in tertiary

care centers have mood disorders and anxiety, it is important to understand the effects of education, stress management and exercise. In addition, the effect of duration of time between diagnosis and treatment has largely been unexamined. This information would be important for rehabilitation counselors and physicians in the planning of services for the patient. The purpose of the study was to determine the effect of six weeks of interdisciplinary treatment on patient's level of pain, depression and anxiety. The study also hypothesized that patients treated within six months of diagnosis would demonstrate a significantly greater improvement of symptoms than patients who initiated treatment after six months of diagnosis.

## **CHAPTER - II**

### **REVIEW OF LITERATURE**

Fibromyalgia is a clinical syndrome characterized by widespread musculoskeletal pain and generalized tenderness. According to the Arthritis Foundation which categorized the 150 different forms of musculoskeletal conditions, Fibromyalgia is a form of soft tissue rheumatism, a condition that encompasses the supporting structures of joints, muscles, and other soft tissues (Wallace & Wallace, 2002). For several years, muscle pains were known as rheumatism and then as muscular rheumatism. The concept that Fibromyalgia was an organic condition became popular only in the 1880s and was thought to be an inflammation of muscle and soft tissue. The term “fibrositis” was initially used to indicate local or regional musculoskeletal pain. It was only recently, in 1976, that the term “Fibromyalgia” replaced other terms such as “fibrositis”, “myofibrositis” and “generalized musculoligamentous strain”. A renewed interest in Fibromyalgia was kindled by descriptions of uniform symptoms and finding of tenderness located at consistent anatomic points in Fibromyalgia (Goldenberg, D. L., 1996). Fibromyalgia is a combination of three words, *fibro* (Latin, *fibra*, or fibrous tissue), *myo* (Greek prefix *myos*, for muscles), and *algia* (from Greek *algos*, which denotes pain) (Wallace & Wallace, 2002).

The American College of Rheumatology (ACR) endorsed certain criteria in 1990 to assist clinicians in diagnosing and identifying Fibromyalgia syndrome. Accordingly, Fibromyalgia is essentially:

- Widespread pain with pain of at least three months duration
- Pain in all four quadrants of the body

- Pain occurring in at least eleven of eighteen specified “tender” points, with at least one point in each quadrant
- Pain defined as discomfort when eight pounds of pressure are applied to the tender point. (Wallace & Wallace, 2002, p.10)

Tender points are predefined anatomic points that are considered “positive” when an individual complains of pain upon the application of four kilograms (approximately eight to nine pounds) of pressure, which is typically the amount of pressure required to blanch the tip of the finger nails. The ACR criterion specifies pain in eleven of the eighteen following tender point sites: the occiput, low cervical, trapezius, supraspinatus, second rib, lateral epicondyle, gluteal, greater trochanter and knees (Wallace & Wallace, 2002). Tender points appear to represent regions of the body where everyone is tender, and individuals who are more diffusely tender will endorse a greater number of tender points. Finally, tenderness is also influenced by other factors such as gender, age, poor aerobic fitness and mood. Therefore, Clauw warns against rigid adherence to the ACR criteria in clinical practice as it might skew the diagnosis of Fibromyalgia towards older females with poor aerobic fitness and high levels of distress. (Clauw, 2001).

Fibromyalgia is a complex condition with multiple facets; it is not a single condition with uniform features in every patient. Yunus (2002) identified subgroups of Fibromyalgia syndrome patients and subclassified them into five groups. They are:

- Predominant pain and fatigue;
- Predominant anxiety, stress, and depression;
- Predominant multiple sites of pain complaints and tender points
- Predominant numbness and swollen feeling;

- Associated features, that is, irritable bowel syndrome and headaches

Due to the variegated nature of Fibromyalgia, individualized and patient-centered management is essential (Yunus, 2002).

### Symptoms

Fibromyalgia is viewed as consisting of a central set of core features that are essential for diagnosis, superimposed on a number of ancillary features that are often seen in association with, but not integral to its diagnosis (McCain, 1996). Pain and tenderness are defining features of Fibromyalgia, but tenderness is rarely a presenting complaint for many patients. The pain in Fibromyalgia frequently waxes and wanes and can even be “migratory” (Clauw, 2001, p 191). In some instances, patients experience “pain all over” or will experience pain in several areas. Regional musculoskeletal pain and prevalence of migraine headaches, temporomandibular joint syndrome, noncardiac chest pain and several entities characterized by chronic pelvic pain and plantar or heel pain are also often reported (Clauw, 2001).

In addition to pain, most individuals experience a high prevalence of nondefining symptoms. Ancillary features are of two types: (1) those that are considered almost characteristic such as fatigue, a nonrestorative sleep pattern and morning stiffness, because they occur in over three quarters of individuals; and (2) those that are less common, occurring in perhaps 25% to 50% of cases, such as irritable bowel syndrome, headache, subjective swelling, nondermatomal parasthesiae, psychological distress and marked functional disability (McCain, 1996).

A constellation of other seemingly nonspecific symptoms occur frequently in patients. The most commonly reported symptoms are morning stiffness, fatigue and sleep disturbance occurring in over 75% of cases. Stiffness is a common accompaniment of pain and reported by about 85% of patients. It is usually worse in the morning but may be experienced at other times too. Pain and stiffness are often aggravated by cold or humid weather, anxiety, stress, overuse, inactivity and poor sleep (Yunus, 2005). Studies have shown that between 78% and 94% of Fibromyalgia patients report being fatigued (Nicassio, Moxham, Schuman, & Gevirtz, 2002). Fatigue is more common in Fibromyalgia than in other rheumatological conditions. Hendriksson et al. (1992) reported that fatigue constituted a greater impediment to the accomplishment of daily tasks for patients with Fibromyalgia than did pain. Research indicates that poor sleep quality fully accounted for the positive relationship between pain and fatigue (Nicassio et al, 2002). The study focused on the roles of pain, depression and sleep disturbance in predicting fatigue in patients with Fibromyalgia. It was also revealed that pain contributed to lower sleep quality which in turn led to greater fatigue. The findings of the study indicate a dysfunctional, cyclical pattern of heightened pain and non-restful sleep underlying the experience of fatigue in Fibromyalgia (Nicassio et al, 2002). Sleep disturbance usually takes the form of a nonrestorative sleep pattern in which the patient wakes each morning unrefreshed, feeling as if he or she has not gone to bed (McCain, 1996).

In addition, most patients exhibit a variety of somatic complaints, cognitive difficulties with memory or concentration, auditory or vestibular complaints, palpitations, chronic rhinitis or allergies and joint swellings (Winfield, 1999). Patients with Fibromyalgia

frequently complain of subjective cognitive problems in attention, word fluency and memory. However, it is not clear if these deficits can be attributed to central nervous system dysfunction. In fact, research suggests that psychological variables such as depression, pain and fatigue contribute to the neuropsychological presentation in patients. Suhr (2003) proposed to study the relationship of cognitive complaints and objective impairment with depression, fatigue and pain. In the study, twenty eight patients with Fibromyalgia, twenty seven patients with chronic pain and twenty one healthy controls were administered neurological assessments. The results showed that patients with Fibromyalgia had more memory complaints and reported more fatigue, pain and depression than other groups. However, no differences were observed in the cognitive performance. Thus, the study concluded that psychological factors contribute to subjective cognitive complaints and objective cognitive impairment (Suhr, 2003). Interestingly, a recent study investigated the memory beliefs and their relationship to actual memory function in Fibromyalgia patients and it concluded that the patients's complaints about memory function have some empirical confirmation (Glass, J. M., Park, D. C., Minear, M., & Crofford, L. J., 2005). In the study, twenty-three patients with Fibromyalgia and twenty-three age and education matched controls and twenty-two older controls completed the Metamemory and Adulthood (MIA) questionnaire which assessed beliefs about seven aspects of memory function. The results showed that Fibromyalgia patients reported lower memory capacity and less stability in memory function than the age matched controls. Patients reported lower control or self-efficacy over memory, higher achievement motivation, higher strategy use, and higher anxiety about memory than the controls. However, Glass et al concluded that it was

plausible that the patients with Fibromyalgia were more sensitive to their memory loss because their memory function was age inappropriate and might have declined over a short period of time which was atypical for their age. They concluded that the complaints about memory function were accurate in the patients with Fibromyalgia (Glass et al, 2005).

Mood disorders and other psychiatric factors are common in individuals with Fibromyalgia. Approximately, 20%-40% of people with Fibromyalgia seen in tertiary care centers have mood disorders and anxiety (Clauw, 2001). A review article by Hudson et al focuses on the nature of the association and overlap between symptoms of Fibromyalgia and symptoms of Major Depressive Disorder (Hudson & Pope, 1996). Hudson et al review seven types of studies to assess the possible association between Fibromyalgia and Major Depressive Disorder. Looking at the results, there appears to be strong evidence for an association between the two disorders on the basis of (1) overlapping symptomology, (2) similar pattern of comorbid disorders, and (3) high rates of Major Depressive Disorder among relatives of patients with Fibromyalgia. They concluded that Fibromyalgia and Major Depressive Disorder share a common etiologic abnormality (Hudson et al, 1996).

Examinations of severity of depressive symptoms using self-report instruments suggest that patients with Fibromyalgia report significantly higher levels of depressive symptoms than patients with Rheumatoid Arthritis or healthy controls (cited in Okifuji, Turk, & Sherman, 2000). Sayar, Gulec, Topbas and Kalyoncu (2004) compared patients with Fibromyalgia and patients with Rheumatoid Arthritis and healthy controls on psychological measures – depression, anxiety, pain intensity and disability. After analysis of data from fifty Fibromyalgia patients, twenty Rheumatoid Arthritis patients and forty-two healthy

controls, it was concluded that chronic pain patients were significantly more depressed and anxious than healthy controls. The study by Sayar et al revealed that anxiety scores determine whether a patient belongs to a Fibromyalgia or a Rheumatoid Arthritis group. It was shown that the more anxious the patient, the more likely he/she suffers from Fibromyalgia and subsequently, an increased depression score correlated with increased chances of a Rheumatoid Arthritis diagnosis. They concluded that anxiety leads Fibromyalgia patients to perceive their somatic sensations as intense and disturbing and it in turn increases the patients' degree of disability (Sayar et al, 2004).

There are several hypotheses regarding the association between Fibromyalgia and depression. Fibromyalgia is associated not only with high degrees of concurrent depression but also with high prevalence of lifetime depressive disorders and family histories of depression. These findings led to a hypothesis that Fibromyalgia is a variant of depressive disorder (cited in Okifuji et al, 2000). A second hypothesis is based on the research indicating that patients with Fibromyalgia have decreased serotonin levels. Since serotonin has an important function in regulation of mood, the findings have prompted the hypothesis that both Fibromyalgia and depression share a common pathophysiology. A third hypothesis regarding the association of Fibromyalgia with depression is that depression is reactive to the various problems and challenges associated with the chronic nature of Fibromyalgia (cited in Okifuji et al, 2000).

A study by Okifuji et al (2000) aimed to study the relationship between Fibromyalgia syndrome and depression by examining the set of factors that differentiate Fibromyalgia patients with and without depressive disorders. Sixty nine patients with Fibromyalgia were

administered self-report inventories and underwent standardized tender point examination. Of the sixty nine, thirty nine met the criteria for depressive disorder and the rest did not. It was observed that depressed patients with Fibromyalgia were more likely to live alone, report higher functional limitations and display maladaptive thought processes. It was demonstrated that the factors that differentiated Fibromyalgia patients with and without depression were primarily cognitive and physical in function. Nondepressed Fibromyalgia patients perceived pain as having less effect on their lives, engaged in more activities, and feel less disabled. Okifuji et al concluded that depression in Fibromyalgia develops independently of the primary features of Fibromyalgia, but is related to the patient's cognitive appraisal of the effect of pain on their lives.

Another study investigated the association of anxiety and depression with patterns of pain symptoms and fatigue among female patients with Fibromyalgia (Kurtze, Gundersen, & Svebak, 1998). The study found that anxiety and depression were strongly related to the severity of Fibromyalgia symptoms, with high levels of both anxiety and depression among the patients with more severe symptoms. Their findings show that anxiety and depression are independently associated with severity of pain symptoms in Fibromyalgia. In a study of Fibromyalgia patients from four tertiary-care centers to determine if psychiatric comorbidity and psychological variables were predictive of functional impairments, it was found that current anxiety levels correlated with functional impairment (Epstein, Kay, Clauw, Heaton, Klein, Krupp, Kuck, Leslie, Masur, Wagner, Waid, & Zisook, 1999). Patients with Fibromyalgia also exhibited marked functional impairment, high levels of lifetime and current psychiatric disorders and significant psychological distress. Finset, Wigers and

Gotestam (2004) investigated prognostic factors in the course of the Fibromyalgia syndrome from baseline to post-treatment. Their research concluded that depressed mood at baseline was a significant predictor of sustained widespread pain at treatment completion and indicate depressed mood as a predictive factor for treatment response.

Fibromyalgia syndrome coexists with other rheumatic diseases, especially systemic lupus erythematosus and rheumatoid arthritis. Other common conditions that simulate Fibromyalgia or occur concurrently with Fibromyalgia are: hypothyroidism, hepatitis C, sleep apnea, parvovirus infection, polymyalgia rheumatica and cervical stenosis. Other less common conditions are autoimmune conditions, endocrine disorders, lyme disease, malignancy and eosinophilia-myalgia syndrome (Clauw, 2001).

Very little is known about the natural history and long-term prognosis of Fibromyalgia since it is a difficult condition to follow. First, there is no mortality from it, and second, any hospitalizations related to Fibromyalgia are rarely listed as such. There is also a lack of biological markers that can be used to assess outcomes and there is no definition of “remission” in Fibromyalgia (Horizon, & Weisman, 2005). There is also evidence that “early” Fibromyalgia (symptoms for <2 years) is different from “late” Fibromyalgia in that it has a different cytokine profile and is more responsive to therapy (Wallace, Linker-Israeli, Hallegua, Silverman, Silver, & Weisman, 2001). In that study, twenty three patients who had less symptoms for less than two years and twenty three who had symptoms for more than two years were studied. A variety of other epidemiological studies showed that when Fibromyalgia was diagnosed and managed within its first two years of presentation (“early”), 50% of patients no longer met the ACR criteria for the

syndrome two years later. In another study by Kennedy & Felson (1996), thirty nine patients with Fibromyalgia were evaluated two years after their initial evaluation. The results showed a slight decrease in pain, improvement of sleep and global functioning. After a ten year follow-up, the patients still had symptoms of Fibromyalgia, but reported that their symptoms were “a lot better” than when they were first diagnosed, and almost half of them had not seen a doctor in the last year (Kennedy & Felson, 1996).

### Epidemiology

Chronic widespread musculoskeletal pain has been subjected to several epidemiological studies. According to various studies, approximately 10% of the general population report complaints indicating chronic widespread musculoskeletal pain as a major health problem. The prevalence of Fibromyalgia is reportedly 3 – 5%, with a significant female predominance (Gran, 2003). Fibromyalgia is the third or fourth most common reason for consulting a rheumatologist. Approximately 15 to 20 percent of all patients seeking rheumatology referrals have Fibromyalgia. Eighty to ninety percent of patients with Fibromyalgia are women (Wallace & Wallace, 2002). The mechanism responsible for the skewed gender ratio remains unknown. Research shows that most patients develop the syndrome in the prime of their lives and careers, in their thirties and forties. Sixty percent of cases are diagnosed in people between the ages of 30 and 49; another 35% of patients are diagnosed in their 20s or between the age of 50 and 65 (Wallace & Wallace, 2002).

The term “Fibromyalgia” when applied to children, presents problems since it is essentially a diagnosis of adults. Although there are similarities between adults and children, the definition of Fibromyalgia is different for children. Most studies report a mean age of

around 12 to 14 for childhood onset. However, there has been little research on the prevalence of Fibromyalgia in children. Using the ACR criteria, Buskila found that 21% of a sample of 338 school children fulfilled the criteria for Fibromyalgia (Sherry, 2005).

### Causes

Pain in Fibromyalgia is caused by a complex combination of psychological and central nociceptive processes that lower pain threshold and pain tolerance. Psychological distress appears to play a crucial role in pain. There are two competing paradigms concerning the origin of fatigue, depression, persistent pain and the multiple other somatic complaints in Fibromyalgia. The first perspective is the biomedical perspective, according to which symptomology in Fibromyalgia and its many overlapping conditions are a physiological consequence of stress. The second and the more traditional perspective is a psychological view that Fibromyalgia is essentially a somatoform disorder which is a result of heightened somatization in the tender points (Winfield, 1999).

#### *Pain threshold and tolerance*

Pain in Fibromyalgia derives, in part, from a generalized decrease in the pain perception threshold and in the threshold for pain tolerance. Most research on pain threshold performed with pressure algometry (dolorimetry) has revealed that patients with Fibromyalgia have reduced thresholds for perception and tolerance of pressure at both tender points and control points (Winfield, 1999). The enhanced pain sensitivity was observed in increased sensitivity to electrical stimulation, radiant and cutaneous heat stimulation and cold stimulation (Petzke, Clauw, Ambrose, Khine, & Gracely, 2003). Petzke et al (2003) compared the results of pressure and thermal pain sensitivities in forty three Fibromyalgia

patients and twenty eight controls. They found an increased sensitivity to both pressure and thermal stimuli for threshold and suprathreshold stimuli in Fibromyalgia patients. The results of the study further confirm the hypothesis of an augmented pain processing or altered sensory processing in patients with Fibromyalgia.

Gracely, Petzke, Wolf & Clauw (2002) used functional magnetic resonance imaging (fMRI) to evaluate the cerebral activation during the application of a painful pressure to determine the pattern of pain augmentation in patients with Fibromyalgia. Application of mild pressure produced subjective pain reports and cerebral responses that were qualitatively and quantitatively similar to many of the effects produced by application of at least twice the pressure in controls. The study draws two important conclusions in mapping the augmentation of pain in the brain. Firstly, the activation of the brain was more pronounced in patients and the activation in the secondary somatosensory cortex on the ipsilateral side suggest an augmentation of painful input to structures involved in processing and sensory discriminative components of pain. Secondly, a mild pressure to healthy controls resulted in activation in two areas, whereas, application of the same pressure to patients resulted in activation of twelve brain regions. The study supports the hypothesis that Fibromyalgia is characterized by cortical or subcortical augmentation of pain processing (Gracely et al, 2002).

### *Inheritance*

Although a genetic predisposition to chronic pain has been postulated, the limited information available is inadequate for a firm conclusion (Winfield, 1999). A family history of pain, depression, or alcoholism is more common in Fibromyalgia and in persons reporting

persistent pain. Family members of patients with Fibromyalgia also display a high frequency of a number of conditions such as irritable bowel syndrome, migraine headaches and mood disorders. A family study of Fibromyalgia was conducted to assess for familial aggregation of Fibromyalgia and measures of pain and tenderness other symptoms of major mood disorders (Arnold, Hudson, Hess et al., 2004). A detailed interview of 78 patients with Fibromyalgia (probands) and 146 first-degree relatives revealed that Fibromyalgia and reduced pressure pain thresholds aggregate in families. In addition, mood disorders and Fibromyalgia also appear to share some of the inherited factors (Arnold, Hudson, Hess et al., 2004). However, further research is needed to clarify definitively, the genetic component of Fibromyalgia.

### *Sleep*

The studies of sleep physiology show that nonrestorative sleep is an important component in the pathogenesis of Fibromyalgia. More than 90 percent of patients with Fibromyalgia report disturbed sleep which is usually perceived to be light and unrefreshing, irrespective of its duration (Moldofsky, 2002). Clinical studies have shown that the myalgia and tender points in specific anatomic regions are related to unrefreshing sleep. The poor sleep quality is not related to psychological factors, but to the increased number of tender points (Yunus, Ahles, & Aldag, 1991). Sleep laboratory studies by Moldofsky show disordered electroencephalographic (EEG) sleep physiology, which is the basis of unrefreshing sleep experience. Alpha wave intrusion into delta wave nonrapid eye movement (non-REM) sleep was indicated as a distinct sleep anomaly in patients with Fibromyalgia. That is, most patients have an arousal disturbance in their sleep EEG known

as the Alpha-EEG disorder during non-REM sleep. Moldofsky et al described that this Alpha-EEG non-REM sleep anomaly persists during stages 2, and 3 or 4 non-REM sleep in patients with Fibromyalgia. They proposed that this EEG sleep disorder is related to the unrefreshing sleep, diffuse myalgia, localized tenderness and mood symptoms. Moldofsky subsequently showed that disruption of stage 4 non-REM (deep) sleep induces unrefreshing sleep, fatigue and muscular pain in normal healthy people (Moldofsky, 2002).

### *Growth Hormone*

Stage 4 of sleep is closely related to the pulsatile secretion of growth hormone; nearly 80% of total daily production of growth hormone is secreted during this stage (Bennett, Clark, Campbell & Burckhardt, 1992). Bennett et al (1992) compared serum levels of somatomedin C, a growth hormone – related peptide, in female Fibromyalgia patients and age-matched controls. Because growth hormone has a very short half-life, serum levels of somatomedin C were measured. Somatomedin C is a major mediator of growth hormone's anabolic actions and is a prerequisite for muscle homeostasis. They found significantly lower levels of somatomedin C in patients with Fibromyalgia when compared to controls. They hypothesized that this disruption of growth hormone may explain the link between disturbed sleep and predisposition to muscle pain (Bennett et al, 1992).

Another study was conducted to determine whether female Fibromyalgia patients exhibit a normal growth hormone response to an acute exercise stressor. The results indicated (1) Fibromyalgia patients have a reduced growth hormone response to exercise; (2) the impaired response is reversed by the administration of pyridostigmine (Paiva et al, 2002).

### *Substance P*

Substance P (SP) is an 11 amino acid, peptide neurokinin that has several important roles in the process of nociception or the process of transmitting a painful stimulus from the periphery to the cerebral cortex. The precise role of SP in nociception is still not entirely clear, but it apparently facilitates the transmission of the nociceptive message by “arming” or “alerting” spinal cord neurons to incoming nociceptive signals from the periphery than directly carrying the nociceptive message as a neurotransmitter (Russell, 2002). Levels of SP in blood are normal in patients with Fibromyalgia, but its levels are increased in the cerebrospinal fluid (CSF)(Wallace & Wallace, 2002). In a study by Vaeroy, Helle, Forre, Kass & Terenius (1998), on thirty patients with Fibromyalgia, it was revealed that CSF SP was three times more elevated than levels of CSF SP in healthy normal controls. Their study has been reproduced by several other studies and in each case, the results were similar, levels of CSF SP in Fibromyalgia patients were more elevated than normal controls.

### *Autoimmune system*

Fibromyalgia is hypothesized to be caused by a dysfunction in the autoimmune system. Staines (2004) proposed that immunological aberration is likely in Fibromyalgia which may be associated with vasoactive neuropeptides. Vasoactive neuropeptides act as hormones, neurotransmitters, immune modulators and have a vital role in maintaining vascular flow in organs, thermoregulation and memory and concentration. Disturbances in their function are recognized as potential causes of autoimmune disease. Staines hypothesized in the paper that unaccustomed exercise or physical activity could provoke inflammatory cytokines (proteins released by the cells of the immune system, that direct action of the other cells and act as messengers to communicate with immune cells) which

trigger a response of vasoactive neuropeptides which then undergo autoimmune dysfunction. The findings mentioned about the growth hormone, substance P, sleep disturbance and HPA axis can be explained by vasoactive neuropeptide system. Therefore, this disruption is hypothesized to be a plausible cause of Fibromyalgia.

### *Cognitive-Behavioral Variables*

Cognitive-behavioral variables in the pain experience play a central role in the development and maintenance of persistent pain and functional disability. They include pain beliefs and attributions, active and passive coping strategies, perceived self-efficacy and psychological disorders of depression and anxiety (Winfield, 1999). Self-assessed inability to work, helplessness, low perceived control over pain and maladaptive coping all affect pain severity and the overall impact of Fibromyalgia. Pain behaviors constitute a multidimensional manifestation of pain that is based on the complex interaction of various psychological and physical factors. At one level, pain behaviors communicate the pain experience to the outside world. Increased pain behaviors have been associated with more depression, greater satisfaction with social support and more negative thoughts. Pain behaviors can be important perpetuators of illness through reinforcement of the responses to seek attention, avoid work or activity, or obtain medication (Winfield, 1999).

Patients with Fibromyalgia report significantly greater vigilance to pain than patients with low back pain. They also report higher pain intensity, more negative affect, and more catastrophic thinking about pain than patients with chronic low back pain (Crombez, Eccleston, Van den Broeck, Goubert, & Van Houdenhove, 2004). In a study, sixty-four patients with Fibromyalgia and forty six patients with chronic low back pain completed self-

report measures of vigilance to pain, negative affectivity and catastrophic thinking about pain. The study revealed that Fibromyalgia patients report a heightened vigilance to pain. Empirical research suggests at least three variables that may relate to hypervigilance to pain in Fibromyalgia. First, heightened vigilance to bodily sensations is linked to a personality trait of low mood and the predisposition to appraise personal and emotional situations negatively. Second, it is theorized that as pain is a biological alarm signal that demands attention, Fibromyalgia is merely due to the experience of high-intensity pain. Third, it is hypothesized that attending to pain is a normal and functional process of attentional interruption that facilitates escape from bodily threat (Crombez, et al, 2004).

Catastrophizing appears to play a more important role in the pain and depression of women with Fibromyalgia than in women with other chronic pain conditions (Hassett, Cone, Patella & Sigal, 2000). Hassett et al examined the complex relationship between depression, catastrophizing and the multidimensional aspects of pain in women with Fibromyalgia and compared these relationships with those in women with Rheumatoid Arthritis (RA). The study showed that patients with Fibromyalgia scored significantly higher on the catastrophizing subscale of Coping Strategies Questionnaire, revealing that they are more prone to catastrophize their pain than women with RA.

#### *Environmental and Sociocultural variables*

Environmental and cultural variables are multiple experiences that influence the pain experience of people. Developmental variables including psychosocial experiences during childhood such as school stress, role models, unhappy families, and abuse shape the psychological makeup of people as adults. In a nine-year longitudinal study of Norwegian

children with Fibromyalgia, persistence of idiopathic pain was associated with more school stress. It is likely that childhood physical, emotional or sexual abuse is a common antecedent of anxiety, somatization, and chronic pain in many adults (Winfield, 1999).

Interpersonal variables such as spousal and family support can either mitigate or impact adversely on the various dimensions of chronic pain. Job satisfaction, personally meaningful routine, a sense of financial security, and the opportunity to use special skills all mitigate the emotional distress associated with chronic pain (Winfield, 1999).

In summary, the etiology of Fibromyalgia is uncertain. There are no routine clinical laboratory tests that are suggestive of Fibromyalgia, making it difficult for primary care physicians to diagnose. Consequently, patients may be misdiagnosed or visit a number of physicians before they are diagnosed with Fibromyalgia. These issues establish the importance of further research to understand Fibromyalgia.

### Treatment

As Fibromyalgia is influenced by many factors, a multimodal approach such as a biopsychosocial model that addresses physical, psychological and environmental domains provides an excellent framework for conceptualizing and developing effective interventions. In a biopsychosocial approach, interventions are selected not only on the basis of the symptoms, but also on areas of functioning affected by the illness (e.g. Pain or fatigue) (Aaron & Buchwald, 2003). Critical components of Fibromyalgia treatment program include improving physical fitness, work and other functional activities and mental health (Barkhuizen, 2002).

### *Pharmacological therapy*

Pharmacological therapy should be used as a part of a comprehensive management program of Fibromyalgia. The main symptoms which are addressed in pharmacological therapy include pain, sleep, mood disturbance and fatigue. Pharmacological therapy is also considered for syndromes commonly associated with Fibromyalgia, including irritable bowel and bladder syndrome and migraine headaches (Barkhuizen, 2002). Pharmacological treatment aims to improve function and palliate (not abolish) symptoms of Fibromyalgia. Every medication is periodically reevaluated and tapered to document ongoing utility. To avoid habituation, “drug holidays” are employed to increase efficacy of agents and to document ongoing need for medication (Barkhuizen, 2002). The majority of drug treatment plans include managing mood, anxiety, pain and fatigue. Nonsteroidal anti-inflammatory drugs, narcotic medication, analgesic drugs and muscle relaxants are aimed at pain relief and help in restoring normal sleep pattern, helping the patient to feel less fatigued. However, not all patients respond similarly to a particular drug treatment and therefore, similar results can not be expected from all patients.

### *Nonpharmacological therapies*

Symptom management is the principal treatment currently available for patients with Fibromyalgia. Nonpharmacological treatments that target pain, stress and physical and psychological dysfunction use a variety of physical, cognitive, behavioral and educational strategies. Nonpharmacological treatments are of two types, those that are largely self-managed, such as cognitive coping skills, exercise, healthful behaviors, and education, and secondly, those that are provided by practitioners, such as physical therapy, massage, acupuncture and chiropractic. Nonpharmacological Fibromyalgia treatments include

multidisciplinary rehabilitation, physical intervention, pain management, cognitive-behavioral strategies, coping skills training, educational programs and mind-body therapies (Burckhardt, 2002). The goals of interdisciplinary programs include improved functional activities of daily living, return to gainful employment, claim closure, discontinued use of the health care system and pain control (Sprott, 2003).

#### Multidisciplinary therapy

Given the complexity of the Fibromyalgia syndrome, a rational treatment program demands that the eclectic nature be addressed. In Fibromyalgia, a cycle of chronic pain, stress, and psychological arousal often generates a set of secondary symptoms.

Multidisciplinary group treatment programs are especially equipped to provide therapy which improves overall functioning of patients with Fibromyalgia. The multidisciplinary group treatment of Fibromyalgia is potentially useful in three areas: (1) to provide patients with basic background information regarding Fibromyalgia, (2) to make them aware of the various treatment options, and (3) to enhance self-efficacy of the patients. Thus, the ultimate goal of multidisciplinary group treatment should be “to complement and maximize” physician-patient interactions (Bennett, 1996).

Multidisciplinary programs as conceptualized by Bennett involve rheumatologists, rehabilitation professionals, psychologists or psychiatrists and physical therapists. Other health professionals who are also a part of the team are, social workers, occupational therapists, sleep specialists, headache specialists, massage therapists, acupuncturists and endocrinologists (Bennett, 1996). The optimum length of a multidisciplinary program is not known. The Portland Program of Bennett is an outpatient program for six months with

weekly meetings and their rationale was that knowledge acquired slowly on a repetitive basis is retained better than information presented once. The multidisciplinary programs to treat Fibromyalgia patients are based on the cognitive behavioral approaches that have been used to treat patients with rheumatoid arthritis and osteoarthritis. Based on this, the major elements of a multidisciplinary program include education, physical exercise and conditioning and cognitive behavioral techniques to help manage Fibromyalgia. Bennett (1996) highlights issues that are essential to be covered in group therapy. They are: (1) Increased knowledge base (e.g., education on diagnosis, prognosis, prevalence, muscle function, stress effects, sleep physiology and so on), (2) Problem-solving skills, (3) Basic sleep hygiene, (4) Principles of exercise therapy, (5) Stress reduction techniques, (6) Role of pharmacologic agents, (7) Role of nonpharmacologic agents and, (8) Effective communication with doctors and health care professionals. Individual therapy should be provided to help the individual manage myofascial pain, improve sleep, develop an exercise routine, and deal with psychological issues (Bennett, 1996).

Due to the heterogeneity of the condition, patients respond differently to the program and the efficacy of the multidisciplinary program depends on tailoring the program to all individuals based on their needs. Identifying what patient characteristics predict response to a particular intervention would allow design of programs that target specific subgroups of Fibromyalgia patients and would allow patients to receive the type of treatment that would be most effective for them (Worrel, Krahn, Sletten, & Pond, 2001). Worrell et al evaluated the efficacy of a brief, intense treatment program of Fibromyalgia to determine which patient characteristics are associated with a better treatment response. One hundred patients with

Fibromyalgia participated in a one and a half day interdisciplinary treatment program and the study found that the treatment was effective in reducing symptoms associated with Fibromyalgia. Their study concluded that a brief interdisciplinary program reduced some associated symptoms of Fibromyalgia, such as number of bad days per week, stiffness, nervousness and anxiety. It was also found that patients more severely affected by Fibromyalgia may benefit most from this approach (Worrell et al., 2001).

A study was conducted to evaluate the impact of a six month group therapy program on the treatment of patients with Fibromyalgia in a group setting using allied health professionals (Bennett, Burckhardt, Clark, O'Reilly, Wiens, & Campbell, 1996). The multimodal approach was based on education, behavior modification, increased aerobic activity and flexibility, treatment of associated sleep disturbances, optimal management of associated problems such as depression, anxiety, irritable bowel symptoms, injection of trigger points and family education. Of the 104 patients who participated in the program, it was found that at the end of six months, 73% of the patients had <11 tender points and the scores on the Fibromyalgia Impact Questionnaire improved by 25% (Bennett et al., 1996). A pilot study of seventy six Fibromyalgia patients was conducted to determine the effect of 1.5 day multidisciplinary Fibromyalgia program on impact of illness, depression and life fulfillment (Pfeiffer, Thompson, Nelson, Tucker, Luedtke, Finnie, Sletten, & Postier, 2003). The study concluded that a 1.5 day treatment program does have a significant positive effect on the impact of illness (as measured by Fibromyalgia Impact Questionnaire). Subjects with depression improved on Fibromyalgia Impact Questionnaire to the same degree as those without depression (Pfeiffer et al., 2003). The study by Mason, Goolkasian & McCain

(1998), revealed that the fifty five patients who attended the month-long multimodal pain treatment program achieved significant positive changes on most of the outcome measures such as, Beck Depression Inventory, Fibromyalgia Impact Questionnaire and Visual Analogue Scale.

A recent study by Lemstra, M., & Olszynski, W. P. (2005) showed that positive health-related outcomes were obtained with a low-cost, group multidisciplinary intervention in a community-based nonclinical setting. In their study, seventy-nine men and women were randomly assigned to one of the two groups – the intervention group was a multidisciplinary treatment program and the control group consisted of standard medical care with patients' family physician. The results showed that the multidisciplinary rehabilitation was effective in increasing health status while reducing average pain intensity, pain-related disability, depressed mood, days in pain and hours in pain. In the long term, all of these health outcomes retained their significance (Lemstra et al, 2005).

### Cognitive Behavioral Treatment

Psychological and behavioral therapies are often used with patients with Fibromyalgia to manage psychiatric and non-psychiatric problems which maintain pain perception and secondary symptoms (Williams, 2003). The basic tenet is that the stress of chronic pain leads to physiological arousal which in turn generates secondary symptoms such as despondency, dysfunctional sleep and deconditioning. From the biopsychosocial perspective, pain is determined not only by the underlying pathology but also by emotional, cognitive and environmental factors. The events during childhood, such as sexual abuse, family sick role environment and a host of other developmental variables modify an

individual's perception of pain (Bennett, 1996). Cognitive-behavioral (CBT) interventions are aimed at teaching skills necessary to control pain and disability, and building their confidence so that they can successfully use the skills in their daily lives.

CBT supported interventions usually include three phases: (1) an educational phase – in which patients are familiarized with the model for understanding their pain (the biopsychosocial model), (2) a skills training phase – in which patients are given training in a variety of cognitive and behavioral coping skills, and (3) application phase – in which patients apply the newly acquired skills to real-life situations. The skills useful for addressing the psychosocial factors of Fibromyalgia are education, pain-coping skills, pleasant activity scheduling, problem solving, assertiveness skills, relaxation skills, sleep hygiene and relapse prevention (Williams, 2003). Since pain is the result of the complex interplay between cognition, affect and behavior, modification of any one of these factors can affect the course of the condition. CBT for patients with chronic pain typically led to decreased catastrophizing, pain interference, life control and affective distress. However, there is no extensive research on the effectiveness of CBT for patients with Fibromyalgia. Also the outcomes of the studies have been mixed and generally a modest positive effect has been reported.

A brief six session group intervention using CBT was conducted to assess the improvement in physical functioning of patients with Fibromyalgia (Williams, Cary, Groner, Chaplin, Glazer, Rodriguez, & Clauw, 2002). One hundred forty-five patients were randomly assigned to either (1) standard medical care group that included pharmacological management, (2) the same standard medical treatment in addition to six sessions of CBT.

The study results conclude that twenty-five percent of patients receiving CBT were able to achieve clinically meaningful levels of long-term improvement in physical functioning, whereas only twelve percent of the patients receiving standard care achieved the same level of improvement. There were no significant differences between the pain ratings of both groups.

A randomized controlled clinical trial evaluated the effectiveness of outpatient group cognitive or educational treatment for patients with Fibromyalgia. The study was conducted on 131 patients who were divided into three groups – one was a combined cognitive/educational intervention group, second group was purely education with group discussion, the third group was the waiting list (Vlaeyen, Teeken-Gruben, Goossens, Rutten-van Molken, Pelt, van Eek & Heuts, 1996). The study results show that the group with cognitive and educational interventions showed greater knowledge about Fibromyalgia and an increase in pain coping. However, interestingly, the study did not show that the cognitive treatment has any greater value compared to group discussion. A similar study was conducted by another group of researchers where they compared a comprehensive behavioral intervention with an education control condition (Nicassio, Radojevic, Weisman, Schuman, Kim, Schoenfeld-Smith, & Krall, 1997). The effects of the behavioral and education control interventions were evaluated across a ten week treatment period, where the behavioral intervention focused on the development of diverse pain coping skills and education control condition presented information on a range of health topics without emphasizing skill acquisition. No significant differences were observed between the groups with regard to depression, self-reported pain behaviors and observed pain behaviors.

In a follow-up study of CBT intervention, White and Nielson (1995) evaluated the long-term improvement of twenty two patients. The patients participated in a study to assess the effectiveness of CBT intervention, during which a statistically significant improvement was observed after three weeks of inpatient CBT. The current follow-up study (average of thirty month follow-up) was aimed at assessing the maintenance of the results and the long-term effect of CBT. The study showed statistically significant improvement at long-term follow-up.

#### Physical Therapy

Physical exercise is an inexpensive intervention that can modify the pain threshold as well as promote health in other aspects. Aerobic fitness can benefit chronic painful conditions through several mechanisms, such as increasing peripheral level of endorphins, influencing the monoamino-serotonergic system, promoting a decrease in sympathetic activity and improving psychological status (cited in Valim, Oliveira, Suda, Silva, Assis, Neto, Feldman & Natour, 2003). Bennett hypothesized that the chronic fatigue reported by individuals with Fibromyalgia results in a relatively sedentary lifestyle and decreases the level of fitness of skeletal muscles. Consequently, the muscles may be more susceptible to microtrauma from any exercise activity which leads to pain. Aerobic exercise may increase the resistance of a trained muscle to microtrauma, improve the individual's sense of being in control of his or her body, and improve circulation within muscles (cited in Nichols & Glen, 1994).

Nichols & Glen (1994) conducted a study to evaluate the effect of aerobic walking on pain, disability and psychological symptoms of individuals with Fibromyalgia. Of the

nineteen subjects recruited for the study, ten patients walked twenty minutes, three times per week for eight weeks, while the rest served as sedentary controls. The results showed lower scores on McGill Pain Questionnaire for the experimental group and on the psychological dimension of Sickness Impact Profile. However, no significant differences were revealed between the two groups but the trends of the scores are suggestive of a beneficial response to aerobic walking.

A variety of exercise activities have been shown to be beneficial for patients with Fibromyalgia. One study compared two exercise modalities to determine their effects on pain, quality of life, depression and anxiety (Valim, Oliveira, Suda, Silva, Assis, Neto, Feldman & Natour, 2003). Valim et al compared aerobic fitness training and stretching exercises in patients with Fibromyalgia and they hypothesized that aerobic exercise was a better treatment than stretching exercise to improve pain and quality of life. Sixty women with Fibromyalgia completed either the aerobic program or stretching program for twenty weeks. They were evaluated at the beginning, middle and post therapy in relation to flexibility, Fibromyalgia Impact Questionnaire, Short-form Health Survey, depression and anxiety levels. The study revealed that aerobic group presented a significant improvement in maximum oxygen uptake, depression, pain and emotional aspects of mental health. Thus, their study concluded that aerobic exercise is beneficial to patients with Fibromyalgia (Valim, Oliveira, Suda, Silva, Assis, Neto, Feldman & Natour, 2003).

Since there is no consensus on the amount and duration of exercise for patients with Fibromyalgia, a study was conducted to assess the effects of short versus long bouts of aerobic activity in sedentary women (Schachter, Busch, Peloso, & Sheppard, 2003).

Schachter et al compared the effects of one long exercise bout versus two short exercise bouts per day on physical function, signs and symptoms of Fibromyalgia and exercise adherence. Their study revealed that exercise adherence was greater for long bouts of exercise group than for the short bout exercise group; however, the difference was not significant.

Short-term exercise programs for individuals with Fibromyalgia have consistently improved physical function. Exercise has also produced improvements in self-efficacy. Moderately intense aerobic exercise has consistently improved physical function, particularly cardiovascular fitness (Gowans & deHueck, 2004). While the health benefits of exercise for Fibromyalgia patients have been established, exercise interventions have been plagued with poor adherence and retention rates and predictors of exercise behavior remain poorly understood. Therefore, a study was designed to identify predictors associated with the initiation and maintenance of regular exercise among a large sample (444) of patients with Fibromyalgia (Oliver & Cronan, 2002). Exercise self-efficacy and continued participation in regular exercise most strongly predicted present and future exercise behavior in patients with Fibromyalgia. Age, employment status, depression, education level and size of one's social network also demonstrated predictive qualities. Therefore, the study concluded that interventions designed to train patients in initiating exercise programs while addressing exercise self-efficacy, depression and social support are necessary (Oliver & Cronan, 2002).

### Aquatic Therapy

Pool therapy or aquatic therapy is a common therapeutic modality for treatment of rheumatic conditions. Temperate pool water reduces stiffness and alleviates pain, while the

viscosity of water provides the resistance required in aerobic and strengthening exercises (Mannerkorpi, 2005).

A recent study investigated the effects of pool-based exercise therapy on Fibromyalgia (Altan, Bingol, Aykac, Koc, & Yurtkuran, 2004). Fifty women with Fibromyalgia were randomly assigned to pool-based exercise and balneotherapy and were evaluated pre and post treatment on pain, tender points, depression, sleep and morning stiffness. The results of the study showed that pool-based exercise had a longer-lasting effect on symptoms of Fibromyalgia. However, statistical analysis didn't reveal any significant superiority of pool-based exercise – which could be due a relatively small sample size.

Exercise in a temperate pool is a common physiotherapy treatment for patients with Fibromyalgia and it has been found to improve function, symptoms and distress (Mannerkorpi & Gard, 2003). Mannerkorpi and Gard studied how patients with Fibromyalgia experienced physiotherapy group treatment comprising pool exercise and education. When nineteen patients were interviewed as a part of the study, they found that physiotherapy group treatment was experienced as an embodied learning process, comprising the themes: positive experience of body, experiencing relaxation, experiencing physical capacity, acknowledging limitations and changing the pattern of activity. Another study examined the effects of pool-based and land-based exercise programs on patients with Fibromyalgia (Jentoft, Kvalvik, & Mengshoel, 2001). The aim was to examine any differences in symptoms, self-efficacy, self-reported physical impairment and physical impairment between two groups of patients performing either pool-based or land-based aerobic exercise program. Improved grip strength was seen in land-based group compared to

pool-based group after twenty weeks of exercise. However, no other significant differences were noticed between the two groups. In both groups, improvements were found in daytime fatigue, stiffness, cardiovascular capacity and walking time. Within group improvements were also reported with respect to self-reported physical impairment, number of days of feeling good, pain, anxiety and depression (Jentoft, Kvalvik, & Mengshoel, 2001).

The current study proposed to investigate the efficacy of the interdisciplinary treatment program at HealthSouth Medical Center, Dallas on patients' level of pain, depression and anxiety.

## **CHAPTER - III**

### **PURPOSE AND HYPOTHESES**

The primary purpose of this study was to determine the effect of a six-week interdisciplinary treatment program on patients' level of depression, anxiety and pain. The current study also proposed to evaluate the effect of duration of time between diagnosis and treatment outcome, that is, treatment effect on patients receiving treatment within six months of diagnosis and treatment effects on patients receiving treatment greater than six months after their diagnosis.

#### *Hypotheses*

1. Patients' subjective pain rating decreases following six-weeks of therapy.

The patients' level of pain assessed using Wong-Baker FACES pain rating scale during intake is defined as pre-treatment pain rating and the level of pain at discharge is defined as post-treatment pain rating.

2. Patients' level of depression decreases following participation in therapy.

The level of depression was measured using the BDI-II at intake and discharge.

3. Patients' level of anxiety decreases following participation in therapy.

The level of anxiety was assessed using Burns Anxiety Inventory at intake and discharge.

4. Patients treated within six months of diagnosis ("early" treatment group) will demonstrate significantly greater improvement of symptoms of pain, depression and anxiety than patients diagnosed greater than six months ("late" treatment group) prior to program participation.

## **CHAPTER - IV**

### **METHODS**

#### Overview of the design

The primary purpose of this study was to determine the effect of a six-week interdisciplinary treatment program on patients' level of depression, anxiety and pain. Archival data of fifty patients who participated in the Fibromyalgia program between January, 2004 and August, 2005 at HealthSouth Medical Center, Dallas were included in the present study. The treatment program consisted of Physical Therapist, Occupational Therapist and a Licensed Professional Counselor. An initial intake was conducted by all the three therapists to assess the severity and the psychological functioning of the subject. The treatment consisted of three hours of therapy (an hour for Behavior Medicine, Physical Therapy and Aquatic Pool therapy) twice a week for six weeks. The Behavior Medicine was designed to educate and teach pain and stress management, sleep hygiene and communication skills. It was intended to help the patients learn skills to manage their pain and also provide social support. Patients were introduced to Cognitive Behavioral techniques such as the cognitive triad and were taught ways to identify and evaluate their irrational and distorted thoughts. The patients were also taught relaxation techniques and other ways to manage stress and to reconcile their previous self-image and personal goals with current limitations. The patients were encouraged to continue to enhance the skills learnt during therapy to facilitate long-term lifestyle changes and create realistic expectations. The Physical Therapy provided training in aerobic and stretching exercises to help relieve the pain symptoms. Occupational therapy was provided to teach

proper body mechanics, energy conservation and manage day to day activities. And finally, the group is supervised in a heated aquatic pool to perform exercises designed to promote aerobic fitness. A sleep therapist and a registered nurse also educated the patients on sleep hygiene, nutrition and pain management.

### Participants

Fifty patients with Fibromyalgia participated in the current study. All the patients were referred by their physicians to attend the interdisciplinary Fibromyalgia program at HealthSouth Medical Center. The inclusion criteria consisted of patients between the ages 18 - 65 who met the ACR criteria of Fibromyalgia - experiencing significant pain for nearly three months in at least 11 out of the 18 tender points when pressure of approximately 9 pounds was applied. Patients with severe psychosis or severe personality disorders were excluded from the study. Confidentiality and anonymity was maintained throughout the study.

### Materials

#### *Beck Depression Inventory – II (BDI-II)*

Published by Beck, Steer and Brown (1996)

The BDI-II is a 21-item inventory used to assess the severity of cognitive, affective and somatic symptoms of depression. Each item is scored from 0 – 3 points with a summary score ranging from 0 – 63. The BDI-II was used to assess psychological distress among patients with increased depressive symptoms indicating greater psychological distress. The BDI-II has demonstrated high internal consistency (alpha

levels of .92) and adequate validity, which has been established with a heterogeneous pain population. Groth-Marnat (1990) reported that re-test reliabilities ranged from .48 to .86, depending on the interval between re-testing and type of population (Dozois, Dobson, & Ahnberg, 1998).

#### *Burns Anxiety Inventory*

Published by David Burns (1984)

Burns Anxiety Inventory is a thirty-three item self-report inventory to evaluate the most common symptoms of anxiety and panic, such as anxious thoughts, anxious feelings and physical symptoms. Each item is scored from 0 to 3 points with a maximum score of 99. A score from 0 to 4 indicates “minimal” anxiety, 5 to 10, “borderline” anxiety, 11 to 20 indicates “mild” anxiety, 21 to 30, “moderate” anxiety, 31 to 50, “severe” anxiety and 51 to 99 indicates “extreme anxiety or panic”.

#### *Wong-Baker FACES Pain Rating Scale*

Published by Wong, D., & Baker, C. (1988)

Wong-Baker FACES Pain Rating Scale is a self-report visual analog scale to assess pain in patients. It offers visual description to assist a patient whose verbal skills do not adequately explain their symptoms or pain. Although originally developed and validated to measure pain intensity in children, the Wong-Baker FACES scale has also been demonstrated to be valid among adults. The scale consists of six faces depicting graduated levels of distress from 0 to 10, with 0 indicating “no pain” and 10 indicating “hurts as much as you can imagine”. The scale is reliable with a Pearson’s product moment correlation coefficient of 0.79 (Wong, 1990).

### Statistical Analysis

In the current study, three paired t-tests and three repeated measures analysis of variance (ANOVA) are used to analyze the data. It is assumed that the data comes from a normal distribution and therefore, parametric tests would be used. SPSS was used to analyze the data. For testing the first three hypotheses, a paired t-test with an alpha level of 0.05 was used to measure significant differences between the groups. For hypothesis four, three repeated measures ANOVA (one comparing pain, one for depression and another for anxiety with the independent variable, the date of symptom onset) and an alpha level of 0.05 was used. It is assumed that the results thus obtained would be valid.

## **CHAPTER – V**

### **RESULTS**

#### Study Sample

Archival data of fifty six patients who participated in the Fibromyalgia treatment program between January 2004 and August 2005 were collected. However, data for six patients were excluded from the study as the patients either discontinued the treatment program or were absent on the day of the evaluation. Therefore, in the current study, fifty patients were included. The mean age of the sample is 47.42 with a standard deviation of 10.36. The median age of the sample is 47 and range is 21 – 65. Participants were primarily from three ethnic backgrounds; Caucasians (n= 41); Hispanic (n= 2) and African American (n=7). Forty participants were married and ten single; thirty one were employed and nineteen unemployed; twenty-nine were taking anti-depressants and twenty one were not taking any anti-depressant medication during treatment. Of the fifty patients who completed the program, nineteen were diagnosed less than six months prior to treatment (“early” treatment) and thirty-one were diagnosed more than six months before treatment (“late” treatment). Descriptive statistics of patients are included in Tables 1, 2 and 3.

#### Hypothesis Testing

Hypothesis One states that patients’ subjective pain rating decreases following six-weeks of therapy. A paired t-test performed between pre-treatment pain rating and post-treatment pain rating revealed a significant difference between the two ratings. The

mean of pre-treatment pain rating was 5.20 and the mean of post-treatment pain rating was 4.14. There is a significant decrease in pain following treatment. The results show that the differences in the levels of pain are significant at 0.01 level. (See Table 4).

Hypothesis Two states that patients' level of depression decreases following six-weeks of therapy. A paired t-test performed between pre-treatment depression scores and post-treatment depression revealed a significant difference between the two scores. The mean of pre-treatment depression was 20.26 and the mean of post-treatment depression was 14.94, revealing a significant decline of depression following therapy. The results show that the differences in the levels of depression are significant at 0.01 level. (See Table 4).

Hypothesis Three states that patients' level of anxiety decreases following six-weeks of therapy. A paired t-test performed between pre-treatment anxiety scores and post-treatment scores revealed a significant difference between the two ratings. The mean of pre-treatment anxiety rating was 32.52 and the mean of post-treatment anxiety rating was 27.94 demonstrating a significant decrease in anxiety levels following therapy. The results show that the differences in the levels of anxiety are significant at 0.01 level. (See Table 4).

Hypothesis Four states that patients treated within six months of diagnosis ("early") will demonstrate significantly greater improvement of symptoms than patients diagnosed greater than six months ("late") prior to program participation. Three repeated measures ANOVA were used to test the hypothesis.

The first ANOVA shows the relationship between the independent variable (“early” or “late” treatment) on the patients’ level of pain (dependent variable). The results show a significant difference in the means between pre-treatment pain rating and post-treatment pain rating. However, the interaction between the level of pain on “early” treatment group and “late” treatment group is not significant, demonstrating that the two groups did not show any significant difference in the levels of pain before and after treatment. Therapy appears to be equally beneficial to both the groups (See Table 5).

The second ANOVA shows the relationship between the independent variable (“early” or “late” treatment) on the patients’ level of depression (dependent variable). The results show a significant difference in the means between pre-treatment depression rating and post-treatment depression rating. However, the interaction between the level of depression on “early” treatment group and “late” treatment group is not significant, demonstrating that the two groups did not show any significant difference in the levels of depression before and after treatment. Therapy appears to be equally beneficial to both the groups in reducing the level of depression (See Table 5).

The third ANOVA shows the relationship between the independent variable (“early” or “late” treatment) on the patients’ level of anxiety (dependent variable). The results show a significant difference in the means between pre-treatment anxiety rating and post-treatment anxiety rating. The interaction between the level of anxiety on “early” treatment group and “late” treatment group is also significant, demonstrating a significant decrease of anxiety in “early” treatment group over the “late” treatment group. The results indicate that patients attending therapy within six months of diagnosis

demonstrate a significantly greater decrease in level of anxiety than patients attending therapy after six months of diagnosis (See Table 5).

### Additional Findings

Previous research by Wallace et al (2001) indicated differences in cytokine profiles in patients with “early” Fibromyalgia (symptoms of <2 years) and “late” Fibromyalgia (symptoms >2 years). Due to these differences, “early” Fibromyalgia patients are reported to be more responsive to therapy. This hypothesis was also tested in the current study where the patients were again grouped based on whether they were treated within two years (N=27) of their diagnosis or after two years (N=23) of their diagnosis. As with the hypothesis four, a repeated measures analysis of variance was used to determine the relationship between pain, depression and anxiety on patients receiving treatment within two years and after two years of diagnosis.

The results reveal no significant difference in level of pain between the two treatment groups, however, therapy within two years seems to be more effective in decreasing levels of depression and anxiety (See Table 6).

## **CHAPTER – VI**

### **DISCUSSION**

Fibromyalgia syndrome is chronic and is characterized by widespread pain and other neuropsychological symptoms. The complexity of features and a lack of defined pathogenesis make treatment frustrating. Multidisciplinary treatment programs address the eclectic nature of the syndrome and try to improve the overall functioning of patients. Several studies have demonstrated the effectiveness of multidisciplinary treatment programs in having a positive effect on patients. Understanding the effect of duration of time between diagnosis and treatment is crucial in helping rehabilitation professionals plan services for patients. Since previous research has not specifically addressed this issue, the current study also aimed to look at the effect of duration of time on treatment. It was also hypothesized that patients receiving treatment within six months of diagnosis would show significant improvements in terms of pain, depression and anxiety. It was assumed that the earlier they receive treatment, the better their long-term prognosis.

The current study hypothesized that patients' level of pain decreases following participation in therapy. The results show a significant decrease in the level of pain rating following participation in treatment program. There was a mean decrease of 1.06 in the pain ratings after treatment. From the results, it can be said that therapy appears to be effective in reducing the patients' level of pain and the results are not due to chance. The current results are consistent with previous research involving multidisciplinary treatment (Lemstra & Olszynski, 2005; Vlaeyen et al, 1996; Bennett et al, 1995).

Secondly, this study hypothesized that patients' level of depression decreased following participation in therapy. A significant difference was found between depression scores before and after treatment. The mean difference between the two scores was 5.32 and it was found to be statistically significant. The results are consistent with past research that has been conducted (Lemstra and Olszynski, 2005; Valim et al, 2003; Altan et al, 2004; Nicassio et al, 2000). Teaching cognitive behavioral skills as well as physical activity seems to be effective in reducing depression as evidenced in the current study.

Finset et al (2004) indicated that depressed mood at baseline was a predictive factor for treatment response. They concluded that depressed mood impeded pain treatment response in patients with Fibromyalgia. However, in a pilot study by Pfeiffer et al (2003), it was demonstrated that there was no significant difference between response to treatment in patients with depression and without depression as they seem to be equally likely to benefit from treatment.

The results from the current study, show improvement of depressive symptoms as well as pain intensity in patients after treatment. However, in the current study, no specific analysis was conducted to find the difference in responsiveness to treatment between patients with depression and patients without depression.

The third aspect investigated by this study was the effect of treatment on anxiety level in patients with Fibromyalgia. The current study revealed a significant decrease of symptoms of anxiety following treatment. The mean difference between pre-treatment and post-treatment was 4.58 and the difference was found to be statistically significant.

The results reflect the effectiveness of six weeks of multidisciplinary treatment in reducing symptoms of anxiety. It is possible that increased knowledge about Fibromyalgia, its prognosis and learning various skills to manage pain could have decreased the anxiety about the syndrome in patients.

The current study hypothesized that patients treated within six months of diagnosis would demonstrate significantly greater improvements of symptoms than patients diagnosed greater than six months prior to program participation. The study revealed no significant difference between the level of improvement in pain and depression between the “early” treatment group and the “late” treatment group. In other words, both groups demonstrated equal responsiveness to treatment. However, the study revealed a significant decrease of anxiety in “early” treatment group. This could be explained by saying that knowledge about Fibromyalgia and learning skills to manage pain helps reduce anxiety in patients who were recently diagnosed with Fibromyalgia and had higher anxiety levels.

Additionally, research by Wallace et al (2000) demonstrated that due to the differences in cytokine profile, patients treated within two years of diagnosis demonstrated greater responsiveness to treatment than patients treated after two years of diagnosis. Since no significant differences were found between patients diagnosed within six months and patients diagnosed after six months on levels of pain and depression, it was interesting to see if there was a difference in patients in treatment within two years and after two years of diagnosis. The analysis revealed no significant difference in pain, but significant differences were revealed in levels of depression and anxiety.

### Limitations of the study

Even though some of the results in this study were significant, it should be noted that there are limitations to this study. Generalization of these results is limited due to a relatively small sample size. It is possible that if this study were repeated with a larger sample size, greater statistical significance would emerge. In the current study, data was obtained from one study site, resulting in the possibility that study participants were not representative of the general population. Data was collected from patients who had already participated in the treatment program over a period of one and a half years. Various external factors (change of therapists, therapy and weather) could not be controlled in the study.

The groups were not matched on variables such as age, pharmacological status, employment and socioeconomic status. The interaction of these variables could have affected the results. Patients' level of motivation was a significant factor which was not accounted for in the study.

In the study, the date of diagnosis was used to divide the population into "early" treatment group and "late" treatment group. However, a number of patients with Fibromyalgia experience symptoms several years prior to their diagnosis. Since this data was unavailable for a lot of patients, the date of diagnosis was used. If this study were replicated where patients were grouped based on the date of symptom onset, then it is possible that the results would be different from those reported in the current study.

### Recommendations for future research

Several ideas emerged during the course of this study which can be explored in future research. Firstly, future research should be conducted using a larger sample using groups matched on age, employment, pharmacological status and socioeconomic status. It would be interesting to use a more formal research design rather than a simple random design.

Secondly, in order to fully assess the effectiveness of therapy, a study looking at the differences between patients taking medication and participating in therapy versus patients taking only medication or therapy only versus medication only patients would be interesting.

An important question which arises following the current study is: how long are improvements in pain, depression and anxiety sustained? A follow up study assessing the maintenance of the symptoms would throw light on the long-term effectiveness of multidisciplinary treatment.

Finally, in order to assess the effectiveness of each component within the multidisciplinary treatment, component analysis studies need to be done to determine the extent to which each component (behavior medicine, physical therapy or occupational therapy) contributes to treatment outcome. The effect of individual therapy on treatment outcome can also be studied.

### Conclusions

The purpose of the current study was to determine the effectiveness of a six-week multidisciplinary treatment program on patients' level of pain, depression and anxiety. The study also aimed to find the responsiveness of treatment in patients attending therapy within six month of diagnosis and patients attending therapy after six months of diagnosis. Most notably, the study illuminated the fact that multidisciplinary treatment programs were effective in reducing levels of pain, depression and anxiety. The study also found that "early" treatment group showed a significantly greater decrease in symptoms of anxiety following treatment. The groups were different with respect to age, race, socioeconomic status, employment and pharmacological status. However, the difference between the groups appears to be greater than that can be accounted for by chance factors.

## TABLES

*Table 1 - Descriptive Statistics of Subject Pool - A*

Characteristic	N	Mean	Median	Standard Deviation	Range
Age	50	47.42	47.00	10.363	21 - 65

*Table 2 - Descriptive Statistics of Subject Pool - B*

Characteristic	N	Percent of the sample
Ethnicity:		
Caucasian	41	82%
African American	7	14%
Hispanic	2	4%
Marital Status:		
Married	40	80%
Single	10	20%
Employment:		
Employed	31	62%
Unemployed/Retired	19	38%
Pharmacological Status:		
Taking antidepressants	29	58%
Not taking antidepressants	21	42%
Date of Diagnosis:		
Less than 6 months	19	38%
Greater than 6 months	31	62%

*Table 3- Descriptive Statistics of Subjects in “early” treatment and “late” treatment groups*

Characteristic		Less than 6 months (N=19)	Greater than 6 months (N=31)
Age	Mean	47.52	47.35
	Median	47	46
	Standard Deviation	9.179	11.173
	Range	21 - 65	22 - 65
Ethnicity	Caucasian	18 (94.7%)	23 (74.19%)
	African American	1 (5.26%)	6 (19.35%)
	Hispanic	0	2 (6.45%)
Marital Status	Married	15 (78.94%)	25 (80.64%)
	Single	4 (21.05%)	6 (19.35%)
Employment	Employed	13 (68.42%)	18 (58.06%)
	Unemployed/Retired	6 (31.57%)	13 (41.93%)
Pharmacological Status	Taking anti-depressants	10 (52.63%)	19 (61.29%)
	Not taking anti-depressants	9 (47.36%)	12 (38.71%)

*Table 4 - Paired t-test comparing pre-treatment ratings and post-treatment ratings*

Variable	N	Mean	df	t	p
<b>Pain</b>					
Pre treatment-Post treatment	50	1.060	49	3.206**	2.009 (0.05)
					2.678 (0.01)
<b>Depression</b>					
Pre treatment-Post treatment	50	5.320	49	5.118**	2.009 (0.05)
					2.678 (0.01)
<b>Anxiety</b>					
Pre treatment-Post treatment	50	4.580	49	2.884**	2.009 (0.05)
					2.678 (0.01)

Note: \*p<.05; \*\*p<.01

*Table 5 - Repeated Analysis of Variance for pain, depression and anxiety for patients receiving treatment within six months and after six months of diagnosis*

Source	df	F	p
<b>Pain</b>			
Pain	1	8.300	.006**
Treatment group	1	.905	.346
<b>Depression</b>			
Depression	1	27.680	.000**
Treatment group	1	1.323	.256
<b>Anxiety</b>			
Anxiety	1	11.901	.001**
Treatment group	1	5.016	.030*

Note: \*p<.05; \*\*p<.01

*Table 6 - Repeated analysis of variance for pain, depression and anxiety in patients receiving treatment within two years or after two years of diagnosis*

Source	df	F	p
<b>Pain</b>			
Pain	1	9.877	.003*
Treatment group	1	.082	.776
<b>Depression</b>			
Depression	1	26.083	.000**
Treatment group	1	4.367	.042*
<b>Anxiety</b>			
Anxiety	1	8.063	.007**
Treatment group	1	7.417	.009**

Note: \*p<.05; \*\*p<.01

## APPENDICES

### APPENDIX - A FIBROMYALGIA?

#### HEALTHSOUTH CAN HELP

#### NEW PROGRAM STARTING EVERY SIX WEEKS

Fibromyalgia is a common rheumatic syndrome with widespread pain in fibrous tissues, muscles, tendons and other connective tissues. It is also characterized by multiple tender areas on the back of the neck, shoulders, chest, ribcage, lower back, thighs, knees, and arms as well as morning stiffness, sleep problems, fatigue, and difficulty concentrating.

HEALTHSOUTH MEDICAL CENTER IN DALLAS offers Fibromyalgia patients a Multidisciplinary Team Approach that includes:

**Physical Therapy:** Assessment, Heated Pool Aquatics, Exercise, Stretching and Education

**Occupational Therapy:** Assessment, Proper Body Mechanics, Energy Conservation and Managing Day to Day Living

**Behavioral Medicine:** Assessments for Depression and Anxiety, Non Pharmacological Approaches to Pain Management, Sleep Hygiene, Stress Management, Relaxation Training, Communication Skills, Obtaining Family Support, Nutrition, Medication Education, and Cognitive Skills

A new program begins every six weeks. It meets every Monday and Thursday for six weeks.

10:00 to 11:00 am	Behavior Medicine Education
11:00 to Noon	Physical and/or Occupational Therapy
Noon to 1:00 PM	Aquatic Therapy in Heated Pool

After our program, patients report a reduction in pain, more energy, better sleep, less depression and anxiety, improved concentration, and a greater feeling of control in their lives. A diagnosis of Fibromyalgia and a referral from your physician are necessary to get started. Evaluations are then scheduled with Behavior Medicine, Physical Therapy and Occupational Therapy.

We would be happy to talk with you. For program questions, call Cammie McAda at 214 904-6131 or email [camellia.mcada@healthsouth.com](mailto:camellia.mcada@healthsouth.com). For admissions and pre-certification questions, call Betty Leavelle at 214 904-6590 or fax her at 214 904-6576.

HealthSouth is between Northwest Highway and Mockingbird off Harry Hines.

### **HEALTHSOUTH'S Fibromyalgia Program**

#### **Physical & Occupational Therapy Component**

The Physical and Occupational Component of the Fibromyalgia Program meets twice weekly each for fifty-minute sessions on Mondays and Thursdays from **11:00 to 11:50 in the basement gym for mat and aerobic exercises and from 12:00 to 12:50 in the pool**. Each class builds on the information taught in the previous class.

Why does HealthSouth include Physical & Occupational Therapy in its Fibromyalgia Program?

Physical & Occupational Therapy (PT & OT) address your aerobic endurance; thus, allowing you to become less short of breath with activity. PT & OT, in addressing these areas, help in the increase/release of endorphins which are the body's own pain relievers. PT & OT assess and educate you on body mechanics and energy conservation/ pacing strategies during the performance of everyday activities; thus, aiding you in reducing the instances of increased discomfort during their performances of such activities. PT & OT also address your overall body strength.

#### **What should I expect from the program?**

Be prepared to be instructed on upper and lower extremity, neck, and back stretches to be performed at home. Anticipate education on body mechanics, energy conservation & pacing strategies, sleep awareness. Expect to be increasing your aerobic fitness level and increasing the overall strength of your body during the course of our program.

#### **What do I need to be prepared?**

For this program, we request that you attend each session in comfortable, loose clothing that will not constrict your movements. You will need to wear shoes that are appropriate for walking or aerobic activity (i.e. athletic shoes with socks). You will need to wear a swimsuit or shorts (not cut-offs) and T-shirt for the aquatic portion of the program. You need not bring towels (we provide these). If you need to wash after exercises we do recommend that you bring soap and shampoo as well as a hairdryer if needed. It is recommended that you obtain pool shoes for when in the pool area to provide better traction and safety.

#### **Behavioral Medicine Component**

The Behavioral Medicine Component of the Fibromyalgia Program meets **for twelve fifty-minute sessions** on Mondays and Thursdays from **10:00 to 10:50 in the basement**. Each class builds on the information taught in the previous class. You will receive many helpful handouts throughout the course. A useful multi-disciplinary reference book is **"Inside Fibromyalgia"** by Mark J. Pellegrino, M.D., a physician who also has Fibromyalgia. During the program, you may also schedule individual counseling sessions with the Behavioral Medicine therapist, Cammie McAda, MS, LPC, CRC.

### **Why does HealthSouth include Behavioral Medicine in its Fibromyalgia Program?**

Research on the mind/body connection tells us that mental stress can literally create illness and diseases of the physical body. Conversely, painful physical conditions can influence the mind, creating depression, anxiety, and negative thinking that can compromise the immune system. With Fibromyalgia, both the mind and the body are affected. HealthSouth's Fibromyalgia Program treats the mind and the body. Stressful situations lead to physiologic, psychological and behavioral changes. This is called the fight or flight response. Stress aggravates Fibromyalgia.

### **What should I expect from the program?**

The goal of the Behavioral Medicine component is to assist you to eliminate as much stress as possible and reduce, control and cope with the stress that can't be eliminated by teaching **Life Skills**. These Life Skills, when used, will help you feel better, function more effectively, and reduce the effects of stress on muscle tension, the immune system and the pain cycle.

### **These Life Skills are:**

- *Stress Management*: Managing your stressors, both internal and external, to reduce tension throughout the body. Reducing your muscle tension will reduce your pain.
- *Exercise and Good Nutrition*: An important part of stress management and well being.
- *Relaxation and Sleep*: Using relaxation exercises can reduce your pain, mental and physical tension, and improve sleep.
- *Time Management*: Maximizing your good energy and conserving your energy when you are fatigued by careful pacing will reduce pain and fatigue.
- *Pain Management Education*: Learning how to manage chronic vs. acute pain and how to interrupt the pain cycle can reduce or eliminate the need for pain medication.
- *Thinking*: Because the way we Think determines how we Feel, and how we Feel determines how we Act. Learning about and modifying Cognitive Distortions can reduce your tension, stress, fatigue, and pain.
- *Managing Fatigue and Flare-ups and Understanding your Medication Options*.
- *Communication Skills*: Becoming more assertive, reducing passive and aggressive styles reduces stress and tension (and therefore pain) for ourselves and those we relate to.
- *Controlling Depression and Anxiety*: Depression and Anxiety contribute to your stress and therefore to your pain. During your evaluation, you will be given inventories to evaluate your depression and anxiety levels. If these are significant, as they often are for people with pain/illness, you should discuss this with your treating physician who may refer you to a psychiatrist for a medication consultation.

We look forward to working with you and know you will benefit from our program in many ways –

\*Most importantly with more energy, less pain, less depression and anxiety, and many beneficial coping skills not only for managing Fibromyalgia but also for your life.

**You will benefit most from the Fibromyalgia program if you will get these four things under control as soon as possible:**

**SLEEP** – getting a good night's sleep reduces pain, fatigue, irritability and depression; improves immune functioning.

- a. Good sleep hygiene
- b. Relaxation technique as you lie in bed
- c. Medication

**PAIN** – having your pain under control with proper medication, deep breathing, and relaxation techniques reduces fatigue, irritability, depression, and anxiety; improves immune system functioning.

**DEPRESSION and ANXIETY** – If your evaluation indicated that these levels were high, you are encouraged to speak to your \*physician about an antidepressant.

Antidepressants, besides treating depression and anxiety, can help you sleep, think more clearly, and reduce pain.

\*It's best, however, to have this evaluation done by a psychiatrist who specializes in the treatment of depression and anxiety and is the most familiar with the various medication options.

**HORMONE LEVELS** – Thyroid, estrogen, progesterone, or testosterone imbalances can cause fatigue and pain. Low cortisol levels can also cause Fibromyalgia like symptoms.

Call your doctor tomorrow to discuss treatment and/or having your hormonal levels checked if you are struggling with these problems. They are roadblocks to feeling better and benefiting from the Fibromyalgia/Chronic Pain program.

### **What do I need to be prepared?**

Follow the steps as outlined above. Come to each class with an open mind eager to participate and learn. Many individuals find it helpful to have a folder or binder to organize their handouts and information.

### **We need your help too – HELP US HELP YOU!**

Please understand that the Behavioral Medicine component of the Fibromyalgia program is not group therapy. It is a series of classes teaching coping and stress management skills. We recognize that at times the life of a Fibromyalgia patient can be extremely difficult and stress filled. It's tempting when you're upset to want to talk about personal problems in the class but we ask that you refrain from this respect the other class members' time and not take time away from their learning. If you would like an

opportunity to discuss something upsetting, you are encouraged to schedule an individual appointment with Cammie McAda, 214-904-6131 before or after the day's program.

Arrive at the hospital at about 9:50 to give yourself plenty of time to get to the basement and get settled. If you are running late or unable to attend, please notify us at 214 904-6575.

Take care of your need for nutrition and good hydration. Eat well before you come. Bring a snack and drinks for yourself as well. It is fine to bring a snack to Behavioral Medicine and eat during class if you need to.

Fibromyalgia sufferers often become isolated because of the pain and fatigue and may find they feeling lonely, misunderstood, and needing social interaction. We encourage you, if you have the time, to get together with one another either at 9:30 before Behavioral Medicine or at 1:00 after the pool. You can meet in the cafeteria. This may meet those very important needs to socialize, discuss Fibromyalgia, compare notes, support, encourage, and be supported and encouraged. As in 12 step programs, share what has happened to you rather than give advice or tell others what they should do. In addition, practice getting back into the whole of life by talking about things besides Fibromyalgia. It is healthy for your mind and body to focus on other things – to get your mind off of Fibromyalgia for a while. What's a good book you're read lately? Good movie you've seen? What do you think about the most recent events in local, regional, national, and worldwide politics? What is your favorite vacation spot? What are things that you used to do that you want to take up again? What are interests you always wanted to explore but you haven't allowed yourself the time? Have fun. Tell each other jokes. Laughter is good for your mind and body and the endorphins produced help reduce pain!

APPENDIX - B  
**FIBROMYALGIA PROGRAM**  
BEHAVIORAL MEDICINE COMPONENT  
**CLASS AGENDA**

Session #1

- Class introductions and agenda setting
- Fibromyalgia Information Resource Handouts
- Overview and Importance of Behavioral Medicine Component

Session #2

- STRESS – What is stress? How does it affect my body and mind?
- The importance of managing stress - internally and externally
- Stress Management Techniques
- Set personal goals for the program – What new habits of self-care do I want to acquire in six weeks?
- Relaxation script

Session #3

- Introduction to Cognitive Therapy
- Cognitive triad – “Thoughts, Feelings, Actions”
- How thoughts affect my pain and stress levels
- Self care: Thinking rationally to reduce pain and stress

Session #4

- Identifying cognitive distortions
- Evaluating and correcting cognitive distortions to reduce pain, stress, anxiety and depression
- What cognitive distortions arise when others comment on my illness and how do I respond verbally?

Session #5

- Nutrition: Fibromyalgia
- Self care: Eating properly to help my body and mind and to reduce pain
- Experiment to find what works for me
- Relaxation script – Progressive muscle

Session #6

- Retest depression and anxiety levels
- Self care: Managing/treating depressions and anxiety
- Self care: Managing flare-ups

Session #7

- Self care: Managing/treating depressions and anxiety (continued)
- Self care: Managing my energy and sleep
- Speaker from the sleep lab

### Session #8

- Evaluating progress toward personal goals for the program – Am I integrating new self-care habits into my life? –  
For example:
  - Am I exercising consistently?
  - Am I taking my medications as directed?
  - Am I gradually reducing my medications (in consultation with my physician) when possible?
  - Am I remaining calmer and breathing deeply when I experience pain?
  - Am I able to identify areas where I need help and ask for it?
  - Am I able to identify where I am over-functioning? Am I able to eliminate unnecessary activities or say “no?”
  - Am I relaxing 20 minutes daily?
  - Am I rewarding myself weekly when I accomplish my goals?
- Relaxation activity (as time permits)

### Session #9

- Fibromyalgia speaker

### Session #10

- Family group (time to be announced)
- Educating families about adjustment to illness
- Communication concerns

### Session #11

- Reconciling previous self-image and personal goals with current limitations
- Coping skills for the unpredictability of Fibromyalgia
- Program evaluation
- Self evaluation
- Preparing to leave – What self-care goals/plans do I need to make to maintain my gains and continue to feel better after I leave?

### Session #12

- Retest depression and anxiety levels
- Unfinished business
- Group discussion

## APPENDIX - C

### Behavioral Medicine Evaluation

**Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

Age: \_\_\_\_\_ Occupation: \_\_\_\_\_ Sex: Female Male

Physicians:

Referring Physician: \_\_\_\_\_

Primary Care: \_\_\_\_\_

Rheumatologist: \_\_\_\_\_

Psychiatrist: \_\_\_\_\_

Other Physicians: Name: \_\_\_\_\_

For What Condition? \_\_\_\_\_

**Check/Add Reason for Referral:**

Fibromyalgia      Migraine      Chronic Pain      Chronic Fatigue  
Lupus      Osteoporosis      Osteoarthritis      Other: \_\_\_\_\_

How long have you had the condition for which you were referred? \_\_\_\_\_

Date of diagnosis? \_\_\_\_\_

By whom? \_\_\_\_\_

Did anything happen in your life at the time, such as an accident, life stress, illness, surgery, etc.?

\_\_\_\_\_

\_\_\_\_\_

Symptoms when diagnosed? \_\_\_\_\_

Current symptoms? \_\_\_\_\_

Is there a family history of your condition, Fibromyalgia, migraine, chronic pain, arthritis, or any other illnesses? If so, please list which family member and the condition (s).

\_\_\_\_\_

**What sleeping concerns do you have? Please check those that apply:**

Trouble falling asleep      Trouble staying asleep      Trouble waking up  
Sleep apnea      Restless legs      Other: \_\_\_\_\_

Do you have any experience with a pain management program? If yes, when? Yes No

\_\_\_\_\_

Have you ever seen a counselor? Yes No

**If yes, when? Reason for visit?**

\_\_\_\_\_

## APPENDIX – D

## Initial Physical Therapy / Occupational Therapy Evaluation Form

Patient's Name:  
 Medical Record #:  
 Physician:  
 Date:

## INITIAL OT / PT FIBROMYALGIA EVALUATION

1. Age:
2. How long have you been diagnosed with Fibromyalgia?
3. How long have you been experiencing symptoms?
4. What are your major complaints?
5. Have you received previous treatment for these problems? (massage, acupuncture, other)
6. Tell us about your prior medical history. (surgeries, hospitalizations, other diagnoses)
7. List all medications you are currently taking, include dosage and frequency.
8. Do you have breast implants? Have they been removed?

## PAIN LEVEL:

1. On a scale of 0 (zero) to 10 (ten), 10 being the worst, how would you rate your pain level at this time? On your best day, how would you rate the pain? On your worst day, how would you rate your pain?
2. Do you have problems with sitting? Standing? Lifting?
3. What activities increase your pain?
4. What activities decrease your pain?

## WORK RESPONSIBILITIES:

1. Are you presently employed? Are you on Workman's Compensation?
2. When was the last time you worked?
3. What kind of work did / do you do?
4. What are the physical requirements of this position?

## SLEEP PATTERNS:

1. What is your daily caffeine, nicotine, and alcohol intake?
2. How long does it take you to fall asleep?
3. How many hours of sleep do you get a night?
4. Why do you wake up? How is your mood in the morning?

OT Section:**ADL status:**

- Meal preparation \_\_\_\_\_
- Grocery Shopping \_\_\_\_\_
- Vacuuming \_\_\_\_\_
- Laundry \_\_\_\_\_
- Making a bed \_\_\_\_\_
- Socialization \_\_\_\_\_
- Yardwork \_\_\_\_\_
- Hobbies \_\_\_\_\_
- Driving a car \_\_\_\_\_
- Cognition \_\_\_\_\_
- Other \_\_\_\_\_

**Upper Extremity ROM & Strength**

(circle dominant)

	Right		Left	
	ROM	MMT	ROM	MMT
Shoulder Flexion	_____	_____	_____	_____
Extension	_____	_____	_____	_____
Internal Rotation	_____	_____	_____	_____
External Rotation	_____	_____	_____	_____
Abduction	_____	_____	_____	_____
Elbow Flexion	_____	_____	_____	_____
Extension	_____	_____	_____	_____
Wrist Flexion	_____	_____	_____	_____
Extension	_____	_____	_____	_____
Grip	_____	_____	_____	_____

PT Section**Objective**

Appearance \_\_\_\_\_  
 Assistive device Y N Type: \_\_\_\_\_

Posture: (circle) forward head forward shoulders protruding abdomen  
 decrease/increase lumbar lordosis decrease/increase cervical lordosis  
 scoliosis \_\_\_\_\_ thoracic kyphosis level/unlevel iliac crest

**ROM/Strength**

Cervical Spine Flexion \_\_\_\_\_  
 Extension \_\_\_\_\_  
 Side Flexion \_\_\_\_\_

Rotation \_\_\_\_\_  
 Protrusion \_\_\_\_\_  
 Retraction \_\_\_\_\_  
 Lumbar Spine Flexion \_\_\_\_\_  
     Extension \_\_\_\_\_  
     Side Flexion \_\_\_\_\_  
 Lumbar curve reversal \_\_\_\_\_

Lower extremity	Right		Left	
	ROM	MMT	ROM	MMT
Hip Flexion	_____	_____	_____	_____
Hip Extension	_____	_____	_____	_____
Hip Abduction	_____	_____	_____	_____
Hip adduction	_____	_____	_____	_____
Quads	_____	_____	_____	_____
Hamstrings	_____	_____	_____	_____
PF	_____	_____	_____	_____
DF	_____	_____	_____	_____
Abdominals	_____	_____	_____	_____

**Endurance:**

Time to walk @ parameter of gym: \_\_\_\_\_

Pre HR \_\_\_\_\_ Pre BP \_\_\_\_\_

Post HR \_\_\_\_\_ Post BP \_\_\_\_\_

Gait: \_\_\_\_\_

**Palpation:** (mark tender points)

**ASSESSMENT:** (Circle appropriate)

1. Increased pain
2. Inadequate knowledge of Fibromyalgia
3. Decreased ability to perform Activities of Daily Living
4. Decreased endurance
5. Decreased upper body strength and/or AROM
6. Decreased lower body strength and/or AROM

**SHORT/LONG TERM GOALS:** (Circle appropriate)

1. Patient will be independent in home exercise program.
2. Patient will increase endurance for tolerating some form of aerobic conditioning for \_\_\_\_\_ minutes, demonstrating independence with heart rate monitoring within target heart rate zone.
3. Patient will demonstrate an understanding of educational series including body mechanics, energy conservation/pacing strategies, sleep awareness with carryover greater than 90% in ADL's.
4. Patient will report a decrease of pain level to \_\_\_\_\_ out of ten, with ten being severe pain.
5. Patient will demonstrate an increase in upper body strength to \_\_\_\_\_ out of five on the MMT scale.
6. Patient will demonstrate an increase in lower body strength to \_\_\_\_\_ out of five on the MMT scale.

**PLAN:**

The patient will be participating in the fibromyalgia program for a 6 week period. The program will consist of OT/PT Therapeutic Exercise Group 2 times a week for stretching, strengthening, aerobic conditioning and education, and pool therapy 2 times a week.

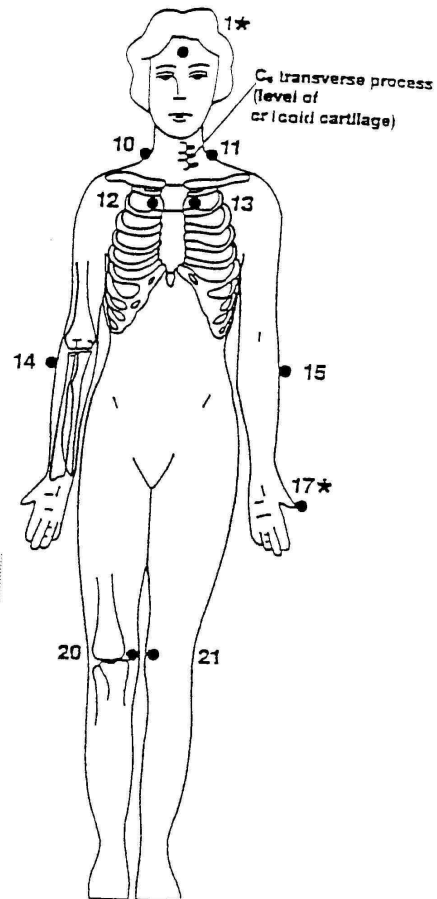
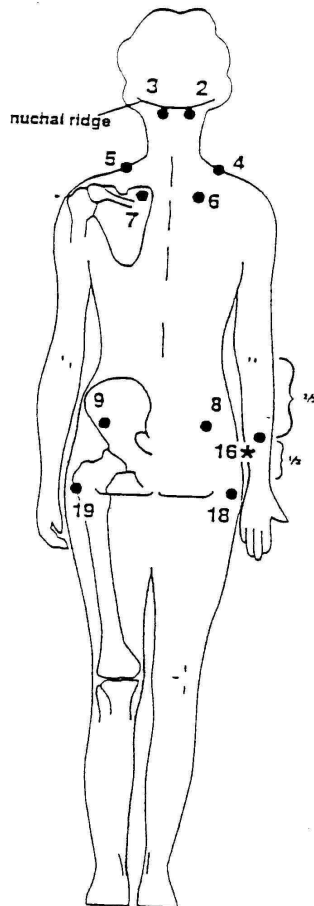
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 Occupational Therapist

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 Physical Therapist

## MANUAL TENDER POINT SURVEY



SCORE ON A SCALE  
OF 1 - 10

0 = NO PAIN

10 = THE WORST  
PAIN YOU  
HAVE EVER  
EXPERIENCED

- SEATED** Mid-Forehead (\*)  
Occiput: Suboccipital muscle insertions  
Trapezius: Midpoint of upper border  
Supraspinatus: Above medial border of scapular spine  
Gluteal: Upper outer quadrant of buttocks  
Low Cervical: Anterior aspect of Intertransverse space of C 5-7  
2<sup>nd</sup> Rib: 2<sup>nd</sup> costochondral junction  
Lateral Epicondyle: 2 cm distal to epicondyle  
Dorsum R Forearm (\*): Junction of proximal 2/3 & distal 1/3  
**STANDING** L Thumbnail (\*):  
Greater Trochanter: Posterior to trochanteric prominence  
Knee: Medial fat pad proximal to the joint line  
Total Tender Points ( /18) \_\_\_\_\_  
\*Total Control Points ( /3) \_\_\_\_\_

RIGHT	MID	LEFT
	1. _____*	
2. _____		3. _____
4. _____		5. _____
6. _____		7. _____
8. _____		9. _____
10. _____		11. _____
12. _____		13. _____
14. _____		15. _____
16. _____*		17. _____
18. _____		19. _____*
20. _____		21. _____

Authors of Survey: Dr. Terrance W. Starz and Dr. J. David Sinclair - University of Pittsburgh Medical Center

## APPENDIX – E

### Initial Plan of Care Physical Therapy

**HEALTHSOUTH®**

Facility Name: \_\_\_\_\_

**INITIAL PLAN OF CARE PHYSICAL THERAPY**

ADDRESSOGRAPH

Patient Name: \_\_\_\_\_ Onset Date: \_\_\_\_\_ Begin Date: \_\_\_\_\_

Physician: \_\_\_\_\_

Primary Diagnosis: \_\_\_\_\_ Prior hospitalization (for current episode): From \_\_\_\_\_ to \_\_\_\_\_ ☐ N/A

Treatment Diagnosis(es): \_\_\_\_\_

Rehab potential: ☐ Excellent ☐ Good ☐ Fair Certification period: From \_\_\_\_\_ to \_\_\_\_\_

**Patient Problems/Treatment Diagnosis:** (Reason for referral)

- |  |   |   |   |
|--|---|---|---|
| <input type="checkbox"/> Pain in _____             | <input type="checkbox"/> ↓ R/L/B UE ROM             | <input type="checkbox"/> Difficulty ambulating                  | <input type="checkbox"/> Joint Instability of _____ |
| <input type="checkbox"/> ↓ bed/mat mobility status | <input type="checkbox"/> ↓ visual perception        | <input type="checkbox"/> Abnormal gait                          | <input type="checkbox"/> Contracture of _____       |
| <input type="checkbox"/> ↓ R/L/B LE ROM            | <input type="checkbox"/> Soft tissue dysfunction    | <input type="checkbox"/> ↓ respiratory capacity                 | <input type="checkbox"/> Edema of _____             |
| <input type="checkbox"/> Skin breakdown            | <input type="checkbox"/> Postural dysfunction       | <input type="checkbox"/> ↓ balance                              | <input type="checkbox"/> Other _____                |
| <input type="checkbox"/> Atrophy                   | <input type="checkbox"/> Improper body mechanics    | <input type="checkbox"/> Dysequilibrium                         | <input type="checkbox"/> Other _____                |
| <input type="checkbox"/> ↓ R/L/B UE strength       | <input type="checkbox"/> ↓ w/c mobility             | <input type="checkbox"/> ↓ Coordination                         | <input type="checkbox"/> Other _____                |
| <input type="checkbox"/> ↓ R/L/B LE strength       | <input type="checkbox"/> ↓ transfer status          | <input type="checkbox"/> ↓ fine motor/dexterity                 | <input type="checkbox"/> Other _____                |
| <input type="checkbox"/> ↓ neck/trunk strength     | <input type="checkbox"/> Abnormal tone              | <input type="checkbox"/> ↓ functional activity: ADL/work skills |   |
| <input type="checkbox"/> ↓ neck/trunk ROM          | <input type="checkbox"/> Abnormal movement          | <input type="checkbox"/> Joint hypomobility of _____            |   |
| <input type="checkbox"/> ↓ endurance               | <input type="checkbox"/> ↓ sensation/proprioception | <input type="checkbox"/> Joint hypermobility of _____           |   |

**Short Term Goals:** \_\_\_\_\_ Weeks

*Short term goals are written to address patient problems and should relate to long term goals.*

1. Patient will: \_\_\_\_\_
2. Patient will: \_\_\_\_\_
3. Patient will: \_\_\_\_\_
4. Patient will: \_\_\_\_\_
5. Patient will: \_\_\_\_\_

**Summary of Evaluation and Findings:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Long Term Goals:** \_\_\_\_\_ Weeks

1. ☐ Decrease pain to \_\_\_\_\_ to allow for \_\_\_\_\_
2. ☐ Increase bed/mat mobility to \_\_\_\_\_
3. ☐ Increase transfer status to \_\_\_\_\_
4. ☐ Increase functional walking tolerance to \_\_\_\_\_ (distance) in \_\_\_\_\_ minutes with \_\_\_\_\_ device/assistance.
5. ☐ Increase functional walking on uneven surfaces/curbs/stairs to \_\_\_\_\_
6. ☐ Increase w/c mobility to \_\_\_\_\_ (distance) with \_\_\_\_\_ assistance.
7. ☐ Increase sensation/proprioception/visual perception to improve functional ADL's such as \_\_\_\_\_
8. ☐ Improve gait mechanics by \_\_\_\_\_ to decrease risk of falls.
9. ☐ Increase strength of \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ to improve functional mobility/ADL's.
10. ☐ Increase functional standing tolerance to \_\_\_\_\_ minutes.
11. ☐ Improve skin integrity \_\_\_\_\_
12. ☐ Improve balance to decrease risk of falls, as evidenced by \_\_\_\_\_
13. ☐ Increase ROM of \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ to improve functional mobility/ADL's
14. ☐ Patient to demonstrate proper posture and safe body mechanics with ADL's and lifting.
15. ☐ Improve balance/coordination for functional skills such as \_\_\_\_\_
16. ☐ Return to work at modified/normal duties.
17. ☐ Perform normal household ADL's
18. ☐ Improve fine motor skills for functional ADL's such as \_\_\_\_\_
19. ☐ Family/caregiver independent with care of patient in these areas: \_\_\_\_\_
20. ☐ Patient \_\_\_\_\_ with Home exercise program.
21. ☐ Other \_\_\_\_\_
22. ☐ Other \_\_\_\_\_
23. ☐ Other \_\_\_\_\_
24. ☐ Other \_\_\_\_\_

**Patient Goals:**

- Treatment Plan:** Treatment may include the following:
- |  |   |  |  |
|--|---|--|--|
| <input type="checkbox"/> Modalities _____  | <input type="checkbox"/> Strengthening Exercise       | <input type="checkbox"/> Posture and/or Body Mechanics | <input type="checkbox"/> Patient/Family Training   |
| <input type="checkbox"/> Neuromuscular Re-education  | <input type="checkbox"/> Home Exercise Program        | <input type="checkbox"/> Fine motor/dexterity          | <input type="checkbox"/> Flexibility/Stretching    |
| <input type="checkbox"/> AROM/PROM   | <input type="checkbox"/> Balance training             | <input type="checkbox"/> Equipment evaluation          | <input type="checkbox"/> Edema Management by _____ |
| <input type="checkbox"/> Manual Therapy  | <input type="checkbox"/> Functional mobility training | <input type="checkbox"/> Splinting/orthotics           | <input type="checkbox"/> Other _____               |
| <input type="checkbox"/> Patient/caregiver participation in development of treatment plan. | <input type="checkbox"/> Gait training                | <input type="checkbox"/> Aquatic exercise              | <input type="checkbox"/> Other _____               |
|  | <input type="checkbox"/> ADL Training                 | <input type="checkbox"/> Endurance Activities: _____   | <input type="checkbox"/> Other _____               |

**Treatment Frequency:** \_\_\_\_\_ Times/Week **Duration:** \_\_\_\_\_ Weeks ☐ 1 x visit

I certify the need for these services furnished under this plan of treatment and while under my care.

Physician Signature \_\_\_\_\_

Date \_\_\_\_\_

Therapist Signature (establishing POC) \_\_\_\_\_

Date \_\_\_\_\_

My therapist has reviewed my Plan of Care with me.

Patient/Caregiver Signature \_\_\_\_\_

## APPENDIX – F

### Initial Plan of Care Occupational Therapy

**HEALTHSOUTH®**

Facility Name: \_\_\_\_\_

**INITIAL PLAN OF CARE OCCUPATIONAL THERAPY**

ADDRESSOGRAPH

 Patient Name: \_\_\_\_\_ Onset Date: \_\_\_\_\_ Begin Date: \_\_\_\_\_  
 Primary Diagnosis: \_\_\_\_\_ Prior hospitalization (for current episode): From \_\_\_\_\_ to \_\_\_\_\_ ☐ N/A  
 Treatment Diagnosis(es): \_\_\_\_\_ Physician: \_\_\_\_\_  
 Rehab potential: ☐ Excellent ☐ Good ☐ Fair Certification period: From \_\_\_\_\_ To \_\_\_\_\_

**Patient Problems:** (Reason for referral)

- |  |   |   |   |
|--|---|---|---|
| <input type="checkbox"/> Pain in _____             | <input type="checkbox"/> ↓ cognition            | <input type="checkbox"/> Joint hypermobility of _____ | <input type="checkbox"/> ↓ balance                              |
| <input type="checkbox"/> ↓ bed/mat mobility status | <input type="checkbox"/> ↓ neck/trunk ROM       | <input type="checkbox"/> Joint hypomobility of _____  | <input type="checkbox"/> ↓ functional activity: ADL/work skills |
| <input type="checkbox"/> Difficulty ambulating     | <input type="checkbox"/> ↓ respiratory capacity | <input type="checkbox"/> Joint instability of _____   | <input type="checkbox"/> ↓ fine motor/dexterity                 |
| <input type="checkbox"/> ↓ w/c mobility            | <input type="checkbox"/> Skin breakdown         | <input type="checkbox"/> Contracture of _____         | <input type="checkbox"/> ↓ sensation/proprioception             |
| <input type="checkbox"/> ↓ transfer status         | <input type="checkbox"/> R/L/B UE strength      | <input type="checkbox"/> Soft tissue dysfunction      | <input type="checkbox"/> ↓ Visual perception                    |
| <input type="checkbox"/> Abnormal tone             | <input type="checkbox"/> ↓ neck/trunk strength  | <input type="checkbox"/> Postural dysfunction         | <input type="checkbox"/> Edema of _____                         |
| <input type="checkbox"/> Abnormal movement         | <input type="checkbox"/> ↓ endurance            | <input type="checkbox"/> Improper body mechanics      | <input type="checkbox"/> Other _____                            |
| <input type="checkbox"/> Atrophy                   | <input type="checkbox"/> Limited R/L/B UE ROM   | <input type="checkbox"/> ↓ Coordination               | <input type="checkbox"/> Other _____                            |

**Short term goals are written to address patient problems and should relate to long term goals.**
**Short Term Goals:** \_\_\_\_\_ Weeks

1. Patient will: \_\_\_\_\_
2. Patient will: \_\_\_\_\_
3. Patient will: \_\_\_\_\_
4. Patient will: \_\_\_\_\_
5. Patient will: \_\_\_\_\_

**Long Term Goals:** \_\_\_\_\_ Weeks

1. ☐ Decrease pain to \_\_\_\_\_ to allow for \_\_\_\_\_
2. ☐ Increase bed/mat mobility to \_\_\_\_\_
3. ☐ Increase transfer status to \_\_\_\_\_
4. ☐ Increase sensation/proprioception/visual perception to improve functional ADL's such as \_\_\_\_\_
5. ☐ Improve balance to decrease risk of falls as evidenced by \_\_\_\_\_
6. ☐ Increase functional standing tolerance to \_\_\_\_\_ minutes.
7. ☐ Improve skin integrity \_\_\_\_\_
8. ☐ Increase strength of \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ to improve functional mobility/ADL's
9. ☐ Increase ROM of \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ to improve functional mobility/ADL's
10. ☐ Patient to demonstrate proper posture and safe body mechanics with ADL's and lifting.
11. ☐ Improve balance/coordination for functional skills such as \_\_\_\_\_
12. ☐ Return to work at modified/normal duties.
13. ☐ Perform normal household ADL's.
14. ☐ Improve fine motor skills for functional ADL's such as \_\_\_\_\_
15. ☐ Family/caregiver independent with care of patient in these areas: \_\_\_\_\_
16. ☐ Patient \_\_\_\_\_ with Home exercise program.
17. ☐ Other \_\_\_\_\_
18. ☐ Other \_\_\_\_\_
19. ☐ Other \_\_\_\_\_
20. ☐ Other \_\_\_\_\_
21. ☐ Other \_\_\_\_\_

**Treatment Plan:** Treatment may include the following:

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> Modalities _____  | <input type="checkbox"/> Strengthening Exercises       | <input type="checkbox"/> Visual perceptual training |
|  | <input type="checkbox"/> Transfer training             | <input type="checkbox"/> Aquatic exercise           |
|  | <input type="checkbox"/> ADL training                  | <input type="checkbox"/> Patient/family training    |
| <input type="checkbox"/> Neuromuscular Re-education  | <input type="checkbox"/> Posture and/or Body Mechanics | <input type="checkbox"/> Flexibility/Stretching     |
| <input type="checkbox"/> AROM/PROM   | <input type="checkbox"/> Fine motor/dexterity          | <input type="checkbox"/> Edema management by _____  |
| <input type="checkbox"/> Manual Therapy  | <input type="checkbox"/> Equipment evaluation          | <input type="checkbox"/> Other _____                |
| <input type="checkbox"/> Patient/caregiver participation in development of treatment plan. | <input type="checkbox"/> Splinting/orthotics           | <input type="checkbox"/> Other _____                |
|  | <input type="checkbox"/> Cognitive retraining          | <input type="checkbox"/> Other _____                |

**Treatment Frequency:** \_\_\_\_\_ Times/Week **Duration:** \_\_\_\_\_ Weeks ☐ 1 x visit

I certify the need for these services furnished under this plan of treatment and while under my care.

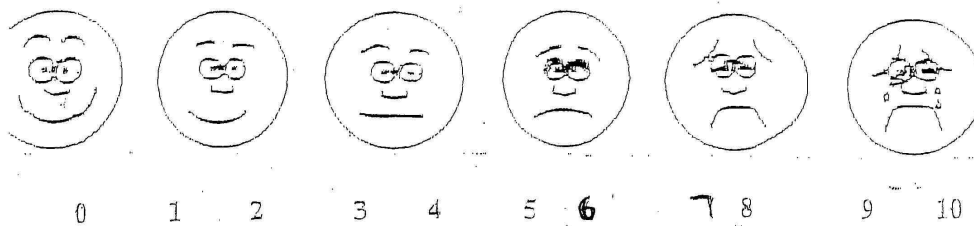
Physician Signature \_\_\_\_\_ Date \_\_\_\_\_

Therapist Signature (establishing POC) \_\_\_\_\_ Date \_\_\_\_\_

My therapist has reviewed my Plan of Care with me. Patient/Caregiver Signature \_\_\_\_\_

APPENDIX – G  
Wong-Baker FACES Pain Rating Scale

Name \_\_\_\_\_ Date \_\_\_\_\_

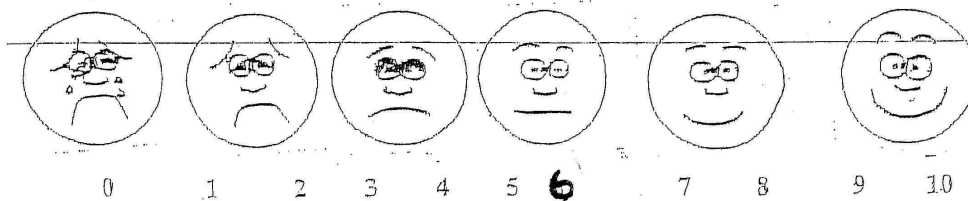


0-1	1-2	3-4	5-6	7-8	9-10
No Hurt	Hurts Little Bit	Hurts Little More	Hurts Even More	Hurts Whole Lot	Hurts Worst

Please rate your pain:

PRE-session \_\_\_\_\_

POST-session \_\_\_\_\_



0-1	1-2	3-4	5-6	7-8	9-10
Worst Sadness	Sad Whole Lot	More sad than happy	More happy than sad	Very Happy	Full of Joy and Peace

Please rate your mood: \_\_\_\_\_

Please write one word or phrase to describe your mood: \_\_\_\_\_

## APPENDIX – H

### Burns Anxiety Inventory

242 / TEN DAYS TO SELF-ESTEEM

#### THE BURNS ANXIETY INVENTORY\*

Place a check (✓) in the box to the right of each category to indicate how much this type of feeling has bothered you in the past several days.

Category I: Anxious Feelings	0 Not at All	1 Somewhat	2 Moderately	3 A Lot
1. Anxiety, nervousness, worry, or fear				
2. Feeling that things around you are strange or unreal				
3. Feeling detached from all or part of your body				
4. Sudden unexpected panic spells				
5. Apprehension or a sense of impending doom				
6. Feeling tense, stressed, "uptight," or on edge				
Category II: Anxious Thoughts	0 Not at All	1 Somewhat	2 Moderately	3 A Lot
7. Difficulty concentrating				
8. Racing thoughts				
9. Frightening fantasies or daydreams				
10. Feeling that you're on the verge of losing control				
11. Fears of cracking up or going crazy				
12. Fears of fainting or passing out				
13. Fears of physical illnesses or heart attacks or dying				
14. Concerns about looking foolish or inadequate				
15. Fears of being alone, isolated, or abandoned				
16. Fears of criticism or disapproval				
17. Fears that something terrible is about to happen				

\*Copyright © 1984 by David D. Burns, M.D., from *Ten Days to Self-esteem*, copyright © 1993.

### THE BURNS ANXIETY INVENTORY (Continued)

Category III: Physical Symptoms	0 Not at All	1 Somewhat	2 Moderately	3 A Lot
18. Skipping, racing, or pounding of the heart (palpitations)				
19. Pain, pressure, or tightness in the chest				
20. Tingling or numbness in the toes or fingers				
21. Butterflies or discomfort in the stomach				
22. Constipation or diarrhea				
23. Restlessness or jumpiness				
24. Tight, tense muscles				
25. Sweating not brought on by heat				
26. A lump in the throat				
27. Trembling or shaking				
28. Rubbery or "jelly" legs				
29. Feeling dizzy, lightheaded, or off balance				
30. Choking or smothering sensations or difficulty breathing				
31. Headaches or pains in the neck or back				
32. Hot flashes or cold chills				
33. Feeling tired, weak, or easily exhausted				
Total score on items 1-33 →				

### SCORING KEY FOR THE BURNS ANXIETY INVENTORY

Total Score	Degree of Anxiety
0 - 4	minimal or no anxiety
5 - 10	borderline anxiety
11 - 20	mild anxiety
21 - 30	moderate anxiety
31 - 50	severe anxiety
51 - 99	extreme anxiety or panic

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## **VITAE**

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