Fibromyalgia (FM) is a chronic widespread pain disorder often seen in primary care practices. Advances in the understanding of FM pathophysiology and clinical presentation have improved the recognition and diagnosis of FM in clinical practice. Fibromyalgia is a clinical diagnosis based on signs and symptoms and is appropriate for primary care practitioners to make. The hallmark symptoms used to identify FM are chronic widespread pain, fatigue, and sleep disturbances. Awareness of common mimics of FM and comorbid disorders will increase confidence in establishing a diagnosis of FM.


ACR = American College of Rheumatology; CRP = C-reactive protein; ESR = erythrocyte sedimentation rate; FM = fibromyalgia; RA = rheumatoid arthritis.

Fibromyalgia (FM), a chronic widespread pain disorder, is estimated to affect more than 5 million Americans (2%-5% of the adult population). It is second only to osteoarthritis as the most common disorder seen in rheumatology practices. In recent years, increasingly more patients with FM are presenting to primary care clinicians for initial diagnosis and ongoing care. Fibromyalgia is a persistent and potentially debilitating disorder that can have a devastating effect on quality of life, impairing the patient’s ability to work and participate in everyday activities, as well as affecting relationships with family, friends, and employers. It imposes heavy economic burdens on society as well as on the patient.

Recent research suggests that the chronic widespread pain that is the hallmark symptom of FM is neurogenic in origin. Fibromyalgia is associated with a central amplification of pain perception characterized by allodynia (ie, a heightened sensitivity to stimuli that are not normally painful) and hyperalgesia (ie, an increased response to painful stimuli). Neuroimaging studies have also shown that FM is associated with aberrant processing of painful stimuli in the central nervous system.

Accurate diagnosis is the critical first step to more effective care and better outcomes for patients with FM. Developed by the FibroCollaborative, a diverse group of leading experts on FM, this review aims to discuss the current understanding of FM symptomatology and diagnostic approaches. Methods for recognizing patients who may have FM on the basis of presentation of symptoms and associated disorders are described, as well as important steps in the differential diagnosis, including the role of the physical examination, laboratory testing, and referrals to specialists to identify both disorders that can mimic FM and those that frequently coexist with FM.

UNDERDIAGNOSIS

Despite improved understanding of its pathologic processes, FM remains undiagnosed in as many as 3 out of 4 people with the condition (Data on file. Decision Resources report 2009. Pfizer, New York, NY). Diagnosis time averages 5 years, resulting in delayed treatment and potentially suboptimal medical care. Women currently account for 80% to 90% of cases diagnosed using the American College of Rheumatology (ACR) 1990 criteria for FM (prevalence, 3.4% in women vs 0.5% in men). Women are more sensitive to painful stimuli than men and therefore have a greater response than men to the diagnostic tender point examination that is included in the ACR criteria (tenderness on digital palpation at predesignated sites). As a result, men with chronic widespread pain rarely meet ACR criteria for FM, despite having a similar underlying pathologic process.

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This article is freely available on publication, because the authors have chosen the immediate access option.

A question-and-answer section appears at the end of this article.

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RECOGNIZING AND DIAGNOSING FIBROMYALGIA

IMPORTANCE OF IMPROVED RECOGNITION AND DIAGNOSIS

Establishing the diagnosis of FM is an essential component of successful management.4 Many patients with FM have been living with chronic pain and other troubling and disabling symptoms for extended periods. Primary care practices undoubtedly see more patients with FM than is currently appreciated. When such patients are finally recognized and a diagnosis is confirmed, both clinician and patient clear a major hurdle to more effective management of the disorder.

Research shows that the diagnosis of FM has no negative effect on clinical outcomes. Indeed, patients newly diagnosed as having FM report improved satisfaction with health and fewer long-term symptoms.13 In addition, several studies have indicated that the utilization of medical resources and the associated costs decline after a diagnosis of FM.4,14 Patients with FM appreciate sincere efforts to help them and can be gratifying to treat.

The diagnostic evaluation of FM can take time, but this should not be a barrier in primary care practices. If a diagnosis of FM is suspected, a trial of treatment can begin while the evaluation for possible other coexisting disorders continues. Subsequent visits during initial diagnosis and management actually reassure the patient with FM that they are receiving appropriate care and validation, which can be very therapeutic.

A PRACTICAL APPROACH TO RECOGNITION AND DIAGNOSIS

Fibromyalgia is a clinical diagnosis based on the disorder’s unique clinical characteristics and not solely a diagnosis of exclusion. Like other pain states (eg, migraine), FM is commonly diagnosed in the primary care setting on the basis of characteristic symptoms.

A focused history and physical examination are the cornerstones of FM recognition. No laboratory or radiologic testing is required to diagnose FM. Such tests are necessary only if clinically indicated to evaluate other potential diagnoses, including conditions that may be comorbid with FM. Routine laboratory tests may help guide the assessment, especially if they have not been performed at some point in the patient’s work-up. Specialist referral is usually not necessary to confirm the diagnosis. The goal is to identify FM and initiate treatment as early as possible, even if further evaluation is needed to identify and confirm possible comorbid conditions that may also require management.

PATIENT HISTORY

Core Symptoms of FM. The core symptoms of FM can be visualized as a triad that includes chronic widespread pain (in the right and left side of the body, above and below the waist, and in the axial skeleton) of long duration (≥3 months) as the primary, hallmark symptom, with fatigue16 and sleep disturbance (including nonrestorative sleep [ie, feeling unrefreshed after a night’s sleep])15,16 as 2 other commonly associated symptoms. These 3 symptoms occur in most patients with FM. Presentation of chronic widespread pain for years, especially in the presence of fatigue and sleep disturbance, should raise suspicion for FM. For many patients, the fatigue commonly associated with FM is the most troublesome symptom and the one that leads them to seek medical attention.

Other key associated symptoms include tenderness, stiffness, mood disturbances (eg, depression and/or anxiety), and cognitive difficulties (eg, trouble concentrating, forgetfulness, and disorganized thinking).17-20 Fibromyalgia symptoms can wax and wane, varying in intensity from day to day and by physical location. Patients with FM frequently report impairment in multiple areas of function, especially physical function.3 Overall, patients with FM are a heterogeneous population. The impact of FM spans the continuum from patients who are mildly to moderately affected by FM symptoms to those who are more severely affected and have markedly impaired function and quality of life.

Fibromyalgia should be considered in all patients with multiple regions of chronic pain (at a single point in time or during the course of their lifetime), especially if they report multiple somatic symptoms. Generally, the index of suspicion for FM should increase the longer the chronic widespread pain and other symptoms have been present, the more variable the symptoms seem, and the more body systems that are involved.

Comorbid Disorders. The presence of common comorbid disorders can also raise suspicion for FM, and it is important for the clinician to ask about chronic widespread pain when presented with these associated conditions. Examples of common comorbid disorders include mood or anxiety disorders, which can precede the development of FM. The lifetime (both current and past) prevalence of these disorders with FM is high, with any lifetime anxiety disorder reported in 35% to 62% of patients, lifetime major depressive disorder in 58% to 86% of patients, and lifetime bipolar disorder in up to 11% of patients.21,22 The high frequency with which FM and mood and anxiety disorders occur together is most likely explained by pathophysiologic abnormalities common to both mood and anxiety disorders and FM, rather than by FM causing the mood and anxiety disorders or the mood and anxiety disorders causing FM.23 Although psychiatric disorders often occur together with FM, they should not be confused with FM or viewed as being the same disorder.22 As comorbid conditions, mood and anxiety disor-
diers need to be treated together with FM, sometimes with different interventions. Treatment aimed at mood alone may result in suboptimal outcomes for the management of all of the symptoms of FM.

Other common comorbid disorders in patients with FM include the following regional pain syndromes that may share certain pathophysiologic features with FM: irritable bowel syndrome, tension-type headache/migraine, interstitial cystitis or painful bladder syndrome, chronic prostatitis or prostadynia, temporomandibular disorder, chronic pelvic pain, and vulvodynia. Patients may focus on local areas of pain and describe one particularly bothersome area; others may hesitate to mention all of their pain symptoms, especially if some of their pain has been dismissed or discounted previously. Therefore, it is important for clinicians to determine whether pain is limited to 1 or more regions of the body or whether the pain is more widespread.

**Fibromyalgia Risk Factors.** The patient’s history may reveal risk factors for FM, such as familial predisposition. Relatives of people with FM are at a higher risk. In a recent family study, first-degree relatives of patients with FM were 8 times more likely to have FM than relatives of the control group of patients with rheumatoid arthritis (RA). Environmental factors, including physical trauma or injury, infections (eg, Lyme disease and hepatitis C), and other stressors (eg, work, family, life-changing events, and abuse history), pose additional risk. Finally, sex is a risk factor. Women are diagnosed as having FM approximately 7 times more often than men; however, the source of at least some of this disparity appears to be an artifact of requiring a certain degree of tenderness to diagnose FM using ACR criteria.

**Medical History Tools.** Tools are available to facilitate a focused medical history in the time-constrained primary care setting. The use of a body pain diagram during the initial examination can assist patients in documenting the presence of widespread pain and establish a baseline for monitoring treatment response. Patient screening can begin in the office waiting area using brochures that include a body pain diagram and a simple questionnaire, with questions such as the following: Have you had pain in your muscles or joints that has lasted 3 months or more? Do you have pain all over? Do you become fatigued during the day so that you have to stop normal activities? Do you wake up in the morning and feel more tired than when you went to bed?

**Physical Examination**
The physical examination of a patient with suspected FM should focus on identifying associated or comorbid disorders as warranted by symptoms, signs, and the medical history because these may require separate management. Joints should be examined for swelling, tenderness, range of motion, and crepitus, and patients should be evaluated for peripheral pain generators (eg, RA, osteoarthritis, tendinitis, adhesive capsulitis) as well as focal and/or objective weakness. If the history is suggestive, signs of connective tissue disease should be assessed and a neurologic examination conducted. It is important to note that the presence of a second disorder (even a painful one) does not necessarily exclude a diagnosis of FM, which can occur together with other painful conditions. In general, the physical examination findings are normal in FM except for diffuse tenderness, evaluated by counting tender points or by digital palpation of several regions of the body. The physical examination (regardless of whether tender points are counted) remains key in the evaluation of patients to assess the tenderness (alldynia and hyperalgesia) associated with FM as well as to aid in the differential diagnosis.

**FORMAL CLASSIFICATION CRITERIA**
The ACR criteria for FM (Figure 1) include a history of widespread pain lasting 3 months or longer. Wide-spread pain is defined as pain above and below the waist and on both sides of the body. In addition, axial skeletal pain (in the cervical spine, anterior chest, thoracic spine, or lower back) must be present. According to the ACR, a patient must have pain on digital palpation at 11 of 18 predesignated sites, commonly referred to as tender points, to be diagnosed as having FM. Approximately 4 kg of pressure must be applied to a site, and the patient must indicate that the site is painful. In practical terms, the pressure to assess tenderness with digital examination is the pressure needed to see your own nail bed blanch.

The ACR criteria have a sensitivity of 88.4% and a specificity of 81.1%. Many health care professionals find the manual tender point examination useful for confirming the presence of widespread tenderness and increasing confidence in the diagnosis. These criteria were originally designed to standardize patient classification in clinical trials rather than to diagnose FM in routine clinical practice. Nevertheless, the tender point examination has been used in hundreds of studies and is recognized by the ACR for the diagnosis of FM.

As a possible alternative to the ACR criteria for use in clinical settings, Wolfe et al recently proposed clinical diagnostic criteria for FM that do not rely on counting tender points. The proposed criteria take into account not only pain but also other FM-related symptoms and are intended to assess the severity of those symptoms (Table 1). To administer the Widespread Pain Index and Symptom Severity scale, the physician asks the patient to report the location
RECOGNIZING AND DIAGNOSING FIBROMYALGIA

History of widespread pain (present for ≥3 mo)
Definition: Pain is considered widespread when all of the following are present: pain on both sides of the body, pain above and below the waist. In addition, axial skeletal pain (cervical spine, anterior chest, thoracic spine, or low back pain) must be present. “Low back” pain is considered lower segment pain
Pain in 11 of 18 standardized sites, commonly referred to as tender points, on digital palpation
Occiput (2)—at the suboccipital muscle insertions
Low cervical (2)—at the anterior aspects of the intertransverse spaces at C5 to C7
Trapezius (2)—at the midpoint of the upper border
Supraspinatus (2)—at origins, above the scapula spine near the medial border
Second rib (2)—upper lateral to the second costochondral junction
Lateral epicondyle (2)—2 cm distal to the epicondyles
Gluteal (2)—in upper outer quadrants of buttocks in anterior fold of muscle
Greater trochanter (2)—posterior to the trochanteric prominence
Knee (2)—at the medial fat pad proximal to the joint line
Digital palpation should be performed with an approximate force of 4 kg. A tender point has to be painful at palpation, not just tender

FURTHER INVESTIGATION/SPECIALIST REFERRAL

A diagnosis of FM can be established appropriately in the primary care setting, but specialist referral may be indicat-
ed. The patient should be referred for specialist evaluation if uncertainty remains about the diagnosis because of unusual symptoms or signs, disease course, laboratory findings, or other concerns. Referral should also occur when the patient has abnormal laboratory results that suggest another condition requiring specialty care. It may also be necessary for the treatment of comorbid conditions, including mood/anxiety and sleep disorders. Figure 2 and Table 2 summarize the approach to the diagnosis of FM.

**CONCLUSION**

Fibromyalgia can have a profound effect on a patient’s quality of life. Despite greater interest in and awareness of the disorder than ever before, FM remains underdiagnosed and undertreated. A greatly improved understanding of FM and its pathophysiologic underpinnings has helped explain the varied and often complex constellation of FM signs and symptoms, resulting in effective new treatment approaches.

Fibromyalgia is a clinical diagnosis that, similar to other chronic pain states such as migraine, is appropriate for primary care practitioners to make. Although routine laboratory work can help guide the assessment, laboratory or radiologic testing is required only if clinically indicated for a concomitant disorder. Presentation of some of the hallmark symptoms (eg, chronic widespread pain, fatigue, and sleep disturbances) should raise suspicion for FM. A structured and focused medical history and physical examination can help in the differential diagnosis and confirm the diagnosis of FM.

Better health outcomes and quality of life can be achieved by patients with FM with effective treatments developed as a result of an enhanced understanding of the disorder. Clinicians, both individually and in collaboration with other health care professionals and their patients, can improve patient care with vigilant recognition and diagnosis of FM.

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**TABLE 1. Clinical Diagnostic and Severity Criteria for Fibromyalgia: Widespread Pain Index (WPI) and Symptom Severity (SS) Scale**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>A patient satisfies diagnostic criteria for fibromyalgia if the following 3 conditions are met:</th>
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<tbody>
<tr>
<td>WPI ≥7 and SS scale score ≥5 or WPI 3-6 and SS scale score ≥9</td>
<td>Symptoms have been present at a similar level for at least 3 months</td>
</tr>
<tr>
<td>The patient does not have a disorder that would otherwise explain the pain</td>
<td></td>
</tr>
<tr>
<td><strong>Ascertainment</strong></td>
<td>WPI (0-19)—Directions: Note the number of areas in which the patient has had pain during the past week. In how many areas has the patient had pain?</td>
</tr>
</tbody>
</table>

**Shoulder girdle, left**
- Hip (buttock, trochanter), left
- Jaw, left

**Shoulder girdle, right**
- Hip (buttock, trochanter), right
- Jaw, right

**Upper arm, left**
- Upper leg, left

**Upper arm, right**
- Upper leg, right

**Lower arm, left**
- Lower leg, left

**Lower arm, right**
- Lower leg, right

**SS scale score (0-12) = Symptom Severity + Extent of Somatic Symptoms**

**Symptom severity**—Directions: Using the provided scale, indicate the level of severity experienced for each of the 3 following symptoms:
- Fatigue
- Waking unrefreshed
- Cognitive symptoms

**Scale**
- 0 = no problem
- 1 = mild: slight, mild, or intermittent problems
- 2 = moderate: considerable problems, often present and/or at a moderate level
- 3 = severe: pervasive, continuous, life-disturbing problems

**Extent of somatic symptoms**—Directions: Indicate how many somatic symptoms the patient has using the following scale
- 0 = no symptoms
- 1 = few symptoms
- 2 = a moderate number of symptoms
- 3 = a great deal of symptoms

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*Somatic symptoms that might be considered include muscle pain, irritable bowel syndrome, fatigue/tiredness, thinking or remembering problems, muscle weakness, headache, pain/cramps in abdomen, numbness/tingling, dizziness, insomnia, depression, constipation, pain in upper abdomen, nausea, nervousness, chest pain, diarrhea, dry mouth, itching, Raynaud phenomenon, hives/urticaria, ringing in ears, vomiting, heartburn, oral ulcers, loss/change in taste, seizures, dry eyes, shortness of breath, loss of appetite, rash, sun sensitivity, hearing difficulties, easy bruising, hair loss, frequent urination, painful urination, and bladder spasms.

Adapted from *Arthritis Care Res (Hoboken)*, with permission.

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*Editorial support was provided by Dr Gayle Scott, PharmD, of UBC Scientific Solutions and funded by Pfizer.*
FIGURE 2. Flow chart for the diagnosis of fibromyalgia (FM). ACR = American College of Rheumatology; PE = physical examination; SS = Symptom Severity; WPI = Widespread Pain Index.

| Suspect FM on the basis of presentation of chronic widespread pain ≥3 mo, fatigue, and nonrestorative sleep |
|---|---|---|
| **Patient history** | **Physical examination** | **Laboratory tests (if not done in past 6-12 mo) should include:** |
| Assess pain quality, ask about hyperalgesia, widespread pain ≥3 mo | Joint examination: Assess for inflammation (synovitis, swelling, and range of motion) Focused neurologic examination on the basis of patient symptoms Tenderness (eg, allodynia), by either ACR tender point examination or digital palpation in several regions of the body | Complete blood cell count Comprehensive metabolic panel Thyroid function test Erythrocyte sedimentation rate and/or C-reactive protein |
| Concomitant symptoms/history: fatigue, nonrestorative sleep, cognitive impairment, depressive and anxiety symptoms, and regional pain disorders | | |
| Pain affecting daily activities/quality of life | | |
| Family history of fibromyalgia | | |
| Numerical pain scale, patient pain diagram, or WPI/SS$^{34}$ | | |

<table>
<thead>
<tr>
<th><strong>FM likelihood high</strong></th>
<th><strong>FM likelihood probable</strong></th>
<th><strong>FM likelihood low</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>≥11 of 18 tender points OR WPI/SS criteria met Physical examination otherwise normal Laboratory results within normal limits</td>
<td>≥11 of 18 tender points OR WPI/SS criteria met Abnormal findings on PE and/or laboratory tests</td>
<td>&lt;11 of 18 tender points identified OR does not meet WPI/SS criteria AND Abnormal findings on PE and/or laboratory tests</td>
</tr>
</tbody>
</table>

**Red flags to prompt additional differential diagnosis**
- Prominent focal abnormalities (eg, numbness, weakness)
- Joint swelling, redness, heat
- Fever
- Rash, skin ulcers, or alopecia
- Abnormal laboratory findings
- Patient taking medications that cause some FM-like symptoms (eg, muscle soreness due to a statin)

<table>
<thead>
<tr>
<th>Initiate FM treatment</th>
<th>Initiate FM treatment and continue work-up on the basis of symptoms/comorbid conditions</th>
<th>Use clinical judgment as to whether initiating FM treatment would benefit patient and continue work-up on the basis of clinical findings</th>
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<tr>
<td>Individualize to patient symptoms/comorbid conditions Multimodal treatment Patient education Support networks Physical therapy/exercise, psychological support Pharmacological approaches Develop long-term FM management plan</td>
<td>FM treatment should be individualized on the basis of symptoms/comorbid conditions</td>
<td>Consider FM reevaluation in the future</td>
</tr>
</tbody>
</table>

After 3 to 4 mo, assess treatment response to evaluate whether treatment adjustments are needed and/or whether additional differential diagnosis is needed to identify comorbid conditions.
Polymyalgia rheumatica

- Weakness, pain in girdle muscles
- Female predominance (2:1 c)
- ESR, CRP, response to corticosteroids
- Stiffness (>1 h)
- Prevalence: ~0.5% to 1% of adults
- Insidious onset, morning
- Onset: 30-50 y
- Chronic widespread pain.

Systemic lupus erythematosus

- Photosensitivity, fever, rash, fatigue, muscle aches
- Joint/muscle pain
- Female predominance (9:1 c)
- Prevalence: ~0.2% of adults
- Onset: 16-55 y
- Fatigue, muscle aches
- Prevalence: ~5% of adults
- Onset: >50 y (especially 45-60 y)

Myositis

- Symmetric, proximal muscle weakness and pain
- Female predominance (2-3:1 c)
- Prevalence: >20 y (especially 45-60 y)
- Onset: >20 y
- Tenderness, muscle aches
- Prevalence: ~0.005%-0.01% of adults

REFERENCES


Questions About Fibromyalgia

1. Which one of the following triad of symptoms is the most typical presentation of fibromyalgia (FM)?
   a. Pain, anorexia, and elevated creatine phosphokinase levels
   b. Pain, mild dysphasia, and ataxia
   c. Pain, disturbed sleep, and fatigue
   d. Pain, paresthesia, and depression
   e. Pain, swollen joints, and elevated erythrocyte sedimentation rate

2. Which one of the following best describes the pathophysiology of FM pain?
   a. Aberrant processing of painful stimuli in the central nervous system
   b. Diffuse chronic inflammation of muscle tissue
   c. Degeneration of muscle fibrous tissue
   d. Neuronal damage by vitamin B₁₂ deficiency
   e. Excessive production of neurotransmitters in muscle tissue

3. Which one of the following is not a risk factor for FM?
   a. Family history of FM
   b. Family history of rheumatoid arthritis
   c. History of trauma or injury
   d. History of abuse
   e. Sex

4. Which one of the following laboratory tests is required for FM diagnosis?
   a. Rheumatoid factor
   b. Erythrocyte sedimentation rate
   c. C-reactive protein level
   d. Iron-binding capacity
   e. No laboratory tests are required to establish the diagnosis of FM

5. Which one of the following presentations should raise a high index of suspicion for FM?
   a. Chronic pain at a specific site
   b. Swelling of multiple joints
   c. A 1-week history of pain in multiple sites
   d. Chronic widespread pain lasting 2 years
   e. Symptoms of depression

Correct answers: 1. c, 2. a, 3. b, 4. e, 5. d