

8-20-2020

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Michael Bozzi, MD

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Bozzi, MD, Michael, "Chronic Muscle Pain" (2020). *Department of Family & Community Medicine Presentations and Grand Rounds*. Paper 433.

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Chronic Muscle Pain

Mike Bozzi
JFMA PGY-2

Learning Objectives

- How to approach the patient with chronic muscle pain
- How a complete history and physical can prevent extraneous testing and unnecessary or premature referrals
- Treatment strategies

Case

JM, 57 year old female

Reason for visit: pain everywhere

Differential Diagnosis

Rheumatologic/Inflammatory

RA/lupus/Sjogren's
Polymyalgia rheumatica
Spondyloarthritis
Osteoarthritis
Fibromyalgia

Infectious

Virus (HIV, Hep B/C, influenza, chikungunya...)
Lyme disease
Pyomyositis

Neurologic

Chronic neuropathy
Opioid induced hyperalgesia

Muscle Disease

Muscle strain/overuse injuries
Rhabdomyolysis

Metabolic

Hypothyroidism
Cushing's syndrome
Hypercalcemia/hyperparathyroidism
Hyperkalemia

Drug-induced myopathies

Statin
Glucocorticoid
Hydroxychloroquine
Alcohol

Decision Points

Where is the pain? - local vs diffuse, joints vs muscles

Timeline - acute vs chronic, constant vs intermittent

Is strength affected? - intact vs decreased

What labs should I get? - Inflammatory vs non-inflammatory

What else is going on? - comorbid conditions, exacerbating factors



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JM

JM is a 57 year old female presents with diffuse pain for the past 2 months. She feels the pain began in her back and shoulders but quickly spread to the rest of her body. When asked if she can point to any specific spots now she gestures generally and says “all over.” She describes the pain as a constant dull ache with increased tenderness to light palpation in various locations. There is no clear association with time of day or activity, though she does feel stiff for 15-30 minutes in the morning. She does not regularly exercise but says her activity level has been worse than usual recently because of the pain. She has been unable to get a full night of sleep in several months and is constantly fatigued, which has taken a significant toll on her mood, which she describes today as “awful.” She asks you to “please make the pain go away.”

Additional information

PMH: hypertension, hypercholesterolemia, obesity, bilateral knee OA, depression

PSH: lap chole at age 44, C-section x2

Medications: HCTZ-lisinopril, atorvastatin, tylenol, sertraline

Allergies: none

SH: works in billing dept for a real estate company, married with two children, lives in a row home in Northeast Philly, never smoker, occasional alcohol, no drugs.

FH: hypertension and heart disease in her father, diabetes in her mother and sister

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Adjusting the differential diagnosis

Rheumatologic/Inflammatory ↑

RA/lupus/Sjogren's

Polymyositis/dermatomyositis

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Spondyloarthritis

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Fibromyalgia

Infectious ↓

Virus (HIV, Hep B/C, influenza, chikungunya...)

Lyme disease

Pyomyositis

Neurologic ↓

Neuropathy

Opioid induced hyperalgesia

Muscle Disease ↓

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Statins

The Importance of a Complete Physical Exam

Skin - careful examination for rashes and skin changes, particularly overlying joints, on the hands, and on the face

Joints - assess for effusions, mobility, tenderness

Muscles - assess for tenderness in multiple areas, strength (subjective vs objective, proximal vs distal vs diffuse)

Which muscles to test?

Deltoids - shoulder shrug

Neck flexors - push against forehead

Wrist extensors - pull hand back

Grip strength - squeeze fingers

Thigh flexion - lift leg off table

Ankle flexion/extension - dorsi- and plantarflexion of foot

Physical Exam

General: tired appearing, no acute distress, speaking in a soft voice

HEENT/Neck: EOMI, PERRL, moist mucous membranes, no LAD, no thyromegaly, neck circumference within normal limits

Chest: lungs clear bilaterally, no chest wall tenderness

Cardiac: RRR, no murmurs

Abdomen: mild diffuse tenderness to palpation, no rebound/guarding, normal bowel sounds

MSK: 5/5 strength throughout with giveaway weakness on shoulder shrug and hip flexion; tenderness to palpation in the bilateral deltoids, biceps, quads, calves, upper back, lower back without bony deformity; moderate bilateral knee tenderness to palpation without significant effusion; no hand deformities, no synovitis, ROM of all joints intact

Neuro: sensation intact throughout

Skin: no rashes, no jaundice, no pallor

Psych: depressed affect, normal thought content, no SI

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Statins 

Okay so what should we do?

Labs

- CBC?
- CMP?
- TSH?
- ESR/CRP?
- CK?
- RF? ANA?
- Lyme?

Medications

- Start?
- Stop?

Imaging

- Ultrasound? X-rays?

Referrals

- Rheum?

Okay so what should we do?

Labs

- CBC - Yes
- CMP - Yes
- TSH - Yes*
- ESR/CRP - Yes*
- CK - Yes*
- RF? ANA? No
- Lyme? Please, no

Medications

- Start - trial NSAIDs (eg. naproxen)
- Stop - statin

Imaging

- No thank you

Referrals

- Not yet

Follow up: return to clinic in two weeks

Two weeks later

Mrs. M returns to the clinic two weeks later and notes that her symptoms are unchanged since her last visit. She stopped her statin as instructed. The naproxen you gave her did not seem to help her pain at all; sleep and mood have continued to be particularly poor. Her exam is unchanged.

Lab results:

CBC: within normal limits

CMP: within normal limits

TSH: within normal limits

CK: within normal limits

ESR: 33 - (normal is 0-30 for women age >50; alternative is $[\text{age}+10]/2$)

Now what?

Inflammatory or Non-inflammatory?

OK so the ESR is mildly elevated. Reminder that this is a very non-specific test but also not entirely sensitive for conditions like PMR or early RA.

So how else can we distinguish inflammatory from non-inflammatory conditions?

Let's try something.

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Prednisone 5 mg BID for a week...

Mrs. M comes back another two weeks later and says nope. Nada. No different.

Fibromyalgia



Fibromyalgia

Fibromyalgia is a chronic neurologic syndrome characterized by pain all over the body and tenderness or increased sensitivity to touch, along with other cognitive symptoms including fatigue, memory problems, difficulty concentrating, and sleep disturbances. It is not an inflammatory or autoimmune condition, at least as far as has been established with current research.

Epidemiology of Fibromyalgia

Prevalence: the CDC estimates that approximately 2% of the adult population in the US have FM, or about 4 million people, though some estimates are as high as 5%

Age: presentation can occur at any age, with the majority experiencing onset between the age of 20 and 50

Gender: women are estimated to be at 2 to 9 times greater risk for FM

Genomic studies have found a handful of genes associated with an increased risk of developing the condition and a relative risk up to 13-fold among first degree relatives of patients with FM, indicating a possible genetic predisposition.

Pathophysiology of Fibromyalgia

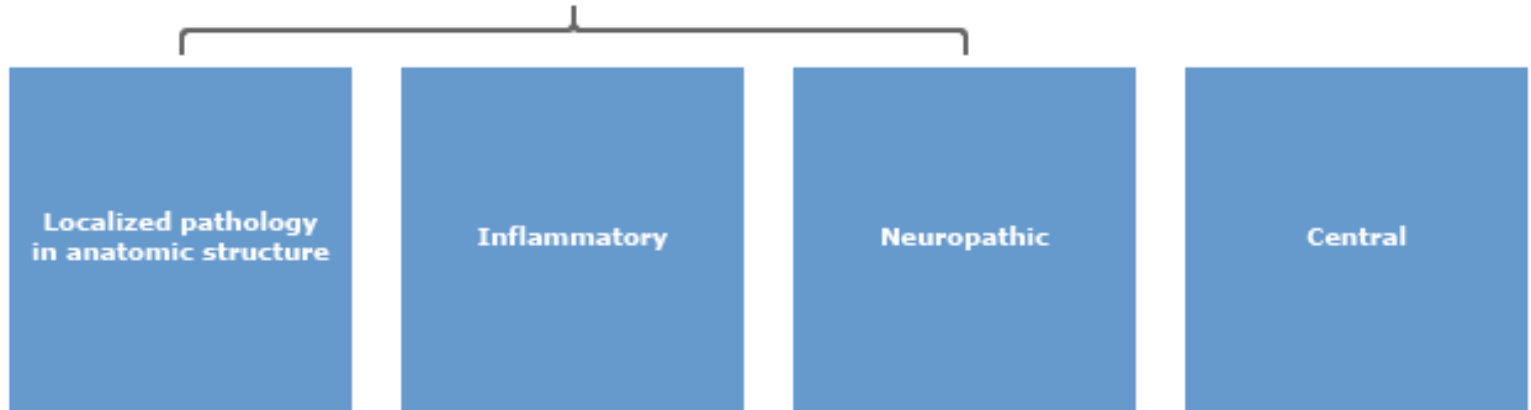
The exact pathophysiology of fibromyalgia has yet to be elucidated.

While there is no unifying clinical history, FM diagnoses are almost always preceded by a triggering factor or event such as arthritis, low back pain, infection, physical or emotional trauma.

Characteristic chronic widespread pain thought to result from sustained release of proinflammatory cytokines and chemokines in the CNS, resulting in neuroinflammation and altered connectivity between brain regions.

Chronic Widespread Pain and Central Sensitization

Driven by "peripheral" pathology



Examples:

- Osteoarthritis
- Low back pain

- Rheumatoid arthritis
- Systemic lupus erythematosus

- Carpal tunnel syndrome
- Peripheral neuropathy

- Fibromyalgia
- Irritable bowel syndrome

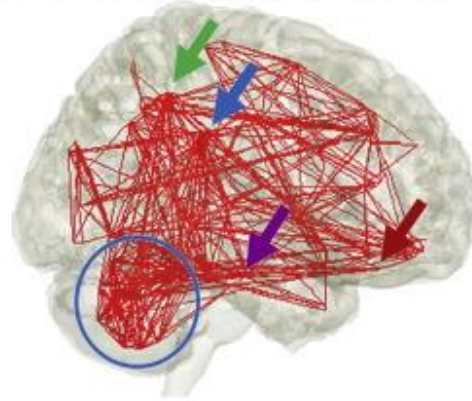


Neurologic Differences

Compared to healthy controls, patients with fibromyalgia have increased connectivity with the cerebellum and decreased connectivity with the prefrontal cortex.

Gray matter density in these regions associated quantitatively with depression symptoms and the number of fibers correlated with severity of hyperalgesia.

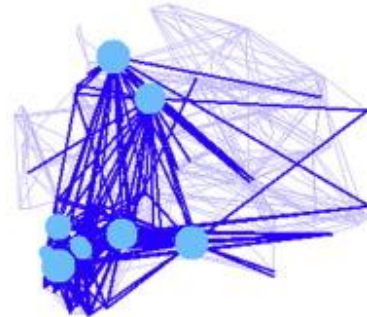
A Fibromyalgia patients



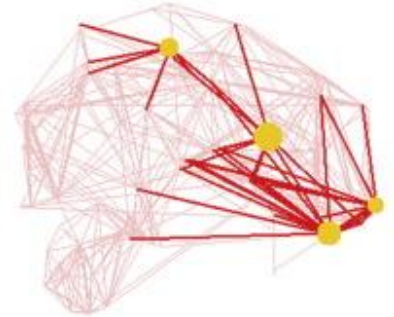
Healthy controls



B



P



A

P

A

Diagnostic Criteria

Three criteria must be met for the diagnosis of fibromyalgia:

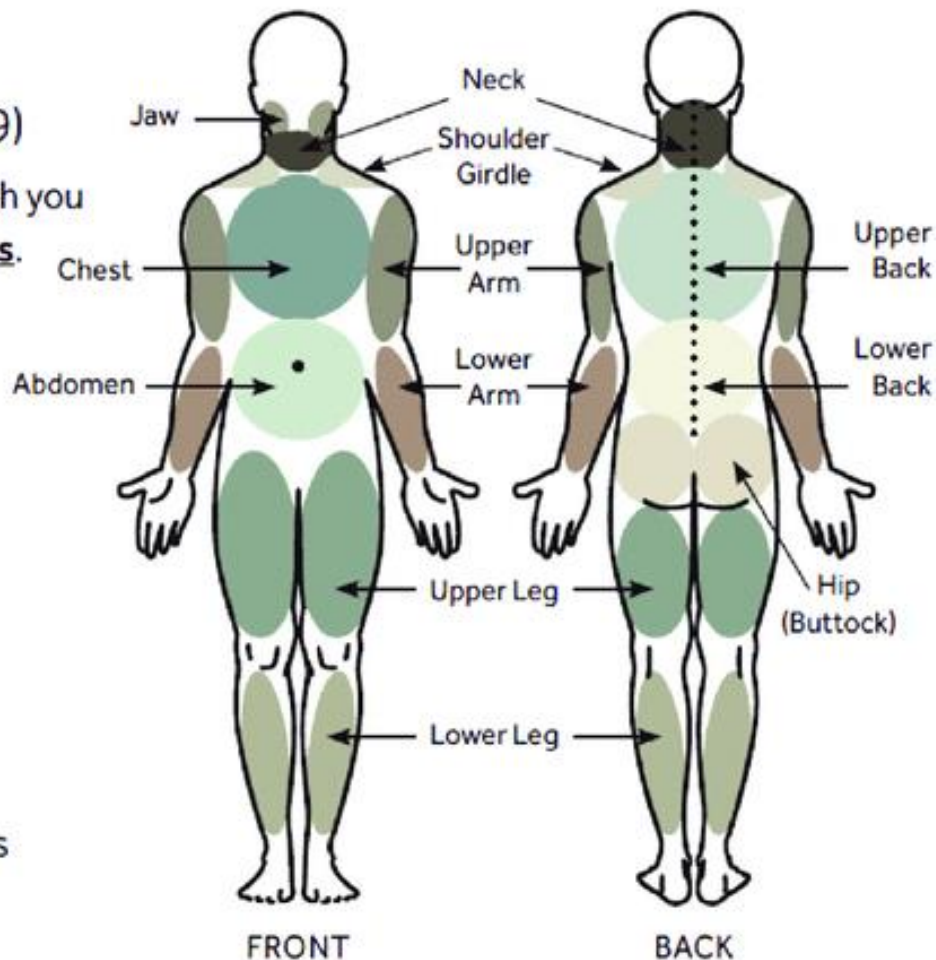
- 1) Widespread pain and significant symptoms severity, as assessed by the Widespread Pain Index (WPI) and Symptoms Severity Score (SS)
- 2) Symptoms present at similar level for at least three months
- 3) No alternative diagnosis that would explain the symptoms

Widespread Pain Index (WPI)

(1 point per check box; score range: 1–19)

Please check the boxes below for each area in which you have had pain or tenderness **during the past 7 days**.

- | | |
|---|--|
| <input type="checkbox"/> Shoulder girdle, left | <input type="checkbox"/> Lower leg left |
| <input type="checkbox"/> Shoulder girdle, right | <input type="checkbox"/> Lower leg right |
| <input type="checkbox"/> Upper arm, left | <input type="checkbox"/> Jaw left |
| <input type="checkbox"/> Upper arm, right | <input type="checkbox"/> Jaw right |
| <input type="checkbox"/> Lower arm, left | <input type="checkbox"/> Chest |
| <input type="checkbox"/> Lower arm, right | <input type="checkbox"/> Abdomen |
| <input type="checkbox"/> Hip (buttock) left | <input type="checkbox"/> Neck |
| <input type="checkbox"/> Hip (buttock) right | <input type="checkbox"/> Upper back |
| <input type="checkbox"/> Upper leg left | <input type="checkbox"/> Lower back |
| <input type="checkbox"/> Upper leg right | <input type="checkbox"/> None of these areas |



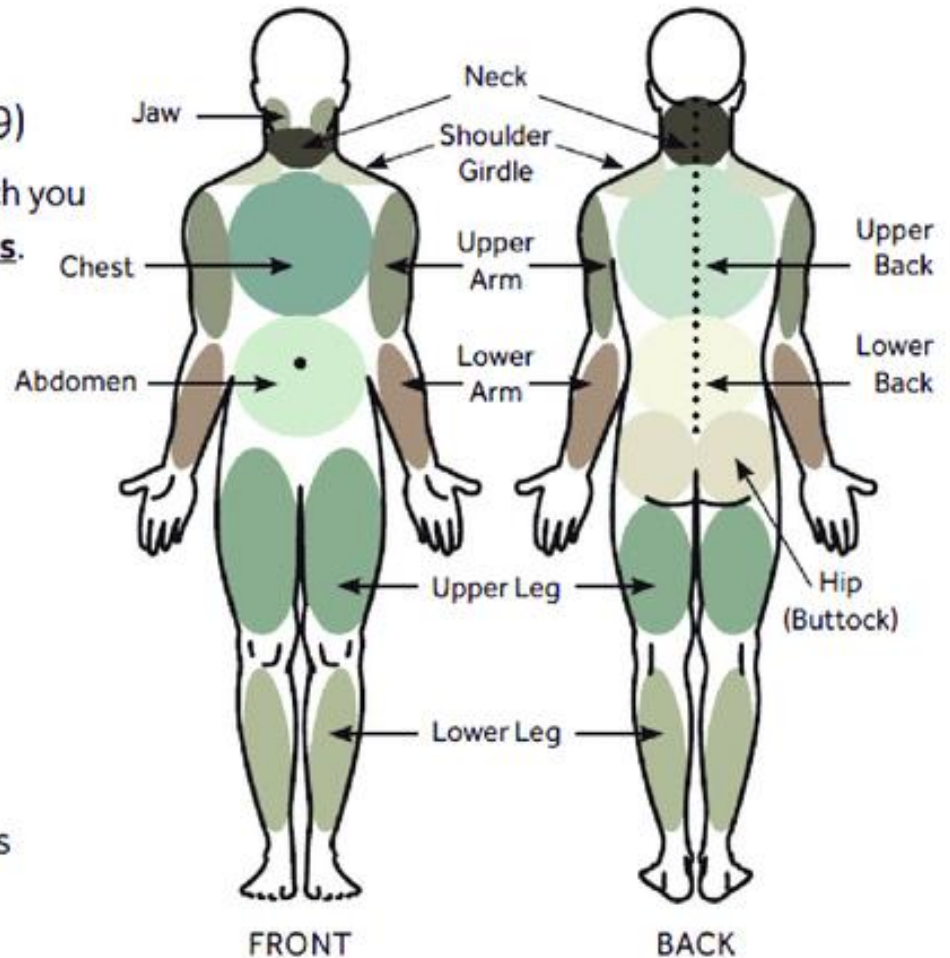
WPI score: _____

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| <input checked="" type="checkbox"/> Upper leg right | <input type="checkbox"/> None of these areas |



WPI score: _____

Symptom Severity Scale

Operates on a scale from 0-12 by summing the answers to these questions:

Level of symptom severity over the past week, on a scale from 0 to 3:

- Fatigue
- Waking unrefreshed
- Cognitive Symptoms

Presence of these symptoms in the past six months (N=0, Y=1):

- Depression
- Pain or cramps in lower abdomen
- Headache

Meeting the Criteria

WPI ≥ 7 and SS ≥ 5

OR

WPI ≥ 3 and SS ≥ 9

In combination, these work within a spectrum of pain and cognitive/mood symptoms to allow for significant leeway in diagnosis.

Diagnostic Criteria

Three criteria must be met for the diagnosis of fibromyalgia:

- 1) Widespread pain and significant symptoms severity, as assessed by the Widespread Pain Index (WPI) and Symptoms Severity Score (SS)
- 2) Symptoms present at similar level for at least three months
- 3) No alternative diagnosis that would explain the pain**

Alternative and Contributing Diagnoses

Connective Tissue Diseases - high prevalence of FM in patients with RA and other CTDs; treat both modalities at once

Polymyalgia rheumatica - look for signs of inflammation, treat with steroids when appropriate, wean off as able.

Myopathies - is that statin causing problems?

Sleep apnea - if you have a patient saying they're always fatigued, waking up unrefreshed, having difficulty concentrating you would probably get a sleep study

Depression - comorbid and contributing, mental and physical symptoms can play off of each other and should both be addressed

Comorbidities

Sleep disturbances and chronic fatigue (90%)

Degenerative Joint Disease (88%)

Depression (75%)

Irritable bowel syndrome (70%)

Migraine/chronic headache (62%)

Anxiety (57%)

PTSD (56%)

Brain fog (50%)

Obesity (50%)

Interstitial cystitis (39%)

Back to our patient

JM has now been having chronic diffuse muscle pain for the past three months. Based on the widespread pain index and the symptom severity scale, she meets criteria for fibromyalgia and no alternative diagnosis has been established.

So now what do we do?

Initial Treatment of Fibromyalgia

1. Education, reassurance, validation, and expectation setting
 - put a name to their condition
 - acknowledge the realness of their symptoms and
 - set realistic goals and expectations for their long term outcomes
1. Physical activity
 - low impact aerobic exercise (swimming, walking, biking)
 - tai chi
1. Physical therapy
 - find a therapist that specializes in chronic pain conditions
1. Cognitive behavioral therapy
 - work on mood symptoms, coping strategies, and evaluate for past trauma
1. Sleep
 - assess and improve sleep hygiene
 - sleep study to rule out other common causes of sleep disturbance

One Month Later

Mrs. M returns to the clinic and notes her pain symptoms have improved “a little.” She had her sleep study done, which did not reveal any abnormalities, and has been working on putting her phone away before bed. She has been using an online tai chi class and says she finds the classes to be relaxing. She has been to a few therapy sessions so far but still feels depressed. She is still markedly fatigued. She asks if there are any medications that can help.

Medication Treatment of Fibromyalgia

Initial therapy should be selected based on the prominence of patients' symptoms and contraindications to their common side effects:

Amitriptyline 10 mg at bedtime

- Why it's good: modest benefit in treating pain and sleep
- Why it's bad: not a good medication for older patients or those prone to anticholinergic side effects

Duloxetine 60 mg with breakfast

- Why it's good: activating, helps patients with severe fatigue/depression
- Why it's bad: activating, exacerbates anxiety symptoms, doesn't help sleep

Gabapentin 100 mg at bedtime

- Why it's good: can add on for pain and sleep symptoms
- Why it's bad: no impact on depressive/fatigue symptoms, can be sedating

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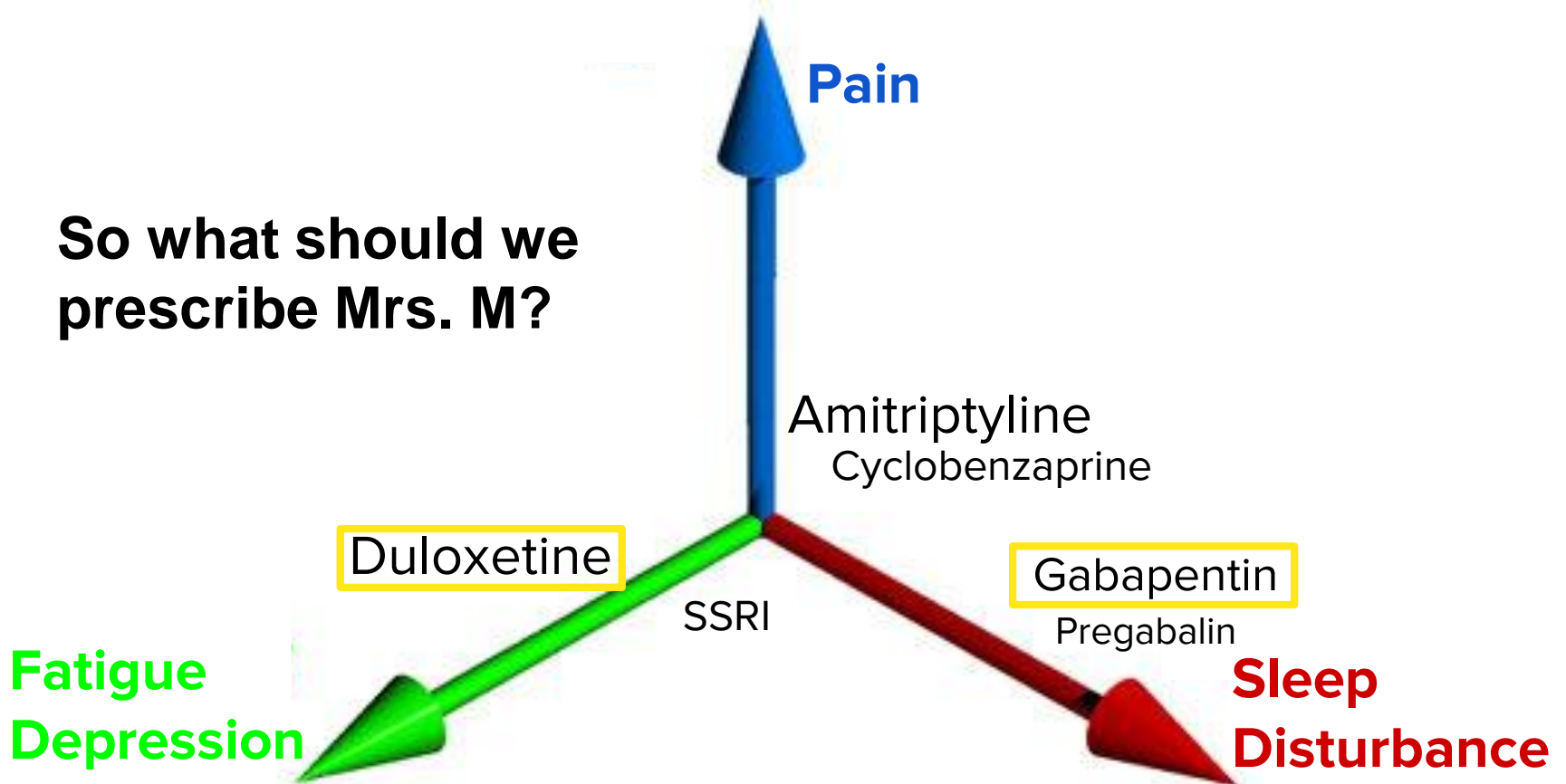
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Medication Personalization for Fibromyalgia

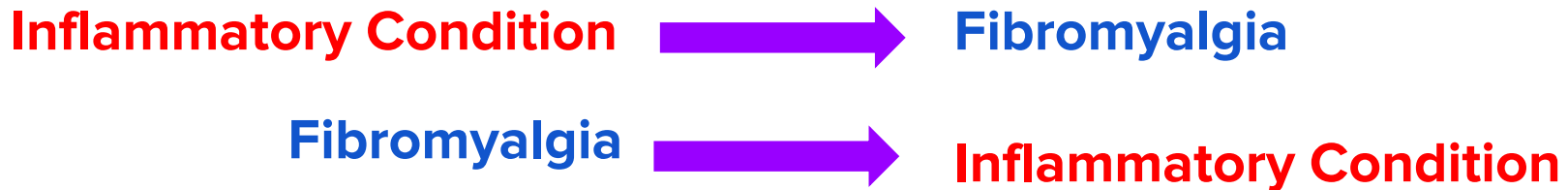
So what should we prescribe Mrs. M?



Long Term Follow Up

Patients often benefit from regular follow up with a consistent provider to monitor their symptoms, titrate dosing, and observe for side effects.

Vigilance is necessary. It is tempting to forego in depth physical exams on these patients but it is important to track their symptom severity as well as to monitor for the development of new signs of pathology. Continue to look for rashes, synovitis, and other joint pathologies.



Prognosis

The numbers needed to treat with these medications are relatively high and the successes are often measured as patients with a 30% reduction in symptoms.

Most patients will continue to have chronic pain and fatigue to a significant degree with a large percentage being chronically disabled.

Worse prognoses are correlated with female gender, low socioeconomic status, unemployment, depression, catastrophizing, and a history of abuse.

There is no clear impact on mortality, though patients with comorbidities are at a markedly increased risk for suicide.

Key Points

- Fibromyalgia pain is real pain
- A detailed history and physical can prevent unnecessary testing
- Comorbidities are common and debilitating
- Treatment should be tailored to the individual patient's needs and should not forget the underlying conditions
- Don't dismiss new pain and symptoms

Questions?



Special thanks to my friendly neighborhood PCP and rheumatologist, Dr. Catharine Arnold.



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