

Fibromyalgia Fitness Specialist Course



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MedFit
CLASSROOM

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Fibromyalgia Fitness Specialist Course

OBJECTIVE: To educate health and fitness professionals on how to effectively work with clients who suffer from fibromyalgia by implementing safe and effective exercise training techniques to develop strength, flexibility, balance, breathing, and improve quality of life.

Learning Objective 1: Participants will obtain a working knowledge of the anatomy and physiology affected by fibromyalgia and how they are used during exercise.

Learning Objective 2: Participants will be able to define the terms associated with fibromyalgia.

Learning Objective 3: Participants will be able to explain the causes, signs and symptoms of fibromyalgia along with traditional treatment and management techniques.

Learning Objective 4: Participants will obtain a working knowledge of other often misdiagnoses and conditions and how they relate to fibromyalgia.

Learning Objective 5: Participants will obtain a working knowledge of musculature anatomy and be able to select proper exercises that improve strength, flexibility, balance, breathing, and improve the overall quality of life for their clients with fibromyalgia.

Learning Objective 6: Participants will be able to provide basic nutrition programming to improve their client's quality of life.

Learning Objective 7: Participants will be able to design and prescribe a proper exercise program with progression tracking for those suffering from fibromyalgia and be able to cue proper technique and body alignment.

Learning Objective 8: Participants will gain an understanding of the power of leveraging specialized education to monetize their fitness career.

Learning Objective 9: Participants will understand the power of building relationships with like-minded fitness professionals including creating networking opportunities and community relationships.

Objective Outcome: These objectives will be measured by a 100-question written exam requiring the participant to achieve a passing grade of 80%.

Table of Contents

Introduction	6
Module I: Theory	11
Lesson One: Fibromyalgia Syndrome and Epidemiology	12
Lesson Two: Fibromyalgia Terms	18
Lesson Three: Pathophysiology of Fibromyalgia & Affected Anatomy	20
Lesson Four: Symptoms, Risk Factors, Diagnosis, Treatments, & Management	32
Lesson Five: Other Related Conditions and Diseases	38
Lesson Six: Common Misdiagnoses	56
Module II: Application	78
Lesson One: Exercise and Fibromyalgia	79
Lesson Two: Scope and Practice for the Health and Fitness Professional	92
Lesson Three: Screening and Assessments	98
Lesson Four: Goals and Program Design	107
Lesson Five: Nutrition and Healthy Weight Management	113
Module III: Business	119
Lesson One: FM Specialization to Expand and Monetize Your Health/Fitness Career	120
Lesson Two: Strategies to Market your Fibromyalgia Fitness Specialist Business	127
Lesson Three: How to Network and Formulate Local and National Relationships to Expand your Reach	133
Module IV: Movement/Exercise Library	137
Lesson One: Body Weight Exercises	138
Lesson Two: Resistance Band Exercises	145
Lesson Three: Hand Weight Exercises	149
Lesson Four: Exercise Templates	155

Conclusion: Health/Fitness Professional Evaluation Checklist	161
Appendix	164
Appendix A: PAR-Q	165
Appendix B: FIQ Form	166
Appendix C: 6-Minute Walk Test	170
Appendix D: 30 Second Chair Stand Test	172
Appendix E: Arm Curl (Bicep) Test	173
Appendix F: Chair Sit and Reach	176
Appendix G: Back Scratch Test	177
Appendix H: Planes of Movement	178
References & Resources	179
About the Author: CarolAnn, MS, Exercise Science & Health Promotion	183
About the Author: Irene McCormick, MS, Exercise Physiology, CSCS, SME	183

Fibromyalgia Fitness Specialist



Introduction

Introduction

According to the National Institute on Health (NIH), fibromyalgia affects over 5-10 million U.S. adults and an estimated 3-6% of the world population. While fibromyalgia is most prevalent in women (75-90% of those with fibromyalgia), it also occurs in men and children of all ethnic groups. Some of your clients may suffer from fibromyalgia, and you may be an important source of relief. Fitness professionals can effectively work with those who have fibromyalgia providing them with a better quality of life through movement. *The Fibromyalgia Fitness Specialist* course provides fundamental information on the anatomy and physiology affected by fibromyalgia, causes of fibromyalgia, signs and symptoms of fibromyalgia, and traditional treatment for fibromyalgia. In addition, this course provides techniques on management of fibromyalgia through exercise. You will learn how to design and prescribe a proper exercise program including basic nutrition to improve the quality of life for your clients with fibromyalgia. With progression tracking, your clients can experience a gradual and pleasant growth in their health and fitness status. You as their health and fitness coach can provide a positive experience to facilitate an effective path to better health and wellness.

What is Fibromyalgia?

Fibromyalgia is also called *fibromyalgia syndrome*. A *syndrome* is a group of symptoms that happen together. People with fibromyalgia experience aches and pain all over the body, fatigue (extreme tiredness that does not get better with sleep or rest), and problems sleeping.

Fibromyalgia may be caused by a problem in the brain with nerves and pain signals. In other words, in people with fibromyalgia, the brain misunderstands everyday pain and other sensory experiences, making the person more sensitive to pressure, temperature (hot or cold), bright lights, and noise compared to people who do not have fibromyalgia.

Fibromyalgia has been compared to arthritis. Like arthritis, fibromyalgia causes pain and fatigue. But, unlike arthritis, fibromyalgia does not cause redness and swelling, or damage to your joints.

History of Fibromyalgia

Fibromyalgia (FM) is often thought of as a relatively new illness because the term “fibromyalgia” wasn’t used until late in the 20th century and it didn’t have official criteria until 1990. However, physicians and researchers have written about FM-like conditions since the early 1800s. In fact, historical accounts of illnesses with remarkably similar symptoms can be found as far back as 1500 BC.

The following are some of the significant milestones in the history of fibromyalgia:

Year	Event
1600s	Symptoms resembling fibromyalgia were given the name muscular rheumatism.
1815	Dr. William Balfour, a surgeon from Scotland, first described what we now know as the "tender points" that patients with FM experience.
1904	Sir William Gowers coined the term fibrositis, which literally means "inflammation of fibers," to identify the pain experienced by patients formerly diagnosed with muscular rheumatism.
1972	Dr. Hugh Smythe laid the foundation for the modern definition of fibromyalgia when he described widespread pain and tender points.
1975	The first sleep electroencephalogram study, which identified the sleep disturbances that accompanied fibromyalgia, was performed.
1976	The term "Fibromyalgia" was coined by Dr. Philip Hench. It was first fully described by Dr. William Balfour in 1815.
1981	Dr. Muhammad Yunis was the first to officially use the term fibromyalgia as a synonym for fibrositis in a scientific publication.
1987	The American Medical Association recognized fibromyalgia as a real physical condition.
1990	The American College of Rheumatology developed diagnostic criteria for fibromyalgia to be used for research purposes. However, since there was no other diagnostic tool available, the criteria soon began to be used by clinicians as a tool to help them diagnose fibromyalgia in patients.
1990s	The concept of neurohormonal mechanisms with central sensitization was developed.
2007	Lyrica (pregabalin) became the first drug to receive FDA approval for the treatment of fibromyalgia.
2008	Cymbalta (duloxetine) was the second drug to receive FDA approval for the treatment of fibromyalgia.
2009	Savella (milnacipran) followed as the third drug to receive FDA approval for the treatment of fibromyalgia.
2010	The American College of Rheumatology proposed a new set of diagnostic criteria which takes into account other common fibromyalgia symptoms, such as fatigue, sleep disturbances, and cognitive problems, as well as pain.
2011	Modifications to the 2010 Fibromyalgia Diagnostic Criteria were proposed.

2012	The Social Security Administration published a ruling (SSR 12-2p) explaining how disability claims examiners and judges should evaluate whether fibromyalgia constitutes a “medically determinable impairment” (MDI). While this ruling does not automatically grant disability benefits to someone with fibromyalgia, it does recognize that fibromyalgia is a legitimate impairment. Beyond that, claimants must still prove that they are too disabled to work.
2013	The 2013 Alternative Criteria for diagnosing fibromyalgia was proposed.
2013	EpiGenetics introduced the first blood test for diagnosing fibromyalgia – the FM/a® blood test.

Take Introduction Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. According to the National Institute on Health (NIH), how many U.S. adults does fibromyalgia affect?
2. What percentage of the world's population does fibromyalgia affect?
3. What is defined as a group of symptoms that happen all together?
4. What other disease has fibromyalgia been compared to initially?
5. Is fibromyalgia considered a new disease? Why or why not?
6. Who was responsible for coining the term that is today known as "Tender Points"?
7. Who coined the term fibrositis?

Fibromyalgia Fitness Specialist



Module I Theory

Lesson One

Fibromyalgia and Epidemiology

Fibromyalgia is one of the most common chronic pain conditions. The disorder affects an estimated 5-10 million people in the U.S. and an estimated 3-6% of the world population. While it is most prevalent in women (75-90% of the people who have FM are women) it also occurs in men and children of all ethnic groups. The disorder is often seen in families, among siblings or mothers and their children. The diagnosis is usually made between the ages of 35 to 45 years, but the incidence rises with age so that by age 80, approximately 8% of adults meet the American College of Rheumatology classification of fibromyalgia. In the United States, chronic pain and fatigue are extremely prevalent in the general population, especially among women and persons of lower socioeconomic status. Within the body, the prevalence of regional pain is 20%; widespread pain, 11%; and chronic fatigue, approximately 20%.

Gender Differences

It's estimated that 6 – 10 percent of people in the United States have fibromyalgia. This chronic pain disorder impacts millions of men and women of all ages and ethnicities all around the world. But fibromyalgia is decidedly more prevalent in women, as is the case with a number of other pain disorders, such as temporomandibular joint disorder, headache, and irritable bowel syndrome.

Studies have shown important gender differences in various clinical characteristics of fibromyalgia. For example, women experience significantly more common fatigue, morning fatigue, all-over hurting, irritable bowel syndrome, and other number of symptoms. Women also typically have significantly more tender points. On the other hand, overall pain severity, global severity, and physical functioning are not significantly different between the sexes, nor are such psychological factors as anxiety, stress, and depression. The mechanisms of gender differences in fibromyalgia are not fully understood, but they are likely to involve interaction between biology, psychology, and sociocultural factors.

Among the mechanisms that may contribute to increased pain sensitivity in women are the following:

- Differences in primary afferent input to the CNS, with developmental and menstrual cycle-dependent enhancement
- Higher levels of trait and state anxiety
- Increased prevalence of depression
- Use of maladaptive coping strategies
- Increased behavioral activity in response to pain

Science has not produced much research on men with fibromyalgia and estimates of the number of men vs. women with the disease vary widely. The National Fibromyalgia Association states that a 2001 review of the literature found the ratio was nine women to every one man with the disease. Elsewhere, self-help groups have put the figure at one man for every eight women with the condition or higher. These groups leave the possibility open that 30 percent of people who experience fibromyalgia might be male.

Due to the leaning towards fibromyalgia as predominantly a female condition, it may be harder for men to receive a fibromyalgia diagnosis, even though some experts believe up to 1.5 million men in the United States may have the condition.

Age

The average age range at which fibromyalgia is diagnosed is 35 to 45 years old, but most people have had symptoms, including chronic pain, which started much earlier in life.

Fibromyalgia likely begins at an early age and is increasingly being diagnosed in adolescents. Like adults, adolescents with juvenile primary fibromyalgia syndrome (JPFS) experience generalized musculoskeletal pain, multiple tender points upon palpation, sleep difficulties, and associated symptoms such as persistent fatigue, psychological distress, and irritable bowel syndrome.

The overall incidence is not clear; however, adolescents with JPFS represent 7% of new patient diagnoses in rheumatology clinics. JPFS occurs more commonly in girls, and the age at onset is typically between 13 and 15 years. JPFS is often difficult to diagnose and treat because of the lack of objective diagnostic findings on laboratory tests, subjective nature of pain reports, poor response to conventional medical treatment, and high levels of distress expressed by patients. Adolescents diagnosed with JPFS have unfortunately received relatively little attention in the research literature. Compared with adults, patients with JPFS face unique developmental and social challenges as they cope with daily pain and difficulties with daily activities. JPFS has been shown to compromise psychosocial functioning, evidenced by poor school attendance, and increased emotional distress.

Ethnicity

Cases of fibromyalgia have been reported by researchers from around the world. Fibromyalgia exhibits no race predilection. Researchers have reported the condition in all ethnic groups and cultures.

While studies have identified patients with fibromyalgia in countries around the world, most have been done in developed countries and few have looked specifically at the effect of race. In the United States, African American women have a higher prevalence of fibromyalgia than white women. However, increased body pain and tenderness are associated with decreased socioeconomic status, so this may be an important influence on racial differences. Another study comparing Sephardic and Ashkenazic Israeli women found that education, rather than ethnic identity, was a determining factor in clinical features of fibromyalgia. Studies of persons in China appear to demonstrate a consistently lower prevalence of fibromyalgia than persons in the United States and Europe.

Much work needs to be done to better understand racial differences, but it has been limited by the need to perform tender-point examinations to identify patients. The demonstration that a patient self-report questionnaire using the modified 2010 ACR criteria fibromyalgia can reliably identify fibromyalgia patients should allow for more studies on race and fibromyalgia to be conducted.

Economic Implications

The annual economic burden of fibromyalgia in 2005 was \$10,199 per patient per year, nearly double that of matched controls. It has been estimated that overall, fibromyalgia costs the US economy over \$9 billion annually. Fibromyalgia is responsible for a decrease in our nation's productivity of 1-2%, results in direct and indirect expenditures of at least \$15 billion, and is inadequately evaluated and managed. Even though most FM patients who wish to be working and are employed full time, the syndrome diminishes their quality of life and overall productivity, which takes a toll on the emotional and psychological self.

Since placing FM patients on total disability harms patients, their families, and society, a more creative approach towards accommodating special needs and optimizing patient skill sets despite their condition demands to be developed. Practicing empathy towards individuals with these unique needs in our demanding and often hostile and unforgiving society is a great place to start.



Lesson One Case Study #1

Lower Socioeconomic Status Associates with Increased Symptom Severity and Functional Impairment in Fibromyalgia

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Meeting: 2013 American College of Rheumatology (ACR)/ARHP Annual Meeting

Background/Purpose: Persons with lower socioeconomic status (SES) have poorer health status for many medical conditions. Reasons for this finding are multiple, but access to care, health related behaviors and adherence likely play a role. As fibromyalgia (FM) is a clinical construct with psychosocial implications, it is possible that SES may influence symptom expression and severity. We have examined the effects of SES (measured as proxy by level of education) for disease severity in a cohort of FM patients.

Methods: In a prospective cohort study of patients with FM followed at a tertiary care multidisciplinary clinic, patients were stratified according to education level: high school or less (Group 1; N=99), college (Group 2; N=84), and university (Group 3; N=63). Demographic and disease severity measures included pain visual analog scale (VAS), patient global assessment disease activity (PGA), Fibromyalgia Impact Questionnaire (FIQ), Health Assessment Questionnaire (HAQ), McGill Pain Questionnaire (MPQ), Pain Disability Index (PDI), Pain Catastrophizing Scale (PCS), and anxiety and depression by Arthritis Impact Measurement Scale (AIMS). Between-group differences in discrete and continuous variables were assessed for statistical significance with the Chi-Square test and one-way analysis of variance, respectively. Linear regression was used to assess between-group differences in disease activity while adjusting for potential confounders.

Results: The cohort comprised 246 patients with a mean \pm SD age of 47.8 ± 10.4 years, disease duration of 10.8 ± 9.8 years, and 91.1% female. Baseline values were pain VAS 6.5 ± 2.3 , PGA 6.7 ± 2.1 , FIQ 67 ± 17 , HAQ $1.19 \pm .59$, MPQ 41 ± 15 , PDI 38 ± 14 , PCS 29 ± 12 , AIMS anxiety 6.3 ± 1.8 , AIMS depression 4.9 ± 1.8 , with a mean medication count of 2.6 ± 1.3 per patient. There were no significant differences between groups for the following parameters: disease duration, marital status, cigarette smoking, previous eating disorder or alcohol abuse, current medication categories, and total number of medications used per patient. Higher education was associated with greater use of alternative medicines ($P < 0.001$) and chiropractic, massage or osteopathic treatments ($P = 0.021$). Lower education level was significantly associated with older age ($P = 0.039$), previous drug abuse ($P = 0.016$), current unemployment ($P < 0.001$) and higher score in the following measures of symptom severity: PGA ($P = 0.019$), FIQ ($P = 0.002$), HAQ ($P = 0.001$), MPQ ($P = 0.026$), PDI ($P = 0.031$), and PCS ($P = 0.015$). These associations remained significant even upon adjusting for age and gender differences. No significant differences in pain severity, anxiety, and depression were observed between groups.

Conclusion: Similar to other health conditions, FM patients with lower SES reported greater symptom severity, functional impairment and unemployment, but not mood disorder. Although FM spans all socioeconomic groups, societal factors, rather than specific disease characteristics or mental status, appear to play an important role in patients' perception of illness.



Lesson One Case Study #2

Associations of Socioeconomic Position and Pain Prevalence in the United States: Findings from the National Health and Nutrition Examination Survey

Jody L. Riskowski, PhD

(Pain Medicine 2014; 15: 1508–1521)

Abstract

Background: Pain is a significant burden within the U.S. adult population, but little is known regarding epidemiology of pain, particularly with respect to race, ethnicity, and socioeconomic position (SEP). Objective. The purpose of this study was to describe and evaluate prevalence and distribution of pain in the United States.

Methods: With data from the population-based 2003–2004 National Health and Nutrition Examination Survey, prevalence of acute (<3 months) and chronic (≥3 months) pain was evaluated, including subgroup analyses of race, ethnicity, and SEP, with SEP defined by the poverty-to-income ratio, a ratio derived from the federal poverty level, accounting for household income and number of household members.

Results: Prevalence of acute pain was 12.2% (95% confidence interval: 11.2–13.3%). Non-Hispanic black as well as Hispanic and Mexican American individuals had higher rates of acute pain than non-Hispanic white people, and a higher prevalence was noted in those with higher SEP. Chronic pain prevalence was 15.6% (13.4–17.7%), with non-Hispanic white people having a higher prevalence than those in other racial and ethnic groups.

Conclusion: Trends of chronic pain by SEP were opposite of acute pain as those in the highest SEP group tended to have less chronic pain than those in lower SEP groups. These findings suggest that SEP, in addition to race and ethnicity, may play a role in the development of pain as well as its treatment and management.

Take Lesson Module I Lesson One Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. What percentage of those with fibromyalgia are women?
2. Although fibromyalgia is predominately found in women, how many estimated U.S. men have fibromyalgia?
3. What is the average age range in which fibromyalgia is diagnosed?
4. In the United States, what race has a higher prevalence of fibromyalgia?
5. What is the estimated U.S. economic annual costs of fibromyalgia?

Lesson Two

Fibromyalgia Terms

Fibromyalgia is a chronic disorder characterized by widespread pain, fatigue, sleep disturbances and cognitive impairments.

The term ‘fibromyalgia’ is a combination of three words:

- fibro – a Latin word meaning fibrous tissues, such as tendons and ligaments.
- my – from the Greek word “myo” meaning muscles
- algia – a Greek word meaning pain.

Therefore, fibromyalgia literally means “fibrous tissue and muscle pain.” That name initially seemed appropriate since fibromyalgia was originally thought to be a musculoskeletal disorder because most of the pain was felt in the muscles and other soft tissues. Much research and the advancement of brain-imaging technology, however, lead to the belief currently held by most that fibromyalgia is actually a disorder of the central nervous system, which causes abnormal pain processing and results in pain amplification.

The collection of symptoms we know today as fibromyalgia, has been called by a variety of other names. Beginning in the 1600s, fibromyalgia-like symptoms were diagnosed as muscular rheumatism. Then in 1904, Sir William Gowers coined the term “fibrositis” to describe a condition which he believed was caused by inflammation within muscle fibers. When further research did not confirm Gowers’ inflammation theory, Dr. Philip Hench renamed the condition fibromyalgia in 1976. Although new findings will not likely lead to another name change, it should be noted that very recent research seems to be indicating that Gowers may have been right all along, as several studies have shown there to be at least some degree of inflammation involved with FM.

The following is a list of other names used for fibromyalgia:

- diffuse myofascial pain syndrome
- fibromyalgia-fibromyositis syndrome
- fibromyalgia syndrome
- fibromyositis
- fibrositis
- FMS
- myofascial pain syndrome

Take Module I Lesson Two Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. What are the current thoughts on what causes FM?
2. The term 'fibromyalgia' is a combination of what three words?
3. Fibromyalgia was first recognized as a disease in as early as _____.
4. In which year did fibromyalgia become identified as a legitimate syndrome?
5. Was Sir William Gowers correct in the hypothesis that inflammation exists within muscle fibers?
6. Fibromyalgia has been referred to by at least _____ other names. List three of them.

Lesson Three

Pathophysiology of Fibromyalgia and Affected Anatomy

Researchers are not sure exactly what causes fibromyalgia. Genetics may play a role. Studies also show that the brains of people with fibromyalgia may not process pain in the same way as people who do not have fibromyalgia. Lower levels of certain brain neurotransmitters, such as serotonin or norepinephrine, may cause one to be more sensitive to pain and have a more severe reaction to pain. Imaging studies of the brain show that people with fibromyalgia feel pain when people without fibromyalgia do not. Some medicines prescribed to treat fibromyalgia try to bring the levels of those neurotransmitters back into balance. This lesson addresses the pathophysiology of fibromyalgia and the anatomy that is affected by fibromyalgia.

The Fibromyalgia Brain

Research results demonstrate that fibromyalgia is all too real, and the proof is easy for even the most adamant disbelievers to see. MRIs show differences in the brains of people with fibromyalgia compared to the brains of people who do not have the chronic pain disorder.

Reduced Gray Matter Density: Fibromyalgia has been associated with alterations in brain morphometry (shape and size). In a 2009 study (Wood, PB, et al.), researchers found a significant reduction in gray matter density within the bilateral parahippocampal gyri, right posterior cingulate cortex, and left anterior cingulate cortex – areas involved in functions related to the typical fibromyalgia symptoms, including enhanced pain perception, cognitive dysfunction, and abnormal stress reactivity.

Decreased Brain Connectivity: Findings from a 2014 study (Flodin, P., et al.) suggest that abnormal connectivity patterns between pain-related regions and the remaining brain during rest reflect an impaired central mechanism of pain modulation in FM. Weaker coupling between pain regions and prefrontal and sensorimotor areas might indicate a less efficient system level control of pain circuits.

Altered Central Processing: According to a 2014 study (Lopez-Sola, M.) conducted at the University of Colorado Boulder, fibromyalgia patients reported increased unpleasantness in response to multi-sensory stimulation in daily life activities. Furthermore, MRI displayed reduced activation of both the primary and secondary visual and auditory areas of the brain, and increased activation in sensory integration regions. These brain abnormalities mediated the increased unpleasantness to visual, auditory and tactile stimulation that patients reported to experience in daily life.

Pleasure/Pain Brain Signals Disrupted: A 2014 study (Loggia, M. et al.) indicates that a disruption of brain signals for reward and punishment contributes to increased pain sensitivity, known as hyperalgesia, in fibromyalgia patients. The results suggest that this altered brain processing might contribute to widespread pain and lack of response to opioid therapy in patients with fibromyalgia.

Abnormal Cerebral Blood Flow: In 2008, using single photon emission computed tomography (SPECT), researchers in France were able to detect functional abnormalities in certain regions in the brains of patients diagnosed with fibromyalgia, reinforcing the idea that symptoms of the disorder are

related to a dysfunction in those parts of the brain where pain is processed. The researchers confirmed that patients with the syndrome exhibited brain perfusion abnormalities in comparison to the healthy subjects. Further, these abnormalities were found to be directly correlated with the severity of the disease. An increase in perfusion (hyperperfusion) was found in that region of the brain known to discriminate pain intensity, and a decrease (hypoperfusion) was found within those areas thought to be involved in emotional responses to pain. (Guedj, et al.)

A 2014 study also showed abnormal cerebral blood flow in fibromyalgia patients. This study demonstrated that the cognitive impairment in fibromyalgia was associated with alterations in cerebral blood flow responses during cognitive processing.

Central Sensitization

It has long been recognized that people with fibromyalgia often have other comorbid conditions like irritable bowel syndrome, migraine disease, restless leg syndrome, myofascial pain syndrome, and multiple chemical sensitivity. In 1984, Dr. Muhammad Yunus used a Venn diagram to depict the overlap between these illnesses and put forth the idea that one thing they all had in common was central sensitization. Several years later, Dr. Yunus suggested these conditions be unified under the term “central sensitivity syndromes.”

Central Sensitization

Central sensitization is defined by an exaggerated response of the central nervous system (CNS) to both stimuli that would be expected to be painful and stimuli that normally would not be considered painful, such as touch or massage. This exaggerated response can be triggered by a physical trauma, another chronic painful condition, or in some cases, by significant emotional stress.

In the May-August 2002 issue of Fibromyalgia AWARE magazine, Dr. Yunus describes what happens when central sensitization is triggered.

- A normally painful stimulus becomes much more painful than expected (hyperalgesia).
- A normally non-painful stimulus such as touch, gentle pressure or massage now becomes painful (allodynia).
- The pain spreads beyond the expected ‘field’ or area of stimulation.
- The pain becomes more sustained and lasts longer.
- As time progresses the whole process becomes self-sustained (“changes beget changes”) with chronic and amplified widespread pain.

What causes these changes following a painful stimulus are several neurochemicals/neurotransmitters are involved, including substance P, neurokinin A, N-methyl-D-aspartate (NMDA), glutamate and aspartate. The fact that fibromyalgia patients typically show increased levels of substance P and

decreased levels of the serotonin metabolite 5-hydroxyindole acetic acid in their cerebrospinal fluid further supports the idea of central sensitization. The process of sensitization involves not only the intensity of pain, but also its quality (burning, tearing, pins and needles and other emotional reactions to pain). It also concerns the sustenance of pain (making it chronic and self-driven) and an expansion of the receptive field, making the pain widespread.

Nerve Fiber Abnormalities

Small Fiber Neuropathy: One of the newest areas of study related to fibromyalgia involves small nerve fibers. Several studies have found significantly reduced densities of small nerve fibers in approximately 30-40% of fibromyalgia patients. That in itself is a pretty large subset, but some researchers think they've only scratched the surface. Thus far, testing has only been done on two parts of the body. They speculate that testing on other parts of the body (like perhaps the tender points) may reveal many more fibromyalgia patients who have small fiber neuropathy.

Nerve Fibers in the Palms: Another nerve abnormality is excessive sensory nerve fibers around specialized blood vessel structures located in the palms of the hands. The excessive sensory nerve fibers could account for the widespread pain and fatigue that occurs in fibromyalgia. In addition to involvement in temperature regulation, an enormous proportion of our blood flow normally goes to our hands and feet, far more than is needed for their metabolism. As such, the hands and the feet act as a reservoir from which blood flow can be diverted to other tissues of the body, such as muscles when we begin to exercise. Therefore, the pathology discovered among these shunts in the hands could be interfering with blood flow to the muscles throughout the body. This mismanaged blood flow could be the source of muscular pain and achiness, and the sense of fatigue which are thought to be due to a build-up of lactic acid and low levels of inflammation fibromyalgia patients. This, in turn, could contribute to the hyperactivity in the brain.

Dopamine Dysfunction

Dopamine is a neurotransmitter in the brain that acts as a messenger so nerves can communicate with each other. One of the important functions of brain dopamine is to serve as a natural pain killer. When a person experiences pain, the brain releases extra dopamine to fight the pain.

One of the first clues that there might be a connection between fibromyalgia and dopamine came from a 1992 study conducted by Dr. I. Jon Russell, et al., which showed lower than normal concentrations of metabolites of dopamine, norepinephrine, and serotonin in the cerebrospinal fluid of fibromyalgia patients.

A second indicator that dopamine may play a role in fibromyalgia came from the fact that a lot of fibromyalgia patients also had restless legs syndrome (RLS), which was being successfully treated with drugs that stimulate the dopamine receptors.

The following is a sample of studies that support the dopamine/fibromyalgia hypothesis:

- A 2007 study of dopamine activity in fibromyalgia conducted by PB Wood demonstrated that female FM patients make significantly less brain dopamine than similarly aged women without the disorder. Not only does the brain make less dopamine, it does not release it properly when a patient experiences pain. Since dopamine serves in part to filter essentially all sensory input, a lack of dopamine results in a person experiencing non-painful stimulation (e.g., simple touch) as being painful.
- In a 2005 study, Dr. AJ Holman conducted a clinical trial testing the effectiveness of pramipexole, a restless leg syndrome drug and dopamine agonist. Forty-two percent of those taking the pramipexole achieved a 50% or greater decrease in pain. The pramipexole seemed to be most effective for a subset of fibromyalgia patients who required opioid analgesics and/or were disabled.
- In a study published in 2009, Dr. Patrick Wood, et al. demonstrated a correlation between the reductions in gray matter density found in fibromyalgia and abnormal dopamine metabolism.

Dr. AJ Holman explains his theory about what may cause fibromyalgia and what role dopamine plays.

It all begins with the fight-or-flight response. The fight-or-flight response is a physiological reaction that occurs in response to a perceived harmful event. Its purpose is to protect us in times of danger by mobilizing a lot of energy very rapidly in order to cope with whatever is threatening us. Normally, the fight-or-flight response turns itself off once the perceived threat has passed. But sometimes it gets stuck in the “on” position. We then find ourselves living in a state of chronic stress.

What causes our fight-or-flight response to get stuck? Possibly a lack of dopamine. Dopamine is a neurotransmitter from a part of the brain called the hippocampus, whose job it is to control the brain stem activity that controls our fight-or-flight response.

When that happens, the fight-or-flight response begins to inhibit our sleep. We’re no longer able to get into stage 4 sleep, which our bodies need to function properly and to regenerate our neurotransmitters. Dr. Harvey Moldovsky, who has done extensive research on sleep, has shown that it doesn’t take long for people who are deprived of stage 4 sleep to develop many of the symptoms of fibromyalgia – pain amplification, fatigue, cognitive problems, etc.

Supporting Dr. Holman’s theory is the PET scan data Dr. Wood gathered showing a lack of dopamine in the hippocampus of fibromyalgia patients. Additional support is the fact that pramipexole stimulates the dopamine 3 receptor, which he believes restores the hippocampus function. Restoring the hippocampus allows it to control the brain stem, turn off the fight-or-flight response and restore stage 4 sleep. His clinical observation has been that fibromyalgia improves significantly and can, on occasion, disappear entirely.

It’s important to remember that even if the dopamine hypothesis is correct, it will not apply to every person with fibromyalgia. There are other subsets of fibromyalgia with other causes.

Cervical Spinal Cord Compression

Positional Cervical Cord Compression: Positional Cervical Cord Compression (PC3) was first described by Dr. Daniel Heffez in 2002. He showed that the cervical canal – the long, bony tube that protects the spinal cord in the neck – can change shape with movement. For people with PC3, leaning their head back to look up can cause significant pain.

PC3 is diagnosed by doing a flexion-extension c-spine MRI. That's simply a regular MRI with two additional views. The regular MRI is done with the neck and head in the normal midline position. The additional views are one with the neck flexed forward and another with the neck extended backward. The images of those with PC3 will show a narrowing of the cervical canal and compression of the cervical spinal cord when the neck is extended backward.

A 2008 study, conducted by Dr. Andrew Holman reported that 71% of the fibromyalgia patients he tested had PC3. In 2010, researchers from Oregon Health & Sciences University reported finding PC3 in 55% of fibromyalgia patients. Approximately 10% of PC3 cases require surgery but most can be effectively treated by a specialized physical therapy program and/or medication.

Chiari Malformation: Chiari malformations (CMs) are structural defects in the cerebellum, the part of the brain that controls balance. Normally the cerebellum and parts of the brain stem sit in an indented space at the lower rear of the skull, above the foramen magnum (a funnel-like opening to the spinal canal). When part of the cerebellum is located below the foramen magnum, it is called a Chiari malformation.

CMs may develop when the bony space is smaller than normal, causing the cerebellum and brain stem to be pushed downward into the foramen magnum and into the upper spinal canal. The resulting pressure on the cerebellum and brain stem may affect functions controlled by these areas and block the flow of cerebrospinal fluid to and from the brain.

Because a number of the symptoms of fibromyalgia and Chiari malformation are similar, it was once thought that CMs might be a possible cause of fibromyalgia. However, a 2011 study found that CMs were no more prevalent in the fibromyalgia community than they were in the general population (Watson NF, et al.).

Even if CM is not a cause of fibromyalgia, it is possible that what is actually a Chiari malformation could be misdiagnosed as fibromyalgia. It's also possible that a person could have both FM and CM. Therefore, if there is any question of a possible Chiari malformation, it's worthwhile to investigate further.

Cervical Spinal Stenosis: Cervical spinal stenosis, also called cervical myelopathy, is a narrowing of spaces in the cervical (neck) area of the spine that results in pressure on the spinal cord and/or nerve roots and possible obstruction of the flow of cerebrospinal fluid. While some people inherit a small spinal canal, it is most often results from a gradual, degenerative aging process. Either structural changes or inflammation can begin the process. As people age, the ligaments of the spine may thicken and calcify (harden from deposits of calcium salts). Bones and joints may also enlarge.

As with PC3 and Chiari malformation, many of the symptoms of cervical spinal stenosis are very similar to those of fibromyalgia. In 2007, Dr. Dan Heffez, et al. Conducted a study comparing the outcome of surgical versus non-surgical treatment of cervical myelopathy in patients with fibromyalgia. They found that there was a striking and statistically significant improvement in all symptoms attributed to the fibromyalgia syndrome in the surgical patients but not in the non-surgical patients at one year following the treatment of cervical myelopathy.

It is not sure whether any or all of these types of cervical spinal cord compression are misdiagnosed as fibromyalgia, can trigger fibromyalgia, or occur along with fibromyalgia. What is important is that patients who have one of these forms of cervical spinal cord compression be properly diagnosed and treated. Eliminating the pain and other symptoms caused by cervical spinal cord compression should also improve many of the symptoms attributed to fibromyalgia.

Hormones

Sex hormones may play a role in the genesis of the pain women and men with fibromyalgia experience. A major gender gap in the incidence of fibromyalgia suggests that sex hormones must play at least something of a role in this disease. Animal studies indicate not only that females are more sensitive to pain but also the sensitivity can be altered by changing the hormone levels.

The fact that that gender gap appears only when girls reach puberty strongly suggests there is a correlation with the hormones in fibromyalgia. Reports abound of improved pain and fatigue during pregnancy for some women with chronic fatigue syndrome (CFS) and FM. Plus, several studies indicate greatly increased rates of gynecological disorders in CFS (Johnson, Cort., 2018).

Studies indicate that sex hormones affect the activity of pain receptors, the central pain-processing pathway in the brain, inflammation in the spinal cord, and opioid pain processing. Two sex hormones in particular, testosterone and progesterone, appear to have pain diminishing properties, and progesterone has anti-inflammatory and neuroprotective effects as well (Johnson, Cort., 2018).

Given the abundant evidence indicating that sex hormones can affect pain, in 2018 Jarred Younger at the University of Alabama at Birmingham published a study measuring hormone levels in women with FM. In this study, Younger measured testosterone, progesterone, and estradiol levels as well as cortisol in eight women with FM for 25 days straight while having them record their pain levels. He found that both progesterone and testosterone were inversely correlated with pain levels. In other words, in patients with FM, the higher the progesterone and testosterone levels were, the lower their pain was.

Progesterone level fluctuations by themselves altered pain levels by about 25%. By themselves, neither estradiol nor cortisol levels had any effect on pain except when progesterone levels were low. Low progesterone in combination with high cortisol produced the highest pain levels. Pain levels were highest during the menstrual period when sex hormone levels were at their lowest.

Younger noted that this was the first-time pain levels and sex hormone levels had ever been tracked on a day-to-day basis in humans. However, another study involving 10,000 subjects also found that lowered sex hormone levels (estrogen, testosterone, androstenedione, and 17-hydroxyprogesterone) were associated with an increased prevalence of chronic musculoskeletal pain.

Genes

Pain commonly aggregates in families, and studies have shown that heritability explains up to 50% of the development of chronic pain or fibromyalgia. A revolution in molecular genetics followed, suggesting that some forms of chronic pain have genetic explanations (Park, D., Kang, J., Yim, Y., et al. 2015).

The search for pain-related genes has primarily featured large linkage or association analyses; these showed that pain-related genes affected the expression or function of proteins in a manner influencing the pain response. Currently, hundreds of pain-regulated genes that are thought to be relevant to pain perception or analgesia have been identified. These include the genes encoding voltage-gated sodium-channels (Nav), GTP cyclohydrolase 1 (GCH1), mu-opioid receptors, and catechol-O-methyl transferase (COMT), and various genes of the dopaminergic, glutamatergic, and GABAergic pathways.

Major advances in our understanding of the pathophysiology of FM have resulted from the recognition of central sensitization. Central sensitization represents an enhancement in the function of neurons and circuits in central nociceptive pathways and thus results in pain hypersensitivity. The development of central sensitization is related to the monoamine neurotransmitters, and COMT is a major enzyme that inactivates catecholamine neurotransmitters such as dopamine, epinephrine, and norepinephrine. Genetic mutations in the COMT gene can induce functional impairment in the COMT enzyme and alterations in COMT activity. Thus, polymorphism in the COMT gene has been suggested as a genetic factor associated with FM susceptibility and symptom severity. Moreover, research is still in progress to evaluate the role of COMT gene polymorphisms in the disease course and the outcomes of FM. Further prospective large-scale studies are needed (Zorina-Lichtenwalter, K., Meloto, C.B., Khoury, S., Diatchenko, L., 2016).

MTHFR, or methylenetetrahydrofolate reductase, is a gene that creates an enzyme of the same name. This gene, and the enzyme it controls, are critical for the body's ability to use the B vitamin, folate, and for the vital biochemical pathway, methylation. The process of methylation is crucial in detoxification, energy production, and mood balancing. Methylation helps to regularly repair DNA (which helps to prevent cancer), controls homocysteine (a dangerous compound that can damage blood vessels and lead to cardiovascular disease) and is involved in the production of neurotransmitters and the control of inflammation. When there's an MTHFR mutation or deficiency, it leads to poor methylation cycle and enzyme production. In addition, it negatively affects glutathione levels and the whole detoxification process. There are about 50 variations in this anomaly, but the two most common are C677T and A1298C. These MTHFR gene mutations are linked to fibromyalgia. An individual can have one gene mutation or both gene mutations. To determine if one has these genetic variants, he/she can obtain a blood or saliva test. Once determined, one can bypass these genetic polymorphisms. This is achieved by supporting methylation with diet, supplements, and other natural therapies and lifestyle choices. These factors impact how genes are expressed. For MTHFR treatment, one can supplement it with the active form of folate. In addition, one should supplement with the active forms of other B vitamins that are involved in methylation and homocysteine breakdown: vitamin B12, riboflavin, and vitamin B6. As always, one should work with his/her doctor to determine the best route of treatment and management (Dong-Jin Park, D. and Lee, S., 2017).

Lesson Three Case Study #1



Fibromyalgia Syndrome: Etiology, Pathogenesis, Diagnosis, and Treatment

Bellato, Enrico et al. "Fibromyalgia syndrome: etiology, pathogenesis, diagnosis, and treatment." Pain research and treatment vol. 2012 (2012): 426130. doi:10.1155/2012/426130

[Read entire article here.](#)

Introduction: Fibromyalgia syndrome is mainly characterized by pain, fatigue, and sleep disruption. The etiology of fibromyalgia is still unclear: if central sensitization is considered to be the main mechanism involved, then many other factors, genetic, immunological, and hormonal, may play an important role. The diagnosis is typically clinical (there are no laboratory abnormalities) and the physician must concentrate on pain and on its features. Additional symptoms (e.g., Raynaud's phenomenon, irritable bowel disease, and heat and cold intolerance) can be associated with this condition. A careful differential diagnosis is mandatory: fibromyalgia is not a diagnosis of exclusion. Since 1990, diagnosis has been principally based on the two major diagnostic criteria defined by the ACR. Recently, new criteria have been proposed. The main goals of the treatment are to alleviate pain, increase restorative sleep, and improve physical function. A multidisciplinary approach is optimal. While most nonsteroidal anti-inflammatory drugs and opioids have limited benefit, an important role is played by antidepressants and neuromodulating antiepileptics: currently duloxetine (NNT for a 30% pain reduction 7.2), milnacipran (NNT 19), and pregabalin (NNT 8.6) are the only drugs approved by the US Food and Drug Administration for the treatment of fibromyalgia. In addition, nonpharmacological treatments should be associated with drug therapy.

Conclusion: Fibromyalgia is a complex syndrome that is often difficult to diagnose, particularly for physicians who do not usually deal with this disease. Pathogenesis is still not fully clear, but modern functional neuroimaging techniques are giving us important data about the CNS involvement. Fibromyalgia is not to be considered a diagnosis of exclusion: the recently published ACR 2010 criteria try to help us not to be confused by all the differential diagnoses for fibromyalgia. A multidisciplinary approach is optimal, and the physician must take into consideration both drugs (in particular antidepressants and neuromodulating antiepileptics) and nonpharmacological treatment, such as aerobic exercise and strength training, aquatic exercises and balneotherapy, cognitive-behavioral therapy, and also the emerging brain stimulation techniques.

This paper is primarily intended to assist orthopedic surgeons who find themselves faced with patients' presenting musculoskeletal symptoms affected by (often undiagnosed) fibromyalgia. It is very important to know and to remember this syndrome so that the patient can be sent to the correct specialist.

Lesson Three Case Study #2



Fibromyalgia Case Study

Becky Brinkworth, Lindsey Hudson, Morgan Jones, Remsing King, and Marley McGraw from the Bellarmine University Physical Therapy Program's Pathophysiology of Complex Patient Problems Project.

[Read entire article here.](#)

Abstract: Fibromyalgia is a diagnosis that has become more prevalent in recent years. These patients are often sent to Physical Therapy for treatment of fatigue, weakness, range of motion deficits, and pain. Exercise and pain management techniques can be utilized with these patients to address musculoskeletal-related dysfunction while also having a positive effect on psychosocial issues often accompanying Fibromyalgia.

Patient Characteristics: Patient is referred to physical therapy after being involved in a motor vehicle accident (four months ago) and continuing to have ongoing pain and stiffness. Patient is 42 years old, female, Caucasian, and lives alone in her apartment. She was working as a receptionist at the time of the accident but is not currently able to work due to pain. Patient has a family history of rheumatoid arthritis and fibromyalgia. She has no history of significant alcohol or recreational drug use. The patient has had no past surgeries, no history of cancer. She is currently taking Prozac for her depression and anxiety. She was referred to physical therapy by her primary care physician. She has never been to physical therapy before today.

Examination

- **Subjective:** Patient suffered from onset of back pain following MVA on November 15, 2014. After the accident the patient immediately complained of pain in her middle thorax and spine, her neck, and lower extremities. The patient also reports having difficulty sleeping and feeling fatigued and stiff in the mornings. Finally, the patient has noticed problems with cognitive issues such as concentrating and the pain has impacted performing daily activities including cooking, cleaning, and working as a receptionist. She hopes to return to work and daily activities with less pain. Patient reports seeing her primary care physician following the accident. The doctor recommended routine labs and had x-rays done showing no fractures. The lab values (CBC, CMP, erythrocyte sedimentation rate) were all normal. The physician referred to her physical therapy to help with her pain and fatigue.
- **Objective:**
 - Body pain diagram: pain noted cervical spine, bilateral shoulders, low back, bilateral hips, bilateral knees
 - VAS: 8/10
 - Resting Vitals:
 - Resting BP = 140/90
 - HR = 88
 - Skin inspection: no abnormal rash or markings, skin temperature appeared normal
 - Reflexes: 2+ bilateral
 - Sensation: hypersensitivity noted in non-dermatomal patterns
 - MMT:
 - Shoulder ABD bilateral= 4/5
 - Shoulder Flexion bilateral= 4-/5

- Hip extension bilateral = 4-/5
- PROM: WNL
- AROM: decreased AROM noted in cervical spine, lumbar spine, and shoulders
- ROM deficits most likely due to self-limiting behavior caused by pain
- Tenderness: trigger points noted over multiple points (12 of 18 predesignated sites)
- Edema: noted in bilateral knees and wrists
- Fibromyalgia Impact Questionnaire: 50
- Fatigue Severity Scale: 40
- ODI: 78%

Clinical Impression

- Patient is 42-year-old female with ongoing pain lasting >3 months after a traumatic event. Her symptoms are indicative of fibromyalgia and include widespread pains (both sides of body, above and below waist) that affect ADLs, fatigue, sleep disturbance, stiffness, non-dermatomal hypersensitivity, and cognitive impairments. Upon physical examination, tenderness was noted in 12 of 18 tender points identified by the Fibromyalgia diagnostic criteria. Passive range of motion was normal; however, active range of motion was limited most likely secondary to widespread pain. Laboratory tests and x-rays were clear. Patient reports of depression and anxiety are also associated comorbidities with Fibromyalgia.

Intervention

- The focus of our treatment included the following components: improving muscle and joint function, decreasing pain, decreasing fatigue, and assisting in avoiding triggers that worsen the symptoms of fibromyalgia. Treatment includes approaches in managing pain and improving overall function for individuals with fibromyalgia.
- Our therapy approach included all of the following: aquatic therapy; land-based therapy; guided imagery/relaxation techniques; patient education; and heat and electrical stimulation for pain management. We found this to be the most successful approach in order to properly educate our patients on the importance of strength and mobility training, pain management, and decreasing overall fatigue.
- The purpose of promoting aquatic therapy for this individual was to decrease the fatiguing component that is often an issue with fibromyalgia patients. This approach allows our patient to tolerate an increased amount of therapy with less overall stress on her joints. This is also something we suggest our patient continue once she is discharged from therapy. We also wanted to incorporate some land-based therapy in order to improve our patient's overall strength that will coordinate with her activities of daily living. Exercises for land-based therapy included: strengthening of anti-gravity and postural muscles such as erector spinae, gluteus muscles, etc. We also instructed our patient to relaxation techniques such as deep breathing, diaphragmatic breathing, and modified plantigrade positioning to use when she experiences anxiety or fatigue.
- Other important aspects of our therapy approach included patient education and pain management techniques. We educated our patients on appropriate times to use the breathing techniques, how to manage fatigue, and the importance of staying active. Pain management for our patient incorporated the appropriate use of heat and electrical stimulation to manage her symptoms of fibromyalgia.

Outcomes

- Following treatment our patient showed improvements in ROM, strength, pain, and fatigue as demonstrated by the following objective measurements at discharge.
 - VAS: 4/10
 - AROM: WNL
 - MMT:
 - Shoulder ABD bilateral= 4+/5
 - Shoulder Flexion bilateral= 4+/5
 - Hip extension bilateral = 4+/5

- Tenderness: trigger points noted in upper trapezius, erector spinae, gluteus maximus, gastric-soleus complex, and pectoralis major lateral attachment sites
- Fibromyalgia Impact Questionnaire: 42 (clinical significance as evidenced by MDIC)
- Fatigue Severity Scale: 29
- ODI: 50% (clinical significance as evidenced by MDIC)

Discussion

- Our patient had several risk factors for the diagnosis of fibromyalgia including her sex and age. Fibromyalgia is most commonly diagnosed in women between the ages of 30-50 years. This patient also has several comorbidities associated with fibromyalgia including sleep disturbances, depression, and anxiety. Clinical signs and symptoms of fibromyalgia which the patient presented with include myalgia, fatigue, stiffness, tender points of palpation, hypersensitivity noted in non-dermatomal patterns, and cognitive difficulties.
- This is important information to note not only with our patient case but with the growing number of patient cases related to fibromyalgia. Stress, illness, disease or anything the body perceives as a threat are risk factors for those who develop FM. But why one person develops this condition, whereas others with equal or worse situations do not, remains a mystery. It is important when taking a patient's history to collect all necessary past medical history, as this disease can be easily mistaken and its complete initiation with regards to pathophysiology is unknown.

Take Module I Lesson Three Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. List 5 brain MRI findings that could be explained as “fibromyalgia brain.”
2. What term describes an exaggerated response of the central nervous system to both stimuli that would be expected to be painful and stimuli that normally would not be considered painful, such as touch or massage?
3. What is a nerve abnormality that is characterized as excessive nerve fibers around specialized blood vessel structures?
4. What neurotransmitter in the brain acts as a messenger so nerves can communicate with one another?
5. Define Positional Cervical Cord Compression.
6. Define Chiari Malformation.
7. Define Cervical Spinal Stenosis.
8. Describe how hormones affect the activity of pain receptors, the central pain-processing pathway in the brain, inflammation in the spinal cord, and opioid pain processing.
9. What gene mutation affects the body’s ability to use the B vitamin, folate, and methylation which is crucial in energy production and mood balancing?

Lesson Four

Fibromyalgia: Symptoms, Risk Factors, Diagnosis, Treatments, and Management

Like other so-called “invisible disorders,” fibromyalgia poses a challenge beyond symptom management to those who are diagnosed with it: the struggle for credibility. It is all too easy for those who have not suffered the pain of fibromyalgia to dismiss it since it offers no visible signs; and it has been, unfortunately, all too easy for healthcare providers to dismiss the symptom descriptions of people with fibromyalgia since there is, for instance, no blood test that can reveal whether or not a person has it.

Symptoms

Chronic (long-term), widespread pain is the most common symptom of fibromyalgia. One may feel pain all over the body, or one may feel regional pain more in the muscles used most often, like in the back or legs. The pain may feel like a deep muscle ache, or it may throb or burn. The pain may also be worse in the morning.

Other symptoms of fibromyalgia include:

- Extreme tiredness, called fatigue, which does not get better with sleep or rest
- Cognitive and memory problems (sometimes called “fibro fog”)
- Trouble sleeping
- Mood problems
- Morning fatigue
- Muscle fatigue, causing them to twitch or cramp
- Headaches
- Irritable bowel syndrome (IBS)
- Painful menstrual periods
- Numbness or tingling of hands and feet
- Restless legs syndrome
- Temperature sensitivity
- Sensitivity to loud noises or bright lights
- Depression or anxiety

*Women with fibromyalgia often have more morning fatigue, pain all over the body, and IBS symptoms than men with fibromyalgia.

Symptom Flare Ups: Fibromyalgia symptoms can happen without warning. Conversely, certain events may trigger flare-ups, including:

- **Hormonal changes during the menstrual cycle or pregnancy:** Females may have more trouble sleeping, more widespread pain, or headaches just before their period when hormone levels drop. Periods may also be more painful.
- **Stress:** Chronic (long-term) stress may raise the risk for getting fibromyalgia. Also, short-term stress, such as work stress, or stressful events, such as a death of a loved one, can trigger flare-ups in people who have fibromyalgia.
- **Changes in weather:** Some women report pain with changes in barometric pressure (such as when the temperature drops from warm to cold) or on hot, humid days.

Causes and Risk Factors

Researchers are not sure exactly what causes fibromyalgia. Genetics may play a role. In addition, studies show that the brains of people with fibromyalgia may not process pain in the same way as people who do not have fibromyalgia. Lower levels of certain brain neurotransmitters, such as serotonin or norepinephrine, may cause one to be more sensitive to pain and have a more severe reaction to pain. Imaging studies of the brain show that people with fibromyalgia feel pain when people without fibromyalgia do not.

Here is a short list of what may cause fibromyalgia:

- **Genes:** Fibromyalgia seems to run in families. Parents may pass on genes that make one more sensitive to pain. Other genes can also make one more likely to feel anxious or depressed, which makes pain worse.
- **Other diseases:** A painful disease like arthritis or an infection raises the chances of getting fibromyalgia.
- **Family history:** If one has a family history of the condition, he/she may be at a greater risk for developing FM.
- **Emotional or physical abuse:** Children who are abused are more likely to have the condition when they grow up. This may happen because abuse changes the way the brain handles pain and stress.
- **Posttraumatic stress disorder (PTSD):** Some people have this mental health problem after a terrible event, like war, a car crash, or rape. These events are also linked to fibromyalgia in some people.
- **Gender:** The condition is much more common in women than men. Doctors think this could be related to differences in the way men and women feel and react to pain, as well as how society expects them to respond to pain.
- **Anxiety and depression:** These and other mood disorders seem linked to fibromyalgia, though there's no proof that they actually cause the condition.
- **Not moving enough.** The condition is much more common in people who aren't physically active. Exercise is one of the best treatments for fibromyalgia. It can help turn the pain volume down.

Diagnosis

The fact that the signs and symptoms of fibromyalgia coincide with those of other disorders makes it challenging for doctors to diagnose. Often people living with fibromyalgia are still sometimes made to feel like it's all in their head.

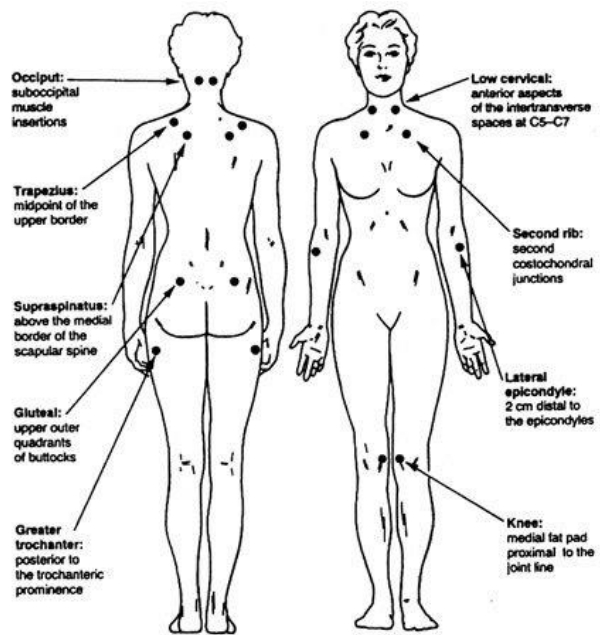
Lab Test: Up until now, there has not been a lab test for fibromyalgia and only interview questions have been used by a doctor. But new research may have found a way to rectify this. Scientists have managed to detect fibromyalgia in blood samples and differentiate it from other similar conditions. Kevin Hackshaw, a professor in the College of Medicine at the Ohio State University in Columbus and a rheumatologist at the university's Wexner Medical Center, led new research to develop a rapid biomarker-based method for diagnosing FM by using vibrational spectroscopy to differentiate patients with FM from those with Rheumatoid Arthritis (RA), Osteoarthritis (OA) or Systemic Lupus Erythematosus (SLE), and to identify metabolites associated with these differences. Hackshaw concluded that vibrational spectroscopy may provide a reliable diagnostic test for differentiating FM from other disorders and for establishing serologic biomarkers of FM-associated pain (Hackshaw, K.V., et al. (2018).

Medical History and Interview: Until lab tests are more accepted and practiced, one's doctor through medical history and interview questions will make a diagnosis based on two criteria:

1. One has experienced widespread (in many places on the body) pain for longer than three months.
2. One has other symptoms, such as fatigue, memory or sleep problems.

One may have to see several doctors before getting a diagnosis. One reason for this may be that pain and fatigue, the main symptoms of fibromyalgia, also are symptoms of many other conditions, such as myalgic encephalomyelitis/chronic fatigue syndrome, rheumatoid arthritis, and lupus. Doctors try to figure out if fibromyalgia or if another health problem is causing symptoms.

Tender Points: Fibromyalgia can be detected using The Manual Tender Point Survey (MTPS). The MTPS is based on the 1990 American College of Rheumatology (ACR) tender point protocol for FM. The ACR conducted a multicenter study published in 1990 that specified two primary criteria that characterized FM: (1) three or more months of widespread pain defined as pain present above and below the waist on the right and left side of the body and along the midline and (2) report of pain at a minimum of 11/18 specified locations (tender points - TPs) throughout the body when palpated with 4 kilograms of digital pressure. These two criteria were selected from several variables examined as they were shown to reliably discriminate FM from other musculoskeletal disorders in the multicenter study. This technique requires approximately 5-10 minutes to perform.



Fibromyalgia Tender Points
General locations of the 18 tender points that make up the criteria for identifying fibromyalgia.

The tender points, used to identify fibromyalgia and differentiate it from other pain conditions, were first described by Dr. Hugh Smythe in 1972. They were used in the 1981 Yunus study, which was the first controlled clinical study to use known fibromyalgia symptoms and tender points as validation. It was also Smythe who, in the training sessions for the 1990 American College of Rheumatology FM criteria study, taught the other investigators how to do a tender point examination.

Treatment

Treatment for fibromyalgia may include:

- **Medicine to treat pain:** The Food and Drug Administration has approved three medicines to treat fibromyalgia: pregabalin, duloxetine, and milnacipran. One's doctor may also suggest pain relievers or antidepressants to treat certain symptoms or to prevent flare-ups.
- **Talk therapy:** Counseling sessions with a trained counselor can teach different skills and techniques one can use to better control the pain. This type of therapy can be either one-on-one or in groups with a therapist. Living with a chronic condition like fibromyalgia can be difficult. Support groups may also give emotional support and help one cope.

Management

Fibromyalgia is neither progressive, nor fatal; however, there is no treatment that cures fibromyalgia. But some patients do experience a spontaneous recovery and many experience notable improvement. In fact, improvement is probably the most common outcome for fibromyalgia, experienced by half to two thirds of patients. The course of fibromyalgia may vary. The location and severity of pain can change over time. Symptoms can be intermittent, fluctuating, or persistent. Triggers of symptom intensification may include excessive activity, inactivity, stress, trauma, repetitive motion, poor sleep, strong emotions, and weather changes.

Patients who experience the greatest improvement are generally proactive and adopt a multi-disciplined approach to treatment, which may include a combination of medication, alternative/complementary therapies, nutritional supplements, exercise, a healthy eating plan, and lifestyle adaptations.

FM Management Guidelines:

- **Get enough sleep.** Most adults should try to get seven to eight hours of sleep every night. But fibromyalgia can make it hard to fall asleep and stay asleep.
 - Go to bed at the same time and get up at the same time every day.
 - Avoid drinking caffeine, alcohol, or eating spicy meals before bedtime.
 - Avoid taking daytime naps.
 - Do relaxing activities, such as listening to soft music or taking a warm bath, which prepare the body for sleep.
- **Reduce stress.** Stress can trigger a flare-up of fibromyalgia symptoms. Strategies such as meditation, massage, and talk therapy may help.
- **Get regular physical activity.** Pain and fatigue may make exercise and daily activities harder to do. But studies show that for those with fibromyalgia, regular physical activity can reduce pain. Any activity, even walking around the home or neighborhood, can help relieve symptoms. Start at a very low level, and slowly increase the amount of activity.

- **Try complementary or alternative therapies.** Some say their symptoms got better from trying complementary or alternative therapies, such as:
 - Physical therapy
 - Massage
 - Myofascial release therapy
 - Acupuncture
 - Relaxation exercises
 - Tai chi
 - Yoga
- Do not attempt to push yourself beyond your present physical capacities. Accept and work within your present realm of abilities.
- Set immediate, realistic, and obtainable short-term goals which can be achieved on a daily basis.
- Talk, talk, talk. Express your feelings and fears. Allow others to assist you in seeing yourself from a more realistic perspective.
- Attending area support group meetings. Try to connect with other individuals that share your background or unique concerns.

Take Module I Lesson Four Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. What does MTPS stand for?
2. What is the most common outcome for those with FM who get therapy?
3. What is the most common symptom of FM?
4. How many tender points have been identified by the American College of Rheumatology?
5. Which is reported as a **most common** pain point for those with Fibromyalgia?

Lesson Five

Related Conditions and Diseases

Because Fibromyalgia has been called “the great pretender,” it can be difficult to determine when it may be the cause of one’s symptoms, or something else. In a podcast interview June 2019 with fibromyalgia specialist Dr. Benjamin Abraham, he discusses the problems for the medical professional associated with making a fibromyalgia diagnosis.

Referenced podcast Fibromyalgia: A Disorder of Pain Processing with Dr. Benjamin Abraham. The Cleveland Clinic, July 19, 2019. <https://my.clevelandclinic.org/podcasts/health-essentials/fibromyalgia-a-disorder-of-pain-processing-with-dr-benjamin-abraham>

“Fibromyalgia is a chronic condition, meaning pain and inflammation is present for greater than three months, with widespread muscle and joint pain. There are many, many symptoms of diseases that could fall into that category. Patients often have multiple, different symptoms. In times past these patients were written off as crazy, or hysterical, or making it up, or told it’s all in your head.”

The following contains information about some of the related conditions and diseases that may present with fibromyalgia. By no means is this an inclusive list but may offer insight and more information about some of the conditions, symptoms, and issues your classes and clients may be experiencing.

Joint Hypermobility Syndrome

What is Joint Hypermobility Syndrome?

Individuals with excessive joint mobility along with pain may have what is referred to as Joint Hypermobility Syndrome. It is a genetic condition that involves extreme flexibility in joints like the knees, shoulders, fingers, and wrists. Along with some other symptoms, people with hypermobility experience pain in these super flexible joints. While there’s no cure, symptoms can be managed by keeping muscles strong, and taking medication if necessary to control the pain.

Causes of Joint Hypermobility Syndrome

The exact cause of joint hypermobility syndrome isn’t known but the disorder tends to have a genetic connection. The genes that are involved in the creation of collagen are believed to play a role. Collagen is the protein that adds flexibility and strength to your joints including the ligaments and tendons. People with joint hypermobility syndrome have loose joints because they likely have weak ligaments due to the defect in their collagen.

Symptoms of Joint Hypermobility Syndrome

The most common symptom of joint hypermobility syndrome is pain in your joints and muscles. Other symptoms may include:

- Frequent joint and ligament injuries, including dislocations and sprains
- Joint and muscle stiffness
- Tiredness & fatigue
- Clumsiness/poor balance
- Bladder and bowel issues
- Dizziness and fainting
- Thin, stretchy skin

Diagnosis of Joint Hypermobility Syndrome

One's health care provider may be able to perform a series of in-office tests to determine if an individual has joint hypermobility syndrome. They can examine the range of motion at a variety of joints. One's provider may use a test or questionnaire called the Beighton to measure the flexibility of the joints. It will use the overall score to measure joint flexibility on a nine-point scale. They may also order blood tests to check for possible genetic conditions.

Treatment of Joint Hypermobility Syndrome

There's no cure presently for joint hypermobility syndrome but treatment involves protecting the joints and managing pain. Other recommendations include:

- Exercise regularly
- Maintain good posture
- Stand with knees slightly bent
- Avoid extreme ranges of motion
- Wear shoes with good arch support
- Use orthotics to help correct flat feet

A Fibromyalgia Specialist can help reduce pain through exercise by helping clients and classes increase muscle strength, improve posture, and increase ability to balance. For mild pain, a healthcare provider may recommend an over-the-counter pain reliever.

Autoimmune Disorders

What is an Autoimmune Disorder?

Autoimmune disease happens when the body's natural defense system can't tell the difference between one's own cells and foreign cells. This causes the body to mistakenly attack healthy, normal cells. There are more than 80 types of autoimmune diseases that can affect a wide range of body parts.

Common autoimmune diseases include:

- Rheumatoid arthritis, a form of arthritis that attacks the joints
- Psoriasis, a condition marked by thick, scaly patches of skin
- Psoriatic arthritis, a type of arthritis affecting some people with psoriasis
- Lupus, a disease that damages areas of the body that include joints, skin, and organs
- Thyroid diseases, including Graves' disease, where the body makes too much thyroid hormone (hyperthyroidism)
- Hashimoto's thyroiditis, where it doesn't make enough (hypothyroidism)
- Type I Diabetes, a condition in which the immune system damages the insulin-producing cells in the pancreas

Causes of Autoimmune Disorders

Researchers don't know the exact causes for the immune system to misfire. According to a 2014 study, women get autoimmune diseases at a rate of about 2 to 1 compared to men — 6.4% of women versus 2.7% of men. The disease often starts during childbearing age (ages 15 to 44).

Some autoimmune diseases are more common in certain ethnic groups. For example, lupus affects more African American and Hispanic people than white people. Certain autoimmune diseases including multiple sclerosis and lupus have strong genetic components.

Symptoms of Autoimmune Disorders

The early symptoms of many autoimmune diseases are very similar, and may include:

- fatigue
- achy muscles
- swelling and redness
- low grade fever
- trouble concentrating
- numbness and tingling in the hands and feet
- hair loss
- skin rashes

Individual diseases can also have their own unique symptoms. For example, type 1 diabetes causes extreme thirst, weight loss, and fatigue. Irritable Bowel Syndrome (IBS) causes belly pain, bloating, and diarrhea. With autoimmune diseases like psoriasis or Rheumatoid Arthritis (RA), symptoms may come and go. A period of symptoms is called a **flare-up**. A period when the symptoms go away is called **remission**.

Diagnosis of Autoimmune Disorders

No single test can diagnose every autoimmune disease. But, when possible, a doctor should use tests, review the symptoms, and conduct a physical examination to reach a diagnosis.

Treatments for Autoimmune Disorders

Treatments cannot cure autoimmune diseases, but they can help control the overactive immune response, and bring down inflammation or at least reduce pain and inflammation. Drugs used to treat these conditions include:

- Over the counter NSAIDs including ibuprofen (Motrin, Advil) and naproxen (Naprosyn)
- Prescribed medication that supports the immune system
- Treatments to relieve symptoms like pain, swelling, fatigue, and skin rashes
- Eating a well-balanced diet and getting regular exercise

Osteoarthritis

What is Osteoarthritis?

Osteoarthritis is a degenerative disease with genetic tendencies. This condition occurs when the protective cartilage that cushions the ends of the bones wears down over time. Although osteoarthritis can occur in any joint, it is most commonly seen in the hips, knees, hands, and feet.

Causes of Osteoarthritis

Osteoarthritis occurs when the cartilage that cushions the ends of bones in your joints gradually deteriorates. Cartilage is a firm, slippery tissue that enables nearly frictionless joint motion. Eventually, if the cartilage wears down completely, bone will rub on bone.

Osteoarthritis has often been referred to as a **wear and tear** disease. Not only does osteoarthritis include the breakdown of cartilage, but also the tendons that hold the joint together and attach muscle to bone.

Osteoarthritis also causes inflammation of the joint lining, which results in swelling, which further reduces the range of motion at the joint capsule. This restriction in movement causes other compensations in the movements of the body, which can contribute to further pain, tightness, and overall discomfort.

Symptoms of Osteoarthritis

Osteoarthritis symptoms often develop slowly and worsen over time. Signs and symptoms of osteoarthritis include:

- Pain: Affected joints might hurt during or after movement or exercise
- Stiffness: Joint stiffness might be most noticeable upon awakening or after being inactive
- Tenderness: Joints might feel tender when one applies light pressure to or near
- Loss of flexibility: One might not be able to move the joint through its full range of motion
- Grating sensation: One might feel a grating sensation when one uses the joint. One might hear popping or crackling
- Bone spurs: These extra bits of bone, which feel like hard lumps, can form around the affected joint
- Swelling: This might be caused by soft tissue inflammation around the joint

Diagnosis of Osteoarthritis

- A physical exam will allow the doctor to check the affected joint for tenderness, swelling, redness and flexibility.
- Imaging may be used to take a picture of the joint through x-ray or MRI (magnetic resonance imaging).
- Lab tests including blood tests and joint fluid tests.

Treatments for Osteoarthritis

Treatment options for those with osteoarthritis include:

- Physical, occupational and TENS (Transcutaneous electrical nerve stimulation) technology therapy
- Surgical and non-surgical techniques including
 - cortisone injections
 - lubrication injections
 - realignment surgery
 - joint replacement

Restless Legs Syndrome

What is Restless Legs Syndrome?

Restless Legs Syndrome, also called RLS, is a condition characterized by a nearly irresistible urge to move the legs. It can begin at any age and generally worsens as one ages. The urges typically occur while sitting or lying down, and especially at night and can significantly disrupt sleep. The main symptom is a nearly irresistible urge to move the legs. Getting up and moving around helps the unpleasant feeling temporarily go away.

Causes of Restless Legs Syndrome

Research and anecdotal evidence suggest that there are three (3) main factors associated with RLS:

- Malfunctioning dopamine-receptors
 - Just about every medical researcher studying restless legs agrees that one of the most common factors affecting all patients is that their dopamine-receptors aren't functioning properly. (Causes of Restless Legs. Role of Dopamine; Earley, Ph.D. 2018)
 - Dopamine receptors are often called the "feel good" chemicals. Their primary function is sending messages that control muscle movement.
- Poor iron metabolism
 - It is believed the issue has not to do with the amount of iron in the blood, most people are fine.

The fact that iron is not actually passing through the blood brain barrier is the issue. For some reason unknown to researchers, it's not that the level of iron in the blood is deficient, the issue is the delivery to the brain, which when in deficit, affects the ability of the dopamine receptors to operate efficiently.

- **Chronic/long-term inflammation**
 - Many are convinced that inflammation is the #1 underlying cause beneath all of the restless legs factors mentioned above.
 - The most recent studies from 2016 and 2017 have linked low-dopamine activity AND low-iron levels in the brain, directly to long term inflammation in restless legs patients. (Inflammation Effects on Motivation and Motor Activity: Role of Dopamine; J. Felger, M. Treadway. 2016)

Symptoms of Restless Legs Syndrome

The main symptom of RLS is a nearly uncontrollable urge to move the legs around, especially while sitting or lying down. The chief symptom is an urge to move the legs. Common accompanying characteristics of RLS include:

- **Sensations that begin while resting**
 - The sensation typically begins after you've been lying down or sitting for an extended time, such as in a car, airplane, or movie theater
- **Relief with movement**
 - The sensation of RLS lessens with movement, such as stretching, jiggling the legs, pacing or walking
- **Worsening of symptoms in the evening**
 - Symptoms occur mainly at night
- **Nighttime leg twitching.**
 - RLS may be associated with another, more common condition called periodic limb movement of sleep, which causes the legs to twitch and kick, possibly throughout the night

People typically describe RLS symptoms as compelling, unpleasant sensations in the legs or feet. They usually happen on both sides of the body. Less commonly, the sensations affect the arms. The sensations, which generally occur within the limb rather than on the skin, are described as:

- Crawling
- Creeping
- Pulling
- Throbbing
- Aching
- Itching
- Electric

Sometimes the sensations are difficult to explain. People with RLS usually don't describe the condition as a muscle cramp or numbness. They do, however, consistently describe the desire to move the legs. It's common for symptoms to fluctuate in severity. Sometimes, symptoms disappear for periods of time, then come back.

Diagnosis of Restless Legs Syndrome

One's provider will record medical history and ask for a description of the symptoms. A diagnosis of RLS is based on the following criteria, established by the International Restless Legs Syndrome Study Group:

- A strong, often irresistible urge to move the legs, usually accompanied by uncomfortable sensations.
- Symptoms start or get worse when one is resting, such as sitting or lying down.
- Symptoms are partially or temporarily relieved by activities, such as walking or stretching.
- Symptoms are worse at night.
- Symptoms can't be explained solely by another medical or behavioral condition.

One's provider may conduct a physical and a neurological exam. Blood tests, particularly for iron deficiency, may be ordered to rule out other possible causes for the symptoms. In addition, one's provider may refer the patient to a sleep specialist. This may involve an overnight stay and a study at a sleep clinic if another sleep disorder such as sleep apnea is suspected. However, a diagnosis of RLS usually doesn't require a sleep study.

Treatments for Restless Legs Syndrome

Medications offer a variety of approaches to this condition.

- Checking iron levels
 - Blood tests for iron deficiency could be a cause of the inactive dopamine receptors
- Medications that increase dopamine in the brain
- Drugs affecting the calcium channels
- Muscle relaxants and sleep medications
- Opioids

Temperature Sensitivity

What is Temperature Sensitivity?

Most people don't like extreme heat, but some find they are always uncomfortable in hot weather. If one suffers from heat intolerance, also referred to as hypersensitivity to heat, it's often because the body isn't regulating its temperature properly. Other individuals experience cold sensitivity or cold intolerance. It consists of unusual discomfort when in a cool environment.

The body regulates its temperature by maintaining a delicate balance between hot and cold. The hypothalamus is the part of the brain that regulates body temperature. When one gets too hot, the hypothalamus sends a signal through the nerves to the skin, telling it to increase sweat production. When sweat evaporates off of the skin, it cools the body down and one may get chilled as a result. Temperature sensitivity could be caused in a number of ways. Extremes of heat and cold may affect the speed at which nerve impulses can travel along the nerves, particularly where there has been demyelination or nerve damage.

Causes of Temperature Sensitivity

Some people find they experience problems with both extremes of temperature. This can be hard to explain to people, as different symptoms may be affected by heat and cold. One may find he/she needs to monitor the temperature and situation and take steps to stay at a comfortable temperature.

Symptoms of Temperature Sensitivity

Cold sensitivity. Symptoms include:

- weakness
- feeling extremely cold
- cold hands and feet
- shakiness

Heat sensitivity symptoms include:

- A buildup of fatigue
- blurred vision
- loss of balance
- a worsening of cognitive symptoms such as concentration or memory

Diagnosis of Temperature Sensitivity

In addition to a decreased body temperature, research shows that people with Fibromyalgia have trouble adapting to temperature changes and have a reduced pain threshold to both heat and cold stimuli—meaning it takes fewer extreme temperatures to make them feel discomfort, or even pain. For example, sunlight shining through a car window onto the arm may cause burning pain, but only mild discomfort in someone else.

If one is abnormally cold and the hands or feet change color, he/she may be experiencing a more serious issue called Raynaud's Syndrome. In some cases, Raynaud's can cause tissue damage or other complications. If one experiences this symptom, he/she should take extra steps to stay warm and consult with their healthcare provider.

Treatments for Temperature Sensitivity

Although there are no treatments aimed specifically at these symptoms, one can take several actions in his/her daily lives to help alleviate hot and cold environments.

Myalgic Encephalomyelitis/Chronic Fatigue Syndrome

Myalgic encephalomyelitis is another name for chronic fatigue syndrome. It means muscle pain with brain and spinal cord inflammation. This term is now used more often than *chronic fatigue syndrome* because ME/CFS is now considered a disease, not a syndrome. Fibromyalgia and ME are both illnesses characterized by extreme amounts of fatigue. The conditions are so interrelated that the medical community continues to debate whether fibromyalgia fatigue is simply a different expression of the same disorder that causes ME. They're both considered central sensitivity diseases, with both involving fatigue, pain, and cognitive dysfunction. Both conditions affect multiple systems in the body and are often referred to as neuroimmune or neuroendocrine-immune disorders. It is not a surprise that fibromyalgia has been misdiagnosed as ME.

Despite their similarities, fibromyalgia has been thought of as a muscle disorder while ME has been linked to viral infections. Each disease comes from two different medical fields with different research focuses. Fibromyalgia researchers are primarily rheumatologists and arthritis experts. ME researchers most often are immunologists and virus experts. ME is more often tied to immune-system abnormalities than fibromyalgia, and fibromyalgia is generally more painful than ME. Statistically, fibromyalgia occurs in more Americans than ME. The Centers for Disease Control and Prevention estimates about 5 million people in the United States with fibromyalgia, compared with a little over 1 million people with ME. With research defining a fine line between fibromyalgia and ME, The Arthritis Foundation estimates that 50 to 70 percent of people with fibromyalgia also fit the criteria of ME.

Causes of ME

- **Infections:** Epstein-Barr virus (a member of the herpes virus family that causes mononucleosis), Ross River virus (passed by mosquitos), *Coxiella burnetti* bacteria (cause Q fever, a disease passed from animals to humans), and some other pathogens.
- **Immune system changes:** Autoimmunity or autoimmune-like qualities, chronic activation, overproduction of some cells and an abnormal function of others can occur.
- **Stress system changes:** A dysregulated stress-response system affects the immune system, increasing inflammation.
- **Energy production changes:** The cells don't produce energy properly, leaving the body depleted.
- **Genetics:** ME tends to run in families. The exact genes involved are not yet identified.

Symptoms of ME

- Fatigue that doesn't go away with rest
- Unrefreshing sleep
- Post-exertional malaise/exercise intolerance (an increase in symptoms after even light exertion)
- Cognitive dysfunction ("brain fog"), involving memory and learning problems
- Chronic, body-wide pain (in some people)
- Orthostatic intolerance (dizziness upon standing due to abnormal drops in blood pressure)
- Flu-like symptoms, including frequent sore throat and low-grade fever
- Sensitivities/intolerances to allergens, sensory input (noise, light), temperatures, food, medications, chemical odor

Diagnosing ME

- Initial Exam by Health Care Provider
 - Symptoms
 - A physical exam
 - Blood tests such as complete blood count and inflammatory markers to rule out other conditions
 - Questionnaires that gauge symptoms, sleep, mental fatigue, and pain
- Diagnostic Criteria
 - Six months (or more) of profound, unexplained fatigue
 - Post-exertional malaise lasting more than 24 hours after mental or physical exertion
 - Unrefreshing sleep, being tired despite significant rest, other sleep disturbances such as an inability to fall asleep or stay asleep
 - Either brain fog or orthostatic intolerance

Treatment ME

- Off-Label Medications (no official approval)
 - Antimicrobials: Target pathogens (including viruses, bacteria, and fungi)
 - Antidepressants: Target neurotransmitters (brain chemicals)
 - Antianxiety drugs: For those with anxiety issues
 - Painkillers: Ranging from over the counter (OTC) or prescription anti-inflammatories to opioid painkillers
 - Sleep drugs: To improve sleep duration and quality
 - Topical pain relievers

- Therapy
 - Cognitive behavioral therapy (CBT): A type of talk therapy that addresses negative thoughts and habits and how to replace them with healthier behaviors.
 - Graded exercise therapy (GET): Controlled exercise that attempts to build exercise tolerance.
- Alternative Treatments
 - Acupuncture (practice that inserts thin, small needles into points around the body to provide stimulation)
 - Massage (the act of rubbing and kneading the joints and muscles)
 - Yoga, tai chi, or qigong (exercises that combine spiritual, physical, and mental components)
 - Hypnotherapy (putting a person into a state of focused attention to increase suggestibility)
 - Biofeedback (teaches people to control the way their bodies function)
- Lifestyle Changes
 - Mild exercise
 - Improving sleep habits
 - Breathing exercises
 - Mindfulness
 - Healthy diet
- Supplements

Chronic Widespread Pain and Complex Regional Pain Syndrome

Chronic widespread pain (CWP) is often used interchangeably with fibromyalgia. Similarly with fibromyalgia, CWP is an amplification of neural signaling within the central nervous system (CNS) that elicits pain hypersensitivity. The brain and the spinal cord heighten their response to any potentially unpleasant stimulus. CWP is characterized by an increased response to a painful stimulus and a pain following a stimulus that is typically not irritating. CWP begins in and is perpetuated solely by CNS alterations without a peripheral trigger or ongoing painful stimulus outside the CNS.

CWP, like fibromyalgia, is also termed centralized pain or nociplastic pain, resulting from a process termed central sensitization and is present in approximately 10 to 40 percent of patients with osteoarthritis (OA), rheumatoid arthritis (RA), spondyloarthritis (SpA), psoriatic arthritis, and systemic lupus erythematosus (SLE). Central sensitization is also prominent in many musculoskeletal pain disorders traditionally thought of as localized and focal musculoskeletal pain disorders, including chronic trauma-induced low back pain (LBP) and neck pain, such as following a motor vehicle accident (MVA); complex regional pain syndrome (CRPS); joint hypermobility syndrome (JHS); carpal tunnel syndrome; and lateral epicondylitis.

Complex Regional Pain Syndrome (CRPS) is a broad term describing excessive and prolonged pain and inflammation that follows an injury to an arm or leg. CRPS has acute (recent, short-term) and chronic (lasting greater than six months) forms.

Categories of CRPS

- CRPS-I: When there is uncertainty about the exact nerve injured
- CRPS-II: The specific injured nerve is identified. There are more extensive injuries that also damage nerves going to muscles (motor nerves) to cause weakness and muscle shrinkage in certain areas, making it easier to identify. Motor nerves control the movement of muscles under conscious control, such as those used for walking, grasping things, or talking.

Causes of CRPS

Most CRPS is caused by damage to, or dysfunction of, injured peripheral sensory neurons (C-fiber nerve fibers), which then has secondary effects on the spinal cord and brain. It is unclear why some people develop CRPS while others with similar trauma do not. In more than 90 percent of cases, CRPS is triggered by nerve trauma or injury to the affected limb that damages the thinnest sensory and autonomic nerve fibers. These “small fibers”—which lack insulating thick myelin sheaths (a protective coating, like insulation that surrounds a wire)—transmit pain, itch, and temperature sensations and control the small blood vessels and health of almost all surrounding cells.

- **Fractures:** This is the most common cause, particularly wrist fractures. Nerves can become injured from a displaced or splintered bone, or pressure from a tight cast. Very tight or painful casts must be immediately cut off and replaced to prevent this complication.
- **Surgery:** A surgical incision, retractors, positioning, sutures, or postoperative scarring can cause nerve injury.
- **Sprains/strains:** Connective tissues ruptures, or causal trauma, can permit excess movement of a joint that stretches nearby nerves.
- **Lesser injuries such as burns or cuts.** These are the visible signs of injuries that may also have damaged underlying nerves.
- **Limb immobilization (often from casting):** Casts force prolonged disuse of a limb and deprive it of sensory input.
- **Very rare penetrations,** such as from a cut or needle stick to a superficial sensory nerve. Larger penetrating nerve injuries are ideally surgically repaired immediately to permit the cut nerve fibers to regrow into the farther nerve portion to reconnect with target tissues.
- **Less than 10% of individuals** with CRPS report no causal injury or trauma. Here, the cause is often an undiagnosed internal nerve injury. New CRPS without evident cause requires thorough evaluation to check for internal problems.

Symptoms of CRPS

- Unprovoked or spontaneous pain that can be constant or fluctuate with activity. Some say it feels like a “burning” or “pins and needles” sensation, or as if the affected limb was being squeezed.
- Excess or prolonged pain after use or contact. There is often increased sensitivity in the affected area in which light touch, normal physical contact, and use is felt by the person to be very painful.
- Changes in skin temperature, skin color, or swelling of the affected limb.
- Changes in skin texture.
- Abnormal sweating and nail and hair growth.
- Stiffness in affected joints.
- Wasting away or excess bone growth.
- Impaired muscle strength and movement. Most people with CRPS do not have direct injury to the nerve fibers that control the muscles coordinating muscle movement. However, most reports reduced the ability to move the affected body part.

Diagnosis of CRPS

No specific test can confirm CRPS and identify the injured nerve.

- Detailed examination by a physician such as a neurologist, orthopedist, or plastic surgeon familiar with normal patterns of sensory nerve anatomy.
- Nerve conduction studies detect some but not all CRPS-associated nerve injuries.
- Imaging nerves by ultrasound, MRI, or MRN sometimes reveals underlying nerve damage.
- Triple-phase bone scans using a dye sometimes show CRPS-associated excess bone resorption which can help with diagnosis and localization.

Treatment for CRPS

Most early or mild cases recover on their own. Treatment is most effective when started early.

- Rehabilitation and physical therapy
- Psychotherapy
- Graded motor imagery (mental exercises)
- Medications
 - Acetaminophen
 - Non-steroidal anti-inflammatory drugs (NSAIDS)
 - Drugs proven effective for other neuropathic pain conditions, such as nortriptyline, gabapentin, pregabalin, and duloxetine.
 - Topical local anesthetic ointments, sprays, or creams such as lidocaine and patches such as fentanyl.
 - Corticosteroids that treat inflammation/swelling and edema.
 - Opioids
- Spinal Cord Stimulation
- Other Types of Neural Stimulation
- Spinal Fluid Drug Pumps
- Alternative and Holistic Therapies
- Sympathetic Nerve Block
- Surgical Sympathectomy
- Cutting Injured Nerve or Nerve Roots
- Amputating the Painful Lower Limb (Very Rare)

Prognosis of CRPS

- Most illnesses are mild and recover over months to a few years as the injured nerve regrows. If this doesn't happen, symptoms can linger to cause long-term disability.
- The outcome depends on the severity of the original injury and on the person's underlying general and nerve health. Younger people, children, and teenagers almost always recover, as do older adults with good circulation and nutrition. Smoking is a major impediment to nerve regeneration as is diabetes and previous chemotherapy.
- Rare individuals experience prolonged severe pain and disability despite treatment.
- Poor circulation and poor nerve health can impede nerve and tissue healing.

Migraine Disease

Migraine disease and fibromyalgia are both chronic pain disorders. Migraine and fibromyalgia have several common factors. They both are much more likely to occur in women, and they have some common symptoms, including headaches, sensitivity to loud noises or bright lights, and gastrointestinal issues. There exists a correlation between the two conditions, because patients with migraines have higher prevalence of fibromyalgia and vice versa. According to a study published in *Clinical Rheumatology*, over 30 percent of people with migraine also have fibromyalgia. Moreover, the frequency of migraine in people with fibromyalgia is 55.8 percent, according to a study involving members of the Mayo Clinic Fibromyalgia Registry. The widespread pain, cognitive difficulties, and fatigue involved with fibromyalgia can be amplified by migraine attacks, decreasing quality of life. Another similarity between migraine disease and fibromyalgia is the increased prevalence within women over men. It isn't clear why having migraine makes fibromyalgia more likely or vice versa.

Comorbidities of Migraine Disease

People living with migraine and fibromyalgia are at a higher risk for other coexisting problems. Research of 1,730 patients with fibromyalgia showed that patients with migraine headaches were also more likely to experience the following health concerns:

- Depression
- Anxiety
- Mood Disorders
- Asthma
- Irritable Bowel Syndrome
- Chronic Fatigue Syndrome
- Post-Traumatic Stress Disorder (PTSD)

Causes of Migraine Disease

- Constriction of blood vessels
- Fatigue
- Insomnia or sleep disorders
- Stress
- Low levels of magnesium
- Other illnesses like fibromyalgia

Symptoms of Migraine Disease

- Pulsing, sharp, or aching pain
- Pain on one side of the face only, extending into the eye
- Head pain that radiates into the neck and shoulder muscles
- Pain along the tender points on the back of your head and neck
- Sensitivity to light, sound, or smells
- Nausea
- Dizziness

Treatment for Migraine

- Cognitive behavioral therapy
- Biofeedback therapy
- Stress reduction
- Exercise
- Avoiding headache triggers
- Dietary changes
- Acupuncture
- Medications
 - Serotonin reuptake inhibitors
 - Botulinum injections
 - Spinal cord stimulation
 - Nerve Blocks

Irritable Bowel Syndrome

Irritable Bowel Syndrome (IBS) is a gastrointestinal disorder. It's characterized by abdominal pain, digestive discomfort, alternating constipation and diarrhea and is present in 8-20 percent of the general population. Many individuals with IBS also suffer from non-gastrointestinal symptoms. Rheumatologic symptoms, such as skin rashes, muscle contraction headache and myalgias, have been reported in two-thirds of IBS patients. Previous studies have found that IBS typically overlaps with fibromyalgia syndrome (FM) in the same patient, suggesting a common cause. FM occurs in up to 60% of patients with IBS and up to 70% of patients with a diagnosis of FM have symptoms of IBS.

The Connection Between IBS and FM

While IBS is a condition characterized by visceral (intestinal) hypersensitivity, FM is a condition of somatic (skin and muscle) hypersensitivity. According to UNC Center for Functional GI and Motility Disorders, clinical characteristics and a significant overlap of symptoms suggest that the functional syndromes IBS and FM may have a common etiology. Visceral and somatic perception studies and brain imaging have demonstrated that each of these conditions have specific responses to painful stimuli and that patients with both IBS and FM may have responses to somatic and visceral stimuli that are uniquely different from that of IBS alone and FM alone.

- There is more brain activity in the parts that process pain. Sense of pain can be enhanced. These pain symptoms cannot be explained by biochemical or structural abnormalities.
- Each condition occurs primarily in women.
- Symptoms are largely associated with stress.
- Disturbed sleep and fatigue are common in both.
- Psychotherapy and behavioral therapy can effectively treat either condition.
- The same medications can treat both conditions.

Treatment for IBS and FM

- Cognitive Behavioral Therapy
- Regular Exercise
- Healthy Diet (Possibly Gluten-Free)
- Stress Relief
- Medications
 - Tricyclic Antidepressants
 - Serotonin-norepinephrine Reuptake Inhibitors
 - Anti-Seizure Medications

Pelvic Floor Dysfunction and Pain

Chronic pelvic pain is pain in the area below the navel and between the hips that lasts six months or longer. Fibromyalgia can highlight pain within the pelvic floor region which can onset pelvic specific conditions. This often leads to pelvic floor dysfunction or hypertonia. This tightness of the pelvic floor muscles can create tension on the supporting organs transitioning into other conditions around bladder pain, pain with bowel movement, and more.

Causes of Pelvic Floor Dysfunction

- Causes Specific to Women
 - Vulvodynia
 - Dysmenorrhea (painful period)
 - Endometriosis

- Uterine fibroid tumors
- Pelvic joint instability linked to childbirth
- Causes Specific to Men
 - Chronic prostatitis (inflammation of the prostate)
 - Penile or testicular pain syndromes
 - Post-vasectomy pain syndrome
- Causes Not Related to Gender
 - Irritable bowel syndrome (IBS)
 - Interstitial cystitis (IC) also called painful bladder syndrome
 - Tumors
 - Chronic kidney stones
 - Nerve damage (neuropathy)
 - An injury in the pelvic region

Risk Factors

- Family History/Genes
- Sensitive Nervous System
- History of Trauma or Sexual Abuse
- Gender as it is more common in women

Symptoms of Pelvic Floor Dysfunction

- Severe and steady pain
- Pain that comes and goes (intermittent)
- Dull aching
- Sharp pains or cramping
- Pressure or heaviness deep within your pelvis
- Pain during intercourse
- Pain while having a bowel movement or urinating
- Pain when you sit for long periods of time

The Connection Between Pelvic Floor Dysfunction and FM

Both fibromyalgia and pelvic pain patients have tenderness in their muscles. This pain is often felt over periods of months or even years. Moreover, according to a study conducted using members of the Fibromyalgia Information Foundation, fibromyalgia (FM) patients are found to have more symptom burden from bothersome pelvic pain syndromes than women seeking care for pelvic floor disease at urogynecology clinics. Patients with either or both conditions have central and peripheral sensitization and have an upregulated nervous system that can contribute to muscle pain. Some researchers believe FM, ME, and many causes of chronic pelvic pain are all in a "family" of illnesses called central sensitivity syndromes (CSS). All CSS involves an underlying central sensitization, which involves abnormalities in the brain and nerves that make one extremely sensitive to a variety of stimuli, such as pain, temperature, and sound.

Treatment for Pelvic Floor Dysfunction

- Pelvic Floor Physical Therapy
- Cognitive Behavioral Therapy
- Regular Exercise
- Healthy Nutrition
- Lifestyle Modifications
- Trigger Point Injections
- Medications
 - Pain Medications (NSAIDS, opiates)
 - Antidepressants

Ehlers-Danlos Syndrome (EDS)

Ehlers-Danlos syndrome (EDS) is a group of genetic disorders that affect the connective tissues primarily the skin, joints, and blood vessel walls. Connective tissue is a mixture of proteins and other substances that provide strength and elasticity to the underlying structures in the body. Those who have EDS usually have overly flexible joints and stretchy, fragile skin. EDS can be classified into thirteen types with hypermobility EDS (hEDS) being the most common and vascular EDS (vEDS) being more severe causing the walls of the blood vessels, intestines, or uterus to rupture. Each EDS type has a set of clinical criteria that help guide diagnosis; a patient's physical signs and symptoms can be matched up to the major and minor criteria to identify the type that is the most complete fit. However, there can be substantial overlap between the EDS types.

Symptoms of EDS

- Fatigue
- Joints and Structure
 - Joint pain (arthralgia) and deformity
 - Muscle pain (myalgia)
 - Nerve pain (neuralgia)
 - Nerve disorders (neuropathy) from cord and nerve entrapment or sensory nerve damage
 - Loose/unstable joints which are prone to frequent dislocations and/or subluxations and injury
 - Muscle tension and weakness
 - Weakness of the voice box and larynx
 - Hernias
 - Pelvic floor weakness and prolapses of the rectum, bladder or vaginal wall and uterus
- **Skin**
 - Soft velvety-like skin
 - Variable skin hyper-extensibility
 - Fragile skin that tears or bruises easily
 - Severe scarring
 - Slow and poor wound healing
 - Development of fleshy lesions associated with scars over pressure areas (molluscoid pseudotumors)
- **Less Common**
 - Arterial/intestinal/uterine fragility or rupture (usually associated vEDS)
 - Scoliosis at birth and scleral fragility (associated with the Kyphoscoliotic Type, kEDS)
 - Congenital hip dislocations
 - Poor muscle tone
 - Severe gum disease

Causes of EDS

EDS mostly affects the connective tissues of the body and one of the key proteins in connective tissues is collagen. In EDS, there are variants in the genes that determine how the body makes collagen, and/or in some subtypes other proteins that work alongside collagen. This leads to the connective tissue becoming weaker. Different tissues and organs can be affected in diverse ways depending on the genetic variant. This explains why there are several subtypes of EDS. EDS is mainly inherited and passed on from parent to child. If one has the most common form, hEDS, there's a 50 percent chance that the EDS gene will be passed on to the children.

The overall prevalence of the EDS is between 1 in 3,500 to 1 in 5,000 people. The hypermobile variant (hEDS) is by far the most common type and may be more common than that as it may be missed or misdiagnosed as something else. Most are rare e.g., 1 in 40,000 – 200,000 and some are ultra-rare i.e., less than 1 in a million people. Individuals of all racial and ethnic backgrounds are affected by EDS which can present with complications from birth and progress over time.

Comorbidities of EDS

Several disorders are associated with EDS especially with the hypermobile variant (hEDS).

- Upper and lower gastrointestinal tract complications such as swallow difficulties and sluggish stomach and large bowel, causing nausea, vomiting, acid reflux, bloating, pain, and absorption and food intolerance concerns
- Autonomic disturbances of heart rate and blood pressure, bowel and bladder function, and temperature regulation
- Anxiety, depression, and phobias
- Organ/systemic inflammation related to mast cell activation

The Connection Between EDS and FM

Although they are not the same disorder, there seems to be a high percentage of patients with EDS (and Hypermobility Spectrum Disorder) who also have Fibromyalgia. Although they are not the same disorder, they seem to coincide with one another. Many patients with hypermobility describe chronic generalized pain and fatigue. This is also true of those with FM as their pain is a result of Central Sensitization which describes changes in the central and peripheral nervous system that increase sensitivity to painful and non-painful stimuli. The injuries often observed in patients with hEDS are a precursor for painful joints. Central sensitization is thought to amplify this pain in addition to creating fatigue, nonrestorative sleep, and brain fog.

FM and hEDS share some similar clinical aspects including joint laxity, chronic widespread pain, chronic fatigue, sleep disturbance, functional gastrointestinal manifestations and cognitive symptoms. Both FM and hEDS are more prevalent in women than in men. hEDS is considered to be linked to autosomal dominant inheritance, but the role of sex hormones on the musculoskeletal system possibly explains the predominance of hEDS in women. Because the disorders are very similar, hEDS is often misdiagnosed as fibromyalgia. Hundreds of thousands of people suffer from overly flexible joints. When the joints are loose (ligament laxity), the tendons will tighten up, in an attempt to stabilize the body. As a result, the patients have the mistaken impression that the issue is tightness. This is why the problem is extremely underdiagnosed and/or misdiagnosed as fibromyalgia.

Temporomandibular Joint Disorder (TMJD)

The temporomandibular joint (TMJ) acts like a sliding hinge, connecting the jawbone to the skull. There is one joint on each side of the jaw. TMJ disorder (TMJD) can cause pain in the jaw joint and in the muscles that control jaw movement. The exact cause of a person's TMJD is often difficult to determine. The pain may be due to a combination of factors, such as genetics, arthritis, or jaw injury. Some people who have jaw pain also tend to clench or grind their teeth. However, many people habitually clench or grind their teeth and never develop TMJD. In most cases, the pain and discomfort associated with TMJ disorders is temporary and can be relieved with self-managed care or nonsurgical treatments.

Symptoms

- Pain or tenderness of the jaw
- Clicking sound or grating sensation when opens the mouth or chews
- Pain in one or both of the temporomandibular joints
- Aching pain in and around the ear
- Difficulty chewing or pain while chewing
- Aching facial pain
- Locking of the joint, making it difficult to open or close the mouth

The Connection Between TMJD and FM

According to the National Institute of Health, TMJD is a local disorder and FM a generalized disorder, and there is less evidence of distress in those with TMJD. TMJD is a separate disorder from FM, but many patients with FM have TMD symptoms. Commonly, patients have been treated for painful TMJD without consideration for FM. Fibromyalgia patients who experience local pain in the temples from the temporomandibular system often struggle with it for years before obtaining a clear diagnosis. It may follow the common pattern of being initiated in other parts of the body and later involving the temporomandibular region.

A significant positive correlation exists between TMJD, and FM. Patients with FM commonly are subject to suffering from headaches, facial pain, tiredness of the jaw, difficulties opening their mouths and chewing, as well as having a history of irritable bowel syndrome or premenstrual syndrome. Individuals with Fibromyalgia also commonly present this disease where the diagnosis of myofascial pain is more frequent.

The pain is frequently described as a “chronic dull aching pain” and is central to the diagnosis of both TMJD and FM disorders. The most common diagnosis of TMJD among patients with FM is masticatory myofascial pain (MP). Patients with FM most often have *headaches and facial pain* reflecting the overlap between the two. FM pain is often considerably more severe and spreads over a larger body area than the pain found in patients with myofascial pain.

Management of TMJD and FM

- Regular Exercise
- Direct Therapy to Muscles
- Reduction of all Contributing Factors
- Short-Term Goal: To restore the muscle and joints to normal function, posture, and full joint range of motion
- Long-Term Goal: Normal function with regular muscle stretching, postural, conditioning, and strengthening exercise program.

Take Module I Lesson Five Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. Why is Fibromyalgia so hard to diagnose?
2. What is the symptom in hypermobile people that indicate hypermobility syndrome?
3. At what ratio are women diagnosed with FM as compared to men?
4. Which two autoimmune diseases can attack the internal organs?
5. Which disease is a symptom of FMS?
6. What disease condition might be a result of malfunctioning dopamine receptors?

Lesson Six

Common Misdiagnoses

Several rheumatic diseases can mimic fibromyalgia. These include rheumatoid arthritis, ankylosing spondylitis, Lyme disease, Anemia, Polymyalgia Rheumatica, and Lupus just to name a few. They have symptoms of widespread pain along with joint involvement. Most rheumatic diseases are treated with medication and physical therapy. Let's examine some of the more commonly seen diagnoses with Fibromyalgia (FM) or instead of FM, which results in a misdiagnosis, or at least delay the diagnosis.

Lupus

What is Lupus?

Lupus is a chronic disease that involves the immune system and can damage any part of the body. The immune system guards against invaders, such as viruses, bacteria, and other germs. Normally, a part of the immune system works to fight off these invaders by making antibodies. But in the case of lupus, the immune system cannot tell the difference between the invaders and the body's own healthy tissue. It creates antibodies that attack and destroy healthy tissue, causing inflammation throughout the body. Over time, this inflammation may damage the organs of the body. Over 5 million people around the world have lupus, and 9 out of 10 of them are women with another autoimmune disease. Lupus is most likely to develop in women at ages 15-44. Women of color, including African American, Asian, Hispanic, Native American, and Pacific Islander are also more likely to develop lupus compared with Caucasian women. People who have a family member with lupus or another autoimmune disease may be at higher risk for developing lupus.

What are the causes of Lupus?

No one understands yet what causes lupus. Scientists believe that it may come from a combination of

- Hormones: Because lupus affects more women than men, hormones (in particular, estrogen) might play a role
- Genetics: A family history of lupus may make someone more likely to develop the disease
- Environment: There may be a link between lupus and certain environmental factors, such as stress, viruses, and certain medicines

What are the symptoms of Lupus?

Systemic lupus erythematosus (SLE), or lupus, is a chronic autoimmune disease where the immune system mistakenly attacks the body's healthy tissues. Inflammation caused by lupus can affect many different body systems, including joints, skin, kidneys, blood cells, brain, heart, and lungs. Common symptoms of lupus include:

- Fever
- Fatigue (feeling tired often)
- Joint pain
- Stiffness and swelling
- Butterfly-shaped rash on the cheeks and bridge of the nose
- Rashes elsewhere on the body
- Sun sensitivity
- Fingers and toes that turn white or blue when exposed to cold or during stressful periods (Raynaud's phenomenon)
- Shortness of breath
- Chest pain
- Dry eyes
- Headaches, Confusion, and Memory Loss

What is the diagnosis for Lupus?

Active lupus may cause severe flares if not treated properly. Severe flares occur when lupus symptoms, or disease activity, worsen or when new ones appear. When severe flares occur, this means that there is a measurable increase in disease activity in one or more organ systems. Lupus affects everyone differently, and symptoms can change or look different over time. One should visit his/her doctor if experiencing a new flare-up or any new or existing symptom.

Lupus nephritis is a complication of lupus that causes the immune system to attack and inflame the kidneys. This inflammation can make it difficult for the kidneys to function properly. Common symptoms of lupus nephritis include:

- Sudden and unexplained swelling, especially in the extremities (feet, ankles, legs, fingers, arms) or the eyes
- Blood in the urine
- Elevated blood pressure
- Foamy or frothy urine

What are the Treatments for Lupus?

By the time lupus nephritis is diagnosed, liver damage is already severe. Some of the natural cures that may help:

- Omega-3 Fatty Acids
 - Shown to curb inflammation, omega-3 fatty acids have been found to improve symptoms in lupus patients in several studies
- Herbal Medicine
- Vitamin and Mineral Supplements
- Mind-Body Therapies
- DHEA

Lyme Disease

What is Lyme Disease?

B. burgdorferi can spread throughout the body during the course of the disease, and has been found in the skin, heart, joints, peripheral nervous system, and central nervous system. *B. Burgdorferi* does not produce toxins. Therefore, many of the signs and symptoms of Lyme disease are a consequence of the immune response to spirochete in those tissues.

B. burgdorferi is injected into the skin by the bite of an infected *Ixodes* tick. Tick saliva, which accompanies the spirochete into the skin during the feeding process, contains substances that disrupt the immune response at the site of the bite. This provides a protective environment where the spirochete can establish infection. The spirochetes multiply and migrate outward within the dermis. The host inflammatory response to the bacteria in the skin causes the characteristic circular EM lesion. Neutrophils, however, which are necessary to eliminate the spirochetes from the skin, fail to appear in necessary numbers in the developing EM lesion because tick saliva inhibits neutrophil function. This allows the bacteria to survive and eventually spread throughout the body. Days to weeks following the tick bite, the spirochetes spread via the bloodstream to joints, heart, nervous system, and distant skin sites, where their presence gives rise to the variety of symptoms of the disseminated disease. The spread of *B. burgdorferi* is aided by the attachment of the host protease plasmin to the surface of the spirochete. If untreated, the bacteria may persist in the body for months or even years, despite the production of *B. burgdorferi* antibodies by the immune system. The spirochetes may avoid the

immune response by decreasing expression of surface proteins that are targeted by antibodies, antigenic variation of the VlsE surface protein, inactivating key immune components such as complement, and hiding in the extracellular matrix, which may interfere with the function of immune factors.

What are the Causes of Lyme Disease?

Lyme disease is caused by four main species of bacteria. *Borrelia burgdorferi* and *Borrelia mayonii* cause Lyme disease in the United States, while *Borrelia afzelii* and *Borrelia garinii* are the leading causes in Europe and Asia. The most common tick-borne illness in these regions, Lyme disease, is transmitted by the bite of an infected black-legged tick, commonly known as a deer tick. One is more likely to get Lyme disease if he/she lives or spends time in grassy and heavily wooded areas where ticks carrying Lyme disease thrive.

What are the Symptoms of Lyme Disease?

The signs and symptoms of Lyme disease vary. They usually appear in stages, but the stages can overlap. Early signs and symptoms

- A small, red bump, similar to the bump of a mosquito bite, often appears at the site of a tick bite or tick removal and resolves over a few days.
 - This normal occurrence doesn't indicate Lyme disease. However, these signs and symptoms can occur within a month after one has been infected:
- Rash
 - From three to 30 days after an infected tick bite, an expanding red area might appear that sometimes clears in the center, forming a bull's-eye pattern.
 - The rash (erythema migrans) expands slowly over days and can spread to 12 inches (30 centimeters) across. It's typically not itchy or painful but might feel warm to the touch.
 - Erythema migrans is one of the hallmarks of Lyme disease, although not everyone with Lyme disease develops the rash.
 - Some people develop this rash at more than one place on their bodies.

Other symptoms:

- Fever, chills
- Fatigue
- Body aches
- Headache
- Neck stiffness
- Swollen lymph nodes can accompany the rash

Later signs and symptoms:

If untreated, new signs and symptoms of Lyme infection might appear in the following weeks to months. These include:

- Erythema migraines
 - The rash may appear on other areas of your body.
- Joint pain
 - Bouts of severe joint pain and swelling are especially likely to affect the knees, but the pain can shift from one joint to another.
- Neurological problems
 - Weeks, months or even years after infection, one might develop inflammation of the membranes surrounding the brain (meningitis), temporary paralysis of one side of the face (Bell's palsy), numbness or weakness in the limbs, and impaired muscle movement.

Less common signs and symptoms:

Several weeks after infection, some people develop:

- Heart problems, such as an irregular heartbeat
- Eye inflammation
- Liver inflammation (hepatitis)
- Severe fatigue

What is the Diagnosis for Lyme Disease?

Only a minority of tick bites lead to Lyme disease. The longer the tick remains attached to the skin, the greater the risk of getting the disease. Lyme infection is unlikely if the tick is attached for less than 36 to 48 hours.

One should contact the doctor if he/she thinks they've been bitten and have signs and symptoms of Lyme disease, particularly if they live in an area where Lyme disease is common. Treatment for Lyme disease is more effective if begun early. The disease does not appear to be transmissible between people, by other animals nor through food. Diagnosis is based on a combination of symptoms, history of tick exposure and possibly testing for specific antibodies in the blood. Blood tests are often negative in the early stages of the disease.

What is the Treatment for Lyme Disease?

If an infection develops, a number of antibiotics are effective, including doxycycline, amoxicillin and cefuroxime. Standard treatment usually lasts for two or three weeks. Some people develop a fever and muscle and joint pains from treatment, which may last for one or two days. In those who develop persistent symptoms, long-term antibiotic therapy has not been found to be useful.

If untreated, symptoms may include loss of the ability to move one or both sides of the face, joint pains, severe headaches with neck stiffness or heart palpitations. Months to years later repeated episodes of joint pain and swelling may occur. Occasionally shooting pains or tingling in the arms and legs may develop.

Despite appropriate treatment, about 10 to 20% of those affected develop joint pains, memory problems, and tiredness for at least six months.

What is Anemia?

Anemia is a condition in which one lacks enough healthy red blood cells to carry adequate oxygen to the body's tissues. Having anemia, also referred to as low hemoglobin, can make one feel tired and weak.

What are the Causes of Anemia?

There are many forms of anemia, each with its own cause. Anemia can be temporary or long term and can range from mild to severe. In most cases, anemia has more than one cause. One should see the doctor if he/she suspects having anemia. It can be a warning sign of serious illness.

Aplastic anemia is a condition that occurs when the body stops producing enough new blood cells. The condition leaves one fatigued and more prone to infections and uncontrolled bleeding. A rare and serious condition, **aplastic anemia** can develop at any age. It can occur suddenly, or it can come on slowly and worsen over time. It can be mild or severe. Treatment for aplastic anemia might include medications, blood transfusions or a stem cell transplant, also known as a bone marrow transplant.

Iron deficiency anemia is a common type of anemia — a condition in which blood lacks adequate healthy red blood cells. Red blood cells carry oxygen to the body's tissues. As the name implies, iron deficiency anemia is due to insufficient iron. Without enough iron, the body cannot produce enough of a substance in red blood cells that enables them to carry oxygen (hemoglobin). As a result, iron deficiency anemia may leave one tired and short of breath. One can usually correct iron deficiency anemia with iron supplementation. Sometimes additional tests or treatments for iron deficiency anemia are necessary, especially if one's doctor suspects that the patient is bleeding internally.

Sickle cell anemia is one of a group of inherited disorders known as sickle cell disease. It affects the shape of red blood cells, which carry oxygen to all parts of the body. Red blood cells are usually round and flexible, so they move easily through blood vessels. In sickle cell anemia, some red blood cells are shaped like sickles or crescent moons. These sickle cells also become rigid and sticky, which can slow or block blood flow. There's no cure for most people with sickle cell anemia. Treatments can relieve pain and help prevent complications associated with the disease.

Thalassemia (thal-uh-SEE-me-uh) is an inherited blood disorder that causes the body to have less hemoglobin than normal. Hemoglobin enables red blood cells to carry oxygen. Thalassemia can cause anemia, leaving one fatigued. One may not need treatment if the thalassemia is mild. But more severe forms might require regular blood transfusions. One can take steps to cope with fatigue, such as choosing a healthy diet and exercising regularly.

Vitamin deficiency anemia is a lack of healthy red blood cells caused by lower than usual amounts of vitamin B-12 and folate. This can happen if one doesn't eat enough foods containing vitamin B-12 and folate, or if the body has trouble absorbing or processing these vitamins. Without these nutrients, the body produces red blood cells that are too large and don't work properly. This reduces their ability to carry oxygen. Symptoms can include fatigue, shortness of breath and dizziness. Vitamin supplements, taken by pill or injection, can correct the deficiencies.

What are the Symptoms of Anemia?

Anemia signs and symptoms vary depending on the cause and severity of anemia. Depending on the causes of your anemia, one might have no symptoms. Signs and symptoms, if they do occur, might include:

- Fatigue
- Weakness
- Pale or yellowish skin
- Irregular heartbeats
- Shortness of breath
- Dizziness or lightheadedness
- Chest pain
- Cold hands and feet
- Headaches

At first, anemia can be so mild that one does not notice it. But symptoms worsen as anemia worsens.

What is the Diagnosis for Anemia?

To diagnose anemia, one's doctor is likely to ask about medical and family history, perform a physical exam, and run the following tests:

- Complete blood count (CBC). A CBC is used to count the number of blood cells in a sample of the blood
- For anemia, the doctor will likely be interested in the levels of the red blood cells contained in the blood (hematocrit) and the hemoglobin in the blood
- Healthy adult hematocrit values are generally between 38.3% and 48.6% for men and 35.5% and 44.9% for women
- Healthy adult hemoglobin values are generally 13.2 to 16.6 grams per deciliter for men and 11.6 to 15 grams per deciliter for women
- These values may differ slightly from one medical practice to another
- Numbers might be lower for people who engage in intense physical activity, are pregnant or of older age
- Smoking and being at high altitude might increase numbers
- A test to determine the size and shape of your red blood cells.

What is the Treatment for Anemia?

Anemia treatment depends on the cause.

- **Iron deficiency anemia.** Treatment for this form of anemia usually involves taking iron supplements and changing the diet. For some people, this might involve receiving iron through a vein. If the cause of iron deficiency is loss of blood, other than from menstruation, the source of the bleeding must be located, and the bleeding stopped. This might involve surgery.
- **Vitamin deficiency anemias.** Treatment for folic acid and vitamin C deficiency involves dietary supplements and increasing these nutrients in the diet. If the digestive system has trouble absorbing vitamin B-12 from food, one might need vitamin B-12 shots.
- **Anemia of chronic disease.** There's no specific treatment for this type of anemia. Doctors focus on treating the underlying disease. If symptoms become severe, a blood transfusion or injections of a synthetic hormone normally produced by your kidneys (erythropoietin) might help stimulate red blood cell production and ease fatigue.
- **Aplastic anemia.** Treatment for this anemia can include blood transfusions to boost levels of red blood cells. One might need a bone marrow transplant if the bone marrow cannot make healthy blood cells.
- **Anemias associated with bone marrow disease.** Treatment of these various diseases can include medication, chemotherapy, or bone marrow transplantation.
- **Hemolytic anemias.** Managing hemolytic anemias includes avoiding suspect medications, treating infections and taking drugs that suppress the immune system, which could be attacking the red blood cells. Severe hemolytic anemia generally needs ongoing treatment.
- **Sickle cell anemia.** Treatment might include oxygen, pain relievers, and oral and intravenous fluids to reduce pain and prevent complications. Doctors might also recommend blood transfusions, folic acid supplements and antibiotics. A cancer drug called hydroxyurea (Droxia, Hydrea, Siklos) is also used to treat sickle cell anemia.
- **Thalassemia.** Most forms of thalassemia are mild and require no treatment. More severe forms of thalassemia generally require blood transfusions, folic acid supplements, medication, removal of the spleen, or a blood and bone marrow stem cell transplant.

Menopause

What is Menopause?

Menopause is not a disease or a disorder. It is a transitional time in a woman's life, when her hormones change, signaling the end of her reproductive years.

What are the causes of Menopause?

Menopause is a point in time 12 months after a woman's last period. The years leading up to that point, when women may have changes in her monthly cycles, hot flashes, or other symptoms, are called the **menopausal transition** or **perimenopause**. The menopausal transition most often begins between ages 45 and 55. It usually lasts about seven years but can be as long as 14 years. The duration can depend on lifestyle factors including:

- smoking
- age of onset
- race
- ethnicity

During perimenopause, the body's production of estrogen and progesterone, two hormones made by the ovaries, varies greatly. The menopausal transition affects each woman uniquely and in various ways. The body begins to use energy differently, fat cells change, and women may gain weight more easily. She may experience changes in bone or heart health. It is not uncommon for a woman's body shape and composition of lean-to-fat ratio to alter. These factors affect physical function. Menopause can also be triggered by a hysterectomy or surgical removal of the ovaries, which produce hormones. If she had surgery to remove her uterus or ovaries, and is not taking hormones, she will experience symptoms of menopause immediately.

What are the symptoms of Menopause?

Many women experience the following. The degree varies:

- Hot flashes
- Trouble sleeping
- Painful intercourse
- Moodiness
- Irritability
- Depression

What is the diagnosis for Menopause?

Twelve, consecutive months with no menstrual cycle signals the onset of the transition into menopause. This period is called perimenopause or menopause transition. If a woman is having symptoms that are common during menopause, a doctor may ask questions about her age, symptoms, and family history to determine if it really is the menopausal transition causing her problems. The doctor may suggest a blood test to check follicle-stimulating hormone (FSH) and estradiol (E2) levels, to rule out any other causes for the changes experienced.

What are the treatments for Menopause?

- Hormone Replacement Therapy (HRT)
- Diet & Lifestyle changes
- Sleep medication
- Pain medication
- Supplements

Rheumatoid Arthritis

What is Rheumatoid Arthritis?

Rheumatoid arthritis is a chronic inflammatory disorder affecting many joints, including those in the hands and feet. In rheumatoid arthritis, the body's immune system attacks its own tissue, including joints. In severe cases, it attacks internal organs. Rheumatoid arthritis affects joint linings, causing painful swelling. Over long periods of time, the inflammation associated with rheumatoid arthritis can cause bone erosion and joint deformity. While there's no cure for rheumatoid arthritis, physiotherapy and medication can help slow the disease's progression.

What are the causes of Rheumatoid Arthritis?

Rheumatoid arthritis is an autoimmune disease. Normally, the immune system helps protect the body from infection and disease. In rheumatoid arthritis, the immune system attacks healthy tissue in the joints. It can also cause medical problems with the heart, lungs, nerves, eyes and skin. Doctors don't know what starts this process, although a genetic component appears likely. While your genes don't actually cause rheumatoid arthritis, they can make one more likely to react to environmental factors — such as infection

with certain viruses and bacteria — that may trigger the disease. Factors that may increase the risk of rheumatoid arthritis include:

- **Gender**
 - Women are more likely than men to develop rheumatoid arthritis
- **Age**
 - Rheumatoid arthritis can occur at any age, but it most commonly begins in middle age
- **Family history**
 - If a member of one's family has rheumatoid arthritis, there is an increased risk of the disease
- **Smoking**
 - Cigarette smoking increases the risk of developing rheumatoid arthritis, particularly if one has a genetic predisposition for developing the disease
 - Smoking also appears to be associated with greater disease severity
- **Excess weight**
 - People who are overweight appear to be at a somewhat higher risk of developing rheumatoid arthritis

What are the symptoms of Rheumatoid Arthritis?

Signs and symptoms of rheumatoid arthritis may include:

- Tender, warm, swollen joints
- Joint stiffness that is usually worse in the mornings and after inactivity
- Fatigue, fever and loss of appetite

Early rheumatoid arthritis tends to affect your smaller joints first — particularly the joints that attach your fingers to your hands and your toes to your feet. As the disease progresses, symptoms often spread to the wrists, knees, ankles, elbows, hips and shoulders. In most cases, symptoms occur in the same joints on both sides of your body. About 40% of people who have rheumatoid arthritis also experience signs and symptoms that don't involve the joints. Areas that may be affected include:

- Skin
- Eyes
- Lungs
- Heart
- Kidneys
- Salivary glands
- Nerve tissue
- Bone marrow
- Blood vessels

Rheumatoid arthritis signs and symptoms may vary in severity and may even come and go. Periods of increased disease activity, called flares, alternate with periods of relative remission — when the swelling and pain fade or disappear. Over time, rheumatoid arthritis can cause joints to deform and shift out of place.

What is the diagnosis for Rheumatoid Arthritis?

Rheumatoid arthritis can be difficult to diagnose in its early stages because the early signs and symptoms mimic those of many other diseases. There is no one blood test or physical finding to confirm the diagnosis.

- The physical exam
 - The doctor will check joints for swelling, redness, and warmth
 - They may also check reflexes and muscle strength
- Blood tests
 - People with rheumatoid arthritis often have an elevated erythrocyte sedimentation rate (ESR, also known as sed rate) or C-reactive protein (CRP) level, which may indicate the presence of an inflammatory process in the body.
 - Other common blood tests look for rheumatoid factor and anti-cyclic citrullinated peptide (anti-CCP) antibodies.
- Imaging tests
 - Medical professionals may recommend X-rays to help track the progression of rheumatoid arthritis in joints over time.
 - MRI and ultrasound tests can help doctors judge the severity of the disease

What are the treatments for Rheumatoid Arthritis?

There is no cure for rheumatoid arthritis. But clinical studies indicate that remission of symptoms is more likely when treatment begins early with medications known as disease-modifying antirheumatic drugs (DMARDs).

The types of medications recommended will depend on the severity of symptoms and for how long.

- NSAIDs
 - Nonsteroidal anti-inflammatory drugs (NSAIDs) can relieve pain and reduce inflammation. Over the counter NSAIDs include ibuprofen (Advil, Motrin IB, others) and naproxen sodium (Aleve)
 - Stronger NSAIDs are available by prescription
 - Side effects may include stomach irritation, heart problems and kidney damage
- Steroids
 - Corticosteroid medications, such as prednisone, reduce inflammation and pain and slow joint damage
 - Side effects may include thinning of bones, weight gain and diabetes
 - Doctors often prescribe a corticosteroid to relieve symptoms quickly, with the goal of gradually tapering off the medication
- Conventional DMARDs
 - These drugs can slow the progression of rheumatoid arthritis and save the joints and other tissues from permanent damage
 - Common DMARDs include methotrexate (Trexall, Otrexup, others), leflunomide (Arava), hydroxychloroquine (Plaquenil) and sulfasalazine (Azulfidine)
 - Side effects vary but may include liver damage and severe lung infections
- Biologic agents
 - Also known as biologic response modifiers, this newer class of DMARDs includes abatacept (Orencia), adalimumab (Humira), anakinra (Kineret), certolizumab (Cimzia), etanercept (Enbrel), golimumab (Simponi), infliximab (Remicade), rituximab (Rituxan)

Axial Spondyloarthritis and Ankylosing Spondylitis

What is Axial Spondyloarthritis and Ankylosing Spondylitis?

Non-radiographic axial spondyloarthritis (nr-AxSpA) is a type of inflammatory arthritis that falls under a category of diseases called spondyloarthritis (SpA). Axial spondyloarthritis (axSpA) mostly affects the spine. It can cause damage visible on X-ray (ankylosing spondylitis) or damage that doesn't show up on X-rays (non-radiographic axSpA). Spondyloarthritis conditions have a common and very specific symptom that affects all people with spondyloarthritis conditions—inflammation of the spine.

Axial spondyloarthritis (AxSpA) affects the axial joints. Non-radiographic means that while there are symptoms, standard X-rays do not show visible damage. Axial relates to the spine, chest, and hip bones. Spondyloarthritis means it affects the joints and the entheses, tissues between bone and ligament or tendons. Axial spondyloarthritis (axSpA) is a type of arthritis.

What are the causes of Axial Spondyloarthritis and Ankylosing Spondylitis?

A specific cause of nr-AxSpA is difficult to pinpoint as most people with this condition may go undiagnosed for many years. What researchers know about nr-AxSpA is that it is an autoimmune disease. This means that the immune system thinks the body is being attacked. As a result, it produces inflammation to protect itself, damaging healthy tissue in the process. While researchers don't know exactly why the immune system overreacts in nr-AxSpA, or spondyloarthritis in general, they believe there is a genetic component. For example, people with all types of spondyloarthritis carry the immune gene variant called HLA-B27 more frequently than other people.

What are the symptoms of Axial Spondyloarthritis and Ankylosing Spondylitis?

Back pain is a hallmark symptom of nr-AxSpA. Back pain is distinguishable based on when it occurs, how long it lasts, the age of when the back pain starts and what it takes to treat it.

- Timing
 - Back pain associated with nr-AxSpA wakes one up at night and one hurts in the morning. One may also feel stiffness in the morning or after sitting for long periods. This type of stiffness makes moving difficult
- Movement
 - Back pain associated with a strain or slipped disc improves with rest. However, with nr-AxSpA, the pain is better with movement, including exercising and stretching.
- Age of onset
 - People who are diagnosed with nr-AxSpA usually start experiencing symptoms in late adolescence and early adulthood, usually getting a diagnosis before age 40

What is the diagnosis for Axial Spondyloarthritis and Ankylosing Spondylitis?

No single test can make a definitive diagnosis of non-radiographic axial spondyloarthritis, so healthcare providers look at clinical symptoms, blood work, and imaging to make a diagnosis. A healthcare provider will order blood work that measures inflammation in the body. This may include c-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) testing. While these tests cannot show exactly where inflammation is occurring, healthcare providers take blood test results into consideration towards a diagnosis. Healthcare providers will also do blood work to see if the HLA-B27 gene is present, which is in 83% of people with axial spondyloarthritis. But HLA-B27 is not enough to confirm a diagnosis because the majority of people with this gene do not go on to develop the condition. And this gene is not present in certain groups of people who also develop Ax-SpA. Healthcare providers can also use MRIs to confirm a diagnosis of nr-AxSpA. MRIs can show inflammation in the SI joints long before the disease progresses

enough to see bone fusions on an X-ray. Even if inflammation isn't evident on MRIs and blood work is inconclusive, a healthcare provider can make a diagnosis and prescribe treatments if symptoms and other clinical characteristics and/or testing results meet the clinical criteria of the Assessment of Spondyloarthritis International Society, and there no other explanations for symptoms

What are the treatments for Axial Spondyloarthritis and Ankylosing Spondylitis?

The most important component of treatment is addressing symptoms such as pain and stiffness. Non-steroidal anti-inflammatory drugs (NSAIDs) and physical therapy are effective in this regard. When these treatments fail, tumor necrosis factor (TNF) inhibitors and biologic drugs are a next line treatment. These drugs target specific inflammation-promoting molecules.

Thyroid Disease

What is Thyroid Disease?

The thyroid creates and produces hormones that play a role in many different systems throughout the body. When the thyroid makes either too much or too little of these important hormones, it's called thyroid disease. There are several different types of thyroid disease including:

- hyperthyroidism
- hypothyroidism
- thyroiditis
- Hashimoto's thyroiditis

What are the causes of Thyroid Disease?

The two main types of thyroid disease are hypothyroidism and hyperthyroidism. Both conditions can be caused by other diseases that impact the way the thyroid gland works.

Conditions that can cause **hypothyroidism** include:

- Thyroiditis
 - This condition is an inflammation (swelling) of the thyroid gland. Thyroiditis can lower the number of hormones the thyroid produces
- Hashimoto's thyroiditis:
 - A painless disease, Hashimoto's thyroiditis is an autoimmune condition where the body's cells attack and damage the thyroid. This is an inherited condition
- Postpartum thyroiditis
 - This condition occurs in 5% to 9% of women after childbirth. It's usually a temporary condition
- Iodine deficiency
 - Iodine is used by the thyroid to produce hormones
 - An iodine deficiency is an issue that affects several million people around the world
- A non-functioning thyroid gland
 - Sometimes, the thyroid gland doesn't work correctly from birth
 - This affects about 1 in 4,000 newborns
 - If left untreated, the child could have both future physical and mental issue
 - All newborns are given a screening blood test in the hospital to check their thyroid function

Conditions that can cause hyperthyroidism include:

- Graves' disease
 - In this condition the entire thyroid gland might be overactive and produce too much hormone
 - This problem is also called diffuse toxic goiter (enlarged thyroid gland)
- Nodules
 - Hyperthyroidism can be caused by nodules that are overactive within the thyroid
 - A single nodule is called a toxic autonomously functioning thyroid nodule, while a gland with several nodules is called a toxic multinodular goiter
- Thyroiditis
 - This disorder can be either painful or not felt at all
 - In thyroiditis, the thyroid releases hormones that were stored there.
 - This can last for a few weeks or months
- Excessive iodine
 - When one has too much iodine (the mineral that is used to make thyroid hormones) in the body, the thyroid makes more thyroid hormones than it needs.
 - Excessive iodine can be found in some medications (amiodarone, a heart medication) and cough syrups
- Diabetes
 - If one has diabetes, he/she is at a higher risk of developing a thyroid disease than people without diabetes.
 - Type 1 diabetes is an autoimmune disorder. If one already has one autoimmune disorder, he/she is more likely to develop another one
 - Type 2 diabetes, the risk is lower, but still present
 - If one has type 2 diabetes, he/she is more likely to develop a thyroid disease later in life

What are the symptoms of Thyroid Disease?

There are a variety of symptoms one could experience if he/she has a thyroid disease. Unfortunately, symptoms of a thyroid condition are often very similar to the signs of other medical conditions and stages of life. This can make it difficult to know if the symptoms are related to a thyroid issue or something else entirely. For the most part, the symptoms of thyroid disease can be divided into two groups — those related to having too much thyroid hormone (hyperthyroidism) and those related to having too little thyroid hormone (hypothyroidism).

Symptoms of an overactive thyroid (hyperthyroidism) can include:

- Experiencing anxiety, irritability and nervousness
- Having trouble sleeping
- Losing weight
- Having an enlarged thyroid gland or a goiter
- Having muscle weakness and tremors
- Experiencing irregular menstrual periods or having menstrual cycle stop
- Feeling sensitive to heat
- Having vision problems or eye irritation

Symptoms of an underactive thyroid (hypothyroidism) can include:

- Feeling tired (fatigue)
- Gaining weight
- Experiencing forgetfulness
- Having frequent and heavy menstrual periods
- Having dry and coarse hair
- Having a hoarse voice
- Experiencing an intolerance to cold temperatures

What is the diagnosis for Thyroid Disease?

Thyroid disease can be difficult to diagnose because the symptoms are easily confused with those of other conditions. One may experience similar symptoms when she is pregnant or aging as she might when developing a thyroid disease. Fortunately, there are tests that can help determine if symptoms are being caused by a thyroid issue. These tests include:

- Blood tests
 - One of the most definitive ways to diagnose a thyroid problem is through blood tests
 - Thyroid blood tests are used to tell if the thyroid gland is functioning properly by measuring the number of thyroid hormones in the blood
 - These tests are done by taking blood from a vein in the arm
 - Thyroid blood tests are used to see if one has:
 - Hyperthyroidism
 - Hypothyroidism

Thyroid blood tests are used to diagnose thyroid disorders associated with hyper- or hypothyroidism. These include:

- Thyroiditis
- Graves' disease
- Hashimoto's disease
- Goiter
- Thyroid nodule
- Thyroid cancer

What are the treatments for Thyroid Disease?

One's healthcare provider's goal is to return the thyroid hormone levels to normal. This can be done in a variety of ways and each specific treatment will depend on the cause of the thyroid condition.

If one has high levels of thyroid hormones (hyperthyroidism), treatment options can include:

- Antithyroid drugs (methimazole and propylthiouracil): These are medications that stop the thyroid from making hormones
- Radioactive iodine: This treatment damages the cells of the thyroid, preventing it from making high levels of thyroid hormones
- Beta blockers: These medications don't change the level of hormones in the body, but they help control symptoms

- Surgery: A more permanent form of treatment, one's healthcare provider may surgically remove the thyroid (thyroidectomy). This will stop it from creating hormones. However, one will need to take thyroid replacement hormones for the rest of his/her life
- If one has low levels of thyroid hormones (hypothyroidism), the main treatment option is:
 - Thyroid replacement medication:
 - This drug is a synthetic (man-made) way to add thyroid hormones back into the body

Diabetes

What is Diabetes?

Although less common than Type 2 diabetes, the American Diabetes Association reports that 1.6 million Americans have type 1 diabetes, including 187,000 children and adolescents. Type 1 diabetes makes up between 5 and 10% of total diabetes cases in the United States, while type 2 diabetes covers the other 90 to 95%.

Type 1 diabetes, once known as juvenile diabetes or insulin-dependent diabetes, is a chronic condition

- In this condition, the pancreas makes little or no insulin. Insulin is a hormone the body uses to allow sugar (glucose) to enter cells to produce energy
- Different factors, such as genetics and some viruses, may cause type 1 diabetes
- Although type 1 diabetes usually appears during childhood or adolescence, it can develop in adults
- Even after a lot of research, type 1 diabetes has no cure
- Treatment is directed toward managing the amount of sugar in the blood using insulin, diet and lifestyle to prevent complications

Type 2 diabetes is an impairment in the way the body regulates and uses sugar (glucose) as a fuel

- This long-term (chronic) condition results in too much sugar circulating in the bloodstream
- Eventually, high blood sugar levels can lead to disorders of the circulatory, nervous and immune systems
- In type 2 diabetes, there are primarily two interrelated problems at work. The pancreas does not produce enough insulin — a hormone that regulates the movement of sugar into the cells — and cells respond poorly to insulin and take in less sugar
- Type 2 diabetes used to be known as adult-onset diabetes, but both type 1 and type 2 diabetes can begin during childhood and adulthood
- Type 2 is more common in older adults, but the increase in the number of children with obesity has led to more cases of type 2 diabetes in younger people
- There's no cure for type 2 diabetes, but losing weight, eating well and exercising can help manage the disease
- If diet and exercise aren't enough to manage blood sugar, diabetes medications or insulin therapy may be needed.

What are the causes of Diabetes?

Type 2 diabetes is an impairment in the way the body regulates and uses sugar (glucose) as a fuel. This long-term (chronic) condition results in too much sugar circulating in the bloodstream. Eventually, high blood sugar levels can lead to disorders of the circulatory, nervous, and immune systems. In type 2 diabetes, there are primarily two interrelated problems at work. The pancreas does not produce enough insulin — a hormone that regulates the movement of sugar into muscle cells. As a result, cells respond poorly to insulin and take in less sugar.

Type 2 diabetes used to be known as adult-onset diabetes, but both type 1 and type 2 diabetes can begin during childhood and adulthood. Type 2 is more common in adults, but the increase in the number of children with obesity has led to more cases of type 2 diabetes in younger people.

What are the symptoms of Diabetes Type 1?

Signs and symptoms of type 2 diabetes often develop slowly. In fact, one can be living with type 2 diabetes for years and not know it. When signs and symptoms are present, they may include:

- Increased thirst
- Frequent urination
- Increased hunger
- Unintended weight loss
- Fatigue
- Blurred vision
- Slow-healing sores
- Frequent infections
- Numbness or tingling in the hands or feet
- Areas of darkened skin, usually in the armpits and neck

What is the diagnosis for Diabetes Type 2?

Type 2 diabetes is usually diagnosed using the glycated hemoglobin (A1C) test. This blood test indicates the average blood sugar level for the past two to three months. Results are interpreted as follows:

- Below 5.7% is normal.
- 5.7% to 6.4% is diagnosed as prediabetes.
- 6.5% or higher on two separate tests indicates diabetes.

If the A1C test isn't available, or if one has certain conditions that interfere with an A1C test, the doctor may use the following tests to diagnose diabetes:

- Random blood sugar test
 - Blood sugar values are expressed in milligrams of sugar per deciliter (mg/dL) or millimoles of sugar per liter (mmol/L) of blood
 - Regardless of when one last ate, a level of 200 mg/dL (11.1 mmol/L) or higher suggests diabetes
 - Fasting blood sugar test
 - A blood sample is taken after an overnight fast

Results are interpreted as follows:

- Less than 100 mg/dL (5.6 mmol/L) is normal
- 100 to 125 mg/dL (5.6 to 6.9 mmol/L) is diagnosed as prediabetes
- 126 mg/dL (7 mmol/L) or higher on two separate tests is diagnosed as diabetes

Oral glucose tolerance test is less commonly used than the others, except during pregnancy. Fasting overnight is required, and then drinking a sugary liquid at the doctor's office where blood sugar levels are tested periodically for the next two hours. Results are interpreted as follows:

- Less than 140 mg/dL (7.8 mmol/L) is normal
- 140 to 199 mg/dL (7.8 mmol/L and 11.0 mmol/L) is diagnosed as prediabetes
- 200 mg/dL (11.1 mmol/L) or higher after two hours suggests diabetes

Screening. The American Diabetes Association recommends routine screening with diagnostic tests for type 2 diabetes in all adults age 45 or older and in the following groups:

- People younger than 45 who are overweight or obese and have one or more risk factors associated with diabetes
- Women who have had gestational diabetes
- People who have been diagnosed with prediabetes
- Children who are overweight or obese and who have a family history of type 2 diabetes or other risk factors

What are the treatments for Diabetes?

There's no cure for type 1 or type 2 diabetes, but losing weight, eating well and exercising can help manage the disease. If diet and exercise aren't enough to manage blood sugar, diabetes medications or insulin therapy may be necessary.

Multiple Sclerosis

Multiple Sclerosis (MS) is considered an autoimmune disease in which the immune system is attacking part of the central nervous system. Specifically, MS affects the protective sheath (myelin) that covers nerve fibers throughout the body, which can cause a wide range of symptoms depending on which nerves are affected. Over time, multiple sclerosis can permanently damage the brain and spinal cord.

Doctors don't know what causes MS but believe that it's due to a combination of genes and environmental factors. Women, Caucasians, people between the ages of 20 and 50, and those who live farther from the Equator have a higher risk of developing MS.

There are four main kinds of MS; symptoms and disease progression depend on what type one has.

- progressive relapsing MS (PRMS)
- relapsing-remitting MS (RRMS)
- primary-progressive MS (PPMS)
- secondary-progressive MS (SPMS)

While many people with MS develop relatively mild issues (especially with newer treatments that can help prevent MS flares and disease progression), those with severe illness can lose mobility and speech and experience other complications.

Symptoms of MS

MS symptoms vary among patients, depending on which parts of the nervous system are affected. The most common type of MS is relapsing-remitting MS which makes up 85 percent of patients that are first diagnosed. It is characterized by attacks, or flare ups, of new symptoms followed by periods of remission. Muscle issues: Numbness and tingling in the limbs often occur with MS, as do muscle spasms. Frequently, someone with MS will feel an electric impulse sensation when they move their neck a particular way; this is called the Lhermitte sign.

- Movement problems: Dizziness and weakness can contribute to balance and coordination troubles. People with MS often complain of feeling suddenly clumsy or report tripping, stumbling, or falling more than usual.
- Vision difficulties: When MS affects the optic nerve in the eye, it can cause eye problems such as blurry eyesight, double vision, and vision loss, and may involve eye pain and unexpected movement of the eye. One may find him/herself partially color blind and have issues such as picking out clothes that don't match.
- Bladder or bowel problems: People with MS may experience loss of control or other complications with function.

Causes and Risk Factors of MS

The cause of multiple sclerosis is unknown. It's considered an autoimmune disease in which the body's immune system attacks its own tissues. In the case of MS, this immune system malfunction destroys the fatty substance that coats and protects nerve fibers in the brain and spinal cord (myelin).

- Age: MS can occur at any age, but onset usually occurs around 20 and 40 years of age.
- Sex: Women are more than two to three times as likely as men are to have relapsing-remitting MS.
- Family history: If one parent or sibling has had MS, one is at a higher risk of developing the disease.
- Certain infections: A variety of viruses have been linked to MS, including Epstein-Barr
- Race: White people, particularly those of Northern European descent, are at highest risk of developing MS. People of Asian, African or Native American descent have the lowest risk.
- Climate: MS is far more common in countries with temperate climates, including Canada, the northern United States, New Zealand, southeastern Australia and Europe.
- Vitamin D: Having low levels of vitamin D and low exposure to sunlight is associated with a greater risk of MS.
- Certain autoimmune diseases: One has a slightly higher risk of developing MS if other autoimmune disorders are present such as thyroid disease, pernicious anemia, psoriasis, type 1 diabetes or inflammatory bowel disease.
- Smoking: Smokers who experience an initial event of symptoms that may signal MS are more likely than nonsmokers to develop a second event that confirms relapsing-remitting MS.

Diagnosis of MS

Diagnosing MS includes identifying certain symptoms, medical history, and a physical exam. Magnetic resonance imaging (MRI) takes pictures of the brain and helps detect damaged nerves. Other tests may include spinal taps, optical coherence tomography, and evoked response tests, which look at how the nerves respond to certain stimulation.

According to the National MS Society, an official MS diagnosis requires the following:

- The discovery of damage in two or more separate parts of the central nervous system
- Proof the damage happened at different times
- The ruling out of other diagnoses

Treatment of MS

- Exercise: Regular physical activity can help manage symptoms of MS, and may improve mood, fitness and function. Swimming, walking, tai chi, and yoga are smart options.
- Nutrition: Though there is no specific diet recommended for MS, a healthy eating plan may boost the immune system, help manage co-existing conditions, and promote overall good health.
- Sleep: Getting adequate rest is vital. It's recommended that adults between ages 18 and 64 should aim for seven to nine hours nightly.
- Complementary practices: Some patients report that activities like acupuncture, deep breathing, and

- massage help them relax and ease symptoms.
- Medications
 - Steroids
 - Muscle relaxants
 - Drugs for fatigue
 - Antidepressants
 - Pain relievers
 - Drugs for insomnia
 - Treatment for sexual dysfunction and bladder or bowel control

The Connection Between MS and FM

Multiple sclerosis and fibromyalgia can sometimes mimic one another. MS and FM are both chronic diseases with no cure. They can both take a long time to get the right diagnosis. They're both more common in women. While MS and FM may have some symptoms in common, they are ultimately distinct conditions with very different causes and treatments. MS is an autoimmune disease, a condition when the body's immune system mistakenly attacks itself. It affects the brain and spinal cord, and it often gets worse over time. MS can permanently damage the nerves. This condition is diagnosed by a neurologist, a doctor who specializes in treating disorders of the brain and nervous system. Fibromyalgia causes pain and stiffness all over the body, along with other symptoms. Doctors aren't sure what triggers it. They think it might have something to do with how the brain processes pain. This condition is diagnosed by a rheumatologist who is an internal doctor who specializes in joint and musculoskeletal diseases. Common symptoms include:

- Pain
- Fatigue
- Cognitive Issues (Brain-Fog)

Polymyalgia Rheumatica

Polymyalgia rheumatica (PMR) is a common cause of widespread aching and stiffness that affects adults over the age of 55, especially Caucasians. More specifically, the average age when symptoms start is 70, so people who have PMR may be in their 80s or even older. Because PMR does not often cause swollen joints, it may be hard to recognize. The disease affects women somewhat more often than men.

Symptoms

The signs and symptoms of PMR usually occur on both sides of the body and might include:

- Aches or pain in the shoulders
- Aches or pain in the neck, upper arms, buttocks, hips or thighs
- Stiffness in affected areas, particularly in the morning or after being inactive for a time
- Limited range of motion in affected areas
- Pain or stiffness in the wrists, elbows or knees
- Mild fever
- Fatigue
- A general feeling of not being well (malaise)
- Loss of appetite
- Unintended weight loss
- Depression

Causes of Polymyalgia Rheumatica

The cause of PMR is unknown. The abrupt onset of symptoms suggests the possibility of an infection but, so far, none has been found. In addition, “Myalgia”, the Greek word for “muscle pain,” is neither the cause with specific tests of the muscles including blood tests for muscle enzymes or muscle biopsies are all normal.

Recent research suggests that inflammation in PMR involves the shoulder and hip joints themselves, and the bursae around these joints. Pains at the upper arms and thighs, in fact, start at the nearby shoulder and hip joints. This is what doctors call “referred pain.” PMR should not be confused with fibromyalgia, a different syndrome that unlike PMR does not elevate typical markers of inflammation.

Diagnosis of Polymyalgia Rheumatica

Polymyalgia rheumatica may be hard to diagnose, but because rheumatologists are experts in diseases of the joints, muscles and bones, they can better recognize the diagnosis of PMR and expertly manage its treatment. In PMR, results of blood tests to detect inflammation are most often abnormally high. One such test is the erythrocyte sedimentation rate (ESR), also called “sed rate.” Another test is the C-reactive protein, or CRP. Both tests may be very elevated in PMR but, in some patients, these tests may have normal or only slightly high results. The doctor will rule out other health conditions such as rheumatoid arthritis and fibromyalgia.

Treatment of Polymyalgia Rheumatica

Treatment for polymyalgia rheumatica (PMR) focuses on reducing inflammation. The treatment of choice for PMR is medication. Corticosteroids are effective at treating PMR and if symptoms do not get better after using them, then PMR might not be the right diagnosis. Non-steroidal anti-inflammatories (NSAIDs) cannot treat PMR.

The Connection Between Polymyalgia Rheumatica and FM

Both PMR and FM cause pain and tension in the muscles, but they differ in their other symptoms, causes, and treatments. Getting a correct diagnosis is key to ensure proper treatment and symptom management. Both PMR and FM are more common in women than men. PMR usually occurs in older people with an initial diagnosis at age 55 and over. PMR and FM are often confused because they both cause muscle pain throughout the body, and they have similar names. However, they are different disorders with different causes. Moreover, it is possible for a person to have both PMR and FM. PMR is an inflammatory form of arthritis and conversely, FM does not show traditional signs of inflammation.

The causes of the two conditions are different:

- Polymyalgia is considered to be an autoimmune disease. Autoimmune disorders cause the body to attack healthy tissue by mistake.
- Fibromyalgia pain is thought to be caused by overactive nerves that make the body perceive pain despite there being no physical injury.

Both conditions can cause widespread pain throughout the body. Similarities and differences in symptoms of polymyalgia and fibromyalgia include:

- The location of the pain: People with FM often experience pain on both sides of the body, usually in 18 key places. People with PMR typically feel stiffness and pain in their shoulders, back, and hip girdles.
- Mental health: Both PMR and FM may cause depression related to living with a painful chronic condition.
- Morning stiffness: Both conditions can cause the muscles and joints to feel stiff. PMR often causes morning stiffness that lasts less than an hour.
- Sleep difficulties: Many people with PMR and FM have trouble sleeping.

Take Module I Lesson Six Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. What is the butterfly rash symptomatic of?
2. A bull-eye rash is a symptom of _____.
3. Osteoarthritis is considered a _____ and _____ disease.
4. Which condition shows damage to the affected area on an X ray?
5. What are the symptoms of an underactive thyroid?
6. Which disease is likely the result of a virus?

Fibromyalgia Fitness Specialist



Module II Application

Lesson One

Exercise and Fibromyalgia

If you are a health and fitness professional, some of your clients may be suffering from fibromyalgia and you may be an important source for relief. Moderate exercise is known to improve use of oxygen, energy levels, anxiety, stress and depression, sleep, self-esteem, cardiovascular fitness, muscle strength, and shortness of breath (Storer, T.W., 2001). While the pain and fatigue associated with fibromyalgia may make exercise and daily activities difficult, it is crucial to be physically active.

Benefits of Exercise

Boost Endorphins

Studies show that exercise can help restore the body's neurochemical balance, and it triggers a positive emotional state. Not only does regular exercise slow down the heart-racing adrenaline associated with stress, but it also boosts levels of natural endorphins -- pain-fighting molecules that may be responsible for the well-known "runner's high." Endorphins help to reduce anxiety, stress, and depression which are symptoms of FM.

Boosts Serotonin

Serotonin is a neurotransmitter in the brain that scientists have found to be related to fibromyalgia. Neurotransmitters are brain chemicals that send specific messages from one brain cell to another. While only a small percentage of all serotonins (1% to 2%) is located in the brain, this neurotransmitter is believed to play a vital role in mediating moods. Studies have found that too much stress can lead to permanently low levels of serotonin. That, in turn, can create aggression. An increased level of serotonin in the brain is associated with a calming, anxiety-reducing effect. In some cases, it's also associated with drowsiness. A stable serotonin level in the brain is associated with a positive mood state or feeling good over a period of time. Lack of exercise and inactivity can aggravate low serotonin levels.

Other Benefits

- Burning calories and making weight control easier
- Giving range-of-motion to painful muscles and joints
- Improving a person's outlook on life
- Improving quality of sleep
- Improving one's sense of well-being
- Increasing aerobic capacity
- Improving cardiovascular health
- Increasing energy
- Reducing anxiety levels and depression
- Relieving stress associated with a chronic disease
- Stimulating the secretion of endorphins or "happy hormones"
- Strengthening bones and muscles
- Relieving pain

Best Types of Exercises for Fibromyalgia

Exercises such as walking, strength training, and stretching activities are effective at improving physical, emotional, and social function. They also are effective in addressing key symptoms in those with fibromyalgia who are also being treated with medication. Some studies point to long-term aquatic exercise programs such as water aerobics as being effective in reducing symptoms and improving the health-related quality of life of those with FM.

- Exercise consistently (aim for daily) for 15 minutes.
- As little as 5 minutes a day can reduce your pain.
- Aim to feel “good tired” after a workout but better the next day.
- If exercising increases your pain, go easier and exercise for less time.
- Don’t try to ramp up in time or intensity unless you notice an increase in energy.

Exercise Limitations for Individuals with FM

Usually, there are no specific exercises to avoid if one has fibromyalgia. Aerobic exercise (running, jogging), weight training, water exercise, and flexibility exercises may all help. Golf, tennis, hiking, and other recreational activities are also healthy. However, exercising hard (overexertion) leads to the problems people experience post-exercise, which are called “post-exertional malaise.” This occurs because people with fibromyalgia do not have the energy to condition like others who can handle the increase in exercise and conditioning. Instead, if exercise uses more than the limited amount of energy the body can make, their systems crash, and they feel like they were hit by a truck for a few days after. Because of this, the key is to find an amount of walking or other low-intensity exercises one can do, where he/she feels “good tired” after, and better the next day. Instead of ramping up in the length or intensity of the workouts, one should stick to the same amount while working to increase energy production.

Also, people with fibromyalgia have a problem called orthostatic intolerance. This means when they stand up, the blood rushes to their legs and stays there. This can be helped dramatically by increasing water and salt intake as well as by using medium pressure (20 to 30 mmHg) compression stockings when they’re up and around. In these situations, using a recumbent bicycle can also be very helpful for exercising.

Here are some tips to consider to avoid or manage flare-ups:

- Always listen to your body and only exercise when you have the energy to do so, never doing more than your body wants you to do.
- Take several breaks in-between exercises to recover. You can also split the workouts into 5- to 10-minute sections that can be done throughout the day.
- Stretch daily to help with posture and increase mobility. This will lead to less pain when you’re active.
- Stick with low-impact movements to prevent excess soreness.

- Avoid going into high-intensity mode while recovering (no more than 60 percent of your maximum heart rate). Staying below this zone will help prevent fatigue.
- Keep all your movements fluid and limit the range of motion in a particular exercise whenever it causes pain.
- Keep records of how a particular exercise routine or activity makes you feel for up to two to three days afterward to see if the routine is sustainable and healthy for your current pain level.
- One should discuss his/her plan with a doctor before getting started.

The 6 Key Components of Fibromyalgia Exercise

Every exercise routine should address six components to achieve a well-rounded and comprehensive program that focuses on the improvement of breathing, cardiorespiratory endurance, muscular strength, core stability, posture, and flexibility.

KEY 1: Breathing and Fibromyalgia

Proper Breathing Technique: One should breathe slowly during exercise. Inhale through the nose with the mouth closed. The inhalation warms and filters the air. Exhale through the mouth for twice as long as the inhale. One should avoid panting. Panting keeps the lungs from getting all the air out. When exercising avoid the Valsalva Maneuver. The Valsalva maneuver is performed by imagining that the chest and stomach muscles are very tight and bearing down as though straining to initiate a bowel movement. The Valsalva maneuver can be dangerous due to the sudden and abrupt changes in blood pressure. These dramatic changes in heart rate, blood pressure, and carbon dioxide may produce symptoms including dizziness, lightheadedness, and syncope (fainting or passing out).

Diaphragm Exercises: This move strengthens a key breathing muscle, the diaphragm. One lies down with the knees bent or sits in an easy chair -- one hand on the chest, one below the rib cage. Slowly inhale through the nose so that the stomach raises one hand. Exhale with pursed lips and tighten the stomach. The hand on the chest should not move. Do this for 5 to 10 minutes, three or four times a day. Breathing this way will become easy and automatic.

Pursed Lip Breathing: This exercise reduces the number of breaths one takes and keeps the airways open longer. More air can flow in and out of the lungs, so that one can be more physically active. To practice it, simply breathe in through the nose and breathe out at least twice as long through the mouth, with pursed lips. Gently puff out the cheeks to create pressure. Creating pressure opens up the airways and slows down the breath.

Yoga Breathing: Yogic breathing exercises can help to reduce stress and anxiety.

Bhastrika: 5 min

- Sit up tall, relax your shoulders, and take a few deep breaths in and out from the nose. With each inhale, expand the belly fully as you breathe.
- Begin “bellows” breathing by exhaling forcefully through your nose. Follow by inhaling forcefully at the rate of one second per cycle.
- Make sure the breath is coming from your diaphragm; keep your head, neck, shoulders, and chest still while your belly moves in and out.

- For your first cycle, move through a round of 10 *Bhastrika* breaths, then take a break and breathe naturally, observing the sensations in your mind and body. After a 15- to 30-second break, begin the next round with 20 breaths. Finally, after pausing for another 30 seconds, complete a third round of 30 bellows breaths.
- Make sure to listen to your body during the practice. Bellows breathing is a safe practice, but if you feel light-headed in any way, take a pause for a few minutes while breathing naturally. When the discomfort passes, try another round of bellows breathing, slower and with less intensity.
- Practice bellows breath on an empty stomach. Wait at least two hours after eating.

Anulom vilom: 15 min Also known as the alternate breathing technique, it facilitates proper functioning of the lungs, mitigates stress, and lifts up one's mood.

- Always sit crossed-legged (Tailor sit), with hands resting sideways on the knees.
- Close the right nostril with your right thumb and inhale slowly through the left nostril to fill up your lungs.
- Now, release the right nostril and close the left nostril with the ring finger and exhale slowly through the right nostril. Inhale through the right nostril
- Now, release the left nostril and close the right nostril with the right thumb and exhale through the left nostril.
- It is essential to focus on your breath and practice the technique slowly.
- Repeat 60 times or for 5 minutes. One can do this any time of the day.
- Ensure that the back is straight, and shoulders relaxed while the pranayama is performed.

Kapalbhati: 10 min Also known as forehead shining breathing technique or breath of fire, Kapalbhati flushes out toxic air from the body, cleansing it in the process. With cleansing come various mental and physical benefits.

- With the legs in crisscrossed position, sit up tall, lengthening the space between your navel and the heart. Place the hands on the knees. Ensure they are facing upwards. Direct the focus and awareness to the belly region.
- Breathe in and out through the nose and start to pull your abdomen in during the exhale and press it out during the inhale. Imagine your belly filling up with air during the inhale and use your abdominal muscles to push the air out during the exhale.
- Start to shorten each breath and pick up the pace. The breathing should be loud and quick.
- Try to equalize the inhale and the exhale in both strength and length.

KEY 2: Cardiorespiratory Fitness and Fibromyalgia

Endurance cardiorespiratory exercise is good for the heart and lungs and allows one to use oxygen more efficiently. Walking, biking, and swimming are great examples of aerobic exercise.

The guidelines are the same as generally healthy individuals. One should attempt to train the cardiorespiratory system 3-5 days a week for 20-60 minutes per session. If one cannot exercise for 30 minutes continuously, he/she should exercise as long as he/she can. One should pace him/herself and take breaks. As one progresses, the goal is to exercise at an intensity level of 6-7 on the Rating of Perceived Exertion Scale (Scale Rating from 0 Nothing at All-10 Very, Very, Heavy).

- **Walking:** Just about everyone with fibromyalgia can exercise. Walking is a great choice, especially if one is just getting started. Do it anywhere – outside, in a mall, on a treadmill. If it seems daunting, add 30 seconds or 10 yards each day. Even a slow pace is beneficial.
- **Cycling:** A stationary bike can work well for people with FM. One can cycle in his/her home, a gym, or rehab setting. It is recommended that before joining a cycling class, one should consult with the cycle instructor about the intensity level of the class. However, because stationary cycling is very much a “go-at-you-own-pace” type of a class, those with FM are encouraged to do what they can in a class setting. One can find supervision and meet people. As one improves, he/she can try to cycle outside on a traditional bike and soak up the scenery.
- **Tai Chi:** This form of exercise is an ancient Chinese practice of gentle, flowing movements. This is an excellent form of exercise for people with FM. It’s a mild workout for the heart and lungs and helps tone the muscles. It also eases stress and helps one relax, if he/she is experiencing anxiety. One can participate in a group class or follow a DVD.
- **Water Aerobics:** Participating in a water-based fitness class or even simply performing self-guided water-based exercises increases aerobic capacity, increases muscular strength and endurance, increases respiratory muscle strength, increases core stability, and improves posture and flexibility.

Interval cardiorespiratory exercise may be an alternative to standard endurance training for individuals with FM who have difficulty in achieving their target intensity or duration of continuous exercise because of fatigue or other symptoms. Interval training is a modification of endurance training in which high-intensity exercise usually lasting less than one minute is regularly interspersed with periods of rest or lower intensity exercise. Health and fitness professionals should teach their clients to perform all daily activities (e.g., stair climbing, uphill walking) at an interval mode consisting of short bouts of activity lasting 15-20 sec and rest periods of 1 minute. One should perform traditional interval training sessions 2-3 days a week mixed in with regular endurance type of workouts. For a more detailed format, view the FITT Principle section for Interval Exercise. Interval training should only be incorporated after months of developing a conditioned foundation to avoid flare-ups.

KEY 3: Muscular Strength and Fibromyalgia

Strength training helps break the chronic pain cycle associated with fibromyalgia syndrome by improving fitness and functional levels, relieving physical and emotional stress, and boosting one’s confidence and self-esteem. Recent research has demonstrated that strength training exercise, when done appropriately, can be safe and beneficial for individuals with FM. Strength training exercises increase muscle strength and can make daily activities, such as climbing stairs and carrying laundry, easier. Stronger muscles use less effort to do work than weaker muscles. Some think that by using less effort, the muscles do not get as fatigued. For many years, when FM was thought to be a disorder of the muscles, people believed that one might damage the muscle if he/she exercised it too hard. Therefore, people with FM were discouraged from doing strength training type exercise. Today, research demonstrates the safety and benefit of this important type of exercise for the person with FM (Andrade, A., 2018).

Resistance training usually involves weights or resistance bands but using one's own body weight works just as well depending on the severity of the symptoms. Strengthening exercises build individual muscles and muscle groups and can help patients with FM to be more functional. Resistance training should be performed 2-3 days a week working all major muscle groups.

- It is recommended to perform exercises that work several muscle groups at once.
- If one is going to exercise individual muscles or a small number of muscle groups, it is imperative that he/she works upper, lower, and core muscles to ensure a balanced workout optimizing function.
- Light weights and more repetitions are better than heavy weights and fewer repetitions. This type of resistance training also improves muscular endurance, which is important for those with FM.
- One should pace him/herself and lot for several breaks when needed.

KEY 4: Core Stability and FM

The word *core* itself implies deep and central. The anatomical structure that is the deepest and most central is the spine. The core is directly related to the spine specifically and generally to the torso. The spine is primarily what one wants to stabilize with the core muscles. There is also a dynamic component to the core. This aspect of the core is all about movement and the specific control of movement from the deep intrinsic muscles that move the body. The major muscles that move, support, and stabilize the spine are called the muscles of the core or trunk.

Strength and Stability- Currently, the strength that comes from the core is what is gaining the most attention. It is important, however, that equal emphasis is placed on both strength and flexibility regarding the core. In other words, there should be a balanced relationship between the two components of strength and flexibility within the core muscles. The balance between strength and flexibility begets stability. Being balanced in the core makes an individual more adaptable in real life situations. For instance, the core is used every time one walks on uneven surfaces. Also, if one trips, starts to fall, and then catches him/herself, it's the adaptability of the core muscles that is catching the individual.

Movement- Movement from the core is how the center of gravity is controlled. Controlling the center of gravity comes from the iliopsoas muscle. The iliopsoas is strategically located around the center of gravity, which is located at a spot close to the top and just forward of the sacrum. When one's center of gravity is in line with gravity itself relative to one's body parts, he/she is in balance and in control. When one moves from his/her center, the movements are not only controlled but expansive and light. Control is a synergy of strength, stability, lightness, and ease during movement. Because one establishes a relationship with the iliopsoas, movement from the core then becomes intentional. (See Figure 5.1 and 5.2)

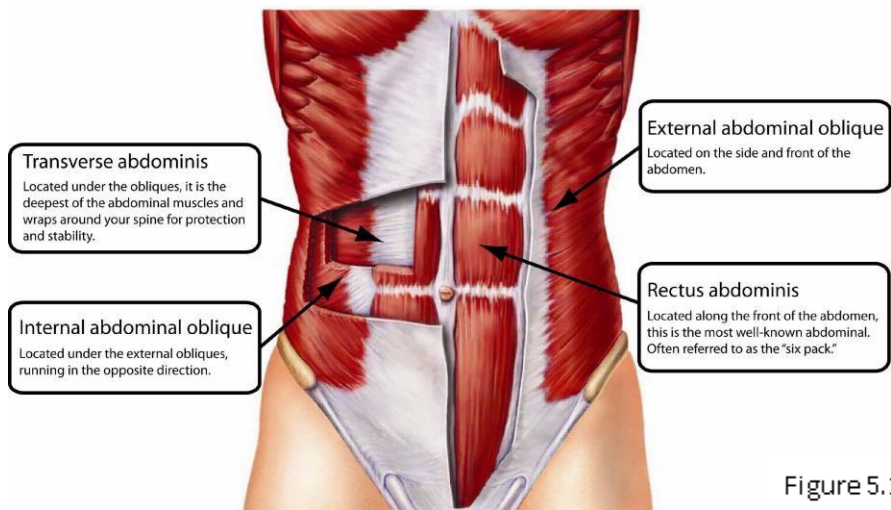


Figure 5.1

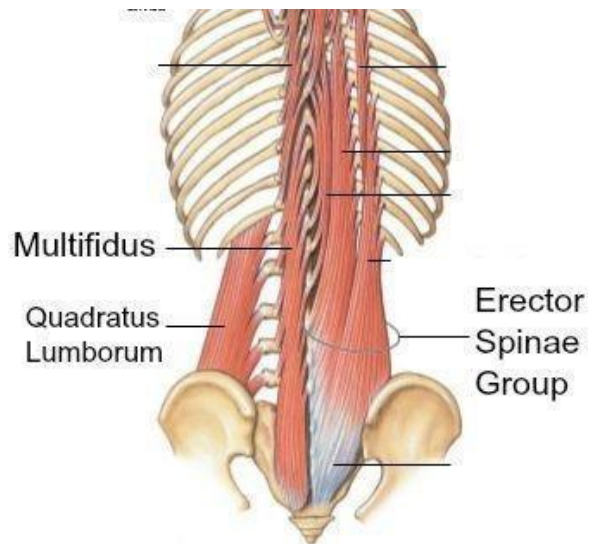


Figure 5.2

KEY 5: Posture and Fibromyalgia

Patients with FM tend to sink in their posture and may even attain forward shoulder posture (kyphosis) due to overall pain. Treating postural disorders could ease muscular and articular rigidity of the spine, which would limit pain and improve one's ability for daily and work activities. Postural alignment of the anterior tilt of the right and left pelvis and thoracic kyphosis is different between those with FM and healthy individuals. (See Figure 5.3)

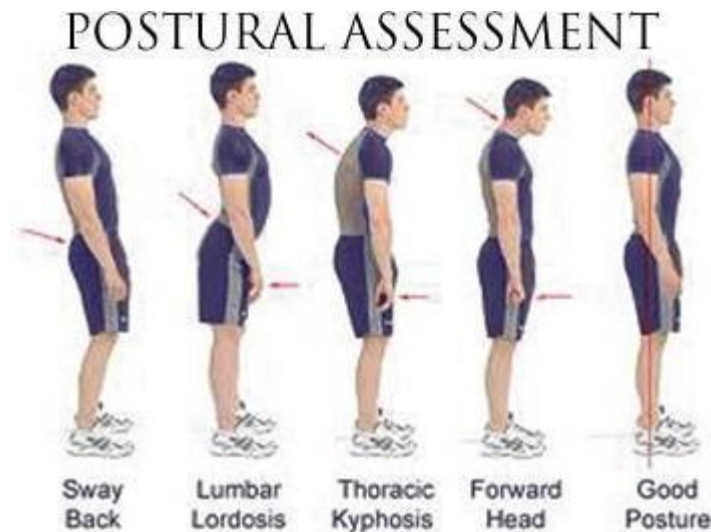


Figure 5.3

Common postural impairments include thoracic kyphosis, increased chest anterior–posterior diameter, shoulder elevation and protraction, and trunk flexion. To improve posture, strengthening and flexibility exercises are recommended for both upper and lower body (including stretching of major muscle groups such as the calves, hamstrings, quadriceps, and biceps, as well as range of motion exercises for the neck, and shoulders and trunk).

Correcting kyphosis in particular leads to straightening of the spine leading to relieving the pressure on the spinal cord that sends pain signals to the brain exacerbating the symptoms of FM. The ability to be balanced in a good posture allows for optimal metabolic rate and contributes to how fast cells exchange. Returning the body to a proper posture can help symptoms disappear.

Key 6: Flexibility and Fibromyalgia

Flexibility is the ability to move a muscle or joint through its full range of motion without discomfort or pain. Flexibility is determined by the range of motion of a given joint or group of joints or the level of tissue extensibility that a muscle group possesses. In other words, each joint and each group of muscles in the body might have a different range of motion (ROM) or a different level of flexibility. Some areas of the body may be very tight, meaning that the muscles feel short and restricted. Some other areas of the body may feel very loose and may be able to lengthen and move freely. For example, one might be very flexible in the hamstrings, allowing him/her to bend over and touch his/her toes. But the thigh (quadriceps) muscles might be tight (inflexible) so it may be harder for one to stand up straight or bend backward. Many people who work in an office all day develop inflexible hips because of sitting all day. This is one of the reasons that health experts recommend standing and moving for a few minutes every hour.

Flexibility Training

Stretching improves flexibility. But it is not absolutely necessary to do hours of stretching to enjoy the benefits of flexibility training. One can take a stretching class or follow an online video that focuses just on stretching exercises to improve the range of motion throughout the body. Flexibility training must begin with a gentle warm-up to increase the body's core temperature. Then, flexibility training progresses through a series of stretching exercises to lengthen the muscles in the feet, legs, hips, torso, and finally up through the head and neck.

Types of Stretching

- **Static Stretching** is a stretch that is held in a challenging but comfortable position for a period of time, usually somewhere between 15 to 30 seconds. Static stretching is the most common form of stretching found in general fitness and is considered safe and effective for improving overall flexibility. However, many experts consider static stretching much less beneficial than dynamic stretching for improving range of motion for functional movement, including sports and activities for daily living.
- **Dynamic Stretching** is a stretch that is performed by moving through a challenging but comfortable range of motion repeatedly, usually 10 to 12 times. Although dynamic stretching requires more thoughtful coordination than static stretching (because of the movement involved), it is favorable in improving functional range of motion and mobility in sports and activities for daily living. Dynamic stretching should not be confused with ballistic stretching which is bouncy in nature. Dynamic stretching is controlled, smooth, and deliberate, whereas ballistic stretching is uncontrolled, erratic, and jerky. Although there are unique benefits to ballistic stretches, they should be done only under the supervision of a professional because, for most people, the risks of ballistic stretching far outweigh the benefits.
- **Active stretching** is stretching a muscle by actively contracting the muscle in opposition to the one being stretched. There is no use of body weight, strap, leverage, gravity, another person, or a stretching device. With active stretching, one relaxes the muscle being stretched and relies on the opposing muscle to initiate the stretch. Active stretching can be challenging because of the muscular force required to generate the stretch but is generally considered lower risk because one is controlling the stretch force with his/her own strength rather than an external force. Active Isolated Stretching (AIS) is another widely used term.
- **Passive stretching** is using some sort of outside assistance to help achieve a stretch. This assistance could be from body weight, a strap, leverage, gravity, another person, or a stretching device. With passive stretching, one relaxes the muscle that is being stretched and relies on the external force to stabilize the body in place. Very little effort is involved in passive stretching; however, there is a risk that the external force is stronger than the individual's flexibility which could cause injury.
- **Proprioceptive Neuromuscular Facilitation (PNF)** is a form of passive stretching. PNF stretching requires stretching a muscle and then forcefully contracting that muscle before stretching it again. As one moves into the stretch after the contraction, one will be able to stretch further than he/she did before. This allows one to create more length in the muscle and receive a greater flexibility benefit from the stretch.

In addition, one doesn't have to take a dedicated class to do flexibility training. Many exercisers simply add a few minutes of stretching to the end of their daily workout to relax muscles and improve range of motion. One could also take 5 to 10 minutes to stretch in the morning after getting out of bed. Just a few minutes of flexibility training each day can provide benefits. When stretching, one should practice

slow and controlled breathing. Not only does proper breathing help to deepen the stretch, but it also helps one to increase lung capacity. One should gently stretch all major muscles to the point of mild discomfort while holding the stretch for 15 to 30 seconds, slowly breathing in and out. Repeat each stretch 2-3 times. Stretching is an effective method to warming up and cooling down before and after workout sessions.

Stretching exercises can help to decrease stress and improve the way the body moves and feels throughout the day. Improved flexibility can even lead to better posture. These benefits help one to move more often throughout the day, burn more calories, and lead a more functional life.

FITT Principle with Fibromyalgia

When prescribing exercise for one with FM, the fitness professional should implement the FITT Principle which is an acronym for *Frequency, Intensity, Time, and Type*. When applying the FITT principle in prescribing exercise for those with FM, the American College of Sports and Medicine Exercise Guidelines (ACSM, 2011) should be implemented.

Frequency: How often or how many times one exercises during the week.

- Endurance/Aerobic Capacity: 3-5 Days Per Week
- Interval Training: 3-5 Days Per Week
- Resistance Training: 2-3 Days Per Week
- Flexibility: 2-3 Days Per Week or After Each Workout

Intensity: How hard one exercises or the level at which heart rate, ventilation, and blood pressure increases to elicit a training response in the body.

- Endurance/Aerobic Capacity:
 - >60% of MHR (Maximum Heart Rate of 220-Age)
 - Borg Dyspnea or Fatigue Score of 4 to 6 (moderate to very severe) (See Chart 5.1)
 - Rating of Perceived Exertion of 12 to 14 (somewhat hard) (See Chart 5.2)
 - Talk Test: Should be able to say a short sentence while breathing heavy and 2-3 stops for a breath
- Interval Training: During the Work Phase <60 Seconds
 - 85-90% of MHR (Maximum Heart Rate of 220-Age)
 - Borg Dyspnea or Fatigue Score of 7-9 (very severe to very, very severe)
 - Rating of Perceived Exertion of 15 to 17 (hard)
 - Talk Test: Able to say one or two words

Shortness of Breath Modified Borg Dyspnea Scale	
0	Nothing at all
0.5	Very, very slight (just noticeable)
1	Very slight
2	Slight
3	Moderate
4	Somewhat Severe
5	Severe
6	
7	Very Severe
8	
9	Very, very severe (almost maximal)
10	Maximal

Chart 5.1

Rating of Perceived Exertion Borg RPE Scale		
6		How you feel when lying in bed or sitting in a chair relaxed.
7	Very, very light	Little or no effort.
8		
9	Very light	Target area when doing general physical activities
10		
11	Fairly light	
12		Target area when doing exercise
13	Somewhat hard	
14		
15	Hard	
16		
17	Very hard	How you felt with the hardest work you have ever done
18		
19	Very, very hard	
20	Maximum exertion	Don't work this hard!

Chart 5.2

- Resistance Training:
 - Initial loads equivalent to either 60 to 70% of the one repetition maximum (i.e., the maximal load that can be moved only once over the full range of motion without compensatory movements)
 - A load that evokes fatigue 8 to 12 repetitions
 - Progressive Overload: The exercise dosage must increase over time to facilitate improvements in muscular strength and endurance. This increase occurs when an individual can perform the current workload for 1 or 2 repetitions over the desired number of 8 to 12, on 2 consecutive training sessions. Overload can be achieved by modulating several prescriptive variables: increasing the resistance or weight, increasing the repetitions per set, increasing the number of sets per exercise, and/or decreasing the rest period between sets or exercises (O'Shea, S.D. et al., 2009).
- Flexibility: Stretch a specific muscle to the point of mild discomfort. No bouncing.

Time: The duration period that one spends during one exercise session.

- Endurance/Aerobic Capacity: 20-60 Minutes
- Interval Training: 20-35 Minutes
- Resistance Training: 1-3 Sets
- Flexibility: Hold each stretch for 15-30 Seconds and Repeat 2-3 Times

Type: The preferred exercise to achieve the specific results for or improvements of Cardiorespiratory Fitness, Muscular Strength and Endurance, and Flexibility. Refer to the section on *Beneficial Types of Exercise*.

Exercise Safety and Proper Exercise Technique

Pre-Exercise: Before starting any form of exercise, one with FM should speak to his/her doctor, nurse or another health care professional to ensure it is safe to exercise. For most people with FM, the best way to learn how to exercise at the right level for him/her is to work with a fitness professional or program referred to by his/her doctor.

Proper Pace: One with FM should try doing a variety of exercises to prevent tiring out one set of muscles too quickly or getting overworked. One should work at a pace that allows one to exercise for longer. For example, one could do some exercises in the morning and some later in the day.

Breathing: When exercising, it is important to remember to inhale in preparation of the movement and exhale on the exertion phase of the movement. An individual should take slow deep breaths and pace him/herself. It is recommended to purse the lips while exhaling. It is not dangerous to feel out of breath when exercising. This is a normal response to exercise, and one will recover. Use the talk test to monitor intensity and level of breathlessness or fatigue. (See the talk test in the intensity section.) Breathing techniques can help one control breathing.

Medication Use: If an individual uses medication for the treatment of FM, he/she should continue to take the medication based on his/her doctor's advice. His/her doctor may adjust the dosage according to the physical activity demands.

Exercise Avoidance: One should take a day off if the FM symptoms are flaring up.

Take Module II Lesson One Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. What is the minimum that one needs to exercise to reduce pain that is associated with fibromyalgia?
2. List 5 benefits of exercise as it pertains to fibromyalgia.
3. List 3 exercise modalities that are best for those with fibromyalgia.
4. Are there any specific exercise limitations for one with fibromyalgia?
5. What is orthostatic intolerance and how can one manage it?
6. What is the proper breathing technique for one with fibromyalgia?
7. According to ACSM guidelines, how many minutes should one perform cardio exercises?
8. According to ACSM guidelines, how many repetitions should one perform when weight training for basic muscular development?
9. When one trains the core muscles, what two components are vital to a healthy core?
10. What is the main posture deviation of one with fibromyalgia?
11. List and define the 5 types of flexibility training?
12. List and define the components that make up the FITT principle.

Lesson Two

Scope of Practice for the Health and Fitness Professional

The health and fitness professional can play a vital role in the overall health and well-being of one who has fibromyalgia. As a health and fitness professional, one should understand the extent of his/her scope of practice and be able to identify when a referral to a healthcare provider would be appropriate to avoid legal implications and potential injuries to his/her clients (Kompf, J., Tumminello, N., and Nadolsky, S., 2014).

The American College of Sports Medicine (ACSM) and the National Strength and Conditioning Association (NSCA) have delineated the specific job description of a personal trainer or health and fitness professional.

According to the ACSM: The ACSM Certified Personal Trainer (CPT) works with apparently healthy individuals and those with health challenges who are able to exercise independently to enhance quality of life, improve health-related physical fitness, performance, manage health risk, and promote lasting health behavior change. The CPT conducts basic preparticipation health screening assessments, submaximal aerobic exercise tests, and muscular strength/endurance, flexibility, and body composition tests. The CPT facilitates motivation and adherence as well as develops and administers programs designed to enhance muscular strength/endurance, flexibility, cardiorespiratory fitness, body composition, and/or any of the motor skill related components of physical fitness (i.e., balance, coordination, power, agility, speed, and reaction time).

According to the NSCA: Personal trainers are health/fitness professionals who, using an individualized approach, assess, motivate, educate, and train clients regarding their health and fitness needs. They design safe and effective exercise programs, provide guidance to help clients achieve their personal health/fitness goals and respond appropriately in emergency situations. Recognizing their own area of expertise, personal trainers refer clients to other healthcare professionals when appropriate. Personal trainers should fulfill a specific role within the healthcare system and as a healthcare provider. Trainers should have a strong knowledge base in kinesiology, psychology, injury prevention, nutrition, and knowledge of simple medical screening tests. Because of this, they may share certain roles with other healthcare providers such as dietitians, physical therapists, doctors, and psychologists.

It is necessary for health and fitness professionals to identify two major components of their profession: research and practical application of that research. In other words, evidence base training must be applied. In addition, the health and fitness professional must take into consideration the population he/she is training and apply proper methodology or intervention.

When working with clients who have FM, health and fitness professionals should focus specifically on exercise screening and prescription. The health and fitness professional can also have general training in injury management, psychology, and nutrition. Given the appropriate educational background, health and fitness professionals may play a role in working with populations with specific medical impairments such as FM.

Injured Clients

Physical therapists and orthopedic specialists work specifically to fix what is broken or severely injured, whereas health and fitness professionals work to enhance what is not broken. Training clients consists of assessing weaknesses and improving upon those weaknesses while working around what is severely injured or broken. Diagnosis and using corrective exercises for injuries is in the scope of the physical therapist and/or orthopedic specialist. The health and fitness professional should follow two criteria when prescribing exercise: 1. Comfort: Movement is pain-free, feels natural, and works within the client's current physiology 2. Control: The client can demonstrate the movement technique and body positioning as provided in each exercise description. To allow for comfort and control, the health and fitness professional may have to modify the range of motion or adjust body alignment to best fit the client's current ability and anatomy.

Psychology and Nutrition Counseling

The personal training profession has a solid base not just in exercise, but in nutrition as well. However, a personal trainer is not qualified like a Registered Dietitian (RD), who can write meal plans for clients. Nutrition is related to psychology in that most clients have a fair and very general understanding of what they need to do to improve their eating habits. The real question is why do they not take the steps to become healthy? Health and fitness professionals should be able to disseminate information on nutrition, serve as counselors to behavior change, and act as a motivator for health change. This can all be done without writing a specific meal plan for a client. Health and fitness professionals can implement an effective change protocol to be used to hasten behavior change.

Medical Care and Special Populations

Practicing medicine is not within the scope of practice for the health and fitness professional. However, there are certain conditions that could be easily screened by a health and fitness professional, especially if a client does not spend much time with their physician or even go to their physician regularly. Health and fitness professionals encourage a healthy all-around lifestyle, which includes diet, exercise, and even sleep. As the obesity epidemic continues, so do the comorbid conditions that accompany it, including osteoarthritis, diabetes, hypertension, and obstructive sleep apnea (OSA). Health and fitness professionals could ask questions from validated questionnaires to know when to refer to a doctor. See the section on "Screening and Assessments".

Table 6.1 provides an overview of what a personal trainer does and does not do. It is important for all health and fitness professionals to be familiar with local bylaws on scope of practice, as they may be different depending on where the health/fitness professional lives.

General Scope of Practice

Fitness Professionals DO NOT:	Fitness Professionals DO:
Diagnose	<ul style="list-style-type: none"> • Receive exercise, health, or nutrition guidelines from a physician, physical therapist, registered dietician, etc. • Follow national consensus guidelines for exercise programs for medical disorders • Screen for exercise limitations • Identify potential risk factors through screening • Refer clients to an appropriate allied health professional or medical practitioner
Prescribe	<ul style="list-style-type: none"> • Design exercise programs • Refer clients to an appropriate allied health professional or medical practitioner for an exercise prescription
Prescribe diets or recommend specific supplements	<ul style="list-style-type: none"> • Provide general information on healthy eating, according to the MyPyramid Food Guidance System • Refer clients to a dietician or nutritionist for a specific diet plan
Treat injury or disease	<ul style="list-style-type: none"> • Refer clients to an appropriate allied health professional or medical practitioner for treatment • Use exercise to help improve overall health • Help clients follow physician or therapist advice
Monitor progress for medically referred clients	<ul style="list-style-type: none"> • Document progress • Report progress to an appropriate allied health professional or medical practitioner • Follow physician, therapist, or dietician recommendations
Rehabilitate	<ul style="list-style-type: none"> • Design an exercise program once a client has been released from rehabilitation
Counsel	<ul style="list-style-type: none"> • Coach • Provide general information • Refer patients to a qualified counselor or therapist
Work with patients	<ul style="list-style-type: none"> • Work with clients

Table 6.1

Scope of Practice for the Medical Fitness Specialist/Fibromyalgia

A fitness professional who has specifically completed the online course titled, Medical Fitness Specialist, or has completed a fitness specialist course focused on a specific chronic disease or medical condition, and through MedFit Classroom, is considered a Medical Fitness Specialist. Through completion of course(s) focusing on a specific condition, the Medical Fitness Specialist has received advanced education and training in that respective medical condition and is qualified to work with clients who have been diagnosed with that respective medical condition. Medical conditions may include, but are not limited to: Alzheimer's disease, arthritis, cancer, diabetes, heart disease, hypertension, lung disease, multiple sclerosis, neuromuscular disorders, obesity, orthopedic disease, Parkinson's disease, mental illness, and type 2 diabetes.

Medical Fitness Specialist courses in MedFit Classroom are considered advanced, continuing education, and do not supplant a general comprehensive fitness certification. Individuals completing a Medical Fitness Specialist course on MedFit Classroom are eligible to earn a Certificate of Specialization once they are able to provide evidence of either a current, general fitness certification, or relevant degree in the field, as well as proof of professional liability insurance.

Medical Fitness Specialists shall first and foremost adhere to the scope of practice as defined by their primary fitness certification, shall also follow all local, regional, state, and/or national regulations (e.g., those defined by their accredited certification organizations, national licensing boards, State licensing and/or registration requirements, primary industry trade organizations, etc.), and shall adhere to the procedures and actions applicable to their credentials.

Medical Fitness Specialists shall not diagnose injury, chronic disease, or any other medical condition, nor provide treatment beyond the scope of their training, and shall refer clients with such needs to properly licensed medical and/or allied healthcare professionals. Medical Fitness Specialists are trained to recognize the signs and symptoms suspicious of a disease process in order to understand when an exercise program should be modified or stopped for the client to seek further evaluation and/or diagnosis.

Clients may be referred to a Medical Fitness Specialist by a licensed healthcare professional (i.e., medical doctor, chiropractic physician, physiotherapist, etc.), to participate in a structured physical exercise program, and/or to begin behavioral change programs (e.g., dietary or mental health). This may also include clients who seek a referral for a specific health or fitness goal and have taken it upon their own merit to begin an exercise and/or behavior change program.

To ensure coordination of care, Medical Fitness Specialists are trained to competently communicate in written, verbal, and/or HIPAA-secure electronic formats with other allied health professionals or healthcare professionals. Medical Fitness Specialists' communication with, and education of, their client about medical fitness, and/or about a client's diagnosed medical condition(s), should stay within the scope of their own specific Medical Fitness Specialist course credentials (i.e., specific to the condition in which the Medical Fitness Specialist was trained).

Medical Fitness Specialists are trained to recognize when it is appropriate to refer their client to a licensed healthcare professional, as well as how and to whom their client needs to be referred. For example, Medical Fitness Specialists should refer their client for the following scenarios:

1. A current client who demonstrates symptoms and signs of an undiagnosed condition or is experiencing an exacerbation or worsening of a current medical condition.
2. Or a prospective or current client who would be placed at risk if physical exercise or behavioral change programs were started or continued.

Medical Fitness Specialists are also trained to take a thorough health history, monitor their client through accurate record-keeping and, once again, to work within the scope of their respective education and training. They understand how to create progressive exercise programs for respective medical conditions, monitor and assess the success of a program, make modifications when necessary, and monitor for circumstances that demand the cessation of the program, and/or referral to an appropriate healthcare professional.

Ultimately, the primary goal of a Medical Fitness Specialist is to responsibly guide a client through a medical fitness program that creates improvements in overall health and wellness, consistent with the goals of both the client and their healthcare team.

Take Module II Lesson Two Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. Which course of action should a fitness professional take when a client complains of pain lasting longer than 7-10 days?
2. Name the TWO most important criteria when prescribing exercise.
3. Within the General Scope of Practice of the Fitness Professional chart, fitness professionals do not treat injuries or medical conditions, but they do prescribe _____.
4. Would a personal trainer having a personal relationship with the PT Manager be considered a conflict of interest? WHY?

Lesson Three

Screening and Assessments

Fibromyalgia is recognized as a polysymptomatic syndrome with pain as the predominant symptom. Fibromyalgia patients show a reduced functional capacity compared to age-matched healthy peers, and similar to healthy older adults. Some physical fitness tests can discriminate between fibromyalgia and non-fibromyalgia females. Before starting an exercise training program, an exercise assessment is needed to individualize the exercise prescription.

When working with individuals with FM, the health and fitness professional will still measure the traditional core components of fitness such as cardiorespiratory fitness, muscular strength and endurance, flexibility, and body composition.

PAR-Q Form

The health and fitness professional should have an established screening protocol including a physical activity readiness questionnaire (PAR-Q) which should be conducted before any cardiorespiratory or strength training. The PAR-Q is a screening test designed to determine an individual's risks in participating in physical activity. The PAR-Q allows the health and fitness professional to identify clients with cardiovascular disease or risk factors for disease. If a client is identified as "at risk" they should be referred to a medical professional who will provide a medical evaluation before beginning an exercise program. (See Appendix A)

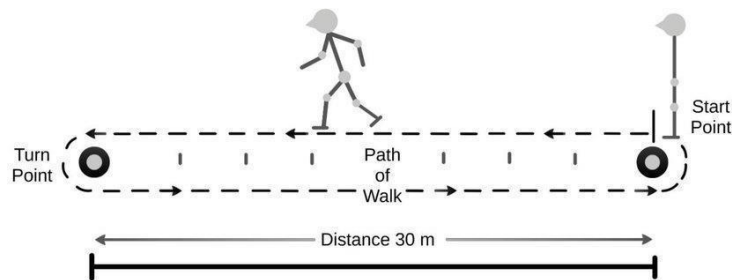
Fibromyalgia Impact Questionnaire

The Fibromyalgia Impact Questionnaire (FIQ) is an assessment and evaluation instrument developed to measure fibromyalgia (FM) client status, progress, and outcomes. It has been designed to measure the components of health status that are believed to be most affected by FM.

The FIQ is composed of 10 items. The first item contains 11 questions related to physical functioning – each question is rated on a 4-point Likert type scale. Items 2 and 3 ask the client to mark the number of days they felt well and the number of days they were unable to work (including housework) because of fibromyalgia symptoms. Items 4 through 10 are horizontal linear scales marked in 10 increments on which the client rates work difficulty, pain, fatigue, morning tiredness, stiffness, anxiety, and depression. (See Appendix B)

Cardiorespiratory Assessment: Six-minute walking test (6MWT)

The 6-min walk test (6 MWT) is a submaximal exercise test that entails measurement of distance walked over a span of 6 minutes. The 6-minute walk test (6 MWT) provides a measure for integrated global response of multiple cardiopulmonary and musculoskeletal systems involved in exercise. Main strengths of the 6 MWT stem from its simplicity in concept and performance, low cost, ease of standardization, and acceptance by test subjects, including those who are deconditioned, elderly, or frail.



In 2002, the American Thoracic Society (ATS) published guidelines on how to perform the 6 MWT. This guideline stressed the need for a standardized protocol to perform the 6 MWT to minimize variation in results. (See Appendix C)

Muscular Strength: Peripheral muscle strength

● Lower Body Strength

- 30 Second Sit to Stand Test (30CST): The 30CST is a measurement that assesses functional lower extremity strength in older adults, but is also used in assessing functional strength in those with FM. It is part of the Fullerton Functional Fitness Test Battery. This test assesses balance, functional mobility, as well as lower body strength. (See Appendix D)



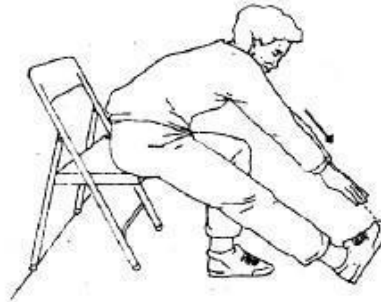
● Upper Body Strength

- Dynamometer: A dynamometer is a machine that measures hand grip strength (HGS). Both muscle endurance and muscle strength are indicators of muscular fitness, and reduced muscle strength – measured by HGS with a dynamometer – has been associated with a higher risk of mortality.
- Arm Curl Test: This test measures upper body strength and endurance through lifting a weight for 30 seconds. Typically, women will lift 4-5 lbs. and men will lift 8 lbs. (See Appendix E)



Flexibility

- **Lower Body Chair Sit and Reach Test:** This test measures flexibility in the lower body. The client, while seated with one leg extended, slowly bends forward sliding the hands down the extended leg in an attempt to touch (or pass) the toes. The number of centimeters short of reaching the toe (minus score) or reaching beyond it (plus score). (See Appendix F)



- **Upper Body Back Scratch Test:** This test measures flexibility of the upper body, more specifically a measure of overall shoulder range of motion. This test involves measuring the distance between (or overlap of) the middle fingers behind the back with a ruler. Participants can perform this test twice, alternating hands taking the best value of each hand. The average of both hands can be used. (See Appendix G)



Postural Screening

There are many methods used to measure or screen posture. One method called photogrammetry is the science of making measurements from photographs. The input to photogrammetry is photographs, and the output is typically a map, a drawing, a measurement, or a 3D model of one's body alignment. Photogrammetry is a widely used non-invasive technique for postural evaluation. It is a viable option for healthcare professionals and researchers in the field of posture, possibly because it allows a succinct and accurate quantitative evaluation by recording subtle changes in posture in general.

From the point of view of spinal evaluation, it is capable of providing information in the frontal and sagittal planes. In this method, photographs of the subjects are taken in the frontal or sagittal plane with a camera which is mounted on a leveled tripod stand, which is placed at some distance from the subjects. This distance varies amongst various researchers. The photographs which are thus obtained are transferred to a computer system. They are used to calculate postural angles with the help of some software which has been installed in the computer system.

The type of software too varies from research to research. Angles are then drawn between the markers by drawing horizontal and/or vertical lines. With the use of this method, quantifiable and reliable data can be obtained. Its use in measuring head posture, shoulder posture, cervical lordosis, thoracic kyphosis, lumbar lordosis, lower limb posture and pelvic tilt has been reported in the literature (Furlanetto, T. S., 2016). (See Figure 7.1)

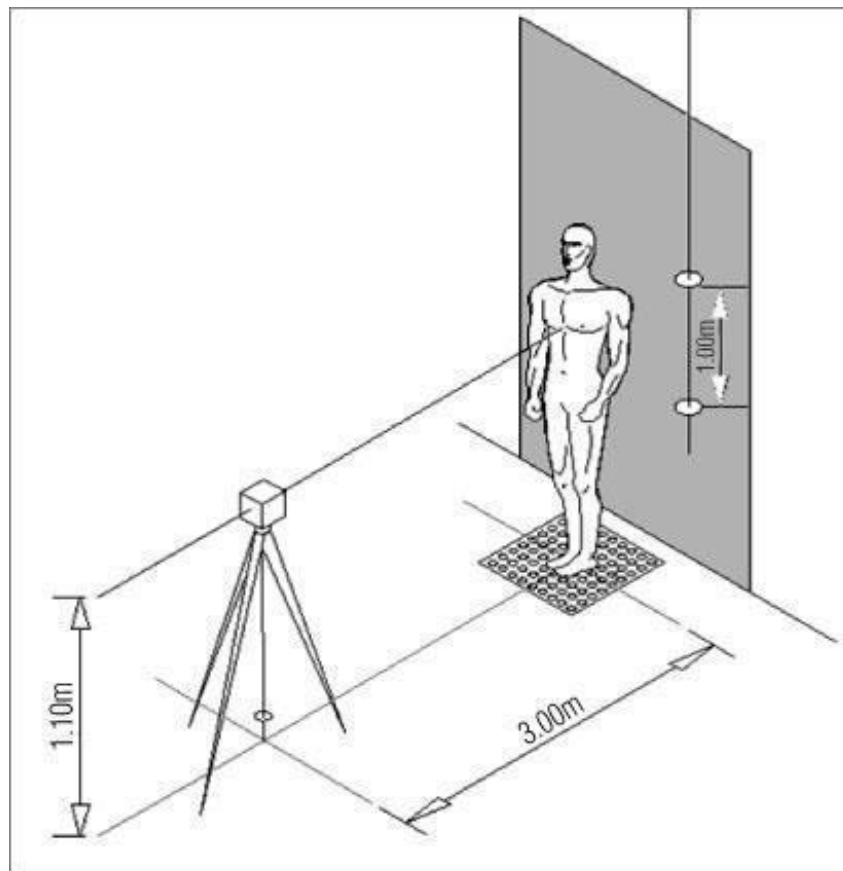


Figure 7.1

Another posture assessment used is the plumb line method. A plumb line is a string suspended overhead with a small weight, or plumb bob, attached at the end near the floor. The client is positioned behind the line so the body can be seen bisected by the plumb line. The assessor observes the individual from the anterior view, the lateral view, and the posterior view. The assessor then uses a checklist to record any deviations from normal. (See Figure 7.2)

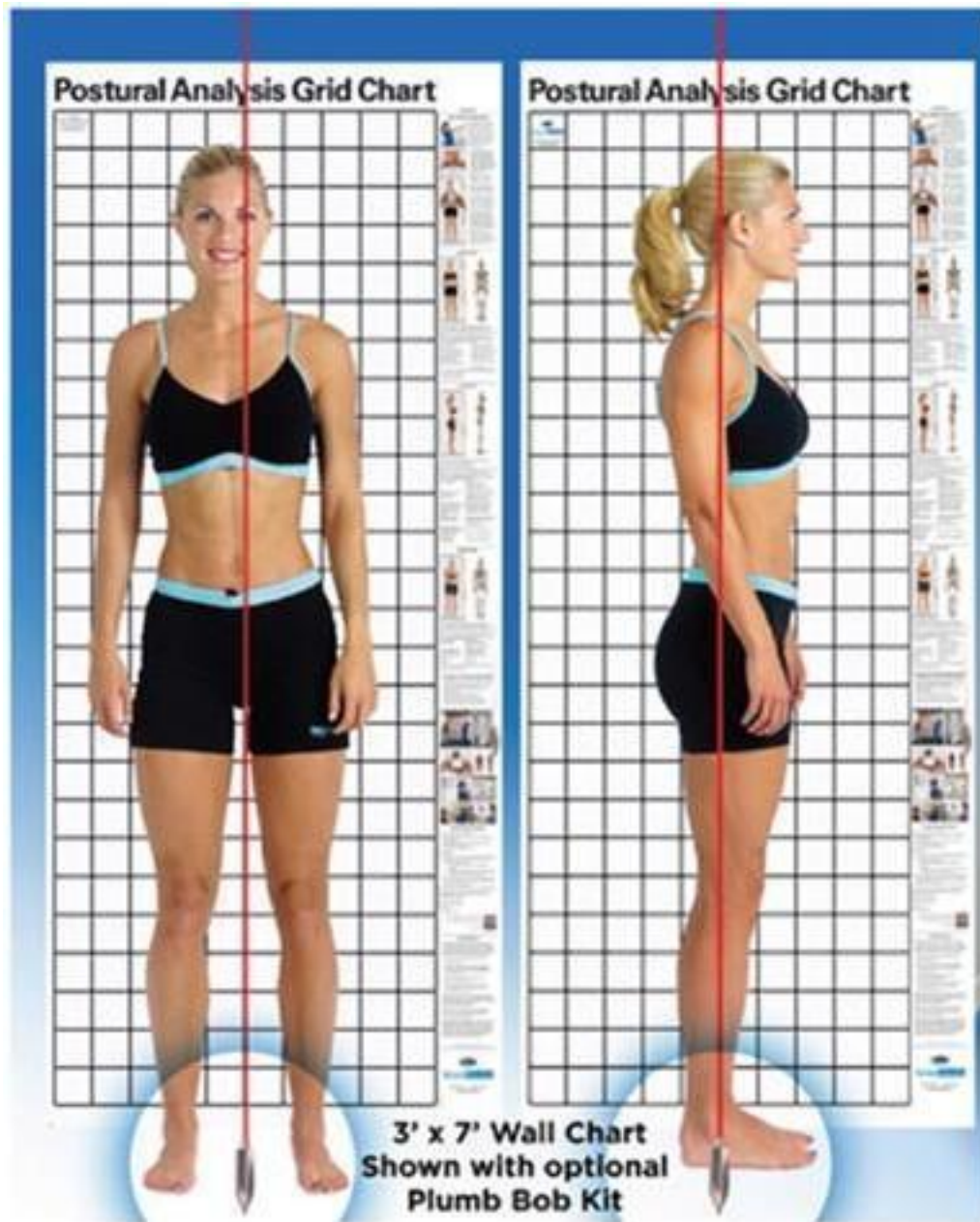


Figure 7.2

Summary

The assessment of clients and program outcomes is a crucial element of an exercise program. Before one should participate in an organized exercise program, a health and fitness professional should measure the condition of clients, including symptoms, endurance, strength, and health-related quality of life. As well as during and after a certain time of training, the health and fitness professional should reassess patient performance and program effectiveness. If working with a health and fitness professional, the client should foster an open line of communication between the health and fitness professional and his/her doctor.

Module II Lesson Three Case Study #1



Effectiveness of Therapeutic Exercise in Fibromyalgia Syndrome: A Systematic Review and Meta-Analysis of Randomized Clinical Trials

Sosa-Reina, M Dolores et al. "Effectiveness of Therapeutic Exercise in Fibromyalgia Syndrome: A Systematic Review and Meta-Analysis of Randomized Clinical Trials." *BioMed research international* vol. 2017 (2017): 2356346. doi:10.1155/2017/2356346

[Read entire article here.](#)

Objective

The aim of this study was to summarize evidence on the effectiveness of therapeutic exercise in Fibromyalgia Syndrome.

Design

Studies retrieved from the Cochrane Plus, PEDro, and Pubmed databases were systematically reviewed. Randomized controlled trials and meta-analyses involving adults with fibromyalgia were included. The primary outcomes considered in this systematic review were pain, global well-being, symptoms of depression, and health-related quality of life.

Results

Effects were summarized using standardized mean differences with 95% confidence intervals using a random effects model. This study provides strong evidence that physical exercise reduces pain (-1.11 [95% CI] $-1.52; -0.71$; overall effect $p < 0.001$), global well-being (-0.67 [95% CI] $-0.89, -0.45$; $p < 0.001$), and symptoms of depression (-0.40 [95% CI] $-0.55, -0.24$; $p < 0.001$) and that it improves both components of health-related quality of life (physical: 0.77 [95% CI] $0.47; 1.08$; $p < 0.001$; mental: 0.49 [95% CI] $0.27; 0.71$; $p < 0.001$).

Conclusions

This study concludes that aerobic and muscle strengthening exercises are the most effective way of reducing pain and improving global well-being in people with fibromyalgia and that stretching and aerobic exercises increase health-related quality of life. In addition, combined exercise produces the biggest beneficial effect on symptoms of depression.

Module II Lesson Three Case Study #2



A simple screening test to recognize fibromyalgia in primary care patients with chronic pain

Kim D. Jones PhD, FNP, FAAN, Jonathan H. Aebischer DNP, FNP, Amanda W. St. John DNP, FNP, Ronald Friend PhD, Robert M. Bennett MD.

The Journal of Evaluation in Clinical Practice

First published: 23 October 2017 <https://doi.org/10.1111/jep.12836>

[Read entire article here.](#)

Abstract

Rationale, aims, and objectives

Primary care providers are increasingly expected to recognize and treat fibromyalgia (FM) without significant interaction with rheumatologists. The purpose of this study was to evaluate the potential usefulness of 3 simple measures (tenderness to digital pressure, BP cuff-evoked pain, and a single patient question) as a screening test for possible FM in a patient with chronic pain.

Methods

A total of 352 patients (mean age 50 ± 16.3 years, 70% female) scheduled for routine examination in 2 primary care practices were studied. There were 52 patients (14.8%) who carried a chart diagnosis of FM, 108 (30.7%) with chronic pain but not FM, and 192 who had neither pain nor FM (54.5%). Subjects were assessed for tenderness to digital pressure at 10 locations, BP cuff-evoked pain, and a single question, "I have a persistent deep aching over most of my body" (0–10).

Results

FM patients endorsed the single deep ache question substantially more than those with chronic pain but without FM (7.4 ± 2.9 vs 3.2 ± 3.4 ; $P < .0001$) and exhibited greater bilateral digital evoked tenderness (6.1 ± 3.1 vs 2.4 ± 2.4 , $P < 0.0001$), and BP-evoked pressure pain ($132.6 \text{ mmHg} \pm 45.5$ vs $169.2 \text{ mmHg} \pm 48.0$, $P < 0.0001$). However, on multivariate logistic regressions, the BP cuff-evoked pain became non-significant. On further analyses, a useful screening test was provided by: (1) pain on pinching the Achilles tendon at 4 kg/pressure over 4 seconds, and (2) and positive endorsement of the question "I have a persistent deep aching over most of my body".

Conclusion

These results suggest that 2 tests, taking less than 1 minute, can indicate a probable diagnosis of FM in a chronic pain patient. In the case of a positive screen, a follow-up examination is required for confirmation or refutation.

Take Module II Lesson Three Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. What is a PAR-Q form?
2. What is The Fibromyalgia Impact Questionnaire (FIQ) and how many items are included?
3. What is a good assessment to use to measure cardiorespiratory fitness in those with fibromyalgia?
4. What two assessments are good to measure upper body strength in those with fibromyalgia?
5. What assessment is good to measure lower body strength in those with fibromyalgia?
6. What two assessments are used to measure flexibility in those with fibromyalgia?
7. What two measurements can be used to assess posture in those with fibromyalgia?
8. What is the general exercise guideline for those with fibromyalgia who are just beginning an exercise program?

Lesson Four

Goals and Program Design

Goal Profile

Individuals with fibromyalgia experience painful, tender points, deep muscle pain, fatigue, and sleep problems, so exercise may be one of the LAST things one might want to do. In the past, the medical community believed exercise would worsen the condition of fibromyalgia, exacerbate symptoms, or accelerate the disease. Therefore, patients were encouraged to rest, and not seek or perform activity. However, more recently, exercise is indicated for those with fibromyalgia by the medical community. Whether it is daily walks, swimming, Tai Chi, yoga, strength training, cycling, or Pilates, low-impact exercise programs can help maintain higher levels of well-being with less pain. This is why once the fitness professional has screened and assessed the fibromyalgia client, it is imperative to use this data to set clear and concise goals to track one's health, daily pain levels, and fitness progress.

Goal setting is based on current fitness levels and training objectives. Outcome data that is based on assessments will guide the fitness professional in creating the appropriate exercise prescription.

Determined by the approach one takes toward achieving their fitness goals safely and efficiently. It is helpful for the client to think about the different aspects of his/her life, where he/she would like to make changes and see improvements. Taking a functional approach to training will guide those with fibromyalgia towards meaningful life changes through safe and effective movement.

Taking a functional approach to training is established by determining one's day to day, aka functional, needs, and tasks. Therefore, specific goal setting is one where an individual who may not be able to perform a specific task or activity as a result of an injury or illness but does want to be able to accomplish those skills and tasks again, eventually. Focusing on functional goals based on specific target skills to be acquired should be set in measurable terms.

Some common fitness and training goals for many people with FM include:

- To exercise on a regular basis.
- To exercise pain free.
- To exercise and feel confident doing it.
- To be less short of breath during daily activities.
- To have a joint range of motion, i.e., be able to turn the head easily, use a shoulder or elbow without pain or dysfunction, etc.
- To increase lean mass and muscle strength to withstand injury and illness better.
- Learn how to select and prepare healthy meals.
- Lose or gain weight.
- Get better sleep.
- To have more fluidity in movement.
- To have more energy.
- Increase bone mass for increased strength and stability

- The goals must be **S.M.A.R.T.**
 - Specific
 - Measurable
 - Attainable
 - Realistic
 - Time-Bound

While a health and fitness program will not cure FM, one can take control of his/her chronic condition and manage it to increase the quality of life. He/she should work with his/her healthcare team including the health/fitness professional and focus on reaching the goals he/she sets at the beginning of the program.

Program Design

A comprehensive health and fitness program for those with FM should include cardiorespiratory exercise, strength training, core conditioning, flexibility training, breathing exercises, proper nutrition, and education. The overall exercise program should include milestones of progression. In other words, as one improves his/her cardiorespiratory fitness and strength, the program should be adjusted to become more challenging to continue improvements. Periodic testing every 3 months will provide data for the health and fitness professional to make concessions for adaptations that have occurred in one's fitness level. The health and fitness professional can use the FITT principle to adjust specific components of the exercises to elicit a continued positive response to exercise.

Exercise Format

Each exercise session should include 5 components: Warm-up, cardiorespiratory exercise, strength exercise, core exercise, and cool-down/stretching. Depending on one's personal schedule and time, he/she can follow different programs to ensure all five components to an exercise session are accomplished during the week.

Warm-Up and Cool-down: Warm up and cool-down are usually 5 to 10 minutes and may involve gentle stretching or exercise at a lower intensity or workload. The warm-up prepares the heart, lungs and muscles for the work to be done during exercise and the cool-down slows and cools everything down after the workout to prevent muscle soreness or injury.

Cardiorespiratory Exercise: Cardiorespiratory exercises like cycling, walking, and swimming should be performed 20-60 minutes per session at an RPE of 12-14 (somewhat hard) 3-5 days per week. If one is incorporating interval training, no more than 3 days a week of intervals should be performed

Strength Training: Resistance exercises should include all major muscles performing exercises at a load that can only elicit 8-12 repetitions for 2-3 sets for 2-3 days per week.

Core Conditioning: The core section of the workout should include exercises that focus on the rectus abdominis, obliques, transverse abdominis, and lower back. Each workout should include a section on core.

Sample Weekly Workout Formats

When first beginning an exercise program, one should introduce exercise at the low end of the intensity recommendations. For example, according to the ACSM Guidelines, healthy adults should exercise with a cardiovascular focus 3-5 days a week for up to 60-minutes at a moderate intensity; strength training 2-3 days a week; and mobility/flexibility 2 times per week.

This template incorporates cardio every session and one strength element at a time (i.e., only upper body on one cardio day, only lower body on one cardio day, and only core on one cardio day). This method establishes a routine so try not to start off with too much too soon, elevating the risk for injury burn out.

See specific client workout templates in Module IV Lesson 4.

Sample #1 Total Body 3 Day/Week						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up		Warm-up		Warm-up		
Cardio 30 min		Cardio 30 min		Cardio 30 min		
Chest		Leg Press		Ball Ab Crunches		
Upper Back		Leg Extension		Forearm Plank		
Shoulders		Leg Curl		Bosu Obliques		
Biceps		Stretch		Bridge		
Triceps				Stretch		
Stretch						

Sample #2 Split Body 4 Day/Week						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Intervals Upper Body Core		Cardio Lower Body		Intervals Upper Body Core		Cardio Lower Body
Warm-Up		Warm-Up		Warm-Up		Warm-Up
Cardio Intervals 20 min		Cardio 45 min		Cardio Intervals 20 min		Cardio 45 min
Chest		Leg Press		Chest		Leg Press
Upper Back		Leg Extension		Upper Back		Leg Extension
Shoulders		Leg Curl		Shoulders		Leg Curl
Biceps		Stretch		Biceps		Stretch
Triceps				Triceps		
Ball Ab Crunches				Ball Ab Crunches		
Forearm Plank				Forearm Plank		
Bosu Obliques				Bosu Obliques		
Bridge				Bridge		
Stretch				Stretch		

Sample #3 Split Body 5 Day/Week						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Intervals Upper Body	Cardio Lower Body	Cardio Core Balance	Intervals Upper Body	Cardio Lower Body		
Warm-Up	Warm-Up	Warm-Up	Warm-Up	Warm-Up		
Cardio Intervals 20 min	Cardio 45 min	Cardio 45 min	Cardio Intervals 20 min	Cardio 45 min		
Chest	Leg Press	Ball Ab Crunches	Chest	Leg Press		
Upper Back	Leg Extension	Forearm Plank	Upper Back	Leg Extension		
Shoulders	Leg Curl	Bosu Obliques	Shoulders	Leg Curl		
Biceps	Stretch	Bridge	Biceps	Stretch		
Triceps		Stretch	Triceps			
Stretch			Stretch			

Take Module II Lesson Four Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. When should the goal setting happen in the client/trainer relationship?
2. What is an appropriate duration for a warmup?
3. “I want to lose 5 lbs.” addresses WHICH of the SMART goals?
4. Is it mobility or is it flexibility that is specific to a joint?
5. How many components are included in a comprehensive fitness design?

Lesson Five

Nutrition and Healthy Weight Management

Another important component of a comprehensive health and fitness program is proper nutrition. This involves choosing healthy foods that can work to heal and repair the body and make it stronger against disease. This section addresses how to eat healthy and achieve a healthy body weight. To educate Americans on the importance of healthy eating and exercise, the USDA and the US Department of Health and Human Services developed the Choose My Plate Food Guide. The Choose MyPlate Food Guide helps one choose the foods and amounts that are healthy and encourages one to be active every day. Food choices and activity level affect one's health – both now and in the future. To adopt a healthy lifestyle and maintain a healthy weight, one should set daily nutrition and activity goals. Living a healthy lifestyle and following the Choose My Plate Food Guide is important for people of all ages, with and without fibromyalgia. One should consult with a registered dietitian about specific nutritional needs. (See Figure 9.1)

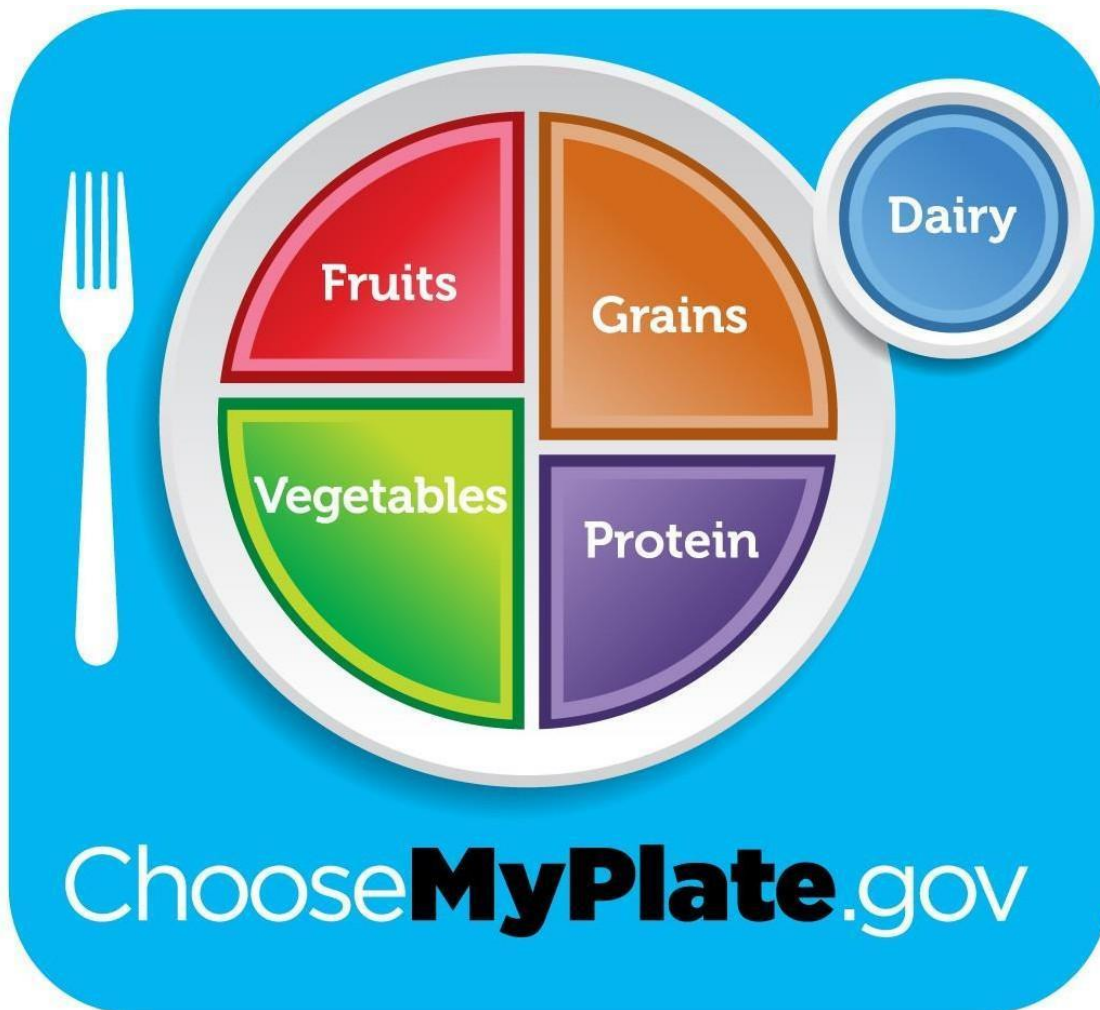


Figure 9.1

10 Tips to a Great Plate

1. **Balance Calories:** Find out how many calories YOU need for a day as a first step in managing your weight. Being physically active also helps you balance calories.
2. **Enjoy Your Food but Eat Less:** Take the time to fully enjoy your food as you eat it. Eating too fast or when your attention is elsewhere may lead to eating too many calories. Pay attention to hunger and fullness cues before, during, and after meals. Use them to recognize when to eat and when you've had enough.
3. **Avoid Oversized Portions:** Use a smaller plate, bowl, and glass. Portion out foods before you eat. When eating out, choose a smaller size option, share a dish, or take home part of your meal.
4. **Foods to Eat More Often:** Eat more vegetables, fruits, whole grains, and fat-free or 1% dairy products. These foods have the nutrients you need for health—including potassium, calcium, vitamin D, and fiber. Make them the basis for meals and snacks.
5. **Make Half Your Plate Fruits and Vegetables:** Choose red, orange, and dark green vegetables like tomatoes, sweet potatoes, and broccoli, along with other vegetables for your meals. Add fruit to meals as part of main or side dishes or as dessert.
6. **Switch to Fat-Free or Low-Fat (1%) Milk:** They have the same amount of calcium and other essential nutrients as whole milk, but fewer calories and less saturated fat.
7. **Make Half Your Grains Whole Grains:** To eat more whole grains, substitute a whole-grain product for a refined product such as eating whole-wheat bread instead of white bread or brown rice instead of white rice.
8. **Foods to Eat Less Often:** Cut back on foods high in solid fats, added sugars, and salt. They include cakes, cookies, ice cream, candies, sweetened drinks, pizza, and fatty meats like ribs, sausages, bacon, and hot dogs. Use these foods as occasional treats not everyday foods.
9. **Compare Sodium in Foods:** Use the nutrition facts label to choose lower sodium versions of foods like soup, bread, and frozen meals. Select canned foods labeled “low sodium,” “reduced sodium,” or “no salt added”.
10. **Drink Water Instead of Sugary Drinks:** Cut calories by drinking water or unsweetened beverages. Soda, energy drinks, and sports drinks are a major source of added sugar and calories in American diets.

Maintaining a Healthy Weight

Achieving and maintaining a healthy weight is an important part of managing FM. Excess body weight can increase an unnecessary added pressure on muscles and joints which may lead to regular flare-ups. Insufficient body weight can decrease the ability to fight infections. A good way to determine if one needs to gain or lose weight is to look at body composition. A male's body fat should be between 10% to 20% of his total body weight whereas a female's body fat should range between 15% and 25% of her total body weight.

Weight Loss

If weight loss is the goal, one should focus on establishing a plan that includes a variety of foods. Avoid using the word “diet” as a diet is something one goes on and then goes off. One should try to make healthy lifestyle changes he/she can maintain for the long term. A healthy rate of weight loss is 1- 2 pounds per week. Rapid weight loss usually results in loss of fluid or muscle rather than body fat.

Here are some weight loss tips:

- Do not skip meals.
- Include 3 food groups with each meal. Limit snacks to designated times (mid-morning/mid-afternoon).
- Limit sweetened beverages to no more than 12 ounces a day. This includes juice, soda, punch, and lemonade to name a few.
- Keep high fat or high sugar foods out of the house.
- Limit serving sizes. Refer to the package for information on serving size.
- Be aware that most of today’s foods come in super-sized versions that are not helpful for weight control. Resist the temptation to order super-size at restaurants. Share an entrée when dining out. Limit use of high calorie condiments such as mayonnaise or salad dressing. Use lower calorie versions instead.
- Increase activity to help strengthen your body and lose weight. Remember what you learned in the exercise section of this book.
- Meet with a registered dietitian (RD) for additional advice on meal planning.

Weight Gain

The best way to gain weight is to eat more. However, it is recommended to eat healthy foods in smaller amounts more often. Here are some tips for weight gain:

- Eat five to six small meals a day and snack whenever you are hungry.
- Keep your favorite foods on hand for snacking and meals.
- Fat is a concentrated source of calories. Small amounts of vegetable oil, butter or margarine can increase the calorie content of any food.
- Use higher calorie versions of foods you eat (butter crackers or cheese crackers instead of soda crackers).
- Avoid “lite” products (skim milk, low fat yogurt and cottage cheese, reduced calorie mayonnaise, low-fat salad dressings, etc.).
- Don’t fill up on fluids. Drink fluids between meals rather than with meals. Drinking during a meal can make you feel full quickly.
- Avoid filling up on low calorie foods like salad at mealtimes; instead eat the heartier foods first.
- Choose nutritious drinks, such as whole milk, milkshakes, and juices. Consider supplemental drinks such as Boost®, Ensure®, or Scandishake®
- Meet with a registered dietitian (RD) for additional advice on meal planning.

Suggested Calorie Boosters

- butter/margarine
- cream cheese
- dried fruit
- dry milk powder
- granola
- honey/sugar
- peanut butter/nuts
- vegetable oi

Mealtime Tips

For someone with FM, doing even simple tasks can take a lot of energy. If one uses all his/her energy preparing a healthy meal, it may be difficult to eat and/or enjoy what has been prepared. Here are a few practical suggestions on how to conserve energy and get the most from mealtime:

- Eat six small meals instead of three big meals. Frequent meals are recommended since many people with FM feel more fatigued when their stomach is full.
- Plan to eat before you are too hungry or tired.
- If you do not have an appetite, use the clock to remind you when it's time to eat. Think of food as medicine and do your best to eat "healthy" foods throughout the day. Try to eat something every 2-3 hours, and do not go longer than 4 hours without eating.
- Breathe evenly while you are chewing and eating. Relax at mealtime.
- When cooking or baking, double or triple your favorite recipes to keep your freezer full for times when you do not feel like cooking. Freeze foods in small portions for when you do not feel like cooking.
- Use prepared foods to save time and energy in the kitchen. Healthy frozen meals, prepared foods or take-out meals from a restaurant can make your life easier. Remember, the sugar, salt or fat content of these foods may be higher than homemade.
- Do the tasks that require the most effort when you have the most energy. For example, many people would agree that grocery shopping is a tiring task. This chore can be done when you feel freshest, in the morning or after a rest. Better yet, make a list and have a friend or family member pick up your groceries for you!
- Don't stand in the kitchen when you can sit. Bring your chopping, cutting and mixing projects over to the kitchen table and sit while you prepare the food or keep a barstool by the kitchen counter.

Module II Lesson Five Case Study



Determining the association between fibromyalgia, the gut microbiome and its biomarkers: A systematic review

Erdrich, Sharon et al. "Determining the association between fibromyalgia, the gut microbiome and its biomarkers: A systematic review." *BMC musculoskeletal disorders* vol. 21,1 181. 20 Mar. 2020, doi:10.1186/s12891-020-03201-9

[Read the entire article here.](#)

Background

The association between fibromyalgia and irritable bowel syndrome is well-established. Alterations in the composition and diversity of the gut microbiome in irritable bowel syndrome have been reported, however, this association is poorly understood in fibromyalgia.

Our aim was to summarize the research reporting on the gastrointestinal microbiome and its biomarkers in people with fibromyalgia.

Methods

A systematic review of published original research reporting on the gastrointestinal microbiota and its biomarkers in adults with a diagnosis of fibromyalgia was undertaken.

Results

From 4771 studies, 11 met our inclusion criteria and were separated into four main groups: papers reporting *Helicobacter pylori*; other gut bacterial markers; metabolomics and other biomarkers, which included intestinal permeability and small intestinal bacterial overgrowth.

Conclusions

The findings of this review suggest the relationship between the gut microbiome and the pathophysiology of fibromyalgia is a largely underexplored area. Despite the limitations of the included studies, there are several indications that associations between the composition and metabolism of the gastrointestinal microbiota and fibromyalgia may exist. As such, well-designed studies that employ the latest technology and accepted diagnostic testing practices while accounting for confounding factors are warranted.

Take Module II Lesson Five Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. What nutritional guideline did the USDA and the U.S. Department of Health and Human Services develop to help individuals select healthy foods and healthy amounts?
2. List 5 tips to a great plate.
3. What is a healthy body fat percentage for a male and female?
4. If one needs to lose weight, at what rate is healthy and is more likely to be more permanent?
5. List 3 mealtime tips to help one maintain a healthy body weight.

Fibromyalgia Fitness Specialist



Module III Business

Lesson One

FM Specialization to Expand and Monetize Your Health/Fitness Career



Why the FM Fitness Specialist Course?

According to the National Institute on Health (NIH), fibromyalgia affects over 5-10 million U.S. adults and an estimated 3-6% of the world population.

While fibromyalgia is most prevalent in women (75- 90% of those with fibromyalgia), it also occurs in men and children of all ethnic groups. The FM community is in desperate need of QUALIFIED and certified personal fitness professionals and trainers who know how to create a proper fitness program for individuals suffering from fibromyalgia symptoms.

Everyday organizations with trainer resources and references available are flooded with requests for qualified trainers. Having the foundational or primary, NCCA-accredited certification, in addition to specialty certifications, it is easier to be successful through specialization.

Specialize in areas that separate you from the crowded landscape of the generalized and homogenous approach to clients and classes in the fitness industry. By becoming an FM Fitness Specialist, you become part of a well-respected worldwide organization, the MedFit Education Foundation. Here you will be supported with educational opportunities

like virtual, live, and in-person educational conferences. Webinars and live events offer the opportunity to connect with other like-minded professionals and create networks that offer referrals.

The Importance of Continuing Education

Getting advanced certifications isn't just about adding credentials to your resume. You are also learning valuable skills that you can apply to your day-to-day job. This can help you become better at tedious tasks that might otherwise be time-consuming or poorly performed. With more information and training, you can also take on new responsibilities for which you are more qualified. This is a really valuable way to obtain promotions and to always be elevating and advancing your career. Continuing education can help you improve job performance. You'll also have special skills your fitness peers don't, helping you stand out from the crowd when it's time for the management team to acknowledge and reward hard work. But hard work is only one important part of climbing the career ladder. Learning new skills and gaining valuable, applicable credentials can make it easier to get more work and do a better job overall.

Career Expansion

Become an expert in the fitness community through obtaining your FM Fitness Specialist credential. Then you will be ready to facilitate the collaboration of academia, with immediate application of the training to build direct pathways between your specialization and your career growth.

Brand Marketability and Image

Brand marketing is promoting a brand's products or services in a way that elevates the brand as a whole. It involves creating and maintaining "brand to consumer" relationships, and marketing brand attributes—the traits that people think of when they picture a particular brand, like Starbucks, Target, or Whole Foods.

Whether you think of yourself as one or not, as a fitness professional, you too are a brand. What you do, say, how you present yourself, how you express yourself, your values, and training habits--all these personal attributes speak volumes about who you are and what you stand for as a brand. People are watching. What do you want to represent to your clients or potential clients about your message, mission, and vision?

Referral Systems and Collaborations

A referral system is a structure that enables a client's health and fitness needs to be comprehensively managed using resources beyond those available at the location they access for fitness. Creating for yourself referral sources is important. As you network and introduce yourself as an FM Fitness Specialist, you will want to think about how you might work with other health and fitness professionals you might find on a patient's fibromyalgia care team. Connect with physicians, clinics, holistic practitioners, physical therapists, etc., as these are the individuals you may find on a comprehensive care team. Know the structure and hierarchy of care and use good judgment when making connections with clients with these referred professionals. Check out their backgrounds, education, google ratings if they sell products or services.

Steps of an Entrepreneur

It's not enough to be a trainer to be successful at being a trainer. You **MUST** develop yourself into an entrepreneur. An entrepreneur is someone who has an idea, and then works to create a product or service that people will buy as a result. An entrepreneur takes on most of the risk and initiative for their new business, and this individual or business is often seen as a visionary or innovator. Common traits for entrepreneurs include:

- Enjoy freedom and flexibility
- Are inventive
- Are goal oriented and ambitious
- Think creatively
- Are fearless
- Problem solvers
- High self-initiative
- Understand basic finance principles



The Entrepreneurial Mindset

Becoming a successful entrepreneur starts with bringing an entrepreneurial mindset to your business venture. The entrepreneurial mindset is a set of skills, beliefs, and thought processes entrepreneurs bring to the task of building a new business. The main elements of this mindset are:

- **Curiosity**
 - An effective entrepreneur questions everything, learns all they can, and is open to new and radical ideas, even if they contradict your most basic assumptions.
- **Independence**
 - There's no precise roadmap to success as an entrepreneur. Turning a new idea into a successful business requires risk taking and an ability to plan your next move without handholding from others.
- **Resiliency**
 - Succeeding as an entrepreneur means not only enduring pressure and failure, but also learning and growing from those experiences.
- **Persuasiveness**
 - To raise money and grow their team, an aspiring entrepreneur needs to be able to confidently sell their business idea to what is often a skeptical audience.
- **Focus on helping others**
 - Entrepreneurs create value by solving problems for the people around them. The best entrepreneurs are focused on creating a positive impact and making money will follow.

Is that you? If you want it to be you, then begin thinking like a business owner more so than a personal trainer. Entrepreneurs come in all shapes and sizes, including small business owners, content creators, startup founders, and anyone who has the ambition to build a business and work for themselves. Examine the few suggestions that can get you started:

- Write down your goals for your training business.
- How do you believe you can reach those goals?
- Create a plan of action.

Running a successful business does NOT happen by accident. Use the following steps to succeed in your new business:

- Decide who your market is.
 - In this case it's FM clients.
- What is the offer you are giving this client base?
- Why should these clients come to you?
 - Credentials, education, experience, personality, compassion, and cost
- Plan a strategy on how to reach that market
- Implement that strategy
 - Social media, local FM community, FM organizations, and personal contacts.
- Stay relevant
 - Stay educated and certified

The Business

There's more than one way to officially set up a business so you can start on the right path, or scale to the next level. You will have many tasks to complete if you want to officially start your own LLC, or simply just set up shop within an existing fitness or medical facility. Choose what is right for your business by getting informed. Choose what's right for your business by learning the differences between an LLC, DBA, and a corporation. What type of corporation do you want to set up?

Setting Up a Limited Liability Corporation (LLC)

How it's unique

- Better for max flexibility in how you manage and run your business; board of directors not required
- Unlimited owners (aka "members") allowed

Protections & taxation

- You're *not* personally on the hook for business liabilities
- Taxed once or twice; you're free to choose which can help minimize taxes

Drawbacks to consider

- Ongoing filings and fees to stay in compliance
- LLCs can't go public
- Not recognized globally; you may be taxed as a corporation in other countries

Doing Business As (DBA)

How it's unique

- Better if you need an easy set-up
- Not an actual legal entity type

Protections & taxation

- You're personally on the hook for business liabilities
- Taxed just once if your business is classified as a sole proprietorship or partnership—you pay on profits in your personal tax return

Drawbacks to consider

- No personal liability protection

INC (Incorporation S and C Corp)

How it's unique

- Best if you plan to go public one day; can issue shares to founders, employees, and investors
- Unlimited owners (aka "shareholders") allowed
- Owners may get preferred stock
- Recognized internationally
- Preferred by investors

Protections & taxation

- You're *not* personally on the hook for business liabilities
- Taxed twice if it's a C corporation—business pays at the corporate level, and shareholders pay on income received
- Avoids double taxation if it's an S corporation

Drawbacks to consider

- Ongoing filings and fees to stay in compliance
- Less management flexibility; must have a board of directors
- More admin; strict rules about holding meetings and keeping records

Check if your company name is available, and file all the required forms to make your business official. You will want to decide on the following:

- Name of Business
- Taxes
 - W-2
 - 1099
- Obtain an EIN Number
- Professional Liability Insurance
- Waiver/Informed Consent
- Marketing
 - Warm Market: Social Media, Blogs, Workshops
 - Gym
 - Allied Health Professionals

Create an Action Plan and use your SMART Goals

1. List what education you need to elevate to become an FM Fitness Specialist.
 - A primary certification is required. It must be an NCCA-accredited certification.
 - Make sure your working knowledge of anatomy and physiology is excellent. This science is very important in understanding how to train and program for those with fibromyalgia. If not, consider an on-line course or a community college course, in which you can apply the college credits towards your certification renewal.
2. List 3 Goals to achieve in the next year to serve the FM community using your SMART goals formula. See examples below:
 - Specific - For example, “I want to become the recognized name in my community as the Fibromyalgia Fitness Specialist”
 - Measurable - I want to have 5 new clients that focus specifically with Fibromyalgia issues in 6-months; once I have this number, I will offer a fitness class
 - Achievable - I have the skill set to teach group exercise classes, so putting together a group FM class is possible
 - Realistic - I have a client base and I have the facility to market and use it for teaching and training.
 - Time Bound - I will make this happen in 12 months.
3. A 1099 worker is an independent contractor whom you pay for a specific task, while a W-2 employee is a person who receives a regular wage or salary for performing a role in your company. What type of employee will you be or hire once your business grows?
4. Liability Insurance
 - Business liability insurance helps cover the cost of injury and property damage claims against a business. It can help pay for medical care, repairing or replacing damaged property and legal fees for covered claims.
 - A liability policy may also cover costs related to errors or misstatements in advertising.
 - Fitness professionals should obtain at least 1 million in coverage; 3 million with employees.

Who needs fitness professional liability insurance?

Whether you are a personal trainer, instructor, or studio owner, fitness professional insurance is a major asset and totally necessary for anyone in the fitness industry. Compared to other businesses that are more sedentary and less physical in nature, the insurance needs of fitness businesses vary. Obtain an insurance plan that can protect small fitness club trainers, instructors, gym owners, as well as many other types of fitness professionals.

Take Module III Lesson One Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. What is the minimal amount of liability insurance an independent fitness professional should hold?
2. What are the main elements of the fitness entrepreneur's mindset?
3. Continuing education is important to establish yourself as a credible expert. What other professional benefits or perks do continuing education opportunities hold?
4. What are the advantages of setting up an LLC over setting up a DBA?
5. When setting up your business, which model is not an actual legal entity?

Lesson Two

Strategies to Market your FM Fitness Specialist Business

WEBSITE/EMAIL

Your website is part of your online calling card combined with Facebook, Twitter, Instagram, etc. Websites must look professionally created. Tell YOUR story and add a section dedicated specifically to the FM community. If you have experience with FM and FM clients, post that on your website. Show what you know and what you have done.

Ways to get more email subscribers through your website and other sources

1. Create a Lead Magnet

- A lead magnet is a digital product that you give to someone visiting your website for free in exchange for their email address.
 - Lead magnets are short, useful, digital content that creates interest and provides value. The lead magnet should be easy to digest, in no more than a few minutes. Too long and it will just sit unused on someone's hard drive. However, it should provide value so that the person consuming the information converts to a client.
- Put the lead magnet "Above the Fold," the place on your website that someone sees when they visit your site before they scroll or navigate around the site.
 - This is an opportunity for you to provide something that solves one of your visitors' main problems before they even look around.
- Use Exit-Intent Pop-Ups:
 - These pop-ups appear when your visitor is about to navigate away from the page. The settings of the web page can detect the cursor navigating away from the page which then signals the pop-up to occur. Using this style of pop-up makes it less likely that you'll lose this visitor forever.
- Promote the Lead Magnet on Social Media

2. Grow a Relevant Email List from Your Sources

Reach out to blog readers, social media followers, personal contacts, website visitors and create a list of prospective clients, members of fitness communities on Facebook Group and Instagram.

Email for Success

1. Communicate on a Regular Basis Consistently

The two most effective time frames to communicate with clients or prospective clients are monthly and/or weekly. Decide how often you want to communicate with your client and stay consistent. The greater the exposure and visibility to your brand name; the greater the chances of conversion.

2. Provide Valuable and Actionable Content in Your Emails

They should contain information which is relevant to your list, and which will provide solutions to their existing problems. For example: 5 Easy Exercises You can do When you Experience a Flare Up.

3. Use a Catchy Subject to Capture Your Audience's Attention

Drafting a good subject line is a great way to get noticed by prospects. The email subject is the first thing your readers will see. If the topic doesn't sound interesting enough, they won't bother to open it and the more that happens the more likely they will start ignoring your emails completely and eventually unsubscribe.

Keep your basic goal in mind: Be clear about offering a discount if that is your goal. If providing exercise tips, be succinct in your message. Words matter. The right words have the best impact. Use high-impact words like ‘quick’ and ‘how to’ to get the “best” results.

Make it time-sensitive: If you’re running a discounted rate for your FM program, then using phrases like ‘for 24-hours only’ is a great way to encourage readers to act on your mail. Include the appropriate landing page link. Avoid just providing your website address. Provide the exact link that includes information on the content of your email, i.e., FM program registration.

4. Personalize the Email

Speak from the heart. People are interested in stories, trials, tribulations, and victories of you and your clients. Include references to how you helped yourself or helped your clients. This will make your FM fitness education more realistic and relatable. Keep your email short and simple. Avoid using technical jargon without sounding patronizing. Graphics generate leads. Images can have the power to attract business. Some research shows that emails with videos and images generate click-through-rates 96% higher than emails that only contain text.

5. Email Signature

Make sure you have your FM Fitness Specialist credentials and your affiliation with MedFit Education Foudation in your email signature. You want people to see what education and affiliations you have without them having to ask.

SOCIAL MEDIA

Social media is key in the success or failure of your FM fitness business. There are now many ways to get yourself and your expertise in front of a worldwide audience through Facebook, Twitter, Instagram, LinkedIn, TikTok, etc. BUT...the posts should be targeted to what you want to say, what you want to offer and to whom you are offering your services.

Ask yourself:

- Who do I want to reach?
- What do I want this market to know about me?
- What am I offering them?

You can NOT expect a “shotgun” approach to social media marketing to be successful. Join a social media platform that reaches the FM target audience.

Set Realistic Social Media Goals:

- Increase Brand Awareness
- Generate Leads and Sales
- Grow Your Brand’s Audience
- Boost Community Engagement
- Drive Traffic to Your Website

BLOGGING/VLOGGING

Blogging first started as a way to have an online personal web log, in which a person would journal about their day. A blog is a type of website where the content is presented in a reverse chronological order (newer content appears first). Blog content is usually in the form of entries or "blog posts." From "web log" came the term "blog."

- Blog vs. Website
 - Blogs are updated frequently
 - Blogs allow for reader engagement
 - A blog can be a website on its own or a part of a bigger site
 - Websites are more static and are organized into pages

Why Blogging is So Popular?

Search engines love new content and blogging provides an easy way to keep your customers and clients up-to-date. A blog allows you to build trust and rapport with your prospects. Blogging engages the reader in a way that can be a two-way communication tool. Blogging is flexible and portable.

Vlogging

A video blog or video log, sometimes shortened to vlog, is a form of blog for which the medium is video. Vlog entries often combine embedded video with supporting text, images, and other metadata. Entries can be recorded in one take or cut into multiple parts. Vlogging can be a great way to show visual content. Obtaining permission from your clients and classes would be necessary before using any photos or video for personal gain.

Starting a Blog

If you've never gone through the process, it can seem intimidating to design your blog, find the right host, create content, and become fluent in SEO. But once you know the process, there's a straightforward path. So much so that there are hundreds of millions of blogs in the world, many with active bloggers posting at least once a month if not weekly.

The only downside to blogs being so easy to create and update is that they are all vying for a limited amount of attention. This means that you will need to create a beautiful blog with insightful content in order to stand out. Moreover, that content needs to be posted regularly because people are drawn to the newest and most relevant blog posts available. By taking the process step-by-step, you can quickly grow your audience and share meaningful content with the world. The necessary steps to manage your blog include setting up the blog, adding content, marketing your content, and ideally, monetizing your blog.

Monetizing Your Blog/Vlog

- Displaying ads. The most popular way to display ads on a blog is via Google AdSense. AdSense, like most ad programs, pays every time a reader clicks on an ad placed in the blog. These ads can be related to FM.
- Affiliate marketing. Another way to increase revenue is through affiliate marketing. There are affiliate marketing sites like Amazon and eBay that pay commissions for every product bought from ad promotions in the blog.
- Membership/Subscription: Charging members by providing member-only content.
- Selling online FM exercise classes.
- Setting up an online store for FM clients.

Blog/Vlog Platforms

- Square Space
- Go Daddy
- Vista Print
- Constant Contact
- Ghost
- Blogger*
- Word Press*
- Wix*

*FREE

WEBINARS

Webinars allow you to reach out to a larger audience where you can boost brand awareness. Webinars offer the opportunity to generate new leads, and nurture quality leads. You can position yourself as an expert in your niche. The purpose for webinars is to teach not present.

Webinars are also effective for:

- Generating a Way to Share New Research and Content
- Engaging YOUR Audience
- Generate NEW Leads
- Build cumulative brand value, directly to FM audience
- Cost Effective Way to Reach Many

Webinar Platforms

- FB Live
- Zoom
- SambaLive
- Go To Webinar
- GlobalMeet

Action Plan

1. What platform will you use to build a website? How much should I budget for this?
2. How long will this take?
3. What Social Media will I use? Where are my clients?
4. Will I blog? If so, what platform will I use?
5. Will I be educated on doing webinars? What platform will I use?



Take Module III Lesson Two Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. Creating a website is an opportunity for the FMS to tell your _____ and share your _____ with FM clients.
2. Explain what a lead magnet is, and WHY they are important.
3. What are the 4 main differences between a Blog and a website?
4. _____ is a form of blog for which the medium is video.
5. Which platform would you use for posting content on social media? Why?

Lesson Three

How to Network and Formulate Local and National Relationships to Expand your Reach

Work with Local FM Organizations to Build Client Base

If you want to be successful as an FM Fitness Specialist, your local FM community must know you are there. Get connected to the local FM groups and organizations. Attend targeted networking events. Unless you are there for strictly educational purposes, nothing says waste of time quite like attending networking events where your main audience is your competition. That is if your goal is to expand *your* reach and gain clients. Make sure you're being strategic when choosing what networking events you attend by choosing events and organizations that your target audience has a reason to attend.

Reach out after and offer a NO COST "seminar" on the importance of fitness in managing FM. For example, you could initially give NO COST programs under the group or organization, so you win their confidence in you. This will help you build rapport, gain confidence, and eventually meet new clients and referrals.

If your target market is local, volunteering for a position in front of the attendees (like sign in person, list builder, event planner, marketing person, etc.) will not only keep you in the spotlight in front of your audience but will give you an opportunity to interact with the audience themselves, so that you can connect later. Just make sure you're not expected to be tied to a table for the entire event.

Work With Local Allied Health Professionals

It's important for the local neurologists, chiropractors, FM clinics, hospitals and other health professionals and practices to know you are an FM qualified trainer. Keep your headshots and resume up to date because business cards and brochures are considered must-have tools.

- Create an FM specific brochure that mimics your FM page on your website.
- Once you develop the connection, you can ask to be listed on the health professional website as their go-to FM Fitness Specialist.

You should put the time into these relationships. You can have hundreds-thousands of clients referred to you as an FM Fitness Specialist. Use your website as a resource and your Facebook group as a platform for FM fitness education all because of relationships.

Offer Community Workshops

- Develop an FM fitness workshop that you can bring to the community under your brand.
- Facilitate a 12-Week Challenge and/or Training Camp
- Offer complimentary sessions, a chance to meet new potential clients. Be sure to make this offer to qualified clients, or those individuals who can pay you for your services.

Connect with Social Media Connections

Use social media to your advantage. But choose the social media platform that your target market is using. For example, you would not choose Twitter to connect to your audience, if your target market is not tweeting, has no idea what a “Twitter” is and has no interest in ever interacting on Twitter. Rather, make sure that you're on the social media sites that they are frequenting. Ask questions, be there to answer them, reach out to people using it as a forum to engage and expand. Join groups that might be looking for your knowledge, not groups of your colleagues, again unless you are there to educate yourself and search for strategic alliances. For example, if your purpose is to connect with chiropractors, find chiropractic sites that these doctors are on already and form relationships there by asking questions, looking for a need (read the feeds!) and be there to be an expert on that “need” with either a comment, a link to your blog or a question.

Form Strategic Alliances

You are an FM Fitness Specialist, and your strategic alliances and sphere of influence are, for the most part, chiropractors, physical therapists, and physicians. Create alliances to benefit both of you, by either having a link placed on each other's websites, or by having the chiropractor send out an email from *her/his* list talking you up, endorsing you, and offering a wonderful incentive. In addition, your strategic partner could promote a new program you're running and add a link right in the email which will bring them directly to a landing page you've set up specifically for this service, with a call to action and an obvious opt-in.

Guest Blogging to Increase SEO

SEO stands for “search engine optimization.” In simple terms, it means the process of improving your site to increase its visibility when people search for products or services related to your business in Google, Bing, Yahoo, and other search engines. The better visibility your pages have in search results, the more likely you are to garner attention and attract prospective and existing customers to your business. Guest blogging, also called “guest posting,” is the act of writing content for another company's website. Generally, guest bloggers write for similar blogs within their industry to:

- Attract traffic back to their website
- Boost their domain authority using external links to high-authority domains
- Increase their brand credibility and awareness
- Build relationships with peers in their industry

How Does an SEO Work?

Search engines such as Google and Bing use bots to crawl pages on the web, going from site to site, collecting information about those pages and putting them in an index. Think of the index like a giant library where a librarian can pull up a book (or a web page) to help you find exactly what you're looking for at the time. This type of content building will help you establish yourself as the expert and authority on FM. Featuring guest bloggers gives you fresh content and new perspectives which also increases SEO.

The MFN Relationship

The MedFit Network (MFN) will help you make connections. After the exam is passed and the MFN public profile page is 100% complete, the network connections will begin. MFN will spotlight you on social media and feature/promote you to the FM community in a 20-mile radius of your zip code (once the exam is passed and your public profile 100% complete). A video instruction offering you information on the benefits of being an MFN member, the advantages, resources available, and how to set up your profile page.

Action Plan

In order to become registered with the MFN Network, follow the steps below.

1. Become an FM Fitness Specialist
2. Get Connected with local FM Organization
3. Get Connected with One FM Facebook Group
4. Develop One Allied Health Professional Relationship



Take Module III Lesson Three Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. Networking with local health-care professionals is useful for growing your business in your community. T/F
2. 1:1 sessions and group-classes are events that can increase your social media, or local presence and can be advertised on your _____ page.
3. Having a guest write on your web site or blog is referred to as _____.
4. MFN will spotlight you on social media and feature/promote you to the FM community within a 20-mile radius of your zip code once your exam is passed and your public profile 100% complete. T/F
5. What are the benefits of SEO's?

Fibromyalgia Fitness Specialist



Module IV









Movement/Exercise Library











Lesson One









Body Weight (BW) Floor Exercises











The following exercises are ideal for those with fibromyalgia. The movements consider joint mobility, equipment portability, and scalability in offering options and modifications. Each exercise in the library has an accompanying video. Each of the three (3) program design templates have coaching ideas, rationale for exercise selection, and methods to implement the training that will be highlighted.

Body Weight (BW) Floor


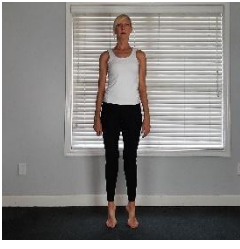

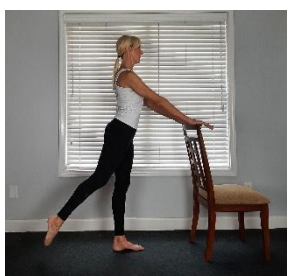




Name	Purpose	Description	Start/Finish Position	Middle Position
Supine Toe Taps Bilateral	To condition and strengthen the core muscles in addition to promoting pelvic stabilization.	Lay supine with legs in table-top. Arms are anchored on the floor next to the body. Imprint the lower back to the floor. With knees and feet together at 90, unhinge at the hips lowering both feet to the floor. Tap the toes to the floor and return legs back to table-top.		
Supine Toe Taps Alternating	To condition and strengthen the core muscles in addition to promoting pelvic stabilization.	Lay supine with legs in table-top. Arms are anchored on the floor next to the body. Imprint the lower back to the floor. With knees and feet together at 90, unhinge at the hips lowering one foot to the floor. Tap the toe to the floor and return the leg back to table-top. Switch legs and continue to alternate.		
Knee Drops	To condition and strengthen the core muscles while promoting scapular stabilization. Emphasis is placed on the oblique muscles.	Lay supine with legs in table-top. Arms are anchored on the floor in a "T" position. With knees and feet together at 90, lower the knees to the side as low as you can without touching the floor. Return the legs back to table-top and lower to the other side. Continue to alternate sides.		
Dead Bug/Dying Bug	To condition and strengthen the core muscles while promoting pelvic stabilization.	Lay supine with legs in table-top. Arms are reaching up towards the ceiling directly above the shoulders. Anchor the shoulders and imprint the lower back to the floor. Extend the right arm overhead while simultaneously extending the left leg out keeping the lower back imprinted. Return and switch sides. Continue to alternate opposite arm and leg.		

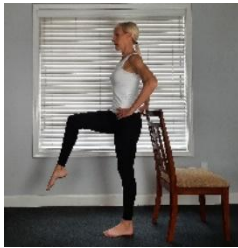
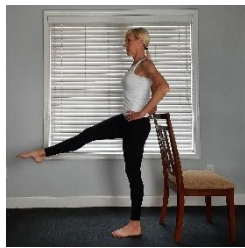
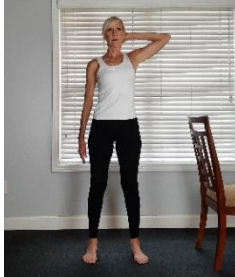
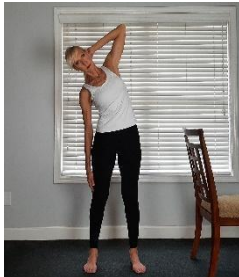

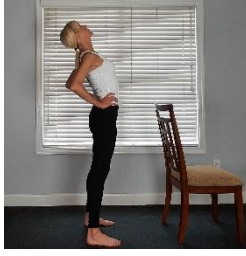

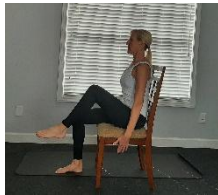
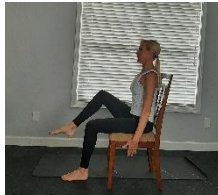
Name	Purpose	Description	Start/Finish Position	Middle Position
Push-Ups	To strengthen the upper body muscles while promoting core stabilization.	Begin in a plank position with the hands spread out beyond the shoulders either on the toes or on the knees. Bend the elbows lowering the entire body to the floor leading with the chest. Press the body away from the floor back to the beginning position. Repeat.		
Single Leg Stretch (5 Ab Series)	To stretch the legs and strengthen the abdominals while emphasizing core stabilization.	In a supine position, imprint the lower back. Head and shoulders are lifted off the floor in forward flexion. One knee is hugging towards the chest. The other leg is extended off the floor. Switch legs, bringing the other knee to the chest and extending the other leg out over the floor. Continue to alternate.		
Double Leg Stretch (5 Ab Series)	To stretch the legs and strengthen the abdominals while emphasizing core stabilization.	In a supine position, imprint the lower back. Head and shoulders are lifted off the floor in forward flexion. Both knees are hugging towards the chest. Extend the arms overhead while simultaneously extending the legs out 45°. Circle the arms around and pull the knees back into the chest. Repeat.		
Single Straight Leg Stretch (5 Ab Series)	To stretch the hamstrings and strengthen the abdominals while emphasizing core stabilization.	In a supine position, imprint the lower back. Head and shoulders are lifted off the floor in forward flexion. One leg is extended straight up towards the ceiling with the hands holding as close to the ankle as possible. The other leg is extended off the floor. Pulse the up leg twice towards the face and switch legs. Pulse the other leg twice towards the face and switch legs. Continue to alternate.		
Double Straight Leg Stretch (5 Ab Series)	To stretch the legs, strengthen the glutes and adductors, and strengthen the abdominals while emphasizing core stabilization.	In a supine position, imprint the lower back. Head and shoulders are lifted off the floor in forward flexion. The hands are behind the head supporting the head and neck. Both legs are together extended straight up towards the ceiling. Lower the straight legs down as low as possible without arching the back, then return to start. Repeat. (modify with bent knees)		



Name	Purpose	Description	Start/Finish Position	Middle Position
Criss Cross (5 Ab Series)	To stretch the legs and strengthen the rectus abdominis and obliques while emphasizing core stabilization.	In a supine position, imprint the lower back. Head and shoulders are lifted off the floor in forward flexion with hands supporting the head and elbows wide. One knee is flexed towards the chest. The other leg is extended straight out off the floor. Keeping the elbows wide, rotate the torso towards the bent knee. Rotate the body to the other side while simultaneously switching legs bending the other knee in and extending the opposite leg out. Continue to alternate sides.		
4-Point Balance	To lengthen the spine while emphasizing core stability and balance.	Begin in table-top position on all fours with hands directly under the shoulders and the knees under the hips. Extend the right arm out overhead in line with the shoulders while extending the left leg straight out behind in line with hips. Hold and then switch sides. Continue to slowly alternate opposite arm and leg.		
Back Extension	To lengthen the spine and emphasize healthy posture.	Begin in a prone position on the floor with the head resting to the right and the arms are extended down along side the body. Keeping the feet on the floor, lift the torso off the floor moving the chest away from the floor. Lower the body to the floor turning the head to the left. Continue to lift and lower the torso while alternating sides with the head.		
Bridge	To strengthen the glutes and hamstrings while focusing on articulation of the spine.	Begin in a supine position with the knees flexed, feet firm on floor hip-width apart; low back in neutral. Curl the pelvis under and articulate the spine one vertebra at a time while lifting the hips high towards the ceiling. Pause. Articulate the spine down one vertebra at a time to return. Repeat.		

Name	Purpose	Description	Start/Finish Position	Middle Position
Clam	To strengthen the abductor muscles gluteus medius and minimus while stabilizing the core.	Begin in a side-lying position with the head resting on the arm, hips are stacked, the knees are stacked and bent, and the feet are together. Keeping the feet together and the knees bent, abduct the leg opening up the hips like a clam. Then return. Repeat.		
Side Lying Leg Circles	To strengthen the gluteus maximus, medius, and minimus in addition to adductors and abductors.	Begin in a side-lying position with the head resting on the arm, hips are stacked, and the legs are extended straight underneath the body. Lift the top leg where the leg is hip level. Circle the leg 10 times in one direction, then circle the leg 10 times in the opposite direction. Maintain stability in the hips.		
Side Plank	To strengthen the core muscles specifically the obliques.	In a side-lying position, one arm is fully lengthened directly under the shoulder and the other is lengthened towards the ceiling. The legs are fully lengthened with one foot staggered in front of the other. The hips are lifted off the floor. Hold for 30 seconds. Variations: Knees stacked on the floor or forearm on the floor.		
Front Plank	To strengthen the core muscles while emphasizing hip/pelvic stabilization.	Position the body in a prone position with the arms fully lengthened and the hands directly under the shoulders. The legs are fully lengthened with the knees lifted off the floor. The body is in a solid diagonal line from the crown of the head to the feet. Variations: Knees on the floor or forearms on the floor.		
Cat/Cow Stretch	The lengthen and stretch the erector spinae and abdominal muscles while focusing on balance.	Begin in table-top position with pelvis neutral and on all fours with hands directly under the shoulders and the knees under the hips. Round the body by flexing the spine, curling the chin towards the chest and curling the pelvis under. Then arch the back sinking the abdominals to the floor lifting the tailbone to the ceiling as well as the chin. Repeat.		

Standing

Name	Purpose	Description	Start/Finish Position	Middle Position
Calf Raises	To strengthen the gastrocnemius, glutes, and adductors while emphasizing core stability.	In standing position, place the feet with the heels together and the toes turned out into a "V" position. Lift the heels off the floor squeezing the glutes. Imagine that you are zipped from the heels all the way to the top of the glutes. Slowly lower the heels back down to the floor. Repeat. Variation: Hold onto a chair for balance.		
Leg Lifts (Hip Extensions)	To strengthen the glutes, while emphasizing core stability.	Stand with the feet together. Extend the hip lifting and lengthening the leg straight back behind you. Engage the glute, pause, and lower the leg back down. Repeat same leg for reps or time then switch to the other leg. Variation: Hold onto a chair for balance.		
Side Leg Lifts	To strengthen the abductor muscles in addition to the gluteus medius and minimus.	Stand with the feet together. Abduct one leg to the side while balancing on the other leg. Engage the glute, pause, and lower the leg back down. Repeat same leg for reps or time then switch to the other leg. Variation: Hold onto a chair for balance.		
Side Fire Hydrants	To strengthen the abductor muscles in addition to the gluteus medius and minimus.	Stand with one knee flexed while balancing on the other foot. Abduct the bent leg to the side while balancing on the other leg. Engage the glute, pause, and lower the leg back down. Repeat same leg for reps or time then switch to the other leg. Variation: Hold onto a chair for balance.		

Name	Purpose	Description	Start/Finish Position	Middle Position
Quad Lift	To strengthen the quadricep muscles.	Stand on one leg. Flex the hip of the other leg and begin with the knee flexed. Extend the leg in front, pause while contracting the quadriceps. Flex the knee back to start. Repeat same leg for reps or time then switch legs. Variation: Hold onto a chair for balance.		
Side Bend	To strengthen and lengthen the oblique muscles.	Stand with feet hip-width apart. One arm is lengthened down alongside the body and the other arm is bent with the hand resting behind the head. Laterally flex the spine to one side lengthening the long arm further down the side of the body. Return to start. Repeat for reps or time.		
Standing Back Extension	To lengthen the spine and emphasize healthy posture.	Stand with feet hip-width apart with hands placed behind the small of the back and the elbow are facing backwards. Lean back from the hips and lift the collar bones towards the ceiling lengthening the spine. Avoid arching the back and instead, think of extending the spine. Return. Repeat for reps or time.		
Seated				
Name	Purpose	Description	Start/Finish Position	Middle Position
Seated Alternating Toe Taps	To strengthen the abdominal muscles while emphasizing core stabilization.	Sit tall in a chair. Flex one hip lifting one foot off the floor about 12 inches. Keep the knee bent at 90. Lower the foot down and switch legs. Continue alternating legs in a slow marching style.		 

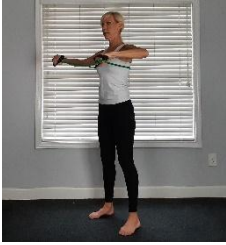


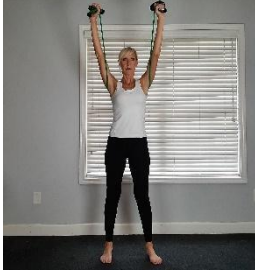
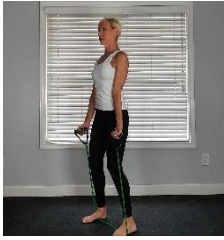
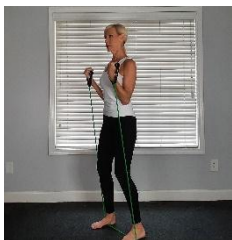
<p>Seated Crunches</p>	<p>To strengthen the abdominal muscles while emphasizing core stabilization.</p>	<p>Sit tall in a chair with the hands placed on the chair next to the hips. Lean back lifting the knees towards the chest. Extend both legs out as far as you can then return the knees back to the chest. Repeat for reps or time.</p>		
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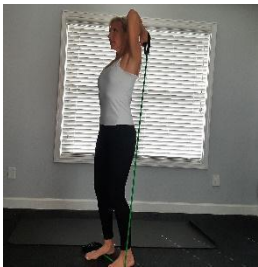
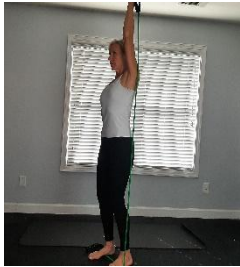
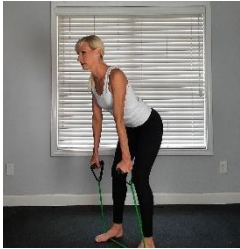
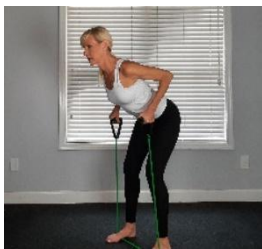
Lesson Two

Resistance Band Exercises

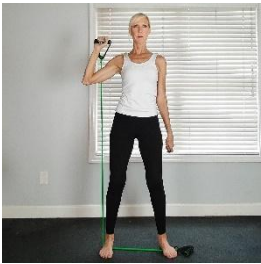
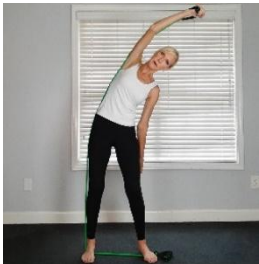
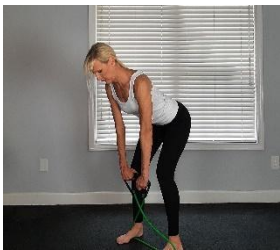
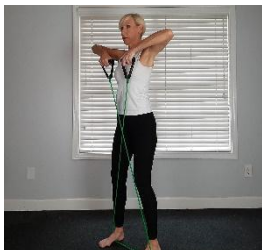
Resistance bands and tubes have been proven to improve strength, size, and function of muscles. Bands can provide very light or heavy resistance, which can be used in targeted ways for specific muscles that also protect joints. Resistance bands are affordable and easy to transport. They can challenge the muscle through the entire range of motion by placing it under tension throughout that entire range while protecting the joints from the load stress of additional weight.



Upper Body

Name	Purpose	Description	Start/Finish Position	Middle Position
Standing Chest Press	To strengthen the pectorals.	Stand hip-width apart. Hold the ends of the band and place the band around the back under the arms. Begin with the hands towards the chest, then extend the arms in front of the body. Return the hands back to the chest. Repeat for reps or time. Variation: Seated, alternating, or one arm at time.		
Standing Shoulder Press	To strengthen the deltoids specifically the medial deltoids.	Stand hip-width apart. Hold the ends of the band and place the band around the back under the arms. Begin with the hands leveled with the shoulders. Extend the arms overhead keeping the hand in your peripheral. Return the hands back to the shoulders. Repeat for reps or time. Variation: Seated, alternating, or one arm at time.		
Standing Bicep Curl	To strengthen the bicep muscles.	Stand on the band hip-width apart. Hold the ends of the band with arms fully extended alongside the body. Flex the elbows, bringing the hands towards the shoulders. Pause at the top then return to start. Repeat for reps or time. Variation: Seated, alternating, or one arm at time.		

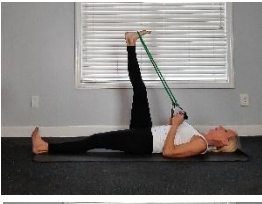

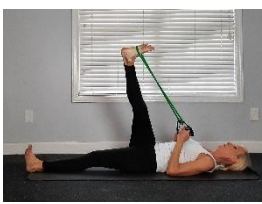
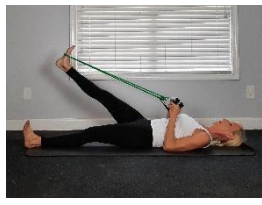


Name	Purpose	Description	Start/Finish Position	Middle Position
Standing Overhead Triceps Extension	To strengthen the triceps muscles.	Stand on the band hip-width apart. Hold one end of the band with the arm fully extended overhead. Flex the elbow, bringing the hand behind the head. Then extend the arm back to start. Repeat for reps or time. Switch arms. Variation: Seated.		
Standing Bent Over Row	To strengthen the upper back muscles specifically the rhomboids and latissimus dorsi.	Stand on the band hip-width apart. Hinge forward at the hips. Hold the ends of the band with arms fully extended. Flex the elbows, bringing the hands towards the hips squeezing the scapular together. Pause at the top then return to start. Repeat for reps or time. Variation: Alternating or one arm at a time.		



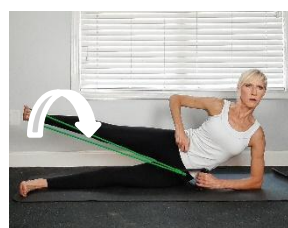
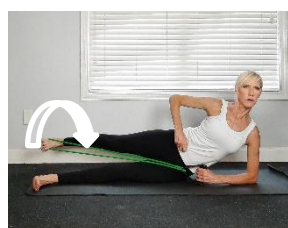
Core

Name	Purpose	Description	Start/Finish Position	Middle Position
Standing Side Bend with Overhead Reach	To strengthen the obliques and medial deltoids.	Stand on one end of the band with the feet hip-width apart while holding onto the other end of the band with one hand. Place the hand with the band next to the shoulder. Laterally flex the spine while simultaneously extending the arm overhead. Return to start and repeat for reps or time. Switch sides.		
RDL with High Row	To strengthen the hamstrings, lower back, and upper back.	Stand on the band with both feet hip-width apart and the ends of the band crossed. Hinge forward at the hips lengthening the arms. Unhinge at the hips and stand upright while simultaneously flexing the elbows pulling the ends of the band towards the shoulders. The elbows lead the way. Return and repeat for reps or time.		

Name	Purpose	Description	Start/Finish Position	Middle Position
Bridge	To strengthen the glutes and hamstrings while promoting core stabilization.	Begin on the floor in a supine position. The knees are bent with the feet firmly planted on the floor hip-width apart. Place the band across the hips and hold the ends of the band. Lift the hips up towards the ceiling to a high diagonal neutral line. Pause and squeeze the glutes and lower back down to start. Repeat for reps or time. Variation: Pulse at the top, pulse alternating sides, or hula hoop the hips at the top of the bridge.		

Lower Body





Name	Purpose	Description	Start/Finish Position	Middle Position
Single Leg Circle	To stretch and strengthen the legs while emphasizing core stabilization.	Begin in a supine position on the floor with one leg extended on the floor and the other leg is extended towards the ceiling with the band around the foot. Hold the ends of the band and anchor the upper arms on the floor. Stabilize the hips with the core. Circle the leg across the body for reps or time then reverse direction. Maintain stability in the hips and be actively engaging the core. Switch legs after circling for reps or time.	 	 
Double Straight Leg Stretch	To stretch the legs, strengthen the glutes and adductors, and strengthen the abdominals while emphasizing core stabilization.	Begin in a supine position on the floor with both legs extended to the ceiling and the band wrapped around both feet. Hold the ends of the band and anchor the upper arms on the floor. Imprint the lower back to the floor. Stabilize the hips with the core. Lower the legs down towards the floor while maintaining an imprinted spine. Lift the legs back up to start. Repeat for reps or time. Variations: Shorten range of motion or bend knees.		







Name	Purpose	Description	Start/Finish Position	Middle Position
Side Lying Leg Lift	To strengthen the abductors while emphasizing core stability.	Begin in a side-lying position propped up on the forearm, hips are stacked, and the legs are extended straight underneath the body. Place the band around the top foot and hold the ends with the propped-up hand. Lift the top leg where the leg is hip level the lower back down. Maintain stability in the hips. Lift and lower the leg for reps or time before switching legs.		
Side Lying Circles	To strengthen the gluteus maximus, medius, and minimus in addition to adductors and abductors.	Begin in a side-lying position propped up on the forearm, hips are stacked, and the legs are extended straight underneath the body. Place the band around the top foot and hold the ends with the propped-up hand. Lift the top leg where the leg is hip level. Circle the leg in one direction, then circle the leg in the opposite direction. Maintain stability in the hips. Circle the leg for reps or time before reversing direction. Switch legs.		

Lesson Three







Hand Weight (HW) Exercises



Using medium to heavy resistance hand weights is a great way to incorporate functional movements into a daily training program. HW's are portable, inexpensive, and relatively easy to use. They can be a big part of increasing muscle strength and lean mass overall. Hand weights also lend themselves to functional training. Even light dumbbells can be very effective.



Upper Body				
Name	Purpose	Description	Start/Finish Position	Middle Position
HW S/A Ground to Shoulder	Multiple joint exercise includes the entire kinetic chain with respect to total body strength.	Begin standing and holding 1 HW in the right hand at shoulder height. Lowering into a squat, bring the HW to the floor.		
2-Shoulder Sequence	To address all components of the deltoid muscle in each range of motion using multiple sets to create muscle growth and endurance.	Begin in a stable standing position. This includes kneeling or standing. Perform the Lateral Raise for 8 reps; then the front raises 8 reps; Repeat each exercise by descending reps of two; 8, 6, 4, and 2 for a total of 4 sets.		

<p>Quadruped Triceps S/A Kick Back</p>	<p>To engage the posterior core and address any shoulder dysfunction during this non-traditional triceps kick back. We also take advantage of the natural contralateral nature of this sequence.</p>	<p>Begin in a quadruped position; one and holding a HW, the other hand supporting the body. Extend the opposite leg and perform a triceps kickback with the weight held by the hand at a 90 degree elbow joint. Perform 10 reps and then switch leg and hand. For additional balance and core stability challenge, extend and hold the leg with tension in the gluteals.</p>		
<p>Biceps Curl with Opposing Knee Lift</p>	<p>To focus on anterior muscles with components of balance, contralateral training, and core stability.</p>	<p>Hold 1 HW in each hand at shoulder height, stand with plank posture. Alternate lowering HW's while lifting one knee to hip height. Continue for recommended rep count.</p>		
<p>S/A Low Row</p>	<p>To focus on the strength and hypertrophy with single arm efforts with a hinge.</p>	<p>Take an off-set foot stance, holding 1 HW in the outside arm hand. Bring the up to hip height, hinge forward and perform repetitions by lowering the HW by extending the elbow joint, then returning to the hip height.</p>		

Lower Body







Name	Purpose	Description	Start/Finish Position	Middle Position
Goblet Style Plie Squat	To open hips and focus on the quadriceps connection to lower body movement	Begin in a Plie stance (feet wider than hip width with toe turn out). Hold 1 HW (heavy) in front of the sternum. Maintain a plank posture while lowering the body by flexing the knees and hips. At the lowest position maintained with control, slowly rise back to upright.		
Alt. Curtsey Lunges	To practice moving the lower body with control in the transverse plane.	Begin with feet hip-distance apart, holding HW one in each hand at shoulder height. Step R back and behind the L lowering the body towards the floor. Aim your knee of the R legs towards the calf of the L. Rise with upright posture.		
S/L DeadLift	Focus on strength in the glutes, hamstrings, and low back with a hinge.	Place one foot onto a bench or another elevated and stable platform. With a HW in each hand, hinge at the hips, lowering the HW's towards the floor. Step about mid-shin height. Press through the feet and rise, using the hamstrings. Stand fully upright. Perform desired reps and then switch legs.		



<p>HW Skiers Swing</p>	<p>To control momentum, while focusing on shoulder control,</p>	<p>Hold one HW in each hand at shoulder height. Use momentum but also control to lower the weights, swinging them backwards while also performing a squat. As the HW's swing back up, rise to an upright stance.</p>		
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<p>S/L Lateral Lunges</p>	<p>To train both sides of the body for strength equally, and to focus on the hip adductors & pelvic stability & balance.</p>	<p>Begin with one HW in each hand held at shoulder height. Step out to the L side into a lateral lunge, keeping the R knee extended as the L knee maximally flexes. Press back to the midline. For a balance challenge, bring the knee up towards hip height, stabilizing the core. Hold for 1-2 seconds. Perform on both sides.</p>		
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Core

Name	Purpose	Description	Start/Finish Position	Middle Position
<p>Plank Pull Thru</p>	<p>The challenge is core stability, hip strength, and upper body endurance.</p>	<p>Begin prone, with hands placed under the shoulders, aligned with the elbows and wrist. Place a HW under the L elbow, closest to the feet. From a plank position, reach through and under, pulling the HW into the same position behind the R elbow. Continue to drag and replace the HW, one time counts as 1 rep.</p>		

Seated V Sit w/Rotation	Engage the core in rotation.	Sit with knees flexed, feet hip width apart with heels on the floor. Hold 1 HW close to the chest. Rotate R from the rib cage, return to center, rotate to the left, return to the center. Keep the weight very close to the body.		
Supine Bridge	Supine glute exercises are helpful in creating more hypertrophy and endurance in the gluteal area.	Being back-lying, with feet about hip-width apart. Place 1 HW on the hips, using the hands to support the load. Lower the hips towards the floor, contract the glutes and return to start position.		
Standing Wood Chops	To promote spinal control and stability in standing rotation.	Stand with feet hip width apart, hold 1 HW at shoulder level with both hands. As you move into a squat, lower the HW towards the opposite knee. Return to a standing position and bring the HW back to the shoulder height.		

<p>Side-Plank with a Lateral Lift</p>	<p>Create stability using the core, shoulder girdle and feet as a base of support for core strength.</p>	<p>Begin in a side-lying plank, with the feet crossed back over front at the ankles. With a flexed forearm under the shoulder joint, and holding a light HW in the opposite hand at floor level, press through the feet and shoulders to lift the body upwards. Bring the HW from the floor up to the ceiling through elbow extension and shoulder abduction in a straight line. Return the HW to the floor as you lower your hips back down.</p>		
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Lesson Four

Program Design Workout Templates

Using the program design from Module II, let's plug in specific exercises from your FM exercise library. Use the following templates to copy and offer clients workouts or classes using plug-n-play programming. Or you can create your own programming using blank templates (one will be provided) that you can use with your clients plugging in program designs of your own. Also see the accompanying videos on coaching these templates with real-time cues. Treat them as a personal workout, as it is easier to teach movements you have performed in real-time. Or use the templates as a coaching reference later.

Program Design for those with Fibromyalgia

The program design of Module II alternates daily cardio with dedicated upper body and core. Also included are options for lower body, cardio, and core. Included here are three templates using the program design of Module II, with the exercises in the exercise library.

When plugging in your own exercises, or using the fully created templates provided, be sure to follow common sense regarding the fulfillment of the expectations on the completed templates. In other words, do not let the exercise design supersede how a client is feeling that day. Offer options for each exercise, be open to client suggestions for alternate exercises, or different ways to perform the prescribed exercises. Offering your client the opportunity to be involved in the planning and implementation is a great way to help them develop exercise efficacy.

When using Template #1, you may feel the cardio intervals are too much volume for your classes or clients, so you can substitute aerobic intervals for the higher-intensity cardio intervals or delete them altogether. Particularly if you know your class participants or clients are getting other forms of aerobic exercise during the week when not seeing you, establish strength training as a priority during your sessions or classes.

Let's tap into the design model and plug in the resources available in the FM Fitness Specialist exercise library. For additional visuals and written demonstrations of the exercises, watch the template videos, where each workout is explained and performed. Remember you can also review each exercise in the video library and in this manual, which are helpful for providing excellent coaching tips.

TEMPLATE #1 Upper Body/Cardio Intervals/Core

FOCUS: Upper Body (UB), Core, Cardio Intervals	FORMAT: AMRAPs, Tabata timing, Reps	DURATION: 45-50-minutes
Warm Up <ul style="list-style-type: none"> • Standing Reaches • Lateral Bends • BW squats • Plank pose 10-sec/5 sec x 6 • Downward facing dog • Runner's lunges 	Warm Up Finisher <ul style="list-style-type: none"> • S/L Stretch 10x • Dbl L Stretch 10x • Bridge 10x • Cat/Cow 10x • Knees Down Push Up 10x 	Warm-up sequence should take about 4-5 minutes. Hold stretches 3-5 seconds. Increase body temperature.
Cardio Interval #1	BW High Knee Lifts	Tabata Timing 20/10 8x = 4 minutes.
UB Strength Round #1 <ul style="list-style-type: none"> • S/A Low Row R & L 12x • 2-Shoulder Raise 8,6,4,2 • S/A Low Row R & L 12 x • Knee lift w/Biceps Curl 	Perform each exercise in each round with precision. Select heavy weight for the Low Row, light weight for the 2-Shoulder sequence. A moderate weight for the knee lift. Watch the weight shift in the knee lift biceps curl.	8-Minute AMRAP Round 1 is 6-minutes long. Perform As Many Rounds as you can of the prescribed exercises for 6-minutes.
Cardio Interval #2	BW Lateral Skaters w/Reach or Touch	Tabata Timing 20/10 8x = 4 minutes.
UB Strength Round #2 <ul style="list-style-type: none"> • BW Push Ups 5x • Skier Swing 10x • Alt. Kneeling DB Shoulder Press 10x 	Knees down push-ups if required; use control with the skier swing; shoulder press can be performed standing or kneeling, but only one arm at a time. Keep tension in the deltoid.	3-Minute AMRAP Round 2 is 3-minutes long. Perform As Many Rounds as you can of the prescribed exercises for 3-minutes.
Cardio Interval #3	DB Plie Goblet Squats	Tabata Timing 20/10 8x = 4 minutes
UB Strength Round #3 <ul style="list-style-type: none"> • Plank Pull Thru 6x • Standing Woodchop R 6x L 6x • S/A Quadruped Triceps Kick Back 	DB can be light or heavy. ROM should honor client's mobility and daily limits	4-Minute AMRAP Round 3 is 5-minutes long. Perform As Many Rounds as you can of the prescribed exercises for 4-minutes.
Transition Out <ul style="list-style-type: none"> • Cat/Cow • Spinal Balance • Prone Quad Stretches • Seated Hamstring Stretch • Seated Fig. 4 Stretch 	Include stretches that flow. Include activation, and use PNF, static and dynamic movements. Include 1-minute of meditation.	3-5 minutes

TEMPLATE #2 Lower Body & Core

FOCUS: Lower Body (LB), Core, Cardio Intervals	FORMAT: EMOMs, Interval timing, Rep-based movements	DURATION: 45-50-minutes
Warm Up <ul style="list-style-type: none"> ● Standing Reaches ● Lateral Bends ● BW squats ● Plank pose 10-sec/5 sec x 6 ● Downward facing dog ● Runners lunges/hip openers 	Warm Up Activation Finisher <ul style="list-style-type: none"> ● Glute Bridge ● Single Leg Circle ● Single Straight Leg Stretch ● Side Lying Leg Lift ● Side Lying Circles 	Warm-up sequence should take about 4-5 minutes. Hold stretches 3-5 seconds. Increase body temperature. Use the finisher to prepare for the next phase of the workout.
Core Interval #1 <ul style="list-style-type: none"> ● Standing Woodshop R & L ● Plank Pull Thru ● Seated V Sit w/Rotation 	Perform the right then left side; Find your plank, then pull the weight thru; Stabilize the HW against the chest, rotate with precision.	Perform each exercise 10 repetitions 3x with 30-seconds recovery between about 4 minutes
LB Strength Round #1 <ul style="list-style-type: none"> ● Curtsey Lunge ● S/L Lateral Lunge R & L ● S/L Deadlift 	45-seconds of each exercise with 15-seconds recovery between sets; perform 3x = 9-minutes.	Hold DB at shoulder height; mid shin for DL
Core Interval #2 <ul style="list-style-type: none"> ● Supine Criss Cross ● Low Back Extension ● 4-Point Back Extension 	Begin supine, then transition to back-lying.	Perform 30-seconds of each movement with 10-seconds transition between 3x. 4-minutes.
LB Strength Round #2 <ul style="list-style-type: none"> ● Leg Lifts ● Side Leg Lifts ● Fire Hydrant ● Quad Lift 	Perform each exercise for 30-seconds R then L; perform 3x with 10-seconds recovery between rounds.	Balance the R & L sides; use a chair or other stable support for the standing exercises. 7-minutes
Core Interval #3 <ul style="list-style-type: none"> ● Supine Heel Drops ● Dead Bug ● Knee Side Drop ● S/L Pull ● Push Ups 	Every30Onthe30 Perform each exercise for 30-seconds, switching at the end of the 30-seconds, no transition cues.	Change the movement every 30-seconds for each exercise. Take 30-seconds recovery; perform 3x - 5 minutes
LB Strength Round #3 <ul style="list-style-type: none"> ● Goblet Style Plie Squat ● Ground to Shoulder R & L ● Lateral Lunges R & L 	Perform each round of movement for 45-seconds. 15-seconds between exercises for a total of 3 rounds.	Quick transitions make this 15-minute round a great finisher.
Transition Out Cat/Cow Spinal Balance Seated Fig. 4 Stretch Back Lying Knee to chest	Include stretches that flow. Include activation, and use PNF, static and dynamic movements. Include 1-minute meditation.	3-5 minutes. Allow the meditation to completely allow for recovery in breathing and effort.

TEMPLATE #3 Total Body

FOCUS: Total Body Strength & Endurance	FORMAT: Reps and sets for greater training volume	DURATION: 45-50-minutes
Warm Up <ul style="list-style-type: none"> ● Perform controlled mobility/ROM focused Body Weight movements; <ul style="list-style-type: none"> ○ squats w/reaches ○ lateral reaches ○ lateral lunges ○ low impact knees to chest ○ floor based movements ○ cat cow ○ spinal balance ○ plank 	Warm Up Finisher <ul style="list-style-type: none"> ● EMOM 6-minutes <ul style="list-style-type: none"> ○ 1. BW jump squats <ul style="list-style-type: none"> ■ stay on toes to decrease impact ○ 2. Plank hold <ul style="list-style-type: none"> ■ knees down is an option ○ 3. Criss Cross ● repeat 1,2,3 	Change exercises every minute on the minute. 3 exercises; perform 1,2,3 and then repeat 1,2,3
Round #1 <ul style="list-style-type: none"> ● Leg Press ● Leg Extension ● Squat 	Lower Body focused, perform 12 repetitions of each exercise; rest for 30-60 seconds, and repeat the entire sequence at 10 reps, 8 reps, then 6 reps for 4 total sets.	Use the descending Pyramid style by increasing the weight load if possible as the rep count decreases.
Round #2 <ul style="list-style-type: none"> ● Standing Side Bend w/Overhead Reach ● Side plank floor to ceiling ● Supine Bridge 	This round is a combination of the use of tubing and HW. <ul style="list-style-type: none"> ● Perform the side bend for 30-seconds ● 4 R & L of Side Plank ● 10 reps plus 10-second hold 	Repeat 3x- good, better, best
Round #3 <ul style="list-style-type: none"> ● Standing Shoulder Press ● Standing Chest Press ● Standing Biceps ● Curl ● Standing Overhead Triceps Extension ● Standing Bent Over Row 	In this fast-paced, upper body focused round use tubing and be ready to make adjustments quickly. Work 30 seconds on with 10-seconds for transition.	Perform this for 2 rounds. Each round is 4-minutes
Round #4 <ul style="list-style-type: none"> ● BW Quad Lift ● BW Side Leg Lifts ● BW Side Fire Hydrant ● BW Calf Raise 	This round focuses on standing lower body endurance and balance.	Perform 15 reps of each exercise, and decrease by 5 for 3 sets
Round #5 <ul style="list-style-type: none"> ● Front Plank ● Side Plank ● Clam Shell ● Criss Cross FFS Manual 	<ul style="list-style-type: none"> ● Hold each plank for 20-30 seconds ● Perform clam shell on R & L for 10 reps ● Criss cross 20 reps 	Perform 2-4 rounds
Round #6 <ul style="list-style-type: none"> ● S/A Bent Over Row ● Plie Goblet Squat ● Ground to Shoulder 	<ul style="list-style-type: none"> ● 2 exercises have a R & L ● sandwich the plie squat between the two with lead changes ● Perform 3 rounds for 45/15 	45-seconds for each exercise with a 15-second transition/rest.

<p>Transition Out</p> <ul style="list-style-type: none"> ● Cat/Cow ● 4 Point Balance ● Back Extension ● Knee to chest 	<ul style="list-style-type: none"> ● Perform each exercise stretch 10-20 seconds. ● Hold each position longer as the session closes 	<p>Perform 2-4 of each</p>

Review the Workout Template Videos

Template #1

Template #2

Template #3

Take Module IV Exercise Library Quiz

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following review questions.



1. What does AMRAP mean?
2. What is the ratio and total duration of a Tabata Timing Interval?
3. Which template includes a 1-minute meditation?
4. Which template/s features a 45-second/15 second recovery interval?
5. Which template offers a round that focuses on standing lower body, endurance, and balance?
6. What type of movements should a client perform for the lower body if their medical provider tells them to avoid loaded squats & lunges?

Conclusion

Fibromyalgia Syndrome management requires an active partnership. Eating healthy, exercising, and working with one's doctor and health/fitness professional are important. One is more successful in his health and fitness program if he/she has support. Support can come in a variety of forms. Family is often a support group. Spouses, adult children, siblings, and/or other relatives can help meet the demands of one's management program on a daily basis. Other support groups include friends, other people with fibromyalgia, people with whom a hobby is shared, church groups and clergy, neighbors, volunteer organizations and even a pet. One should not be embarrassed or afraid to ask people for help when needed.

Fitness professionals can effectively work with those who have fibromyalgia providing them with a better quality of life through movement. You as their health and fitness coach can provide a positive experience to facilitate an effective path to better health and wellness.

Health/Fitness Professional Evaluation Checklist

As a health and fitness professional working with clients who have fibromyalgia, it is imperative that he/she master the skills below and have a working knowledge of the fundamentals, principles, anatomy, and exercise programming for clients with FM. Take a moment and check off the skills that you have mastered and make notes and adjustments to the ones upon which you need improvement.

Definition of Fibromyalgia	
Fibromyalgia Terms	
Fibromyalgia Pathophysiology and Anatomy Affected by FM	
Fibromyalgia Epidemiology	
Fibromyalgia	
Signs and Symptoms	
Risk Factors	
Diagnosis	
Treatment	
Management	
Exercise and Fibromyalgia	
Benefits of Exercise	
Exercise Limitations	
6 Key Components of FM and Exercise	
Lung Capacity: Proper Technique of Breathing Exercises Presented	
Cardiorespiratory Fitness: Proper Technique of Cardio Exercises Presented	
Muscular Strength: Proper Technique of Strength Exercises Presented	
Core Stability and Control: Proper Technique of Core Exercises Presented	
Posture: Obtain Working Knowledge of Correcting Poor Posture	

Flexibility: Proper Technique of Stretches Presented	
FITT Principle	
Scope of Practice of the Health and Fitness Professional	
Screening and Assessments	
Goal Profile	
Program Design	
Nutrition and Healthy Weight Management	
Specializing to Expand & Monetize Health & Fitness Career	
Strategies to Market Your FM Fitness Specialist Brand	
Networking and Forming Relationships to Expand Reach	
Review the Exercise Library	

Fibromyalgia Fitness Specialist



Appendix

Appendix A PAR-Q

NAME: _____ DATE: _____
 HEIGHT: _____ in. WEIGHT: _____ lbs. AGE: _____
 PHYSICIANS NAME: _____ PHONE: _____

PHYSICAL ACTIVITY READINESS QUESTIONNAIRE (PAR-Q)

Questions	YES	NO
1 Has your doctor ever said that you have a heart condition and that you should only perform physical activity recommended by a doctor?		
2 Do you feel pain in your chest when you perform physical activity?		
3 In the past month, have you had chest pain when you were not performing any physical activity?		
4 Do you lose your balance because of dizziness or do you ever lose consciousness?		
5 Do you have a bone or joint problem that could be made worse by a change in your physical activity?		
6 Is your doctor currently prescribing any medication for your blood pressure or for a heart condition?		
7 Do you know of any other reason why you should not engage in physical activity?		

If you have answered "Yes" to one or more of the above questions, consult your physician before engaging in physical activity. Tell your physician which questions you answered "Yes" to. After a medical evaluation, seek advice from your physician on what type of activity is suitable for your current condition.

Appendix B

Fibromyalgia Impact Questionnaire (FIQ)

Name: _____ Date: / /

Directions: For questions 1 through 11, please circle the number that best describes how you did overall for the *past week*. If you don't normally do something that is asked, cross out the question.

Were you Able to:	Always	Most	Occasionally	Never
Do shopping?	0	1	2	3
Do laundry with a washer and dryer?	0	1	2	3
Prepare meals?	0	1	2	3
Wash dishes/cooking utensils by hand?	0	1	2	3
Vacuum a rug?	0	1	2	3
Make beds?	0	1	2	3
Walk several blocks?	0	1	2	3
Visit friends or relatives?	0	1	2	3
Do yard work?	0	1	2	3
Drive a car?	0	1	2	3
Climb stairs?	0	1	2	3

12. Of the 7 days in the past week, how many days did you feel good?

0 1 2 3 4 5 6 7

13. How many days last week did you miss work, including housework, because of fibromyalgia?

0 1 2 3 4 5 6 7

(continued)

FIBROMYALGIA IMPACT QUESTIONNAIRE (FIQ) – page 2

Directions: For the remaining items, mark the point on the line that best indicates how you felt overall for the past week.

14. When you worked, how much did pain or other symptoms of your fibromyalgia interfere with your ability to do your work, including housework?

No problem with work • I I I I I I I I I • Great difficulty with work

15. How bad has your pain been?

No pain • I I I I I I I I I • Very severe pain

16. How tired have you been?

No tiredness • I I I I I I I I I • Very tired

17. How have you felt when you get up in the morning?

Awoke well rested • I I I I I I I I I • Awoke very tired

18. How bad has your stiffness been?

No stiffness • I I I I I I I I I • Very stiff

19. How nervous or anxious have you felt?

Not anxious • I I I I I I I I I • Very anxious

20. How depressed or blue have you felt?

Not depressed • I I I I I I I I I • Very depressed

Fibromyalgia Impact Questionnaire (FIQ): Description and Scoring

The FIQ is an assessment and evaluation instrument developed to measure fibromyalgia (FM) patient status, progress and outcomes. It has been designed to measure the components of health status that are believed to be most affected by FM.

Content

The FIQ is composed of 10 items. The first item contains 11 questions related to physical functioning – each question is rated on a 4-point Likert type scale. Items 2 and 3 ask the patient to mark the number of days they felt well and the number of days they were unable to work (including housework) because of fibromyalgia symptoms. Items 4 through 10 are horizontal linear scales marked in 10 increments on which the patient rates work difficulty, pain, fatigue, morning tiredness, stiffness, anxiety, and depression.

Administration

The FIQ is a self-administered instrument that takes approximately 5 minutes to complete. The directions are simple, and the scoring is self-explanatory.

Scoring

The FIQ is scored in such a way that a higher score indicates a greater impact of the syndrome on the person. Each of the 10 items has a maximum possible score of 10. Thus, the maximum possible score is 100. The average FM patient scores about 50, severely afflicted patients are usually 70 plus. The questionnaire is scored in the following manner:

1. The first item consists of 11 questions that make up a physical functioning scale. The 11 questions are scored and summed to yield one physical impairment score. Each item is rated on a 4-point Likert type scale. Raw scores on each item can range from 0 (always) to 3 (never) - thus the highest total possible raw score is 33. Because some patients may not do some of the tasks listed, they are given the option of deleting items from scoring. In order to obtain a valid summed score for questions 1 through 11, the scores for the items that the patient has rated are summed and divided by the number of items rated (e.g., if the patient completed only 9 items at a score of 2 for each, the final score would be $9 \times 2 / 9 = 2$). An average raw score between 0 and 3 is obtained in this manner.
2. Item 2 is scored inversely - so that a higher number indicates impairment (i.e., 0=7, 1=6, 2=5, 3=4, 4=3, 5=2, 6=1 and 7=0, etc.). Raw scores can range from 0 to 7.
3. Item 3 is scored directly (i.e., 7=7 and 0=0). Raw scores can range from 0 to 7.
4. Items 4 through 10 are scored in 10 increments. Raw scores can range from 0 to 10. If the patient marks the space between two vertical lines on any item, that item is given a score that includes 0.5.
5. Once the initial scoring has been completed, the resulting scores are subjected to a normalization procedure so that all scores are expressed in similar units. The range of normalized scores is 0 to 10 with 0 indicating no impairment and 10 indicating maximum impairment.

Scale	Item #	Recode	Score Range	Normalization
Physical impairment	1	No	0 - 3	S X 3.33
Feel good	2	Yes	0 - 7	S X 1.43
Work missed	3	No	0 - 7	S X 1.43
Do work	4	No	0 - 10	None
Pain	5	No	0 - 10	None
Fatigue	6	No	0 - 10	None
Rested	7	No	0 - 10	None
Stiffness	8	No	0 - 10	None
Anxiety	9	No	0 - 10	None
Depression	10	No	0 - 10	None

In order to maintain a maximum possible score of 100 it is necessary to employ an “equalization calculation” if a patient does not answer all 10 items. If one or more items are missed, the final summative score needs to be multiplied by $10/x$. (e.g., if one question is missed multiply by $10/9$ [i.e., 1.111], if 2 questions are missed multiply by $10/8$ [i.e. 1.25 etc.]

Addendum

When the first version of the FIQ was developed, patients who were not working outside the home were asked to skip the 2 questions regarding work. Therefore, a total score was made from the remaining 8 items. Since the revision of 1997 (unpublished), the work items have included housework so that all patients could potentially answer the work questions. Researchers over the years have used either 8 items or 10 items to form the total score. Users of the FIQ should indicate in their publications whether they used the 8-item method of deriving a total score or all 10 items. If they use the 8-item version, they should multiply the total FIQ score by $10/8$ (i.e., 1.25) so that results can be compared across studies.

Translations

The FIQ has been translated into at least 16 languages of which we are aware. These include Swedish, Norwegian, Icelandic, Danish, Portuguese (Brazil, Portugal), Hebrew, Spanish (Spain, Mexico, Argentina, Cuba), German, Farsi, Arabic and French (France and Canada), Greek, Italian, Korean, Dutch and Turkish. Most of these translations have been validated.

FIQ Citation

Burckhardt, C.S., Clark, S.R., & Bennett, R.M. (1991). The Fibromyalgia Impact Questionnaire: Development and validation. Journal of Rheumatology, 18, 728-734

Appendix C

6-Minute Walk Test (6MWT)

According to ATS guidelines, a 30 m distance course is recommended. Turnaround points should be identified. Three-meter interval measurements are marked with colored tape on the floor. Shorter corridor lengths may increase the 6 MWD due to more frequent turns involved.

Required equipment

1. Stopwatch or timer
2. Two small cones to mark the lap boundaries
3. Measurement scale for floor measurement
4. Mechanical lap counter
5. Resuscitation equipment

The 6 MWT is performed on a walking track in a facility. The track has been marked at 3-m intervals so that accurate measurement of the walking distance can be performed. Chairs are available at 30-m intervals in case the patients become so symptomatic that they must stop and sit.

Client Preparation

1. Comfortable clothing should be worn
2. Environment temperature should be ambient
3. Shoes should be comfortable and any walking aids that the patient ordinarily uses should be used
4. Light meals are acceptable before morning and afternoon tests

Technique

1. Don't perform a warmup before the test.
2. The subject should rest comfortably for 10 minutes prior to the test. During this time blood pressure and heart rate should be measured and potential contraindications assessed.
3. Before the test starts, the subject should stand up and rate his/her dyspnea and fatigue. The Borg scale may be used for this.
4. Set the lap counter to zero and timer to 6 minutes. Assemble all necessary equipment and move to the starting point.
5. The tester may walk a lap to demonstrate performance of the test to the client. During the test the tester should never walk with or in front of the subject as the subject may try to match the tester's pace. The tester may walk behind the subject to support him/her in case of staggering or to prevent falling. The subject is allowed to rest during the test if he/she gets fatigued.
6. Use standardized phrases and an even tone for encouragement at completion of each minute of the test. For an example of a standardized script, the reader is referred to the 2002 ATS guidelines. It is recommended to give standardized encouragement every 30 seconds using phrases "keep up the good work" or "you are doing fine".
7. Resting during the test is allowed, but don't stop the clock. If the subject cannot go any further, the test should be stopped and distance covered recorded.
9. Stop the test if patient develops chest pain, intolerable dyspnea, staggering, diaphoresis, intolerable cramps, and/or ashen appearance. Test supervisors should be trained to provide appropriate care at this point.
10. At the conclusion of the test, ask the subject to rate his/her dyspnea and fatigue levels. Record the reason for stopping the test.

Norms: The six-minute walk distance in healthy adults has been reported to range from 400m to 700m. Age and sex-specific reference standards are available and may be helpful for interpreting 6MWT scores for both healthy adults and those with chronic diseases such as FM. However, it is difficult to use normative values because of the differing methods used in studies. An improvement of 54m has been shown to be a clinically important difference.

6 Minute Walk Test		
Normal Range of Scores		
Age	Distance Covered by Women in Meters	Distance Covered by Men in Meters
60-64	498-603	558-673
65-79	457-580	512-640
70-74	439-571	498-622
75-79	398-535	430-585
80-84	352-454	407-553
85+	311-466	347-521

Appendix D

30 second Chair Stand Test

Chair height: 17” (43 cm), placed against wall for stability

Starting position: sitting in the middle of the chair, back straight, arms crossed over chest, feet flat on floor.

1. Take resting vital signs.
2. Demonstrate the movement, first slowly, then quickly.
3. Have the patient/client practice one or two repetitions to ensure proper form, and adequate balance
4. On the signal “go” the patient/client rises to a full stand, then returns to a fully seated position, as many times as possible in 30 seconds.
5. If a person is more than halfway up at the end of the 30 seconds, count it as a full stand.
6. One trial.
7. Take post exercise vital signs.
8. Document any modifications (chair height, assistance needed)

Age	Men: number of stands	Women: number of stands
60 - 64	14 - 19	12 - 17
65 - 79	12 - 18	11 - 16
70 - 74	12 - 17	10 - 15
75 - 79	11 - 17	10 - 15
80 - 84	10 - 15	9 - 14
85 - 89	8 - 14	8 - 13
90 - 95	7 - 12	4 - 11

*Scores less than 8 (unassisted) stands are associated with lower levels of functional ability

Rikli RE, Jones CJ (1999). Functional fitness normative scores for community residing older adults ages 60-94. *Journal of Aging and Physical Activity*, 7, 160-179.

Appendix E

The Arm (Bicep) Curl Test

The Arm Curl test is a test of upper body strength, and is part of the Senior Fitness Test (SFT) and the AAHPERD Functional Fitness Test, and is designed to test the functional fitness of seniors. This test is also used for subjects or clients with FM. There are slight differences between the protocols for the Senior and AAHPERD tests, such as the weight used for women. The differences are indicated below.

- **Purpose:** This test measures upper body strength and endurance.
- **Equipment required:** 4-pound weight (women, AAHPERD), 5-pound weight (women, SFT), 8-pound weight (for men). A chair without armrests, stopwatch.
- **Pre-test:** Explain the test procedures to the subject. Perform screening of health risks and obtain informed consent. Prepare forms and record basic information such as age, height, body weight, gender, test conditions. Ensure that the subjects are adequately warmed-up
- **Procedure:** The aim of this test is to do as many arm curls as possible in 30 seconds. This test is conducted on the dominant arm side (or stronger side). The subject sits on the chair, holding the weight in the hand using a suitcase grip (palm facing towards the body) with the arm in a vertically down position beside the chair. Brace the upper arm against the body so that only the lower arm is moving (tester may assist to hold the upper arm steady). Curl the arm up through a full range of motion, gradually turning the palm up (flexion with supination). As the arm is lowered through the full range of motion, gradually return to the starting position. The arm must be fully bent and then fully straightened at the elbow. The protocol for the AAHPERD test describes the administrator's hand being placed on the biceps, and the lower arm must touch the tester's hand for a full bicep curl to be counted. Repeat this action as many times as possible within 30 seconds.
- **Target population:** the aged population which may not be able to do traditional fitness tests.
- **Comments:** It's important that the upper arm is stable throughout the test and doesn't swing.
- **Scoring:** The score is the total number of controlled arm curls performed in 30 seconds. Below is a table showing some recommended ranges for this test based on age groups (from Jones & Rikli, 2002).

Men's Results

Age	below average	average	above average
60-64	< 16	16 to 22	> 22
65-69	< 15	15 to 21	> 21
70-74	< 14	14 to 21	> 21
75-79	< 13	13 to 19	> 19
80-84	< 13	13 to 19	> 19
85-89	< 11	11 to 17	> 17
90-94	< 10	10 to 14	> 14

Women's Results

Age	below average	average	above average
60-64	< 13	13 to 19	> 19
65-69	< 12	12 to 18	> 18
70-74	< 12	12 to 17	> 17
75-79	< 11	11 to 17	> 17
80-84	< 10	10 to 16	> 16
85-89	< 10	10 to 15	> 15
90-94	< 8	8 to 13	> 13

Appendix F Chair Sit and Reach

Purpose This test measures lower body flexibility, especially the hamstrings. It is associated with the lifestyle tasks of movement in and out of a vehicle, walking and climbing stairs, and also with a person's gait and posture.

Equipment required

- ruler or tape measure
- straight back or folding chair (about 44 cm high)

Procedure

- Sit on the edge of the chair (placed against a wall for safety). One foot must remain flat on the floor. The other leg is extended forward with the knee straight, heel on the floor, and ankle bent at 90°.
- Place one hand on top of the other with tips of the middle fingers flush.
- Inhale, and then as you exhale, slowly reach forward toward the toes by bending at the hip. Keep the back straight and head up. Avoid bouncing or quick movements, and never stretch to the point of pain.
- Keep the knee straight and hold the reach for 2 seconds. If your knee bends, straighten your leg and start again.
- The distance is measured between the tips of the fingertips and the toes. If the fingertips touch the toes, then the score is zero. If they do not touch, measure the distance between the fingers and the toes (a negative score), if they overlap, measure by how much (a positive score). Record the measurement to the nearest ½ inch or 1 cm and which leg you performed the test.
- Repeat the test 2 times on each leg.

Contraindications This test should not be done if you have severe osteoporosis.

MEN	Age	below average	average (inches)	above average
	60-64	< -2.5	-2.5 to 4.0	> 4.0
	65-69	< -3.0	-3.0 to 3.0	> 3.0
	70-74	< -3.5	-3.5 to 2.5	> 2.5
	75-79	< -4.0	-4.0 to 2.0	> 2.0
	80-84	< -5.5	-5.5 to 1.5	> 1.5
	85-89	< -5.5	-5.5 to 0.5	> 0.5
	90-94	< -6.5	-6.5 to -0.5	> -0.5
WOMEN	Age	below average	average (inches)	above average
	60-64	< -0.5	-0.5 to 5.0	> 5.0
	65-69	< -0.5	-0.5 to 4.5	> 4.5
	70-74	< -1.0	-1.0 to 4.0	> 4.0
	75-79	< -1.5	-1.5 to 3.5	> 3.5
	80-84	< -2.0	-2.0 to 3.0	> 3.0
	85-89	< -2.5	-2.5 to 2.5	> 2.5
	90-94	< -4.5	-4.5 to 1.0	> 1.0

Appendix G Back Scratch Test

Purpose

The Back Scratch Test measures how close the hands can be brought together behind the back, so provides an indication of the general shoulder range of motion, and the upper body and shoulder flexibility. It is associated with lifestyle activities such as getting dressed, reaching for objects and putting on a car seat belt.

Required equipment

- ruler or a yardstick or a tape measure

Procedure

- Perform this test in the standing position.
- Place one hand behind the head and back over the shoulder and reach as far as possible down the middle of your back, your palm touching your body and the fingers pointing downwards.
- Place the other arm behind your back, palm facing outward, and fingers pointing upward and reach up as far as possible, attempting to touch or overlap the middle fingers of both hands.
- An assistant is required to direct you so that the fingers are aligned, and to measure the distance between the tips of the middle fingers.
- If the fingertips touch, then the score is zero. If they do not touch, the assistant should measure the distance between the fingertips (a negative score), if they overlap, then measure by how much (a positive score). Practice two times with the arms in opposite positions to determine the preferred side for reaching over the shoulder, and then test two times. Record the best score to the nearest ½ inch or 1 centimeter.

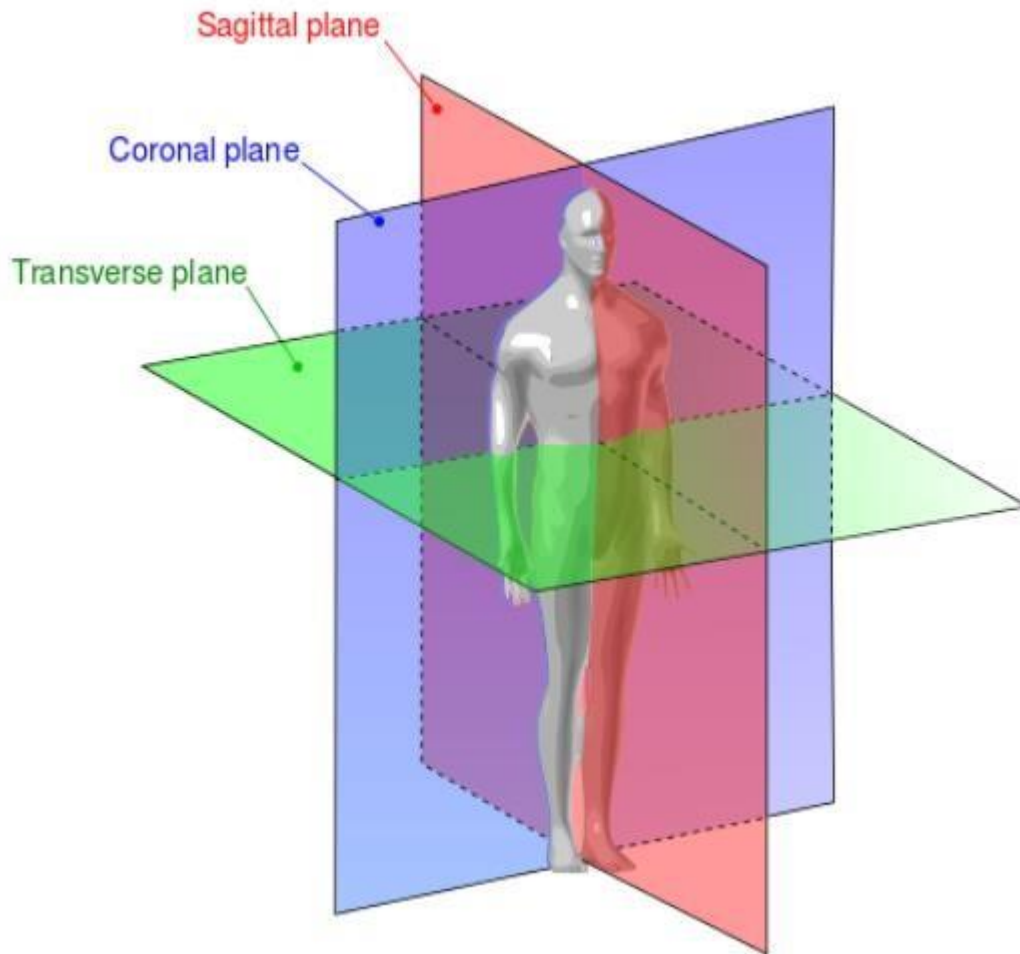
Safety issues

Stop the test if you experience pain.

MEN	Age	below average	normal (inches)	above average
	60-64	< -6.5	-6.5 to 0	> 0
	65-69	< -7.5	-7.5 to -1.0	> -1.0
	70-74	< -8.0	-8.0 to -1.0	> -1.0
	75-79	< -9.0	-9.0 to -2.0	> -2.0
	80-84	< -9.5	-9.5 to -2.0	> -2.0
	85-89	< -10.0	-10.0 to -3.0	> -3.0
	90-94	< -10.5	-10.5 to -4.0	> -4.0

WOMEN	Age	below average	normal (inches)	above average
	60-64	< -3.0	-3.0 to 1.5	> 1.5
	65-69	< -3.5	-3.5 to 1.5	> 1.5
	70-74	< -4.0	-4.0 to 1.0	> 1.0
	75-79	< -5.0	-5.0 to 0.5	> 0.5
	80-84	< -5.5	-5.5 to 0	> 0
	85-89	< -7.0	-7.0 to -1.0	> -1.0
	90-94	< -8.0	-8.0 to -1.0	> -1.0

Appendix H Planes of Movement



Planes of Movement: Imaginary lines that dissect the body into sections or planes. Movement occurs parallel to the plane of movement. The point at which all planes of movement intersect dictates one's center of gravity and balance.

- Coronal or Frontal Plane: Front and Back Sides
 - Example Movement: Jumping Jacks
- Sagittal Plane: Left and Right Sides
 - Example Movement: Running
- Transverse Plane: Superior and Inferior Sections (top & bottom)
 - Example Movement: Oblique Crunches or Swinging a Bat

Fibromyalgia Fitness Specialist



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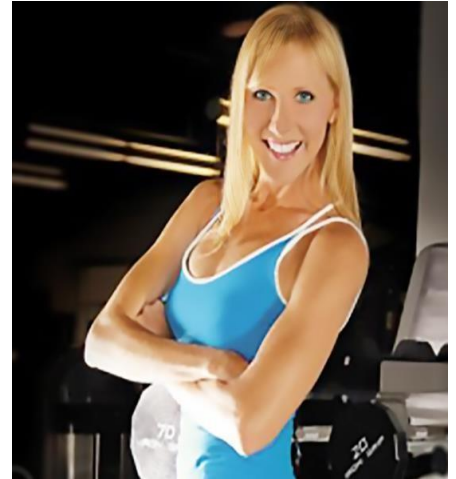
Resources

1. Fibromyalgia Network: educational materials on fibromyalgia syndrome
www.fmnetnews.com
2. American Fibromyalgia Syndrome Association: research, education, and patient advocacy
www.afsafund.org
3. National Fibromyalgia Association: increase fibromyalgia awareness and improve treatment options
www.fmaware.org
4. Fibromyalgia Research Foundation: metabolic basis of fibromyalgia and treatment
www.drloewe.com

About the Authors

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Known as the trainers' trainer, CarolAnn, MS, CPT, CN has become one of the country's leading fitness educators, authors, and national presenters. Combining a master's degree in Exercise Science/Health Promotion with several fitness certifications/memberships such as FiTOUR, IDEA, and AFAA, she has been actively involved in the fitness industry for over 30 years. She has executed her leadership and business skills within her career through various positions such as Wellness/Fitness Coordinator, General Manager, and Studio Owner. She is the creator and star of The Steel Physique Fitness on Demand series (www.CarolAnn.Fitness). She is a freelance health & fitness expert content provider for various companies and organizations such as MedFit, www.eHOW.com and www.LiveStrong.com. She is currently an education provider and ProTrainer with FiTOUR as well as the Founder and Director of Education for Chiseled Faith, a Faith Based Health and Fitness Program for churches (www.ChiseledFaith.com). She is the Lead Instructor and Master Trainer for Club Pilates.



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