





# Module 12-1

## Myofascial, Connective Tissue, and Fibromyalgia Pain

### By the end of the module, you will be able to:

- Identify the characteristics of Myofascial Pain Syndrome (MPS) and Fibromyalgia Syndrome (FMS).
- Differentiate MPS from FMS.
- Explain the pathophysiology and identify the precipitating factors of MPS and FMS.
- Describe multi-modal treatments for MPS and FMS.

### We will review:

Topic One: Impact of Pain on Society

Topic One: Basics of MPS and FMS

Topic Two: Prevalence, Pathophysiology, and Precipitating Factors

Topic Three: Treatment of MPS and FMS

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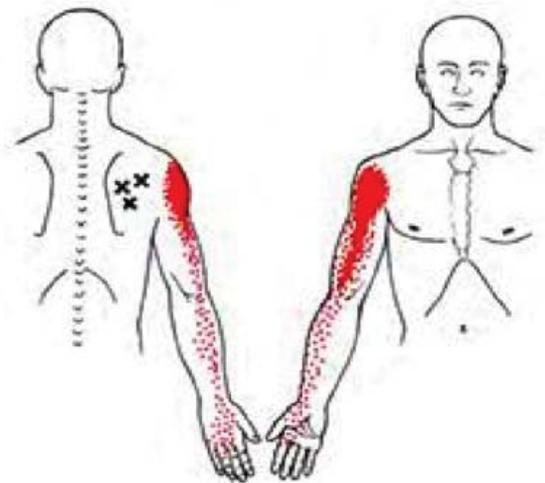
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# Topic One

## Basics of MPS and FMS



MPS is muscle pain with multiple hypersensitive areas called trigger points.



Notes: Facilitator may detail:

Definition of MPS as a regional disorder with characteristic feature of trigger points. These trigger points often refer pain to specific locations and in specific distributions, as demonstrated by the referral pattern for supraspinatus and infraspinatus trigger points in the diagram above.

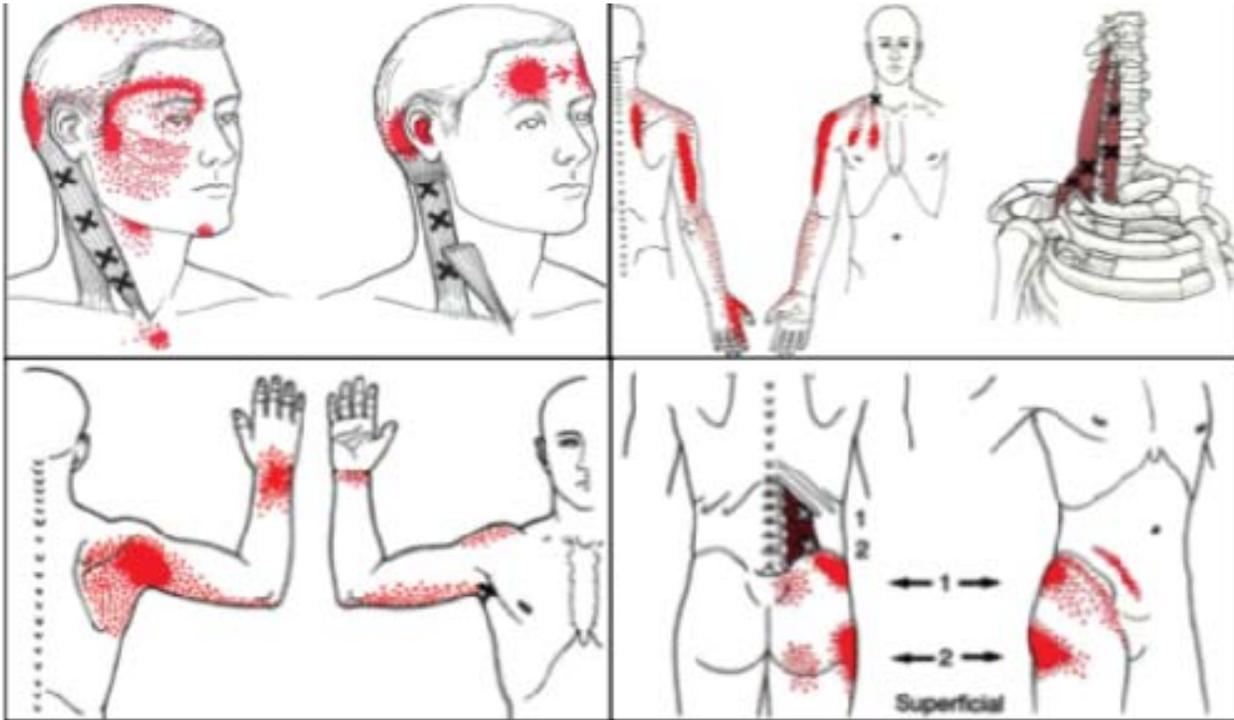
Myofascial Trigger Points (MTPs) Characteristics:

Circumscribed area of tenderness

Palpable tense band of muscle fibers that causes concordant pain in a referred pattern

Local twitch response upon palpation

These palpable trigger points cause decreased range of motion and weakness without muscle atrophy.



#### Notes

Emphasize that despite apparent muscle 'weakness', the neurological exam is essentially normal.

Upper Left- Referral pattern for SCM muscle trigger points.

Upper Right- Referral pattern for Scalene muscle trigger points.

Bottom Left- Referral pattern for Subscapularis muscle trigger points as well as shoulder labrum pathology.

Bottom Right- Referral pattern for Quadratus Lumborum and Lumbar Paraspinal trigger points.

FMS is a triad of: widespread muscle pain, fatigue, and cognitive slowing ('fibro-fog').

- Its onset is insidious and commonly appears after physical or emotional trauma.
  - FM-like pain can be secondary in other disorders:
    - Rheumatoid Arthritis
    - Systemic Lupus Erythematosus
    - Sjogren's Syndrome
    - Chronic Fatigue Syndrome (now called Systemic Exertion Intolerance disease)
  - Physical exam is normal.
  - Laboratory is normal (ESR, CRP, TSH, CBC, BMP, LFT, Vitamin D, HIV, HBV, HCV).

#### Notes

Diffuse/Generalized aching stiffness and fatigue with multiple tender points in specific areas.

Associated with:

- Headaches
- Neck and upper trapezius discomfort
- Upper extremity paresthesias

Fatigue - Lack of sleep, awakening with "fibro-fog"

Facilitator may detail:

- American College of Rheumatology 1990
  - Criteria set up to facilitate better research
- Revised Criteria 2010
  - Criteria set up to facilitate better research and to assist in clinical diagnosis and management
  - Primary Care can confidently diagnose fibromyalgia, specialty referral not needed for confirmation

Using the above criteria is 88% sensitive for diagnosing fibromyalgia.

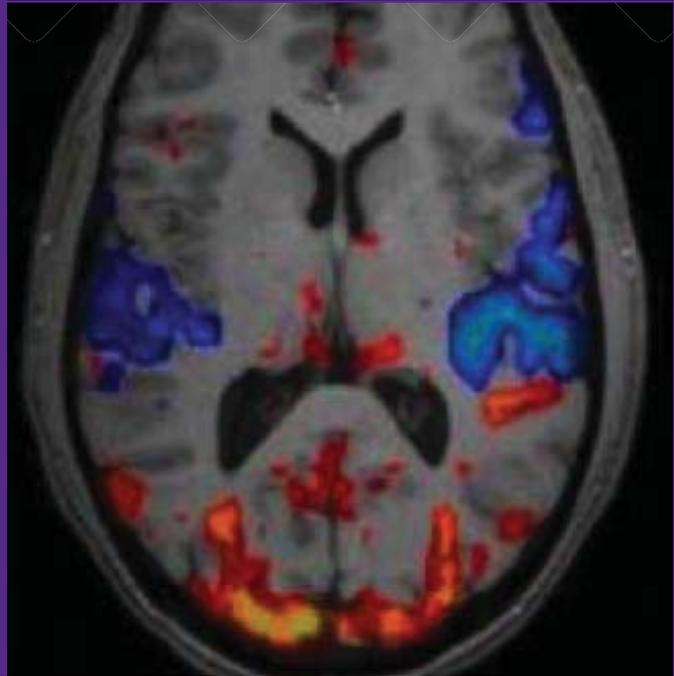
Tender points removed from diagnostic criteria because of poor sensitivity and specificity.

Exam should be normal in patients with fibromyalgia.

Lab recommendations are expert opinion level evidence. These labs are recommended to rule out other conditions.

## Topic Two

### Prevalence, Pathophysiology and Precipitating Factors



**MPS: About a third of primary care patients that suffer from chronic pain have MPS.**

- Often MPS is triggered and worsened by:
  - Poor posture and overuse injuries
  - Trauma
  - Work-related stress
- Or from medical conditions like:
  - Nutritional deficiencies such as iron, folic acid, vitamin B12, vitamin D deficiencies
  - Endocrinopathies like gout, hypothyroidism,
  - Infections like candidiasis, parasites
  - Functional diseases like interstitial cystitis, IBS, endometriosis
  - Insomnia, obstructive sleep apnea
  - Depression, anxiety, other psychological stress

#### Notes

##### Primary care:

31% of patients present with pain at an Integrative Medicine practice

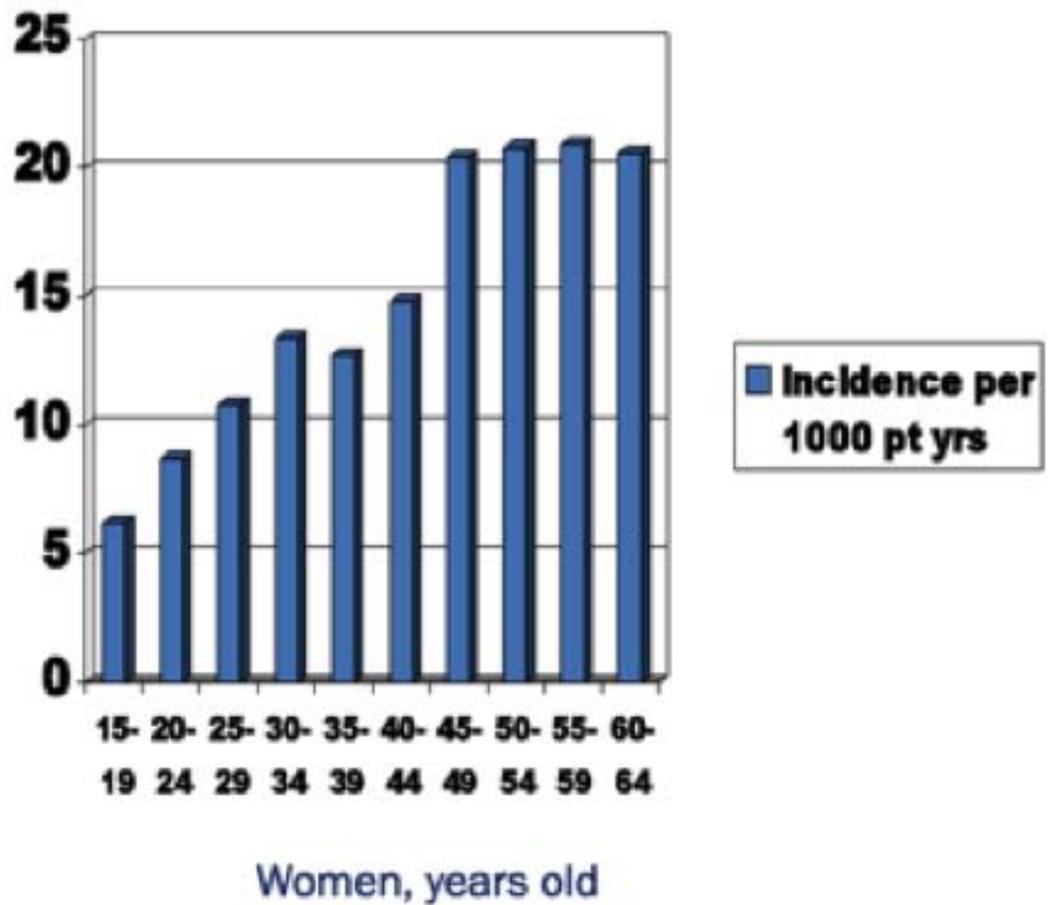
30% of these patients satisfied criteria for MPS 3

##### Pain clinics:

The incidence of MPS with associated trigger points varies between 30 and 85% of people presenting to pain clinics.<sup>4</sup>

The most common causes predisposing for development of myofascial pain syndrome.

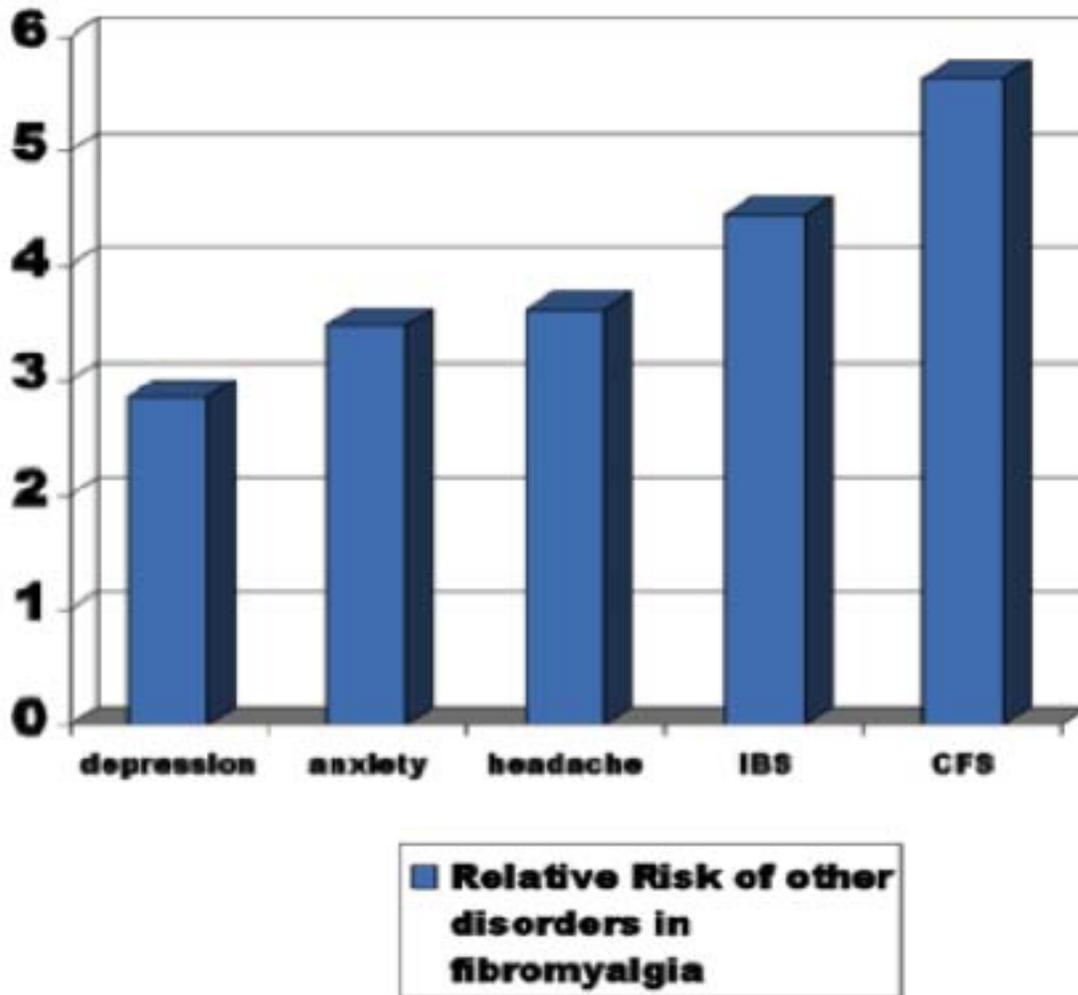
FMS mostly affects women and increases with age.



Notes

FM in men is rare.

FMS is worsened by depression, anxiety and other pain syndromes.



Notes

Patients may have more than one comorbidity. Worsening of one condition can worsen fibromyalgia symptoms and vice-versa.

IBS is Irritable Bowel Syndrome, CFS is Chronic Fatigue Syndrome.

## FMS is seen in patients with a history of adverse childhood and adult events.

These life stressors can cause:

- Changes in the brain as seen in Functional MRI.
- Changes in the Hypothalamic-Pituitary-Adrenal Axis resulting in elevated cortisol levels with a blunted response to pain or stress.
- Increased levels of substance P and decreased levels of Serotonin that result in excitability of spinal cord neurons and pain sensations that are more painful and last longer.

### Notes

Facilitator may detail:

#### Precipitants

- Trauma
  - Some studies show up to 45% of FM starts after trauma (MVA)
- Abuse
  - Anderberg 2000 – Childhood or teen life event (conflict with parents, physical or psychological abuse, death of parent, close friend or relative). 47.5% FM vs. 23.7% controls
- Infection
  - Higher rates of Fibromyalgia seen in hepatitis B,C and HIV patients
- Functional MRI
  - Increased blood flow in pain areas at lower threshold than controls
  - No blood flow in areas of brain associated with pain inhibition
- PET Scans
  - Decreased baseline thalamic activity

## In summary: MPS vs. FMS

MPS is:

- Multiple trigger points that cause muscle twitch with palpation or needling
- Slightly more common in women

FMS is:

- Diffuse/Generalized muscle pain
- Associated with tender (not trigger) points, fatigue, morning fogginess (“fibro-fog”)
- Much more common in women than men

### Notes

Compare and contrast MPS with FMS.

## Knowledge Check

The characteristics MPS include all of the following except:

- a. Taut band
- b. Referred pain
- c. Twitch response sometimes observed
- d. Requiring 11/18 tender points for diagnosis

## Knowledge Check – Answer

The characteristics MPS include all of the following except:

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Notes

Read question aloud

## Knowledge Check

Secondary Fibromyalgia develops in the setting of other disorders such as RA, SLE, and Chronic Fatigue Syndrome and \_\_\_\_\_.

- a. Diabetes
- b. Sjogren's Syndrome
- c. Bi-Polar Disorder
- d. Psoriasis

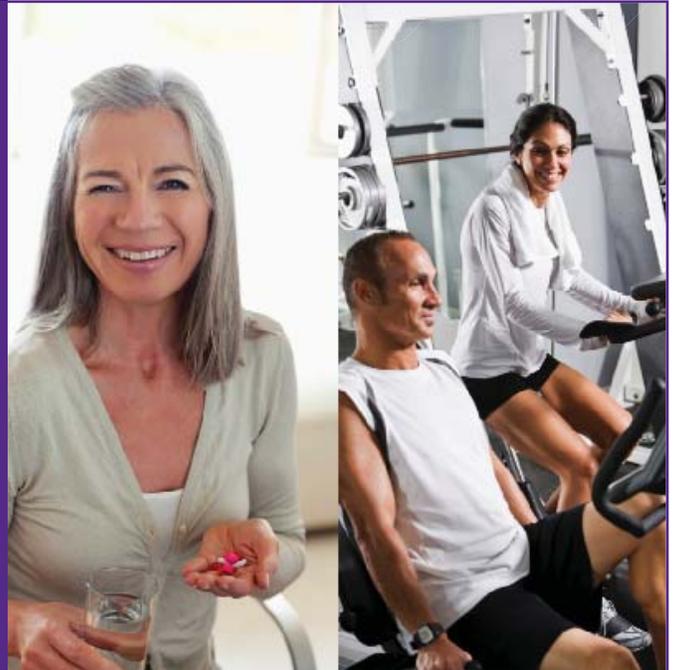
## Knowledge Check – Answer

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## Topic Three

### Treatment of MPS and FMS



#### MPS treatments include:

- Treatments may include:
- Spray and Stretch with Fluorimethane
- Trigger Point Dry Needling/Injections
- Soft Tissue Mobilization techniques
  - Muscle-energy
  - Massage
- Physical Therapy
- Yoga
- Acupuncture
- Cognitive Behavioral Therapy
- Medications

#### Notes:

First and foremost in the treatment of MPS is to treat any underlying causes (medical conditions, joint pathology, etc). Then other techniques such as spray and stretch, trigger point treatments, soft tissue mobilization, physical therapy, yoga, acupuncture, CBT and medications may be considered.

Facilitator may demonstrate:

Spray and Stretch<sup>9</sup>

Fluorimethane: Developed by Janet Travell

Sweeping pattern of vaso-coolant spray

Gentle stretching

Post isometric relaxation

## Trigger point injections for MPS can relieve pain and facilitate physical therapy.

- Calming effects of trigger point injection are by:
  - Direct mechanical disruption of the pathological muscle response (twitch) by the stimulating needle.
  - Decreased muscle spasm following local anesthetic injection.
- Procedure risks are rare but include bleeding, edema, infection, nerve injury, organ perforation, pneumothorax, inadvertent nerve block, syncope, allergic reaction.
- Long term failure may be due to technical difficulties like missing the trigger point, inadequate post procedure stretching or ignoring precipitating comorbidities.

### Notes

Facilitator may detail:

Trigger point injections can be used in the diagnosis of MPS in that injection of suspected trigger points may reproduce the symptoms for which your patient presents, thus confirming the condition.

Trigger point injections can also be therapeutic by targeting and deactivating the pain generator.

Finally, treatment of myofascial trigger points can reduce pain adjunctively and facilitate the patient's participation in therapy.

Trigger Point Injections (TPIs)

- Diagnostic
  - Identify Myofascial trigger points (MTP) as the pain generator
- Therapeutic
  - Deactivation of MTPs
  - Relief of acute MTP pain
- Adjunctive
  - Inactivation of MTPs to facilitate PT

## For FMS patients: education, CBT and exercise are more effective than each treatment alone.

- Best results are seen with low - to moderate- intensity aerobic exercise (walking, pool therapy).
- Sleep hygiene is helpful in patients suffering from sleep disturbances.
- Acupuncture may help in selected cases, although it is usually poorly tolerated by patients.
- Other treatments like chiropractic, massage therapy, electrotherapy, ultrasound, trigger point injections do not help and should be discouraged.

### Notes

Treatment of FMS is designed to:

- Increases self-efficacy
- Decreases pain
- Decreases depression
- Improves quality of life as seen on FM Impact Questionnaire (FIQ) scores
- Education can be done at home (pamphlets), individually or in groups  
Facilitator may detail:  
Best treatment is CBT:
  - Increase self-efficacy
  - Change external locus of control to internal
  - Overcome learned helplessness  
Evolves after failed attempts at self-management  
Diminishes motivation to take personal responsibility for managing illness
- Dupree-Jones 2006, Cochrane review 2008  
Relief with low- to moderate- intensity aerobic exercise(walking, pool therapy)  
Improved pain and well beingwith strength training  
Studies with 50% max HRhad lower attrition rates andbetter symptom improvement
- Cochrane Review 2013  
Low- to moderate-level evidence  
Manual acupuncture  
Increased pain relief, decreased morning stiffness  
But often seen with sham acupuncture studies  
Electrical Acupuncture  
Probably better at pain relief and stiffness  
Some improvement in global well being, sleep, and fatigue
- Weak Evidence for Efficacy  
Chiropractic  
Massage therapy  
Electrotherapy  
Ultrasound
- No evidence for Efficacy  
Trigger point injections

Note that often patients with FMS are frustrated with their providers. Communicate using a motivational interview technique.

- Patients suffer from a diminished quality of life.
- Patients suffer from the consequences of disbelief about their condition.
- Patients and providers have concerns about the low likelihood of resolution during an office visit.
- Patients and providers are frustrated that there are no diagnostic laboratory or imaging studies.
- Patients and providers are frustrated that no single therapeutic approach is effective for all patients.

Notes

For FMS patients: education, CBT and exercise are more effective than each treatment alone.

Drug Name	Drug Class	Dose Most Studied/Most Effective	Effect
Cyclobenzaprine	Muscle relaxant	10 to 30 mg	Improved global functioning
Amitriptyline	Tri-cyclic antidepressant	25-50 mg qhs	Improvement in pain, sleep, fatigue
Tramadol	Opioid analgesic, weakly inhibits serotonin and norepinephrine reuptake	50 mg, 4 tabs a day	Improvement in pain
Fluoxetine	Selective serotonin reuptake inhibitor (SSRI)	40 mg	Improved pain, fatigue, depression

#### Notes

Facilitator may detail:

Highlight the different drugs and the effects to treat fibromyalgia pain. Please see attached slides at end of lecture for more details about each drug class.

Experts recommend starting first with cyclobenzaprine or amitriptyline and then trying other medications. It is not unusual for these 2 drugs to initially work but then be less effective.

Fluoxetine and Amitriptyline is a good drug combination (more effective than either drug alone).

Most studies show only about a 30% improvement in pain (30% reduction in pain is considered "clinically significant" in research). It is therefore important to set realistic expectations with your patients about drug effects.

Adjuvant therapy can help and should be prescribed judiciously.

Drug	Drug Class	Dose Most Studied/Most Effective	Effect
Duloxetine	Serotonin norepinehrine reuptake inhibitor (SNRI) and SSRI	60-120 mg	Improved pain, depression
Milnacipran	SNRI	100 mg bid	Improved pain
Gabapentin	Anticonvulsant	1800 mg qd	Improved pain, improved FIQ scores
Pregabalin	Anticonvulsant	225 mg qd	Improved pain

- Note that opioids, NSAIDs, sedatives, steroids, melatonin, calcitonin and other supplements should be avoided.

Notes

- Facilitator may detail:
  - No evidence for efficacy
  - Opioids
  - Benzodiazepines
  - Nsaids
  - Corticosteroids
  - Melatonin
  - Calcitonin
  - Thyroid hormone
  - Guaifenesin
  - DHEA
  - Magnesium
- Weak evidence for efficacy
  - Growth hormone
  - S-adenosyl-methionine
- Balanced SSRI and SNRI
- Same effects for depression or no depression
- Treatment effect (Russell 2008)
  - 30% response (62.2% decreased pain, 37.8% improved depression)
  - 50% response (79% decreased pain, 21% improved depression)
- Similar effects seen at 6 months
- Predominantly SNRI, some SSRI

## Patient activation, integrative and behavioral treatments are the best approach for MPS and FMS.

- Patient activation (like aquatherapy) added to cognitive behavioral therapy is very helpful.
- Yoga and TaiChi may be helpful in the setting of a multidisciplinary approach.
- Long-term adjuvants such as antidepressants and anticonvulsants might be of use.
- Long-term use of muscle relaxants, sedatives (Benzos), NSAIDS, and opioids should be avoided.
- Soft Tissue Mobilization Techniques, such as massages do not provide long-term relief.
- Botulinum Toxin has no proven role in MPS.

### Notes

#### Facilitator may detail:

Some studies have found soft tissue mobilization techniques to be no better than placebo in the treatment of myofascial pain. Others have shown them to be helpful. More rigorous double blinded, placebo controlled studies are needed. No studies have shown such techniques to be harmful.

Research has shown that PT reduces chronic pain symptoms during patient participation in therapy. More studies are needed to examine long term effects of physical therapy on myofascial pain.

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In summary:

Treatment	MPS	FMS
Low impact exercise (e.g. aquatherapy)	Yes	Yes
Education	Maybe	Yes
CBT	No	Yes
Sleep hygiene	No	Yes
Medications (adjuvants only)	Uncommon	Yes (not opioids)
Stretch and spray Trigger point injection	Yes	No
Integrative treatment (Yoga, TaiChi)	Yes	Yes (not acupuncture)

Notes

Summarize table

## Knowledge Check

\_\_\_\_\_ is a pharmacologic treatment known to improve pain, fatigue, and depression associated with fibromyalgia.

- a. Diabetes
- b. Sjogren's Syndrome
- c. Bi-Polar Disorder
- d. Psoriasis

## Knowledge Check – Answer

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## Summary



Recall that MPS and FMS are chronic muscle pains. FMS is generalized and widespread accompanied also by fatigue and cognitive slowing ('fibro-fog').

Be prepared that many patients are frustrated and suffer from depression and anxiety as well.

After excluding and correcting other medical comorbidities, MPS and FMS are best treated by low intensity aerobic exercise and integrative treatments.

MPS can be treated with physical modalities and FMS can benefit from individual or group education, cognitive behavioral therapy and sleep hygiene.

Long term adjuvant medications should be used judiciously and the use of sedatives, NSAIDS and opioids should be avoided altogether.

# Resources



- National Fibromyalgia Association, [www.fmaware.org](http://www.fmaware.org)
  - List of support groups in each state
- Oregon Fibromyalgia Foundation, [www.myalgia.com](http://www.myalgia.com)
  - Exercise programs
  - Exercise DVDs
- American Academy of Family Physicians [www.familydoctor.org](http://www.familydoctor.org)
- Clinical Fibromyalgia Diagnostic Criteria [http://neuro.memorialhermann.org/uploadedFiles/\\_Library\\_Files/MNII/NewFibroCriteriaSurvey.pdf](http://neuro.memorialhermann.org/uploadedFiles/_Library_Files/MNII/NewFibroCriteriaSurvey.pdf)
- Arthritis Foundation Fibromyalgia Self-Help Course: [www.health.state.mn.us/divs/hpcd/arthritis/pdfs/selfhelpflyer.pdf](http://www.health.state.mn.us/divs/hpcd/arthritis/pdfs/selfhelpflyer.pdf)
- Fibromyalgia Network: [www.fmnetnews.com](http://www.fmnetnews.com)

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# JPEP

Joint Pain Education Program

