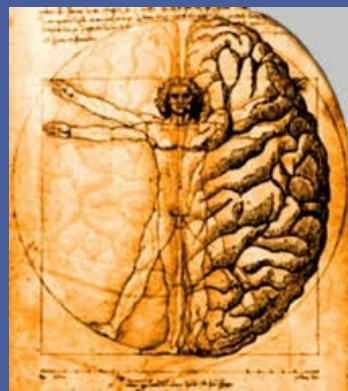
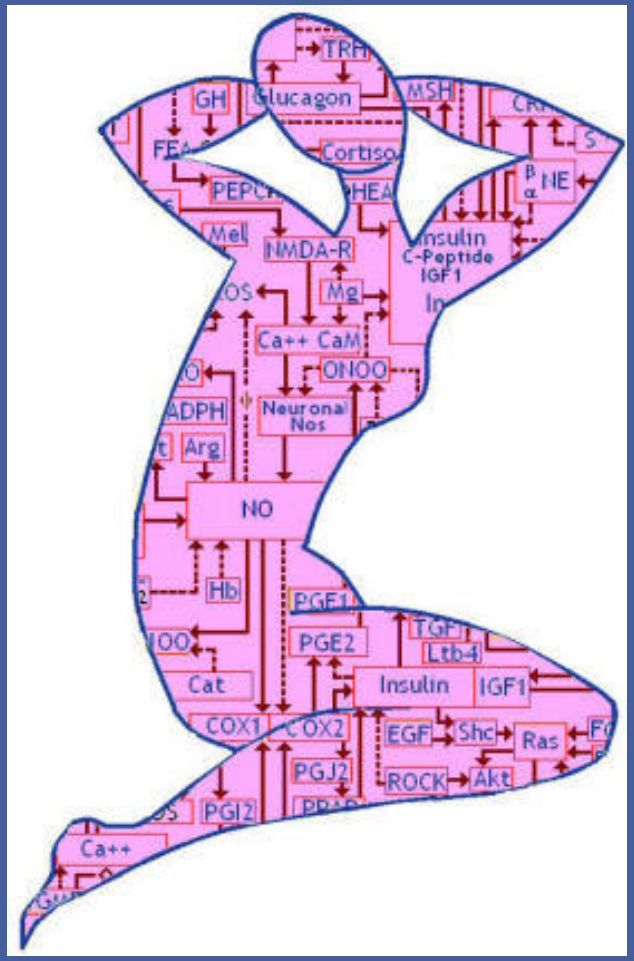
Approaching Chronic Pain in Primary Care: Treating the Correct Mechanism

March 7, 2019
Jill Schneiderhan, MD
Assistant Professor
Department of Family Medicine
University of Michigan



Introduction



Questions?

- How do we approach patients with chronic pain?
  - Do you have a structured way you think about these visits?
- What are the biggest barriers to successful pain management?
  - Patient side vs Physician side?
- What responsibility does each side have in creating a successful outcome?

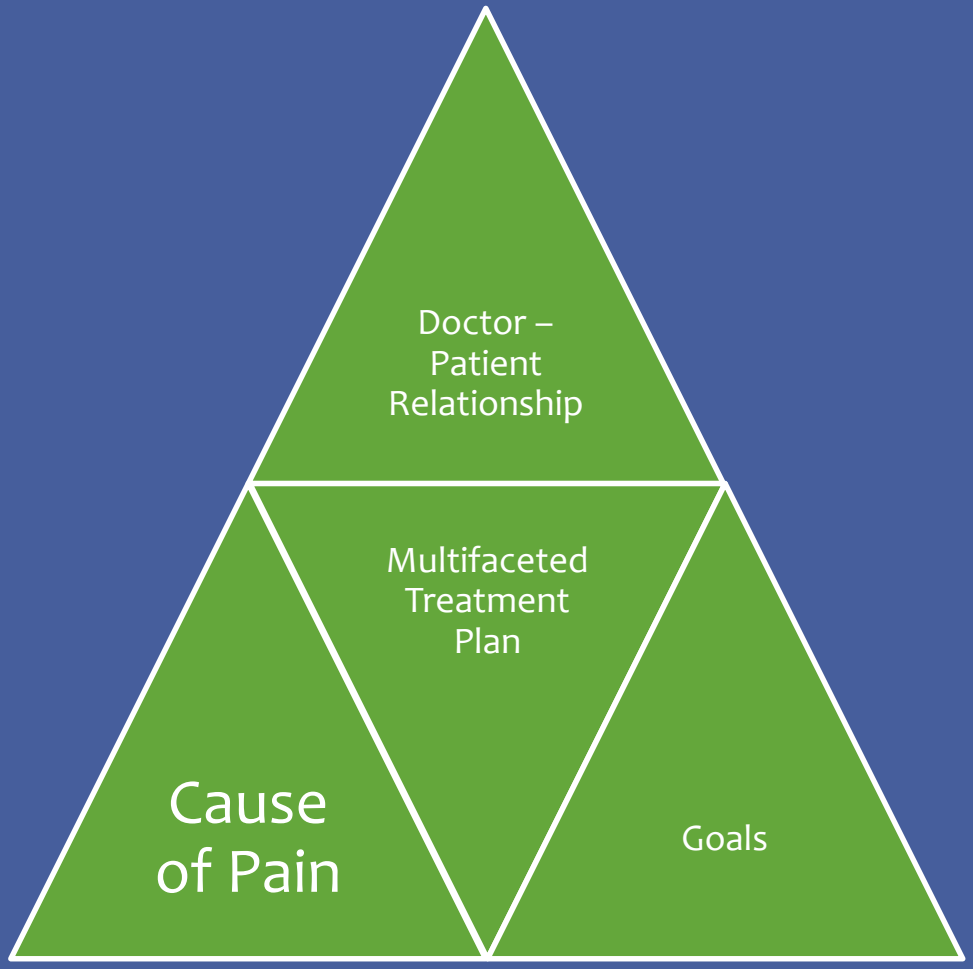
Condition	Number of Sufferers	Source
Chronic Pain	100 Million Americans	Institute of Medicine of The National Academies[1]
Diabetes	25.8 million Americans (diagnosed and estimated undiagnosed)	American Diabetes Association [2]
Coronary Heart Disease (heart attack and chest pain) Stroke	16.3 million Americans 7.0 million Americans	American Heart Association [3]
Cancer	1.9 million Americans	American Cancer Society

1. Dzau, V.J. and P.A. Pizzo, *Relieving pain in America: insights from an Institute of Medicine committee.* JAMA, 2014. **312**(15): p. 1507. 2. American Diabetes Associations. http://www.diabetes.org/diabetes-basics/statistics 3. AHA Statistical Update Heart Disease and Stroke Statistics—2011 Update A Report From the American Heart Association Circulation.2011; 123: e18-e209. 4. American Cancer Society. http://www.cancer.org/cancer/cancerbasics/cancer-prevalence

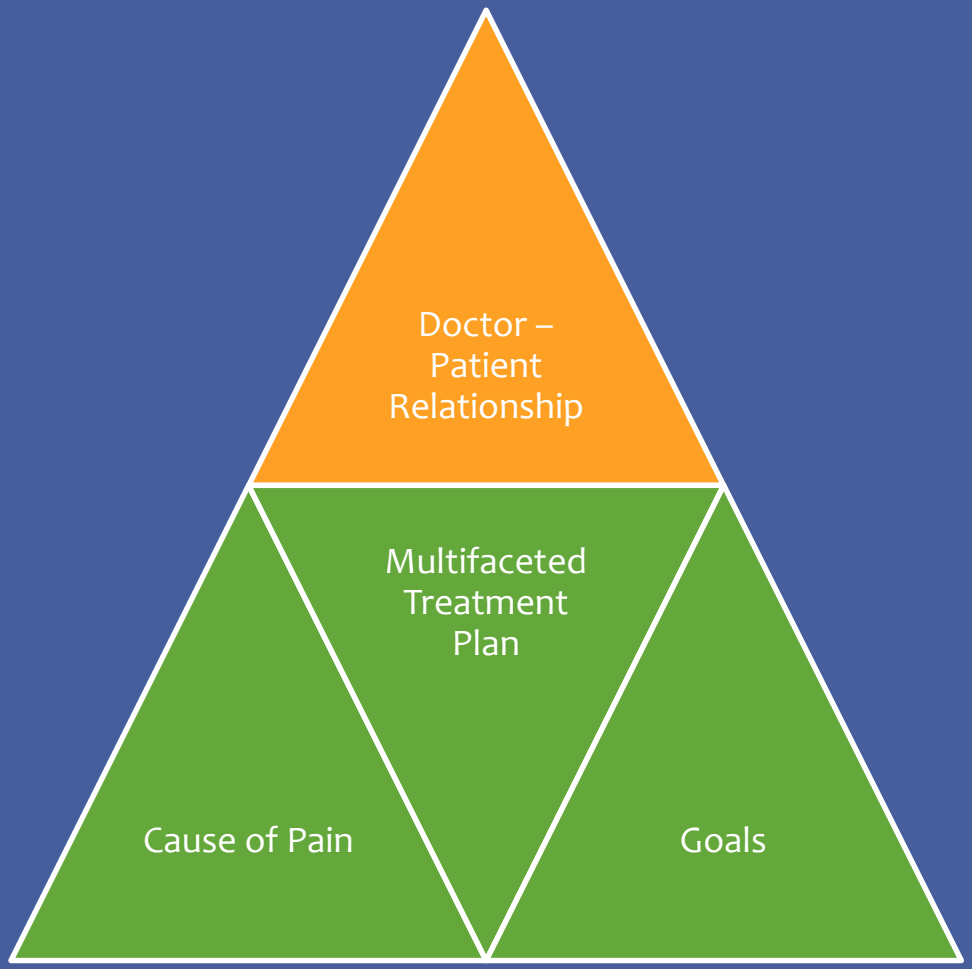
What is Chronic Pain?

- End point
- Description
- Not really a diagnosis
- Many etiologies can lead to similar picture

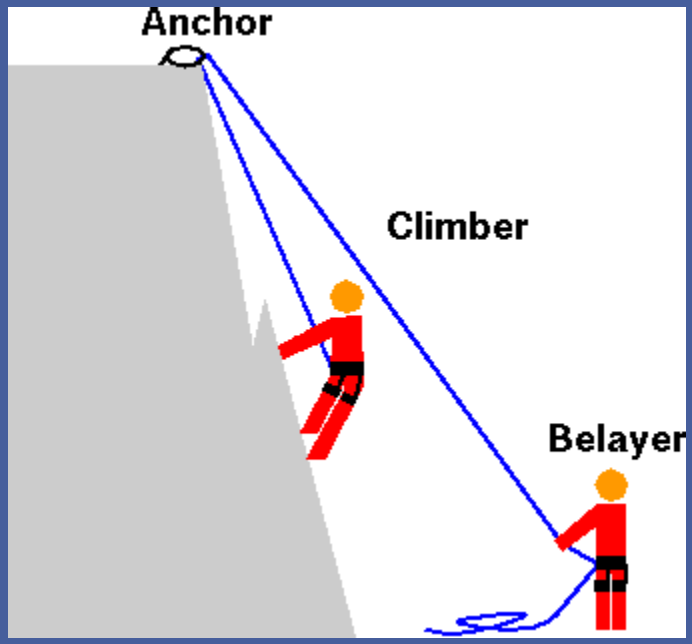
Model for Approaching Chronic Pain



Step One: Cement the Relationship



Partnership

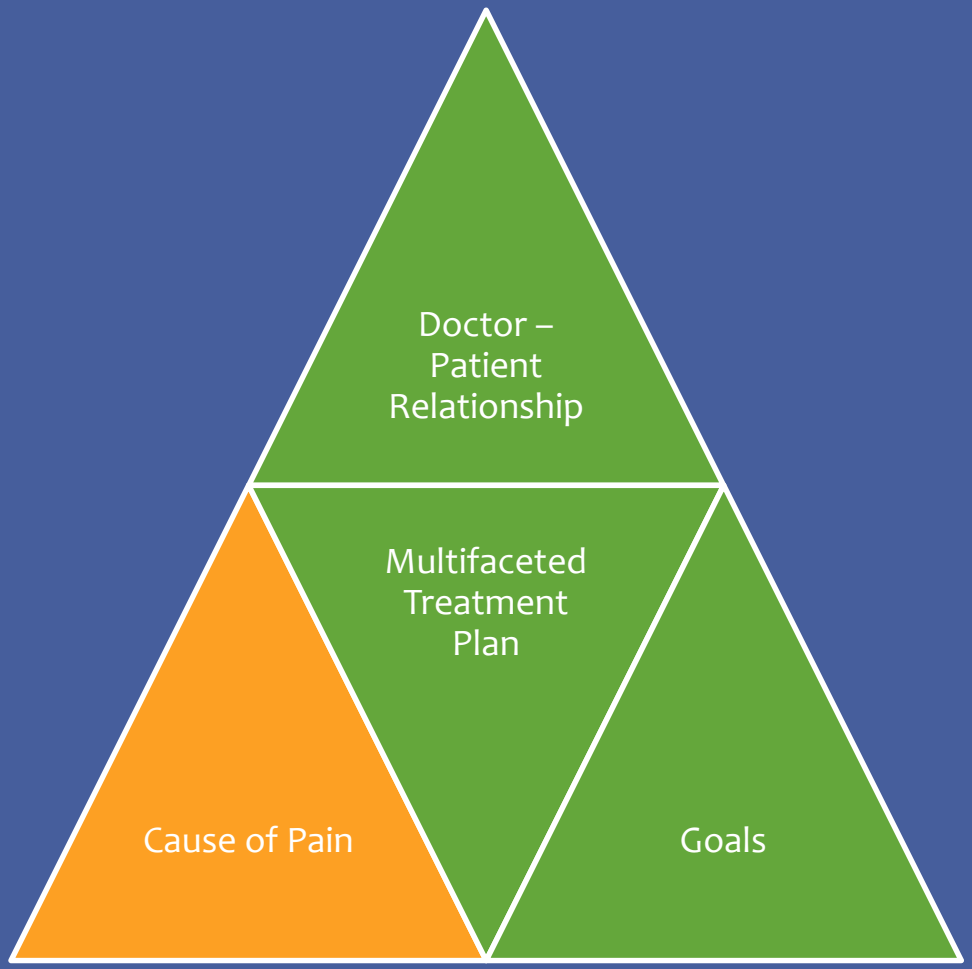


Doctor as placebo

- Using yourself as a treatment
- Listen, empathize, and educate
- Patient's express decreased pain with improved understanding of pain physiology [1]
- Studies that show patients had more improvement when physicians were positive vs. negative in setting of unexplained illness [2]

1. Van Oosterwijck, J., et al. (2013). Pain physiology education improves health status and endogenous pain inhibition in fibromyalgia: a double-blind randomized controlled trial. *Clin J Pain*, 29(10), 873-882. doi: 10.1097/AJP.0b013e31827c7a7d
2. Thomas, K. B. (1987). General practice consultations: is there any point in being positive? *British medical journal (Clinical research ed.)*, 294(6581), 1200.

Step Two: Determine the Cause of Pain & Suffering



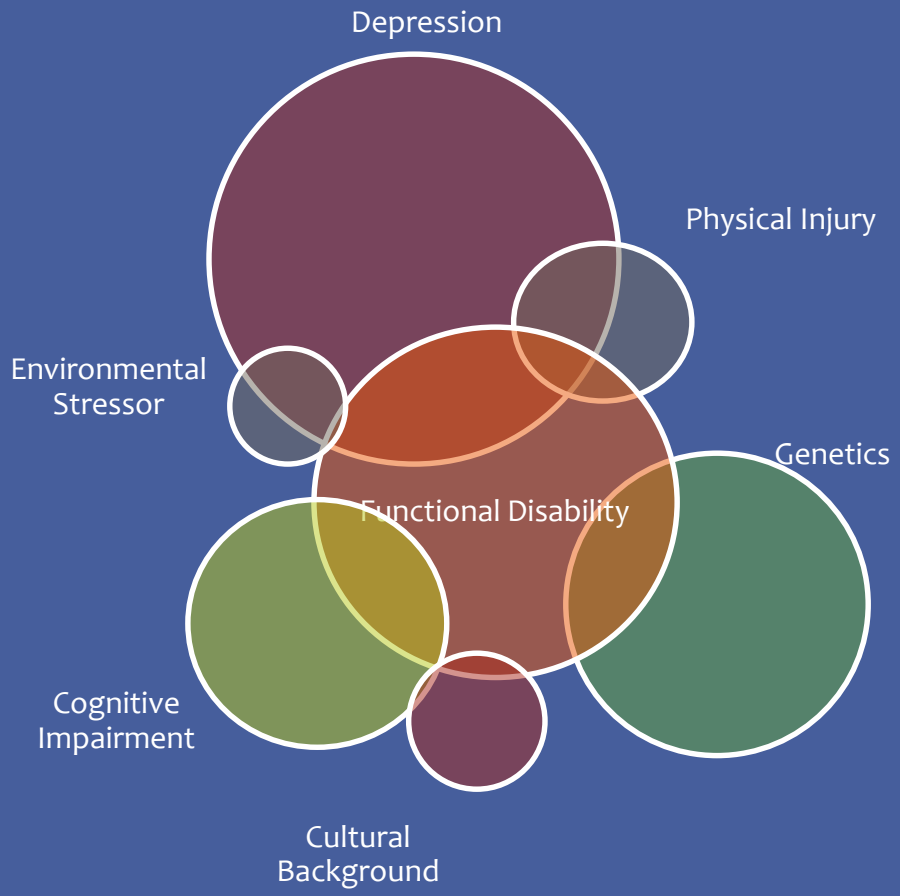
Pain vs Suffering

- Pain: The sensation arising from perceived nociception. Sensory description of hurt and harm.
- Suffering: Affective (emotional), behavioral and cognitive responses to pain and to the problems/experiences associated with pain and injury. Emotional reactions, meanings, thoughts, and existential and psychosocial issues all fall into the domain of suffering.

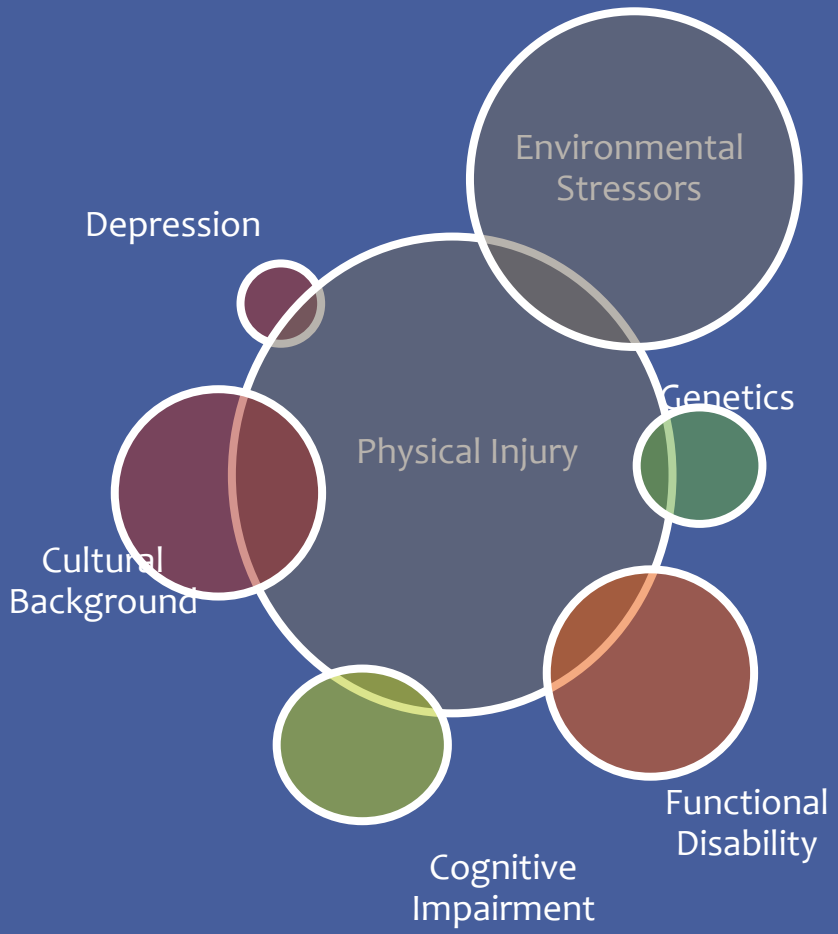
Dixon, W. K. (1998). CHRONIC PAIN MANAGEMENT: PAIN VS. SUFFERING *The PIER Review, 1*(3).

Determine the cause?

Patient “A” Pain 8/10



Patient “B” Pain 8/10



Determine Cause of Physical Pain

- Goal is to place pain in one of three categories
  - Peripheral Tissue Damage
  - Central Pain ("Centralized Pain")
  - Mixed Pain State – both peripheral and central are present
- How do we get there?
  - By doing a good work up
  - By getting to know our patient

History of Pathophysiology

- Antiquated paradigm
- Degree of nociceptive input ≠ level of pain
- Disparity = Psychogenic factors

Current Thinking

- Neurobiological factors increase +/-decrease sensitivity to pain
- Operative in most chronic pain states
- Play a prominent role in many individuals with chronic pain
- Modify our paradigm

Mechanistic Characterization of Pain

Variable degrees of any mechanism can contribute in any disease

	Nociceptive	Neuropathic	Centralized
Cause	Inflammation or damage	Nerve damage or entrapment	CNS or systemic problem
Clinical features	Pain is well localized, consistent effect of activity on pain	Follows distribution of peripheral nerves (i.e. dermatome or stocking/glove), episodic, lancinating, numbness, tingling	Pain is widespread and accompanied by fatigue, sleep, memory and/or mood difficulties as well as history of previous pain elsewhere in body
Screening tools		PainDETECT	Body map or FM Survey
Treatment	NSAIDs, injections, surgery, ? opioids	Local treatments aimed at nerve (surgery, injections, topical) or CNS-acting drugs	CNS-acting drugs, non-pharmacological therapies
Classic examples	Osteoarthritis Autoimmune disorders Cancer pain	Diabetic painful neuropathy Post-herpetic neuralgia Sciatica, carpal tunnel syndrome	Fibromyalgia Functional GI disorders Temporomandibular disorder Tension headache Interstitial cystitis, bladder pain syndrome

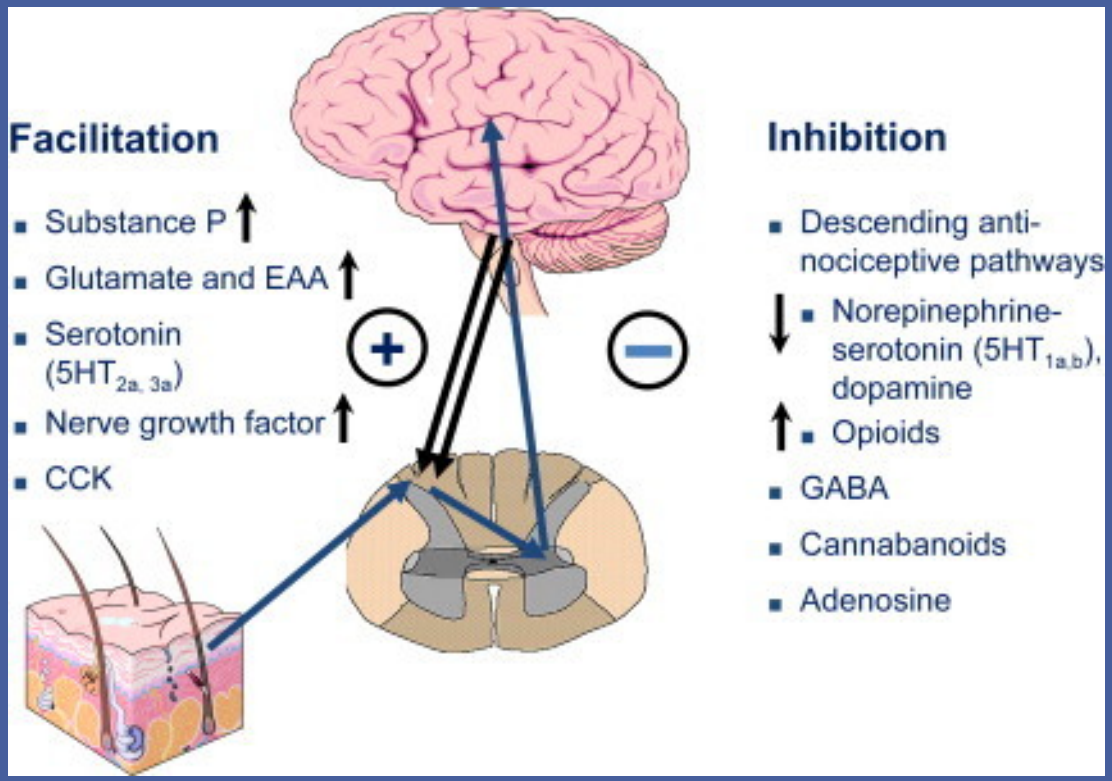
Ablin, K., & Clauw, D. J. (2009). *Rheum Dis Clin North Am, 35*(2), 233-251.

Pathophysiology of centralized pain states

- Most patients display augmented pain and sensory processing on quantitative sensory testing and functional neuroimaging [1,3]
- Manifest by increased connectivity to pro-nociceptive brain regions and decreased connectivity to anti-nociceptive regions [2,3]
- These abnormalities are being driven by imbalances in concentrations of CNS neurotransmitters that control sensory processing, sleep, alertness, affect, memory [3,4]
- Autonomic, HPA, and peripheral abnormalities likely play a prominent role in some individuals

1. Phillips, K. and D.J. Clauw. Arthritis Rheum, 2013. 65(2): p. 291-302. 2. Napadow, V., et al., Arthritis Rheum, 2012. 64(7): p. 2398-403. 3. Harris, R.E., et. al. Anesthesiology, 2013. 119(6): p. 1453-1464. 4. Schmidt-Wilcke, T. and D.J. Clauw, Nature reviews. Rheumatology, 2011. 7(9): p. 518-27.

Neurotransmitters



Aglin K, Clauw DJ. *Rhem Dis Clin North Am* 2009: 35 233-251

American Pain Society
RESEARCH
EDUCATION
TREATMENT
ADVOCACY
PUBLISHED BY ELSEVIER
The Journal of Pain, Vol 17, No 9 (September), Suppl. 2, 2016: pp T93-T107
Available online at www.jpain.org and www.sciencedirect.com

Overlapping Chronic Pain Conditions: Implications for Diagnosis and Classification

William Maixner,[*,†] Roger B. Fillingim,[‡] David A. Williams,[§] Shad B. Smith,[*,†] and Gary D. Slade[*,¶,‖]

*Center for Pain Research and Innovation, ¶Department of Dental Ecology, ‖Department of Epidemiology, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.
†Center for Translational Pain Medicine, Department of Anesthesiology, Duke University, Durham, North Carolina.
‡Pain Research and Intervention Center of Excellence, University of Florida, Gainesville, Florida.
§Chronic Pain and Fatigue Research Center, Department of Anesthesiology, University of Michigan, Ann Arbor, Michigan.

Abstract: There is increasing recognition that many if not most common chronic pain conditions are heterogeneous with a high degree of overlap or coprevalence of other common pain conditions along with influences from biopsychosocial factors. At present, very little attention is given to the high degree of overlap of many common pain conditions when recruiting for clinical trials. As such, many if not most patients enrolled into clinical studies are not representative of most chronic pain patients. The failure to account for the heterogeneous and overlapping nature of most common pain conditions

Clinical Characteristics of Central Pain

- Not "yes" or "no" – occurs over a wide continuum
  - Diagnostic labels (e.g. FM, IBS, TMJ) largely historical and irrelevant [1]
  - Wolfe et al. has shown that degree of fibromyalgia-ness predicts pain intensity, symptoms, and disability over a wide range of rheumatic disorders (RA,OA, regional musculoskeletal pain, FM) [2]

1 Aglin K, Clauw DJ. *Rhem Dis Clin North Am* 2009: 35 233-251. 2 Wolfe F, Rasker JJ. *J Rheumatol* 2006: 33 2291-9

Centralization Continuum

Proportion of individuals in chronic pain states that have centralized their pain

Peripheral — Centralized

Acute pain

Tension HA

Osteoarthritis

TMJD

IBS

SC disease

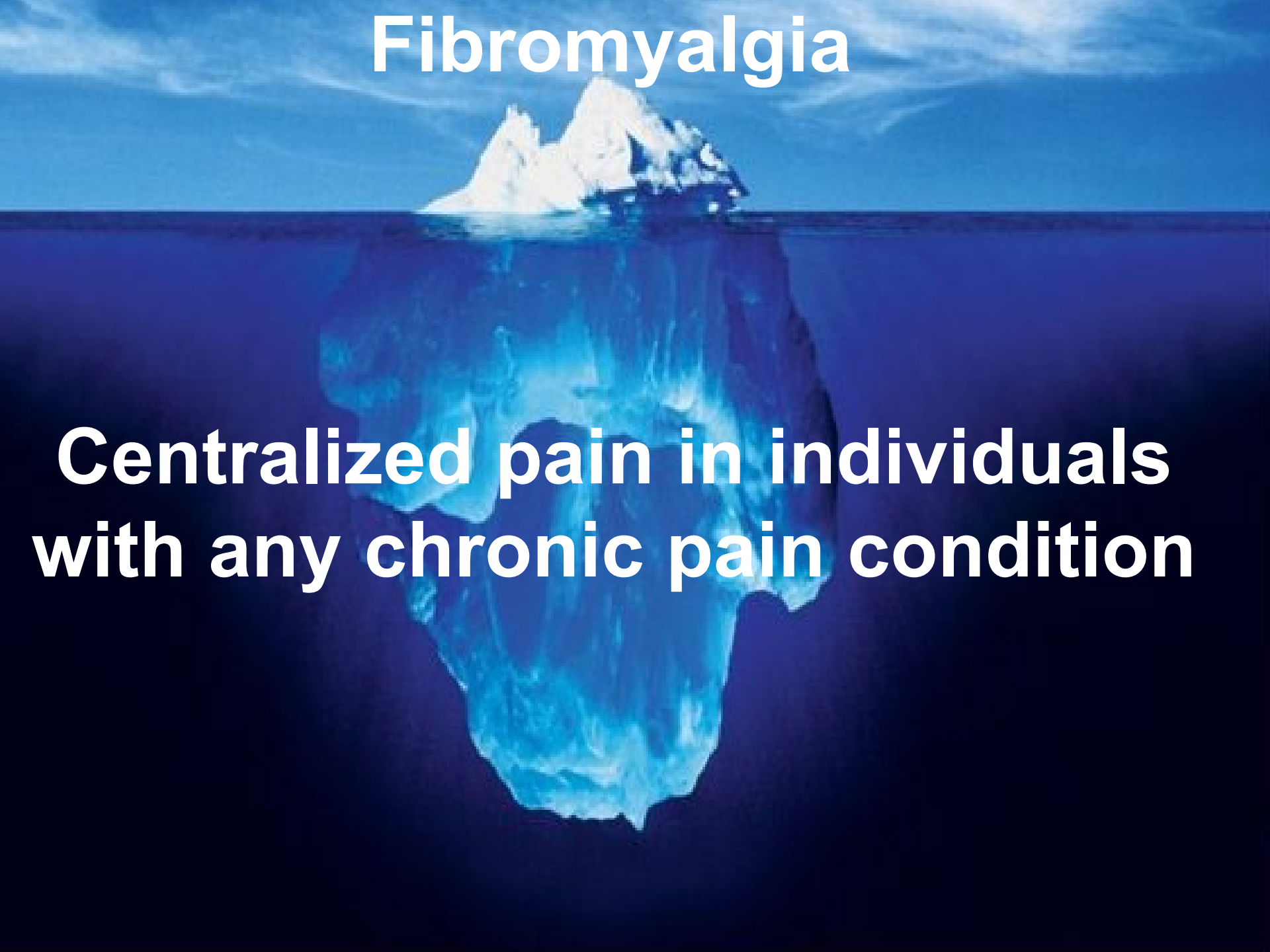
RA

Fibromyalgia

Ehler's Danlos

Low back pain

Fibromyalgia



Centralized pain in individuals with any chronic pain condition

Clinical Characteristics of Central Pain

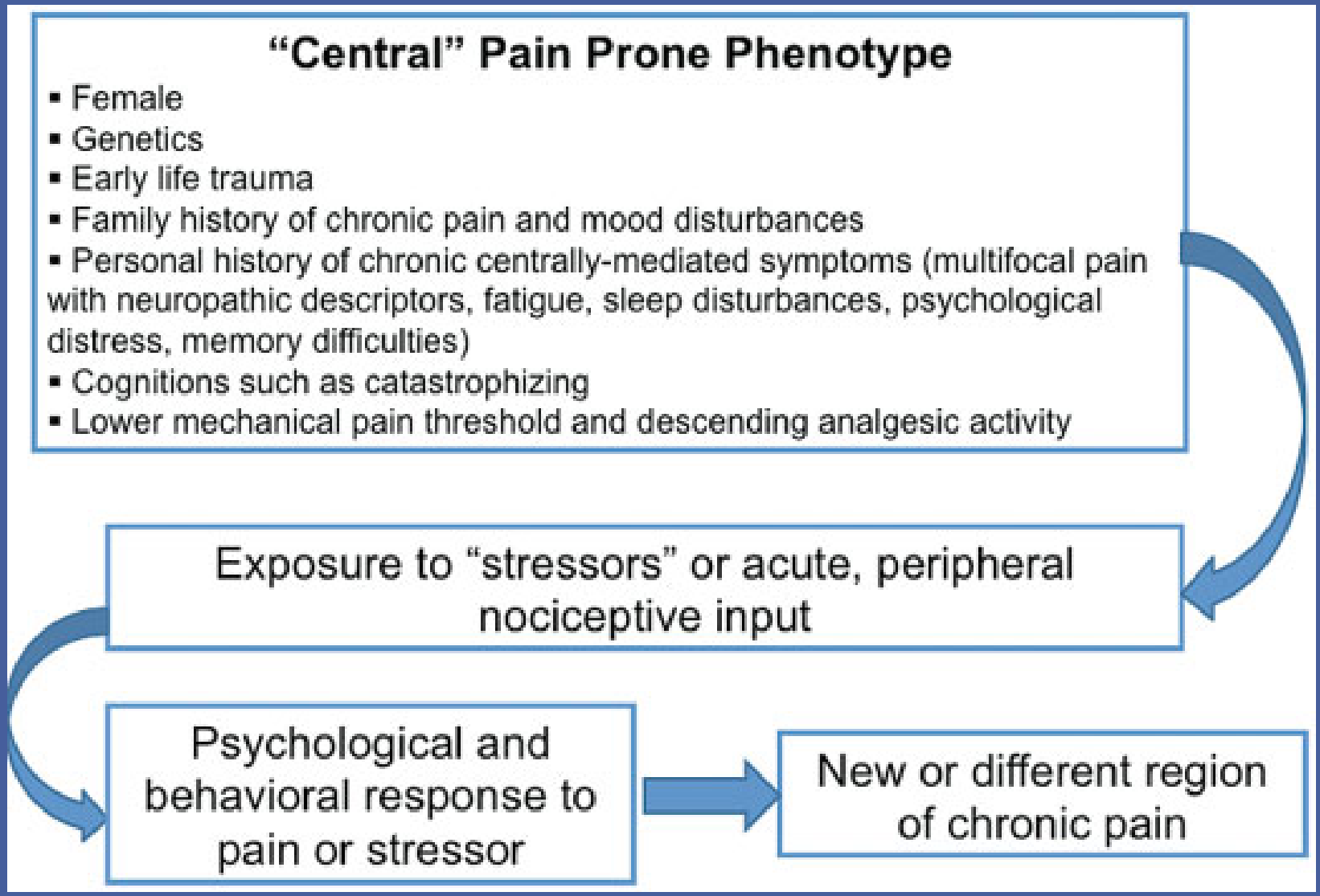
- 1.5-2 X more common in females
- Multifocal pain (use Brief Pain Inventory)
- Higher current and lifetime history of pain
- Strong familial/genetic underpinnings
  - Take a family history of pain

Kato K, et al. *Psychol Med.* 2009:39: 497-505.

Clinical Characteristics of Central Pain

- Triggered or exacerbated by stressors [1]
- Generally normal physical examination except for diffuse tenderness and nonspecific neurological signs [2]
- Multiple other somatic symptoms:
  - Fatigue
  - Cognitive difficulties (brain fog)
  - Sleep disturbances

1 Kato K, et al. *Psychol Med.* 2009:39: 497-505. 2 Aglin K, Clauw DJ. *Rhem Dis Clin North Am* 2009: 35 233-251. 3 Watson NF, et al. *Arthritis Rheum* 2009: 60 2839-2844

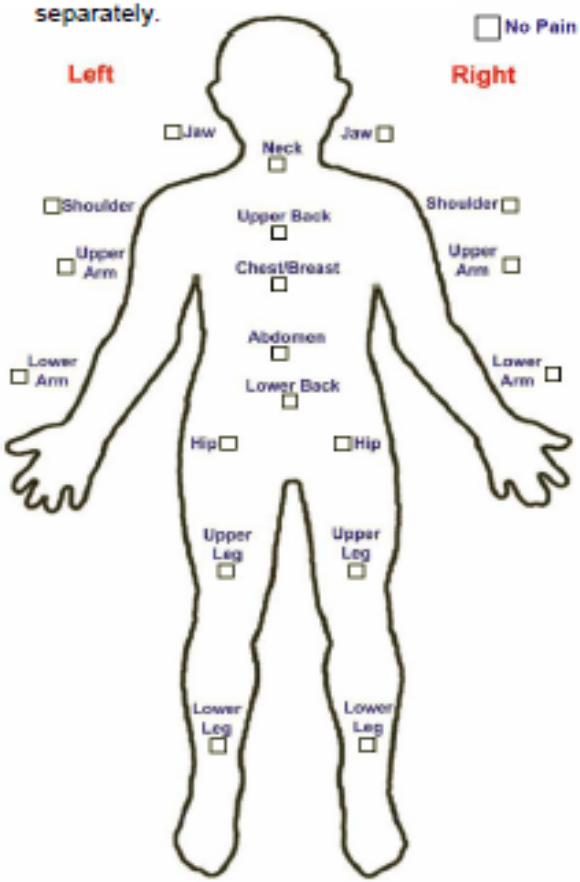


1. Phillips K, Clauw D. Arthritis and Rheumatism 2013; 65(2), 291–302 2. Williams DA et al. J Pain 2009; 10:777-791. 3. Ablin K, Clauw DJ. Rheum Clin North Am 2009; 35: 233-51. 4. Diatchenko et al. Hum Mol Gen 2005; 14(1)L 135-143. 5. Kehlet et al. Lancet 2006; 367: 1618-25

Concept of "Fibromyalgia-ness"

Fibromyalgia Symptoms (Modified ACR 2010 Fibromyalgia Diagnostic Criteria)

1. Please indicate below if you have had pain or tenderness over the past 7 days in each of the areas listed below. Check the boxes in the diagram below for each area in which you have had pain or tenderness. Be sure to mark right and left sides separately.



2. Using the following scale, indicate for each item your severity over the past week by checking the appropriate box.

No problem
Slight or mild problems: generally mild or intermittent
Moderate: considerable problems; often present and/or at a moderate level
Severe: continuous, life-disturbing problems

	No problem	Slight or mild	Moderate	Severe
a. Fatigue	☐	☐	☐	☐
b. Trouble thinking or remembering	☐	☐	☐	☐
c. Waking up tired (unrefreshed)	☐	☐	☐	☐

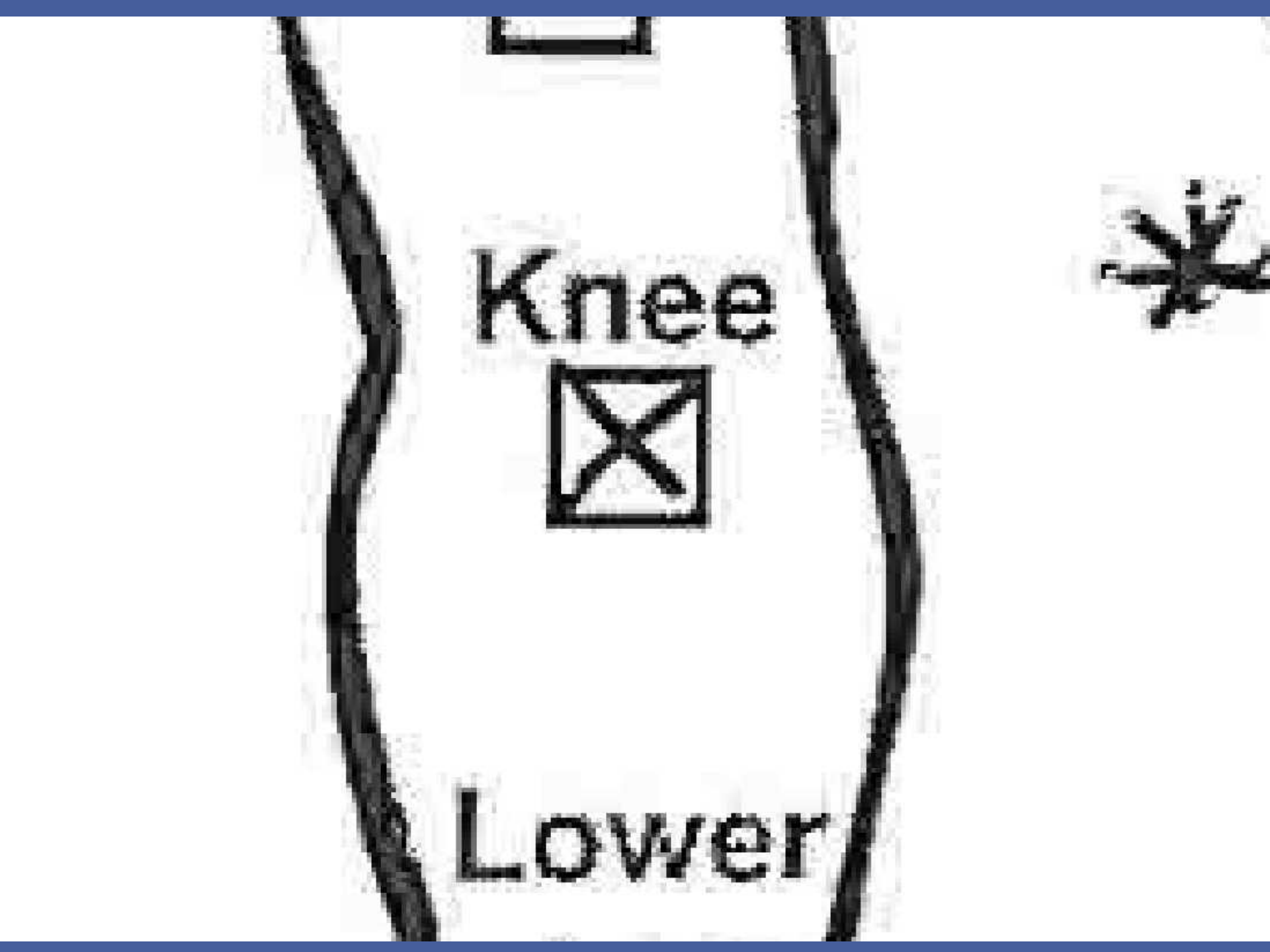
3. During the past 6 months have you had any of the following symptoms?

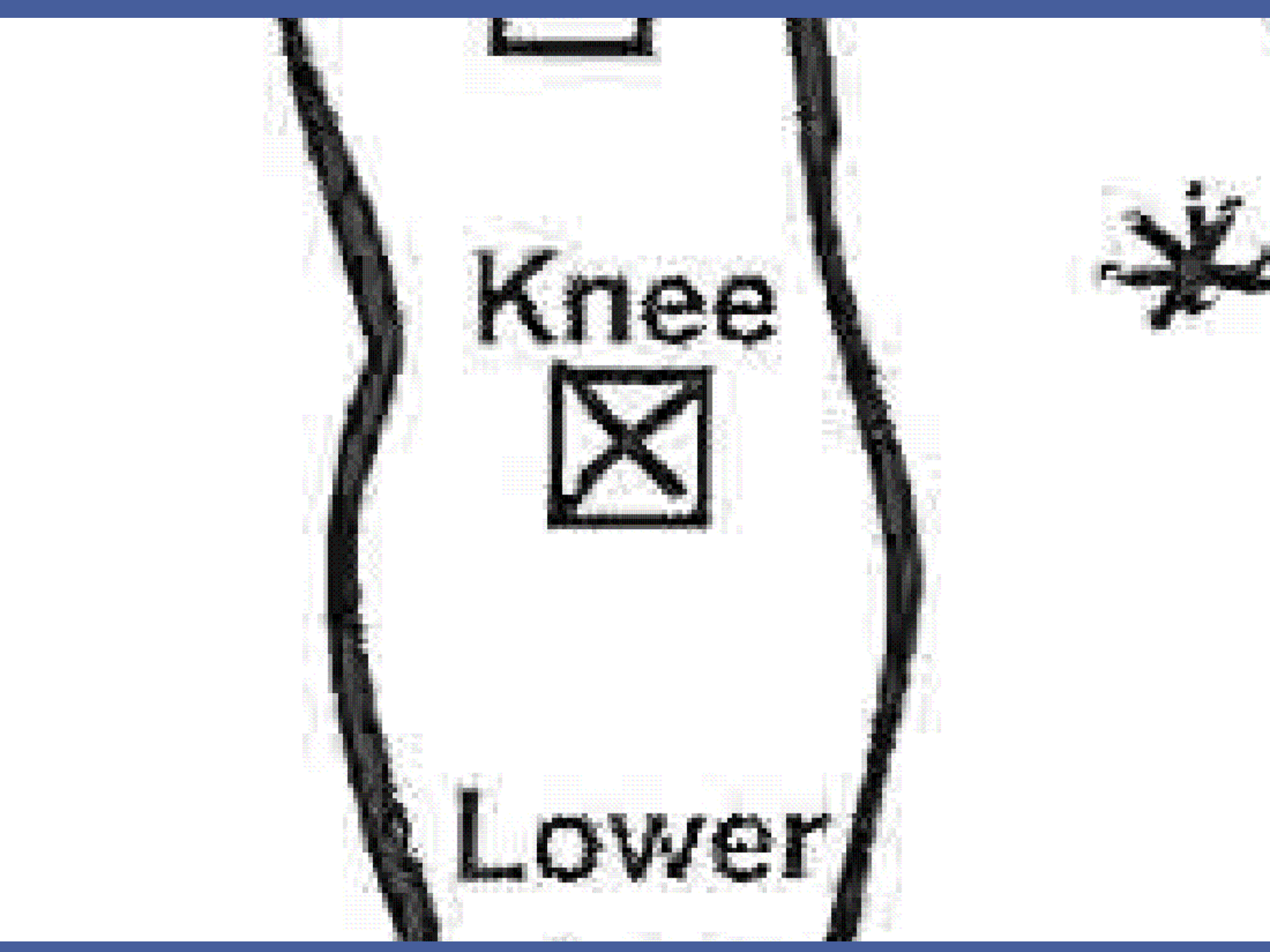
	No	Yes
a. Pain or cramps in lower abdomen	☐	☐
b. Depression	☐	☐
c. Headache	☐	☐

4. Have the symptoms in questions 2-3 and pain been present at a similar level for at least 3 months? No ☐ Yes ☐

5. Do you have a disorder that would otherwise explain the pain? No ☐ Yes ☐

1. Wolfe et. al. Arthritis Rheum. Jun 15 2009;61(6):715-716. 2. Wolfe et. al. J Rheumatol. Feb 1 2011. 3. Clauw DJ. JAMA, 2014.


Knee
Lower


Knee
Lower

Sub-threshold FM is Highly Predictive of Surgery and Opioid Non-responsiveness in Patients Undergoing Arthroplasty and Hysterectomy

- Primary hypothesis of studies is the measures of centralized pain in OA (FMness) will predict failure to respond to arthroplasty and hysterectomy
- Extensive preoperative phenotype using validated self-report measures of pain, mood, and function
- Two outcomes of interest:
  - Postoperative opioid consumption
  - Pain relief from procedure at 6 months

1. Brummett, C.M., et al., Anesthesiology, 2013. 119(6): p. 1434-43. 2. Brummett, C.M., et al., Arthritis Rheumatol, 2015. 67(5):1386-94. 3. Janda, A.M., et al., Anesthesiology, 2015. 122(5): p. 1103-11.

Variables Analyzed

- Age
- Sex
- Surgery (Knee vs Hip)
- Primary anesthetic (GA vs neuraxial)
- Home opioids (IVME)
- Pain severity (BPI)
  - Overall
  - Surgical site
- Neuropathic pain score (PainDETECT)
- Depression (HADS)
- Anxiety (HADS)
- Catastrophizing
- Physical function-WOMAC

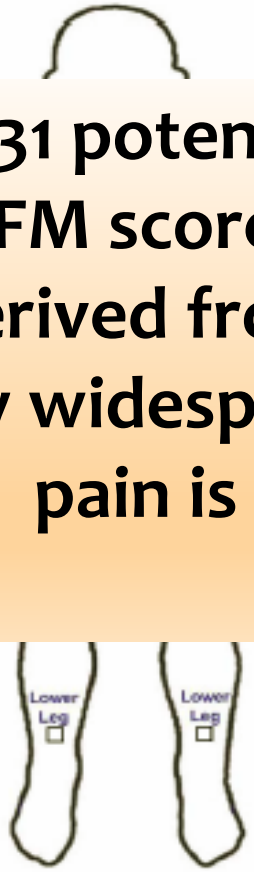
“Fibromyalgia-ness” can be scored 0-31

Fibromyalgia Symptoms (Modified ACR 2010 Fibromyalgia Diagnostic Criteria)

1. Please indicate below if you have had pain or tenderness over the past 7 days in each of the areas listed below. Check the boxes in the diagram below for each area in which you have had pain or tenderness. Be sure to mark right and left sides separately.

☐ No Pain

Left Right



19/31 potential FM score derived from how widespread pain is

2. Using the following scale, indicate for each item your severity over the past week by checking the appropriate box.

No problem
Slight or mild problems: generally mild or intermittent
Moderate: considerable problems; often present and/or at a moderate level
Severe: continuous, life-disturbing problems

Severe

a. Fatigu ☐
b. Troub reme ☐
c. Wakin (unre ☐

3. During th symptoms?

a. Pain
b. Depre
c. Head

4. Have the at a similar level for

5. Do you h n?

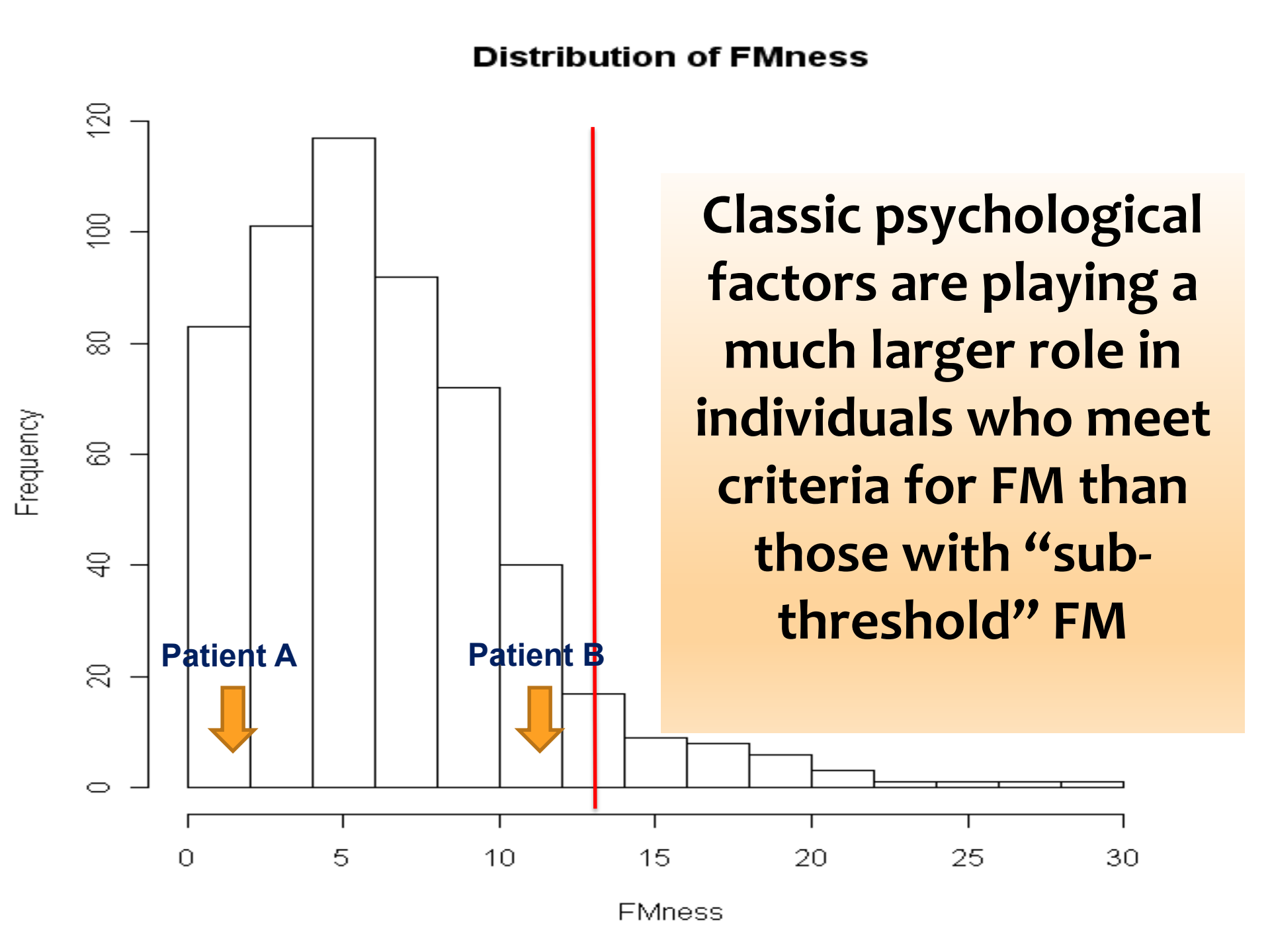
No ☐ Yes ☐

12/31 potential FM score derived from co-morbid CNS-derived symptoms that accompany CNS pain

1. Wolfe et. al. Arthritis Rheum. Jun 15 2009;61(6):715-716. 2. Wolfe et. al. J Rheumatol. Feb 1 2011. 3. Clauw DJ. JAMA, 2014.

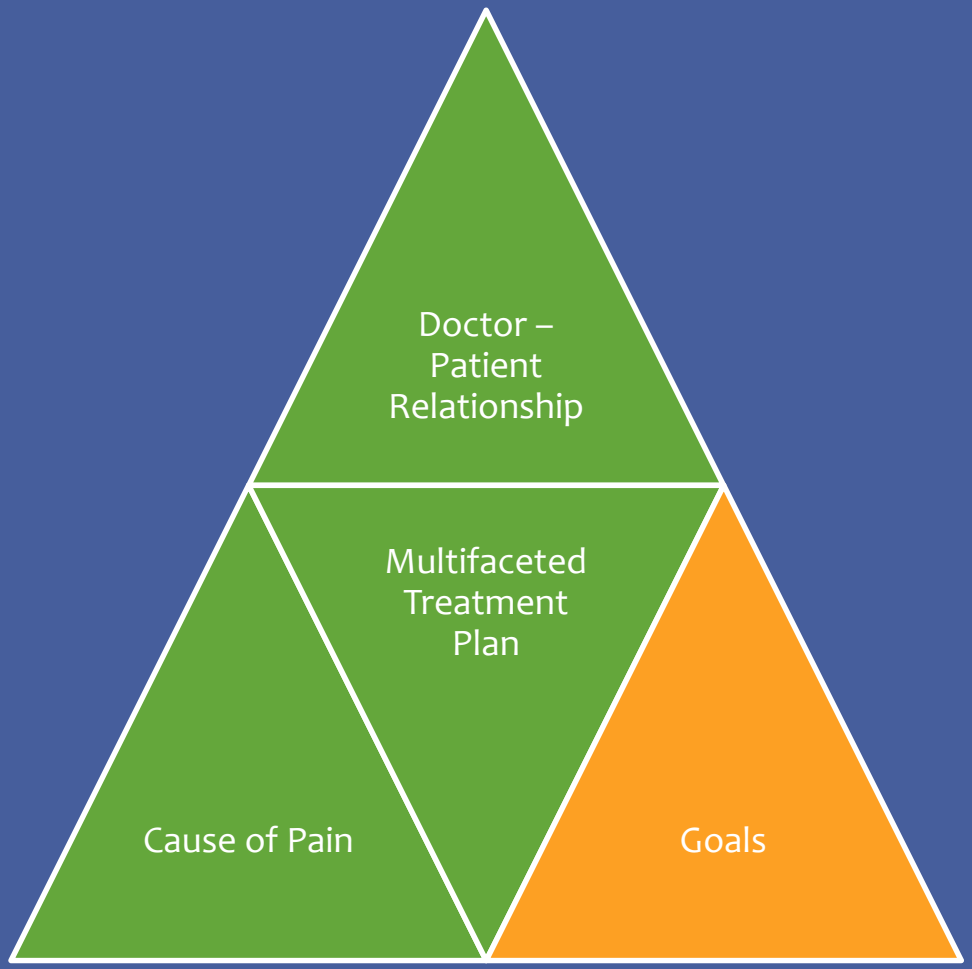
Each one point increase in fibromyalgianess led to:

- 9 mg greater oral morphine requirements during acute hospitalization (8mg greater when all individuals taking opioids as outpatients excluded)
- 20 – 25% greater likelihood of failing to respond to knee or hip arthroplasty (judged by either 50% improvement in pain or much better or very much better on patient global)
- These phenomenon were linear across entire scale up to a score of approximately 18 - and equally strong after individuals who met criteria for FM were excluded
- This phenomenon was much stronger than and largely independent of classic psychological factors



Classic psychological factors are playing a much larger role in individuals who meet criteria for FM than those with "sub-threshold" FM

Tier II: Develop Functional Goal



Tier II: Develop Functional Goal

- What is a functional Goal?
- How do we develop one?
- Is it your goal or the patient's?

Every Patient Is Different

- Psychosocial history
- Family history of pain
- Family history of psychiatric d/o
- Occupational history including satisfaction with job
- Hx of psychiatric disorders
- Hx of substance abuse/misuse
- Personal history of trauma/abuse
- Attitudes toward pain

Functional Goals

- What they are not….
  - They are not about decreasing pain
  - They are not about decreasing other unwanted symptoms
- What they are….
  - They are about function
  - What does the patient want/need to be able to DO that they are not able to do currently… because of the pain
  - Examples include:
    - Being able to get through an entire day at work without going home early
    - Being able to walk to the grocery
    - Being able to pick up my grandchild

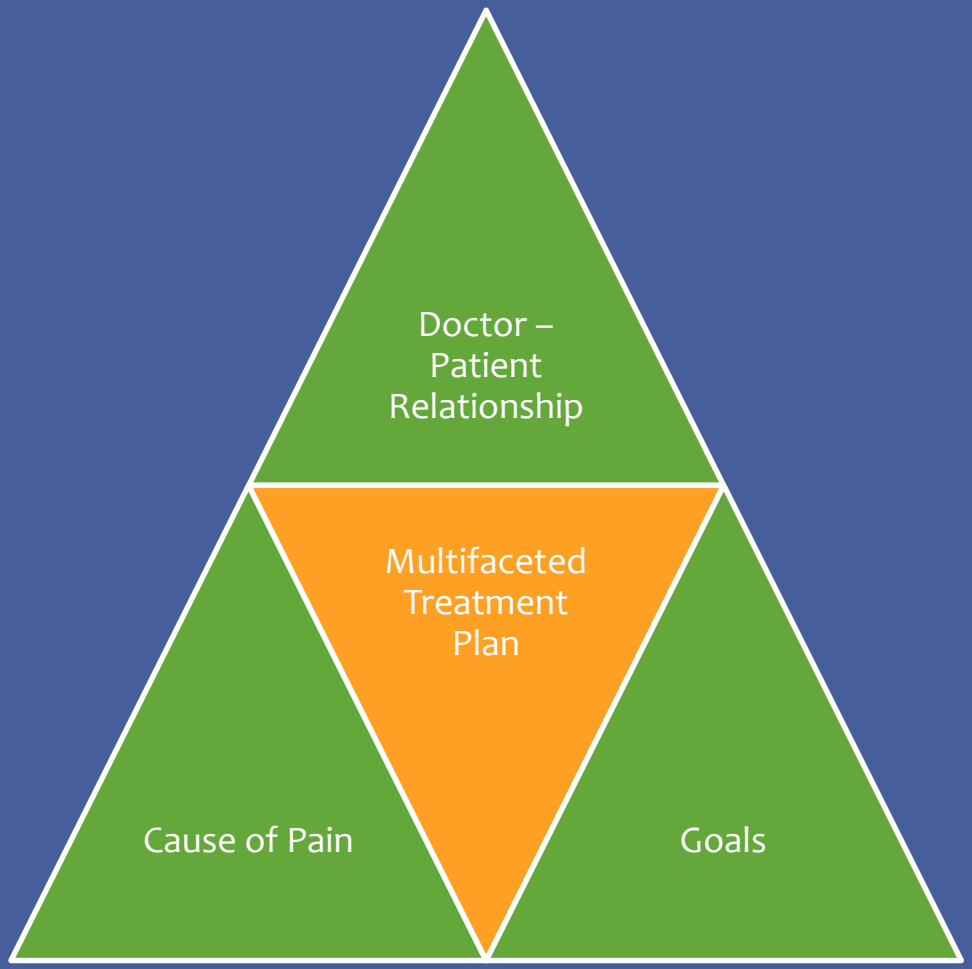
Patient's Attitudes Toward Pain

- Very important in order to set a goal that is realistic
- How does your patient think about their pain? (Pain Attitudes Form)
- What do they think is causing it?
- Is their cause and what you think the cause is similar?
- How do you get to a middle ground?

Functional Goal

- Patients may be more focused on decreasing pain
- Hard to shift conversation to function
- Often a long running conversation
- Patients can be functional while in pain
- It is critical for the clinician to understand what the patient is looking for in terms of successful treatment, regardless of the painful condition
  - The clinician can make judgment and comment on realistic vs. unrealistic goals
  - Ie Be The BELAYER istead of the CLIMBER

Step Four: Development of a Treatment Plan



Treatment Plan Musts

- Must have patient "buy in"
- Must be in line with cause of pain
  - Peripheral Tissue Damage vs. Centralized Neuropathic
- Must help patient work towards their stated functional goal

Treatment in General

- Significant advances in understanding of physiology have not equaled improvement in treatments
- Most treatments overall are poor to fair
  - Most average around 30% effective in improving pain (roughly equal to placebo)
- Even if a treatment improves pain it rarely provides concomitant physical or emotional functional improvements

Turk, D. C., Wilson, H. D., & Cahana, A. (2011). Pain 2: Treatment of chronic non-cancer pain. The Lancet, 377(9784), 2226-2235.

Multifaceted Pain Management

What actually works?

- Lifestyle changes
- Behavioral strategies
- Some medications

- How do we get patients to buy into the idea that lifestyle factors and behavior change is the key to their pain management?

- Our relationship with the patient!

3 E's of Patient Communication

- Empathy
- Educate
- Empower

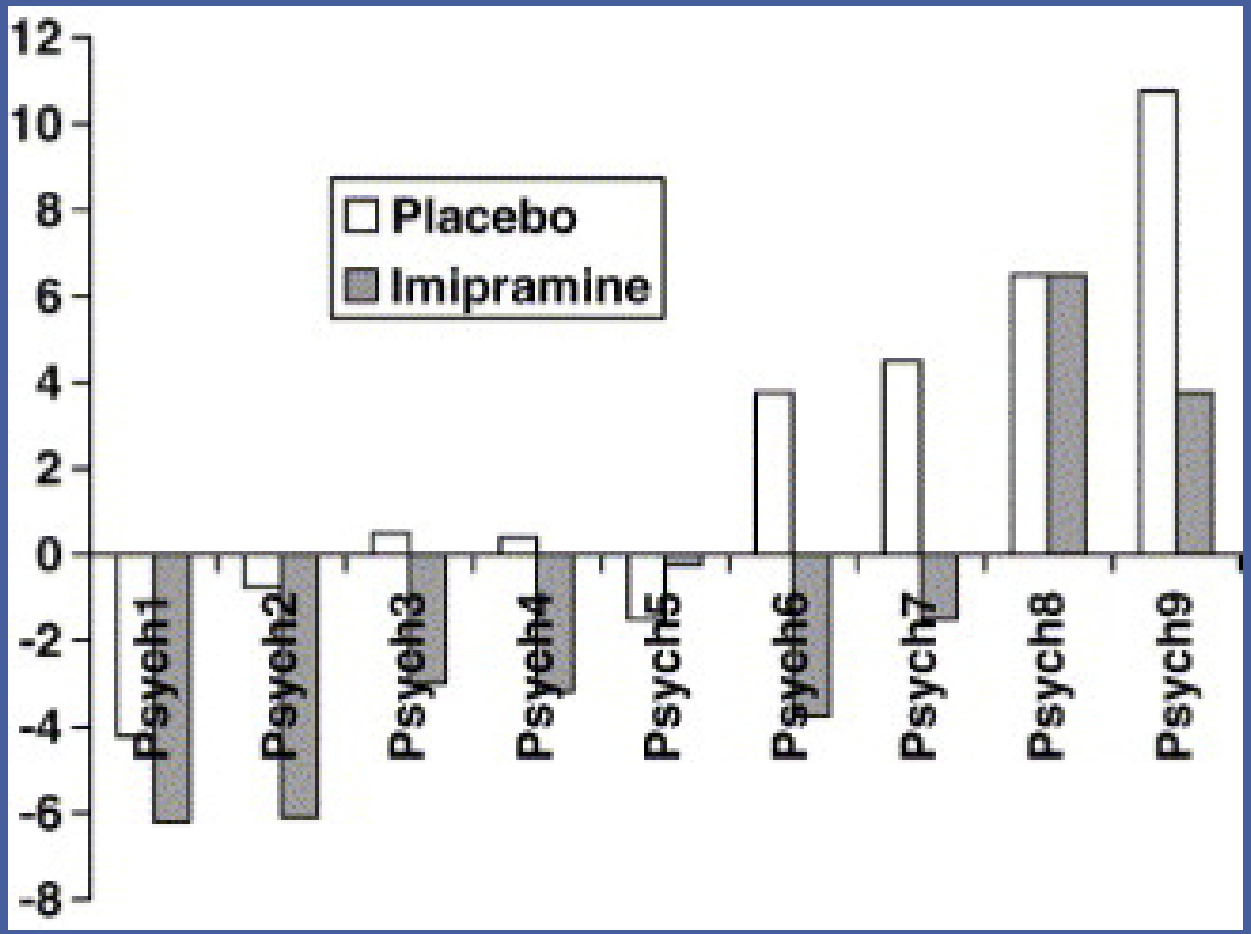
Communicating with Empathy

- Communication is where the heart of the issue starts
- Patient's feel positively about pain management:
  - If they feel cared for by doctor
  - Feel listened to
  - Even in the setting of decreased or refused pain medication [1]
- Be positive [2]
- Express empathy for thier suffering [3]

1. Matthias, M. S., et al. Eur J Pain **18**(6): 835-843. 2. Thomas, K. B. (1987). *British medical journal (Clinical research ed.)*, 294(6581), 1200. 3. Collen, M. (2014). *J Pain Palliat Care Pharmacother, 28*(2), 152-157.

PRACTITIONER EFFECTS

For Depression; Good Therapist + Placebo > Poor Therapist + Imipramine



McKay KM, Imel ZE, Wampold BE. Psychiatrist effects in the psychopharmacological treatment of depression. *J Affect. Disord.* 2006;92:287-90.

3rd Person Statements

- Examples of phrasing:
  - *"We know this is really a painful condition."*
  - *"Fibromyalgia is a painful condition."*

- Avoid using "I statements," such as "*I know you have pain,*" or "*I'm sorry you have pain,*"

Education around cause of pain

- Educate your patient on what you understand to be the cause of their pain and suffering
- Patient's express decreased pain with improved understanding of pain physiology [1]
- Be positive [2]

1. Van Oosterwijck, J., et al. (2013). Clin J Pain, 29(10), 873-882. 2. Thomas, K. B. (1987). British medical journal (Clinical research ed.), 294(6581), 1200.

Realistic AND Hopeful

- Address “Fix me” mentality
- Persistent nature of chronic pain, but there are ways to make your life better
- Address underlying cause
- Set up framework for working together

Examples

"There are two components to pain:

- 1. Something wrong in the part of our body (ie. Injury/inflammation)
- 2. The wiring that tells our brain that the above thing is happening"

- "For all pain there is a component of both of these but it might be more the injury or more the wiring, or a mixture of both".

Educating Your Patient

- Analogy: Imagine pain is music.
  - Your body is the guitar – peripheral pain is when the guitar is being strummed louder
  - Your nervous system is the amplifier – centralized pain is like the amplifier having the volume turned to 10

Barriers to Empowerment

- Deficits in Executive Functioning
- Decreased Self- Efficacy
- Co-occurring Depression
- Lack of Social Support
- Lower socio-economic and educational status

Schmidt SG. *Physiotherapy theory and practice.* 2016.

Motivational Interviewing

- Collaborative: a partnership
  - Motivation is shaped within context of relationship
- Evocative: focused on evoking what patient already has
  - No patient is completely unmotivated
- Honoring patient autonomy: an acceptance that people can and do make choices about their lives
  - Shifting away from offering patients what we think they lack

Non-Pharmacological

- Physical Activity
- Sleep
- Psychological Interventions
  - Targeting mood
  - Emotional regulation
  - Cognitive Reframing

Physical Activity

- Fear of damage from pain often leads to less activity leading to tightening of muscles and increased pain in a negative cycle
- For most chronic pain conditions graded exercise programs are shown beneficial
- 30% improvement for low back pain
- Most effective for centralized pain conditions

Cunningham, N. R., & Kashikar-Zuck, S. (2013). Nonpharmacological treatment of pain in rheumatic diseases and other musculoskeletal pain conditions. *Curr Rheumatol Rep, 15*(2), 306.

Physical Activity

- Programs can vary
- Patient and diagnosis dependent
- Simplest and least expensive approach is patient initiated activity
- Most likely to be successful if they have support around plan (physical therapy, group exercise, friend/family member support, FitBit?)

Sleep

- Pain and sleep are reciprocally related
- Sleep deprivation is a stronger predictor of worsening and recurrent chronic pain episodes
- Sleep disorders proven to exists in centralized pain disorders
- Frequent pain behavior is to cope in ways that get in the way of good sleep hygiene

Finan, P. H., Goodin, B. R., & Smith, M. T. (2013). The association of sleep and pain: an update and a path forward. *J Pain, 14*(12), 1539-1552.

Obesity

- Increasing evidence for obesity as risk factor for chronic pain
  - Higher incidence of fibromyalgia, chronic low back pain, tension and migraine headaches [1]
- Obesity associated with decreased QOL and increased rates of depression for patients with chronic pain [2]

1. Seaman, D. (2013). Body mass index and musculoskeletal pain: is there a connection? *Chiropractic & Manual Therapies, 21*(1), 15. 2. Marcus, D. A. (2004). Obesity and the impact of chronic pain. *Clinical Journal of Pain, 20*(3), 186-191.

Obesity and Inflammation

- For many obese patients there is chronic non-resolving inflammation [1]
- CRP is an accepted marker of chronic inflammation
- Elevated CRP has been shown preliminarily to increase rates of low back pain
  - Higher elevation in patients who are obese [2]

1. Arranz, L. I., Rafecas, M., & Alegre, C. (2014). Effects of obesity on function and quality of life in chronic pain conditions. *Curr Rheumatol Rep, 16*(1), 390. 2. Briggs, M., Givens, D., Schmitt, L., & Taylor, C. (2012). The relationships of C-reactive protein and obesity to the prevalence and odds of reporting low back pain. *Arch Phys Med Rehabil, 94*(4), 745-752.

Inflammation

- Chronic inflammation promotes nociception
- Chronic non-resolving inflammation is associated with:
  - Low back pain, arthritis, RA, MS, atherosclerotic disease, diabetes [1]
- Western diets low in fruits and vegetable (natural antioxidants) and high in red meat (generator of IL-6) promote inflammation [2]

1. Seaman, D. (2013). Body mass index and musculoskeletal pain: is there a connection? *Chiropractic & Manual Therapies, 21*(1), 15 2. Esposito, K., & Giugliano, D. (2006). Diet and inflammation: a link to metabolic and cardiovascular diseases. *Eur Heart J, 27*, 15 - 20.

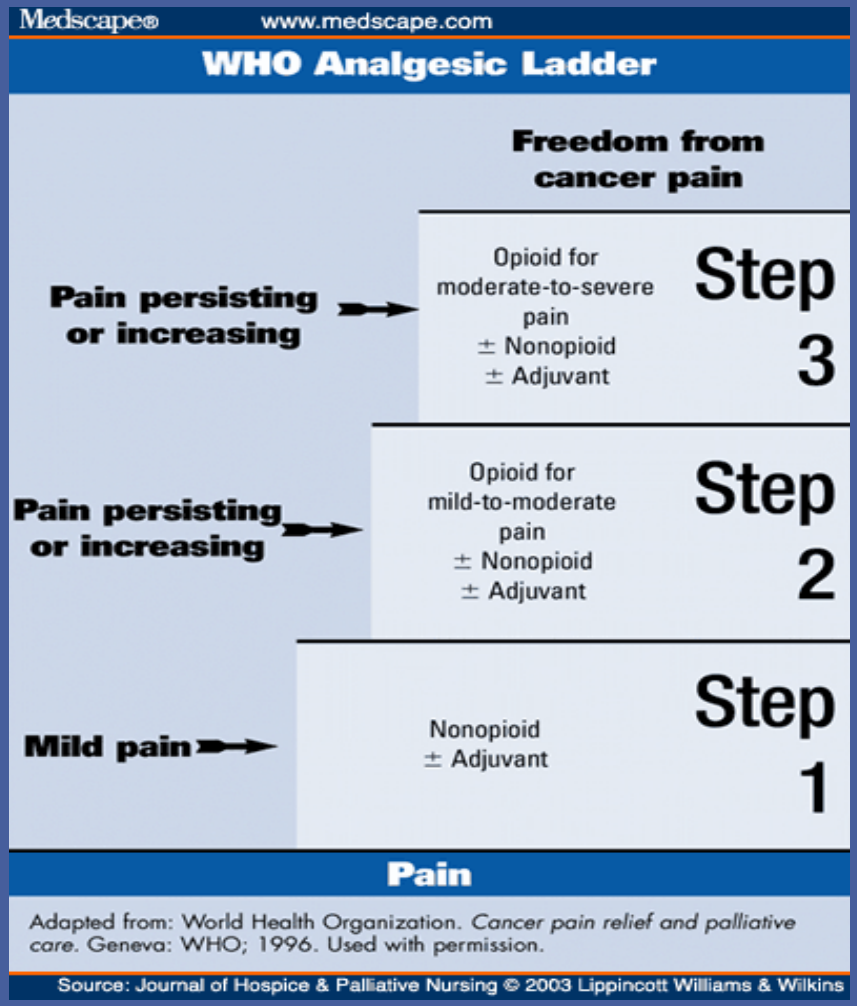
Diet as Treatment

- Diets high in fruits, vegetables, fiber and Omega 3 Fatty Acids decrease inflammation [1]
- Anti-Inflammatory Diet – high in fruits, vegetables, legumes, healthy oils, omega 3
- Mediterranean Diet – high in vegetables, fish, olive oil as main fat [2]

1. Esposito, K., & Giugliano, D. (2006). Diet and inflammation: a link to metabolic and cardiovascular diseases. *Eur Heart J, 27*, 15 - 20. 2. Esposito, K., et al. (2004). Effect of a mediterranean-style diet on endothelial dysfunction and markers of vascular inflammation in the metabolic syndrome: a randomized trial. *JAMA, 292*, 1440 - 1446.

Medications

Medications for Peripheral Tissue Damage



Pharmacological Therapies for Centralized Pain States

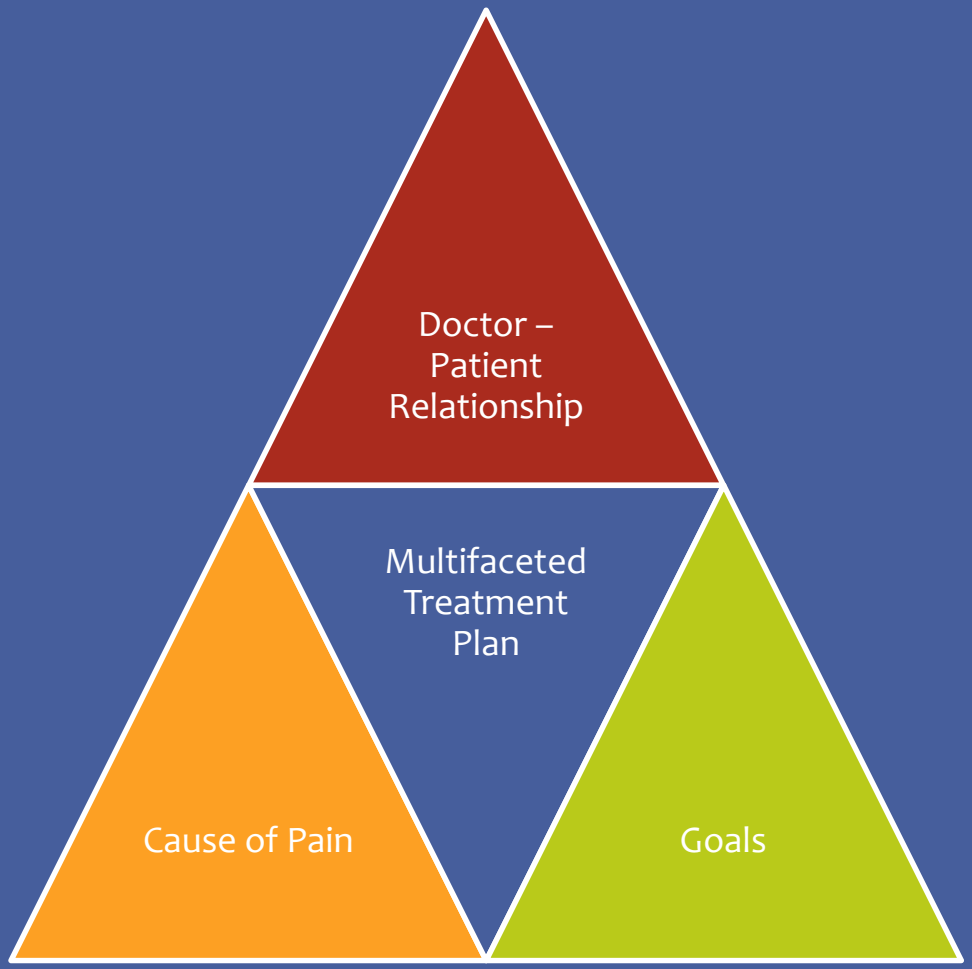
Strong Evidence	• Dual reuptake inhibitors such as
	  ▪ Tricyclic compounds (amitriptyline, cyclobenzaprine)
	  ▪ SNRI and NSRI (milnacipran/Savella, duloxetine/Cymbalta, venlafaxine/Effexor?)
	• Anticonvulsant (pregabalin/Lyrica, gabapentin/Neurontin)

Modest Evidence	• Tramadol • Selective Seratonin Reuptake Inhibitors (SSRI's) • Gamma hydroxybuturate (GHB/sodium oxybate/Xyrem) • Dopamine agonists • Low Dose Naltrexone
Weak Evidence	Growth Hormone, 5-hydroxytrptamine, tropisetron, S-adenosyl-L-methionine (SAMe)
No Evidence	Opioids, corticosteroids, NSAID's, benzodiazapines and nonbenzodiazepine hypnotics (ie. Ambien), guaifenisen

Modified from Goldenberg et al., *JAMA* 2004, 292 (19); 2388-2395

Multifaceted Pain Management

Summary


Doctor – Patient Relationship
Multifaceted Treatment Plan
Cause of Pain
Goals

Summary

- Make your relationship with your patient the primary thing you focus on
- Make sure you feel comfortable with what is causing their pain and suffering
  - Understand what portion of their pain is peripheral vs centralized
- Know what the patient's goals are
- Develop a treatment plan that is multifaceted, appropriate to the patient and the diagnosis
- Don't over emphasize medications!