ASSESSMENT AND DIAGNOSIS

Overview

Clinical Features of Central Sensitization/Dysfunctional Pain

Pain

- Pain all over body
- Muscles stiff/achy
- Headaches
- Pain in jaw
- Pelvic pain
- Bladder/urination pain

Anxiety/depression

- Sad or depressed
- Anxiety
- Stress makes symptoms worse
- Tension in neck and shoulder
- Grind/clench teeth

Fatigue

- Do not sleep well
- Unrefreshed in morning
- Easily tired with physical activity

Other symptoms

- Difficulty concentrating
- Need help with daily activities
- Sensitive to bright lights
- Skin problems
- Diarrhea/constipation

Central Sensitization Inventory (CSI)

- A self-report measure designed to assess key somatic and emotional symptoms often associated with central sensitivity syndromes, including fibromyalgia
- Clinical goal: help better assess symptoms to aid physicians in syndrome categorization, sensitivity, severity, identification, and treatment planning and to help minimize or avoid unnecessary diagnostics and treatment procedures
- Fibromyalgia patients report high CSI scores
- Test demonstrates psychometric strength, clinical utility and validity

Central Sensitization Inventory (CSI)

Part A

Plea	se circle the best response to the right of each statemen	t.				
1	I feel unrefreshed when I wake up in the morning.	Never	Rarely	Sometimes	Often	Always
2	My muscles feel stiff and achy.	Never	Rarely	Sometimes	Often	Always
3	I have anxiety attacks.	Never	Rarely	Sometimes	Often	Always
4	I grind or clench my teeth.	Never	Rarely	Sometimes	Often	Always
5	I have problems with diarrhea and/or constipation.	Never	Rarely	Sometimes	Often	Always
6	I need help in performing my daily activities.	Never	Rarely	Sometimes	Often	Always
7	I am sensitive to bright lights.	Never	Rarely	Sometimes	Often	Always
8	I get tired very easily when I am physically active.	Never	Rarely	Sometimes	Often	Always
9	I feel pain all over my body.	Never	Rarely	Sometimes	Often	Always
10	I have headaches.	Never	Rarely	Sometimes	Often	Always
П	I feel discomfort in my bladder and/or burning when I urinate.	Never	Rarely	Sometimes	Often	Always
12	I do not sleep well.	Never	Rarely	Sometimes	Often	Always
13	I have difficulty concentrating.	Never	Rarely	Sometimes	Often	Always
14	I have skin problems such as dryness, itchiness or rashes.	Never	Rarely	Sometimes	Often	Always
15	Stress makes my physical symptoms get worse.	Never	Rarely	Sometimes	Often	Always
16	I feel sad or depressed.	Never	Rarely	Sometimes	Often	Always
17	I have low energy.	Never	Rarely	Sometimes	Often	Always
18	I have muscle tension in my neck and shoulders.	Never	Rarely	Sometimes	Often	Always
19	I have pain in my jaw.	Never	Rarely	Sometimes	Often	Always
20	Certain smells, such as perfumes, make me feel dizzy and nauseated.	Never	Rarely	Sometimes	Often	Always
21	I have to urinate frequently.	Never	Rarely	Sometimes	Often	Always
22	My legs feel uncomfortable and restless when I am trying to go to sleep at night.	Never	Rarely	Sometimes	Often	Always
23	I have difficulty remembering things.	Never	Rarely	Sometimes	Often	Always
24	I suffered trauma as a child.	Never	Rarely	Sometimes	Often	Always
25	I have pain in my pelvic area.	Never	Rarely	Sometimes	Often	Always
					Total=	

Part B

	Have you been diagnosed by a doctor with any of the following disorders? Please check the box to the right for each diagnosis and write the year of the diagnosis.					
		NO	YES	Year Diagnosed		
1	Restless Leg Syndrome					
2	Chronic Fatigue Syndrome					
3	Fibromyalgia					
4	Temporomandibular Joint Disorder (TMJ)					
5	Migraine or tension headaches					
6	Irritable Bowel Syndrome					
7	Multiple Chemical Sensitivities					
8	Neck Injury (including whiplash)					
9	Anxiety or Panic Attacks					
10	Depression					

Mayer TG et al. Pain Pract 2012; 12(4):276-85.

Diagnosing Fibromyalgia

- On average it takes patients >2 years to be diagnosed with fibromyalgia
- A estimated **75%** of people with fibromyalgia remain undiagnosed

Overview of Diagnosis

- History of fibromyalgia or related conditions
 - Personal and family history
- Physical examination
 - Most important to identify any other possible conditions
- Differential diagnosis
 - Clinical/laboratory evaluation to identify other possible conditions

Consequences of Non-diagnosis

 Failure to diagnose fibromyalgia is associated with increased costs and increased use of medical resources

Annemans L et al. Arthritis Rheum 58(3):895-902; Choy E et al. BMC Health Serv Res 2010; 10:102; Clauw DJ et al. Mayo Clin Proc. 2011; 86(9):907-11; Mease P. J Rheumatol 2005; 32(Suppl 75):6-21; Wolfe F et al. Arthritis Rheum 1990; 33(2):160-72.

FiRST: Fibromyalgia Rapid Screening Tool

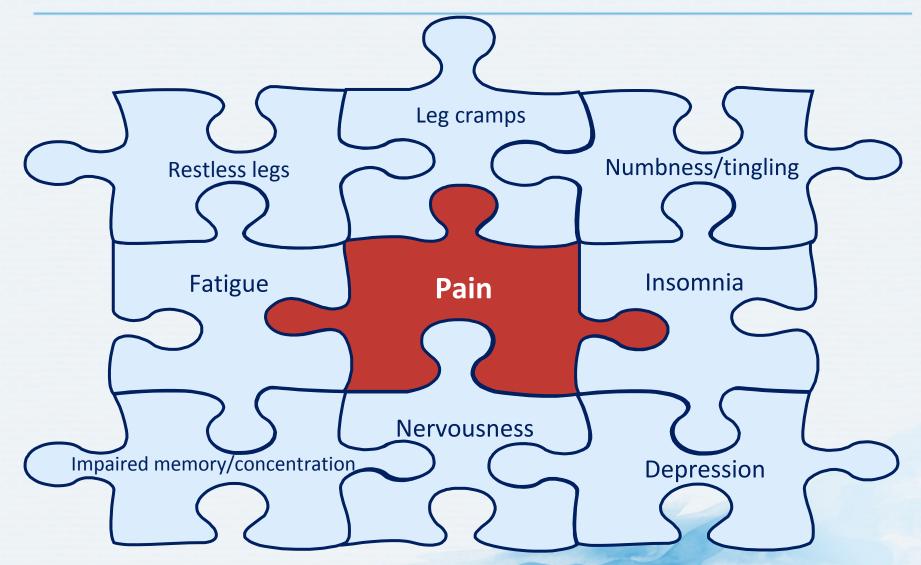
Items

- 1. I have pain all over my body.
- 2. My pain is accompanied by continuous and very unpleasant general fatigue.
- 3. My pain feels like burns, electric shocks or cramps.
- My pain is accompanied by other unusual sensations throughout my body, such as pins and needles, tingling or numbness.
- My pain is accompanied by other health problems such as digestive problems, urinary problems, headaches or restless legs.
- 6. My pain has a significant impact on my life, particularly on my sleep and my ability to concentrate, making me feel slower generally.

- Self-administered 6-item questionnaire
- Score of ≥5 is indicative of fibromyalgia
- Sensitivity: 90.5%
- Specificity: 85.7%

History

How to Recognize Fibromyalgia: Pain Is the Common Piece of the Puzzle



Wolfe F et al Arthritis Rheum 1990; 33(2):160-72.

Patients with Fibromyalgia Present with a Global Pain Disorder

- This is a pain drawing
 - Patient colors all areas of the body in which he or she feels pain¹
- The diagram shows that the pain of fibromyalgia is widespread²

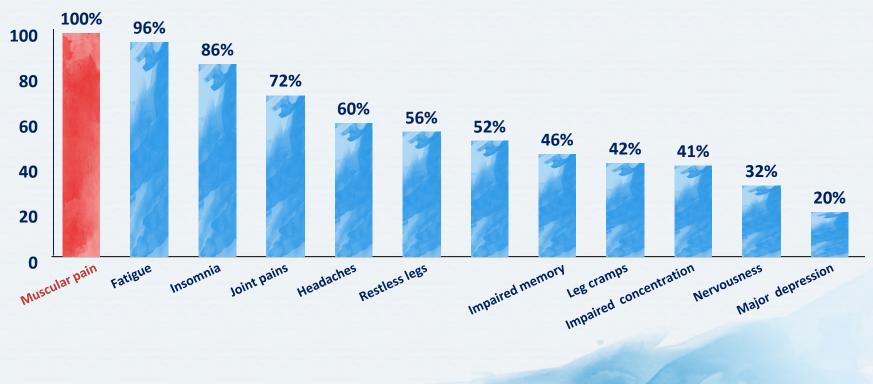


Adapted from pain drawing provided courtesy of L Bateman.

1. Silverman SL, Martin SA. In: Wallace DJ, Clauws DJ (eds.). *Fibromyalgia & Other Central Pain Syndromes*. Lippincott, Williams & Wilkins; Philadelphia, PA: 2005; 2. Wolfe F *et al. Arthritis Rheum* 1990; 33(2):160-72.

Symptoms of Fibromyalgia

 Pain, fatigue and sleep disturbance are present in at least 86% of patients*



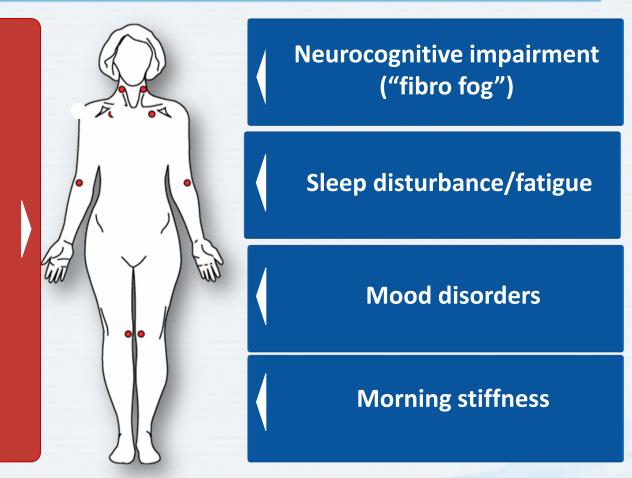
*United States data

Wolfe F et al Arthritis Rheum 1990; 33(2):160-72.

Core Clinical Features of Fibromyalgia

Widespread pain

- Chronic, widespread pain is the defining feature of fibromyalgia
- Patient descriptors of pain include:
 - Aching
 - Exhausting
 - Nagging
 - Hurting



Carruthers BM *et al. J Chron Fat Synd* 2003; 11(1):7-115; Harding SM. *Am J Med Sci* 1998; 315(6):367-37; Henriksson. *J Rehabil Med* 2003; 41(41 Suppl):89-94; Leavitt *et al. Arthritis Rheum* 1986; 29(6):775-81; Roizenblatt S *et al. Arthritis Rheum* 2001; 44(1):222-30; Wolfe F *et al Arthritis Rheum* 1990; 33(2):160-72; Wolfe F *et al. Arthritis Rheum* 1995; 38(1):19-28.

Stressors

- Some triggering event may trigger fibromyalgia but is *not* a prerequisite
- Onset of fibromyalgia is often gradual, with no identifiable trigger
- Stressors that may trigger fibromyalgia:
 - Peripheral pain syndromes
 - Physical trauma,
 - Infections (e.g., parvovirus, Epstein-Barr virus, Lyme disease, Q fever)
 - Psychological stress/distress, including sleep disturbances

Development of fibromyalgia after a precipitating event may represent the onset of a prolonged and disabling pain syndrome with considerable social and economic implications.

Greenfield S et al. Arthritis Rheum 1992; 35(6):678-81; McLean SA, Clauw DJ. Med Hypotheses 2004; 63(4):653-8.

Fibromyalgia as a Consequence of Trauma

Factors Triggering Fibromyalgia or Associated with its Onset (n = 136)

Factor	Trigger factors	Associated factors*
Cold	0	15
Stress	9	35
Emotions	5	35
Overwork	0	22
Trauma	24	24
Surgery	4	13
Death in the family	0	13
Family problems	2	25
Fatigue	0	23
No cause/association	55	5

In most cases of fibromyalgia, there is **no predisposing trigger**.

*More than one factor possible for the same patient Adapted from: Wolfe F. *Am J Med* 1986; 81(3A):7-14.

Modulating Factors of Fibromyalgia Syndrome Pain

Exacerbating factors	Mean %	Relieving factors	Mean %
Weather (cold, humidity)	65	Local heat	58
Poor sleep	70	Rest	54
Anxiety, stress	61	Moderate activities	46
Physical inactivity	49	Stretching exercises	43
Noise	22	Massage	40

Yunus MB In: Wallace DJ, Clauw DJ (eds). Fibromyalgia & Other Central Pain Syndromes. Lippincott, Williams & Wilkins; Philadelphia, PA: 2005.

Symptom Intensity Scale (SIS)

- Easy, rapid way to assess regional pain and fatigue in a patient
- Can uncover comorbid depression
- Is a simple way to measure overall health
- Can detect fibromyalgia in patients who have other diseases
- When fatigue is the dominant system, questionnaire includes consideration of obstructive sleep apnea
- SIS score is derived from 2 distinct measures:

Regional Pain ScoreFatigue Visual Analog ScoreNumber of anatomic areas (out of 19) in
which the patient feels painHPatient makes a mark somewhere along a
10-cm line to indicate how tired he or she feels

Wilke WS. Cleve Clin J Med 2009; 76(6):345-52.

Symptom Intensity Scale (SIS)

AREAS	YES	MO	AREAS	YES	NO
Jaw (left)			Upper arm (left)		
Jaw (right)			Upper arm (right)		
Chest			Upper back		
Abdomen			Hip (left)		
Forearm (left)			Hip (right)		
Forearm (right)			Shoulder (left)		
Upper leg (left)			Shoulder (right)		
Upper leg (right)			Neck		
Lower leg (left)			Low back		
Lower leg (right)					
Total number of painfu (this is the Regional Pain					
Please indicate your cu No fatigue		of fatigue			Very fatigued
(Measure the position of the patient's response in centimeters from the left end of this 10-cm line. This is the fatigue visual analogue scale score.)					
Survey Criteria for fibromyalgia syndrome: Regional Pain Scale score of 8 or higher and fatigue visual analogue scale score 6 cm or higher*					
Symptom Intensity Scale score = [Fatigue visual analogue scale + (Regional Pain Scale score / 2)] / 2 ^b					

Fibromyalgia Impact Questionnaire (FIQ)

- Developed to capture the total spectrum of problems related to fibromyalgia and responses to therapy
- Has been shown to have a credible construct validity, reliable retest characteristics, and a good sensitivity in demonstrating therapeutic change
- Commonly used as an outcome measure in therapeutic trials
- Self-administered; requires 3–5 minutes to complete
- Simple directions and scoring
- Has been translated into 8 languages
- Most recent version is available at www.myalgia.com/FIG/FIQ

Fibromyalgia Impact Questionnaire (FIQ)

The FIQ Directions and Questions

Directions: For questions 1 through 3, 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 the question out.

Question 1.

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

Question 2. Of the 7 days in the past week, how many days did you feel good ?

0 1 2 3 4 5 6 7

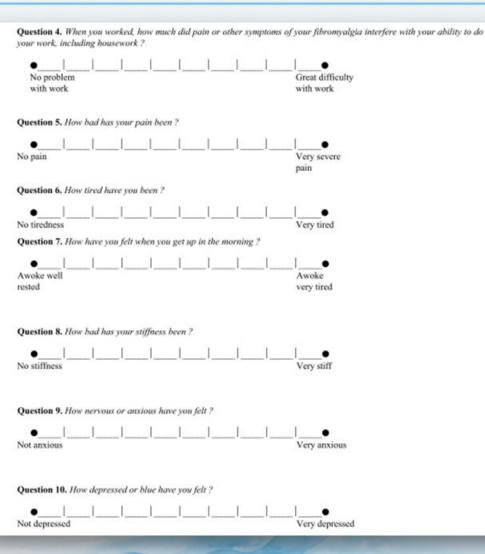
Question 3. How many days last week did you miss work, including housework, because of fibromyalgia ?

0 1 2 3 4 5 6 7

Bennett R. Clin Exp Rheumatol 2005; 23(5 Suppl 39):S154-62.

Fibromyalgia Impact Questionnaire (FIQ)

"For the remaining items, mark the point on the line that beat indicates how you felt overall for the past week."



Physical Examination

Physical Exam: Manual Tender Point Survey

- Based on 1990 ACR tender point protocol for fibromyalgia
- Can be performed in 5–10 minutes
- 18 survey and 3 control sites examined in a specific numerical order
- Control sites reveal baseline of patient's pain perception

ACR = American College of Rheumatology

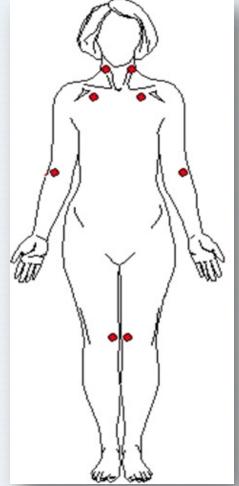
National Fibromyalgia Association. The Manual Tender Point Survey. Available at: http://www.fmaware.org/News2eb58.html?p. Accessed: August 13, 2013

Performing a Manual Tender Point Survey

- Digital palpation with an approximate force of 4 kg
 - Estimated pressure needed to turn the examiner's thumbnail white upon depressing
 - For a "positive" tender point, subject must state palpation was painful
- Accuracy for fibromyalgia:
 - Sensitivity: 88.4%
 - Specificity: 81.1%
- Controversies regarding tender point evaluation:
 - Subjective
 - May not be necessary for diagnostic studies
 - What about fewer than 11 of 18 tender points?

National Fibromyalgia Association. *The Manual Tender Point Survey*. Available at <u>http://www.fmaware.org/News2eb58.html?p</u>. Accessed August 13, 2013; Wilke WS. *Cleve Clin J Med* 2009; 76(6):345-52; Wolfe F *et al. Arthritis Rheum* 1990; 33(2):160-72.

Manual Tender Point Survey: Illustration of 18 Tender Points



- Lateral epicondyle (2) 2 cm distal to epicondyles
 - Occiput (2) at suboccipital muscle insertions
- Low cervical (2) at anterior aspects of the intertransverse spaces at C5-C7
- Trapezius (2) at midpoint of upper border
- Supraspinatus (2) at origins,
 above scapula spine near medial border
- Second rib (2) upper lateral to second costochondral junction
- Gluteal (2) in upper outer quadrants of buttocks in anterior fold of muscle
- Greater trochanter (2) posterior to trochanteric prominence
- Knee (2) at medial fat pad proximal to joint line

Imaging and Other Tests

Imaging and Laboratory Tests: Fibromyalgia

 No specific tests are necessary to diagnosis fibromyalgia, but may be useful to exclude other diagnoses

Differential Diagnosis of Fibromyalgia

- Hypothyroidism
- Vitamin D deficiency
- Inflammatory rheumatic disease
- Cancer
- Inflammatory muscle diseases

Differential Diagnoses for Fibromyalgia and Corresponding Testing Options

Differential diagnoses	Diagnostic testing options
Adrenal dysfunction	Morning serum cortisol, urinary catecholamine metabolites
Anemia	CBC with differential, RBC indices (MCV, MCH, MCHC)
Bone marrow disease	WBC differential, ESR, CRP, CMP
Chronic fatigue syndrome	Clinical history
Functional disorders (e.g., intestinal dysbiosis, subtle endocrine imbalances, and postviral immune suppression)	Standard laboratory testing yields unclear results
Hypothyroidism	Thyroid function tests (T3, T4, TSH)
Lyme disease	Lyme titer, CMP
Psychiatric conditions (e.g., post-traumatic stress disorder, anxiety, and depression)	Refer to DSM

CBC = complete blood count; CMP = common myeloid progenitor; CRP = C-reactive protein; DSM = Diagnostic and Statistical Manual of Mental Disorders; ESR = erythrocyte sedimentation rate; MCH = mean corpuscular hemoglobin; MCHC = mean corpuscular hemoglobin concentration; MCV = mean corpuscular volume; RBC = red blood cell; TSH = thyroid-stimulating hormone; WBC = white blood cell Bellato E *et al. Pain Res Treat* 2012; 2012:426130.

Differential Diagnoses for Fibromyalgia and Corresponding Testing Options (cont'd)

Differential Diagnoses	Diagnostic Testing Options
Multiple sclerosis	MRI scan, lumbar puncture, evoked potential testing
Phenomenological referred myofascial pain	Muscular tender points on physical examination
Rheumatoid autoimmune disorders (e.g., rheumatoid arthritis, ankylosing spondylitis, scleroderma)	Rheumatic profile (rheumatoid factor, ESR/CRP), ANA
Sleep disorders	EEG sleep studies
Spinal facet pain or sacroiliac joint pain	Radiologic studies (MRI scan, CT scan), bone scans (minimal diagnostic assistance)
Spinal disc herniation	MRI scan
Systemic inflammation or infection	Radiologic studies (MRI scan, CT scan), bone scans (minimal diagnostic assistance)
Vitamin and/or mineral deficiency	Radiologic studies (MRI scan, CT scan), bone scans (minimal diagnostic assistance)

ANA = antinuclear antibody; CRP = C-reactive protein; CT = computed tomography; EEG = electroencephalography ESR = erythrocyte sedimentation rate; MRI = magnetic resonance imaging Bellato E *et al. Pain Res Treat* 2012; 2012:426130.

Diagnosis

Is it fibromyalgia or chronic fatigue syndrome?

Fibromyalgia

- Primary symptom is generalized muscle pain
- Primary sign is pain at more than 11 of 18 tender points
- 20–70% meet criteria for chronic fatigue syndrome¹

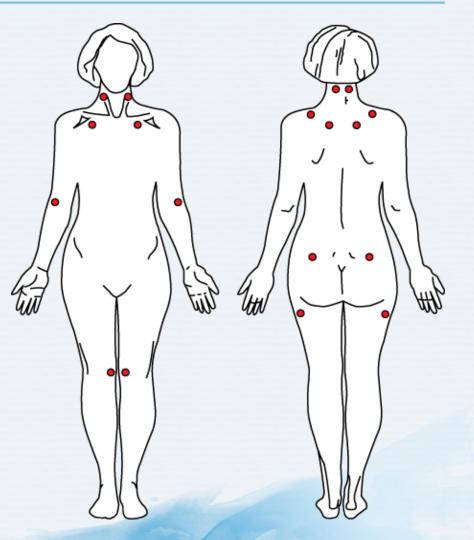
Chronic Fatigue Syndrome

- Primary symptom is post-exertional malaise, fatigue
- No current diagnostic test but mitochondrial dysfunction is suspected
- Score of <50 on SF-36 physical function scale can help differentiate from major depression
- 75% also meet criteria for fibromyalgia²

1. Aaron LA et al. Arch Intern Med 2000; 160(2):221-7; 2. Goldenberg DL et al. Arthritis Rheum 1990; 33(3):381-7.

ACR Classification Criteria for Fibromyalgia (1990)

- ACR criteria:
 - History of chronic widespread pain ≥3 months
 - Patients must exhibit
 ≥11 of 18 tender points
- ACR criteria are both sensitive (88.4%) and specific (81.1%)



ACR Proposed Diagnostic Criteria for Fibromyalgia (2010)

- Fibromyalgia can be diagnosed if:
 - Patient experiences widespread pain and
 - associated symptoms
 - Symptoms have been present at same level for ≥3 months
 - No other condition otherwise explains the pain

Associated

symptoms include:

- Unrefreshed sleep
- Cognitive symptoms
- Fatigue
- Other somatic symptoms

ACR Diagnostic Criteria for Fibromyalgia – 2010

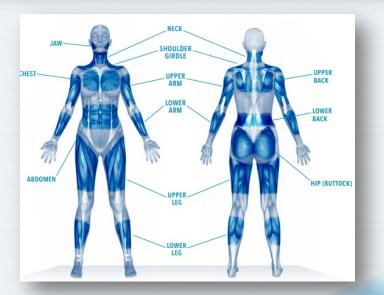
The 2010 ACR criteria require assessment of 3 key elements:

- Presentation of widespread pain and symptoms for ≥**3 months**
- Widespread Pain Index (WPI)*
 - Assesses number of painful body areas
- Symptom Severity Scale (SSS)*
 - Assesses severity of fatigue, waking unrefreshed, cognitive symptoms, and extent of other somatic symptoms

*Health care practitioner-administered questionnaire ACR = American College of Rheumatology Wolfe F *et al. Arthritis Care Res (Hoboken)* 2010; 62(5):600-10.

Widespread Pain Index (WPI)





Symptom Severity Scale (SSS) (Part A)

Fatigue

- 0 = No problem
- 1 = Slight or mild problems; generally mild or intermittent
- 2 = Moderate; considerable problems; often present and/or at a moderate level
- 3 = Severe; pervasive, continuous, life-disturbing problems

Waking unrefreshed

- 0 = No problem
- 1 = Slight or mild problems; generally mild or intermittent
- 2 = Moderate; considerable problems; often present and/or at a moderate level
- 3 = Severe; pervasive, continuous, life-disturbing problems

Cognitive symptoms

- 0 = No problem
- 1 = Slight or mild problems; generally mild or intermittent
- 2 = Moderate; considerable problems; often present and/or at a moderate level
- 3 = Severe; pervasive, continuous, life-disturbing problems

Symptom Severity Scale – Other Somatic Symptoms (Part B)

Other somatic symptoms

Muscle pain	Depression	Ltching	Dry eyes		
Irritable bowel syndrome	Constipation	U Wheezing	Generation Shortness of breath		
□ Fatigue/tiredness	Pain in upper abdomen	Raynaud's	Loss of appetite		
Thinking or memory problem	Nausea	Hives/welts	Rash		
Muscle weakness	Nervousness	Ringing in ears	Sun sensitivity		
Headache	Chest pain	Uvomiting	Hearing difficulties		
Pain/cramps in abdomen	Blurred vision	Heartburn	Easy bruising		
Numbness/tingling	Gever Fever	Oral ulcers	Hair loss		
Dizziness	Diarrhea	Loss/change in taste	Frequent urination		
Insomnia	Dry mouth Seizures Bladder spasms				
Based on the quantity of syr	nptoms, the patient's sco	ore is:			
0 = No symptoms	2 = A moderate number of symptoms				
□ 1 = Few symptoms □ 3 = A great deal of symptoms					

What the Patient's Scores Mean

The patient's WPI score (Part 1):

The patient's SS score (Parts 2a and 2b):

A PATIENT MEETS THE DIAGNOSTIC CRITERIA FOR FIBROMYALGIA IF THE FOLLOWING 3 CONDITIONS ARE MET:

1a. The WPI score (Part 1) is greater than or equal to 7 and the SS score (Parts 2a and 2b) is greater than or equal to 5.

OR

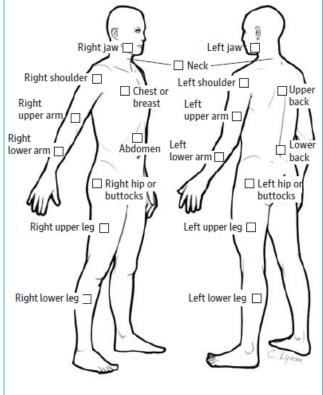
- 1b. The WPI score (Part 1) is from 3 to 6 and the SS score (Parts 2a and 2b) is greater than or equal to 9.
- 2. Symptoms have been present at a similar level for at least 3 months.
- 3. The patient does not have a disorder that would otherwise explain the pain.

Example of Patient Self-report Survey for the Assessment of Fibromyalgia

Widespread Pain Index (1 point per check box; score range: 0-19 points)

 Please indicate if you have had pain or tenderness <u>during the</u> past 7 days in the areas shown below.

Check the boxes in the diagram for each area in which you have had pain or tenderness.



Symptom Severity (score range: 0-12 points)

- For each symptom listed below, use the following scale to indicate the severity of the symptom during the past 7 days.
 - No problem
 - Slight or mild problem: generally mild or intermittent
 - Moderate problem: considerable problems; often present and/or at a moderate level
 - Severe problem: continuous, life-disturbing problems

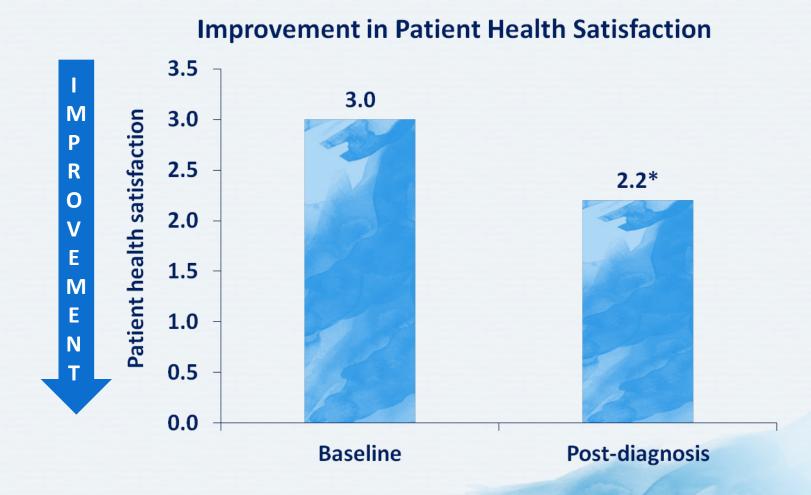
		No problem	Slight or mild problem	Moderate problem	
	Points	0	1	2	3
١	A. Fatigue				
per ck	B. Trouble thinking or remembe	ring 🗌			
1	C. Waking up tired (unrefreshed)			
wer	3 During the past 6 months have ye	ou had any of	the following s	symptoms?	
ck /	Points	0	1		
$\left\{ \right.$	A. Pain or cramps in lower abdon	nen 🗌 No	Yes		
	B. Depression	No No	Yes		
	C. Headache	🗆 No	Ves Yes		
	Additional criteria (no score)				
	(4) Have the symptoms in questions similar level for at <u>least 3 month</u>		videspread pair	n been pres	ient at a
		No No	Ves		
J	5 Do you have a disorder that woul	d otherwise e	xplain the pain	1?	

The possible score ranges from 0 to 31 points; a score \geq 13 points is consistent with a diagnosis of fibromyalgia. Wolfe F *et al. J Rheumatol* 2011; 38(6):1113-22.

Tips on Providing the Diagnosis of Fibromyalgia

- Be **specific** about the diagnosis
- Be **positive** about the diagnosis
- Promote and encourage patient self-efficacy around the disease but...
 - Set realistic expectations
 - Emphasize there is no cure but improved control of symptoms is usually possible

Diagnosis of Fibromyalgia Can Improve Patient Satisfaction



*Statistically significant vs. baseline (confidence interval -1.2 to -0.4) White KP *et al.* Arthritis Rheum 2002; 47(3):260-5.

Summary

Assessment and Diagnosis: Summary

- Key clinical features of central sensitization/dysfunctional pain syndromes are pain, anxiety/depression and fatigue
 - The cardinal symptoms of fibromyalgia are widespread pain, fatigue, sleep disturbance, and cognitive slowing
- Diagnosis of fibromyalgia is based on widespread pain and associated symptom cluster, with a physical exam (and possible laboratory investigations) to exclude other conditions
- A number of questionnaires are available for use in assessing patients
- A diagnosis of fibromyalgia can improve health outcomes and reduce costs