



Breaking the Cycle: Practical Strategies for Central Sensitization and Chronic Pain

Marissa Cohler, MD

PM&R Physician, Override Health

Michigan Osteopathic Association Annual Autumn
Conference

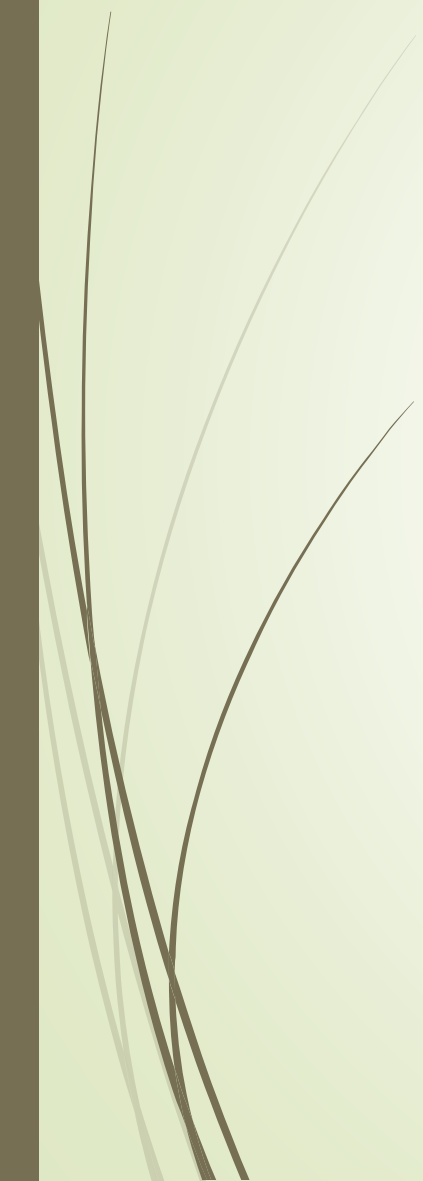
October 26, 2025



Disclosures

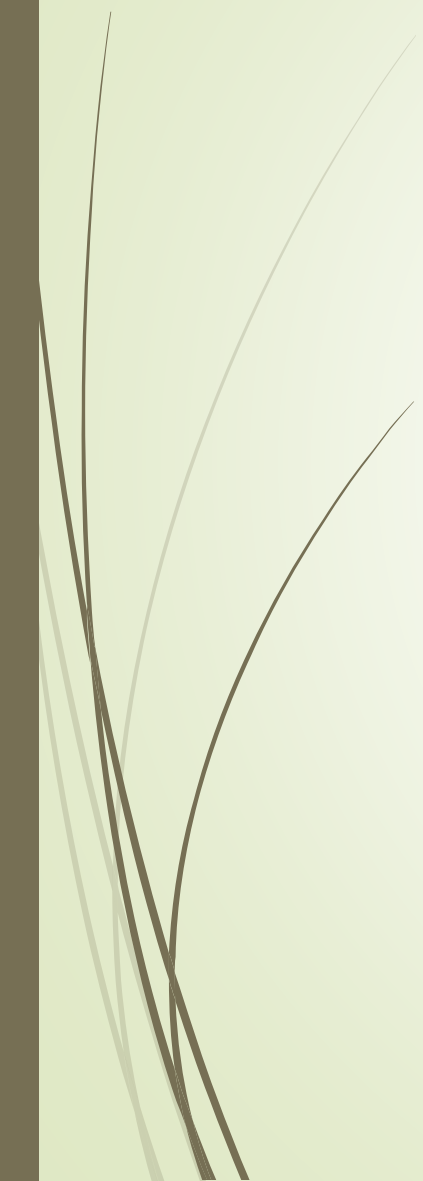


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Learning Objectives



- Define central sensitization and understand its pathophysiology
- Identify central sensitization in clinical practice
- Understand neuroplasticity in chronic pain and apply multimodal treatment strategies
- Improve communication with patients to reduce stigma and improve participation

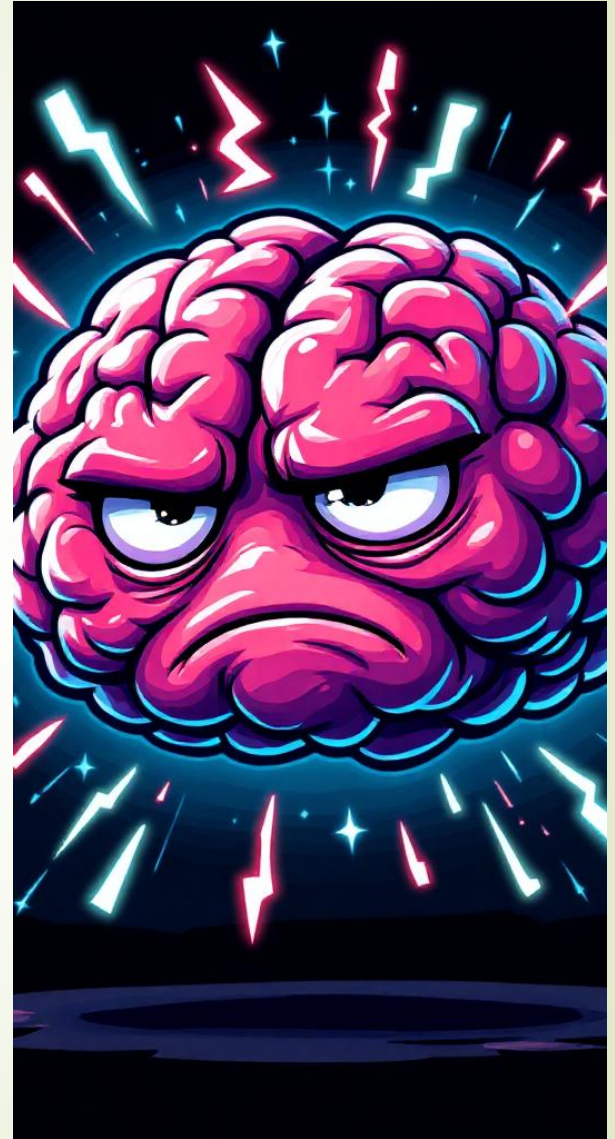


Clinical Vignette

- Middle-aged woman with chronic pain in back and legs
- RA, FM diagnoses
- Worsened after major life stressor
- Treated with ESIs, PT, chiropractor, numerous meds
- Several ED visits for flares
- Poor function
- Uses alcohol to cope
- Reports fatigue, poor sleep, minimal exercise

Central Sensitization

- CNS is hyperexcited even without sensory input.
- Pain no longer reflects tissue damage alone.
- Central sensitization can be maintained with or without continued peripheral input



Central Sensitization

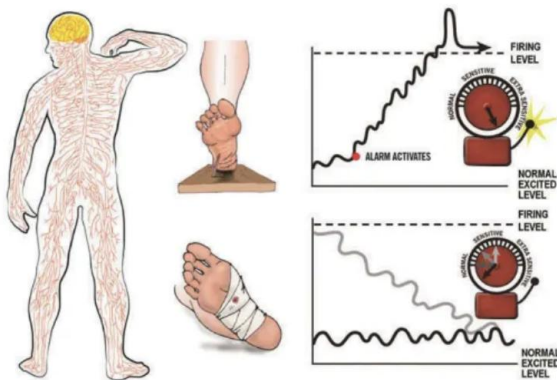


Figure 1. Metaphorical explanation of the nervous system as an alarm system during nociceptive activation (Images with permission from Louw, 2013).

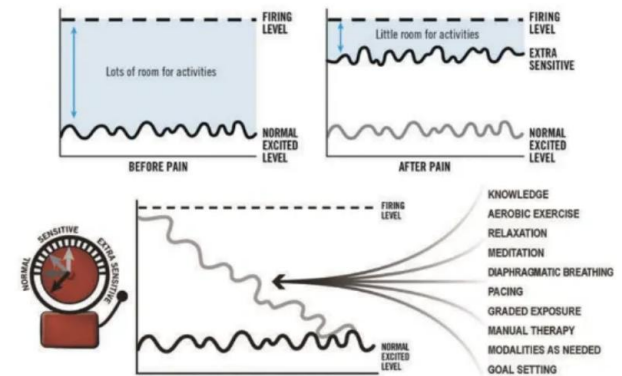
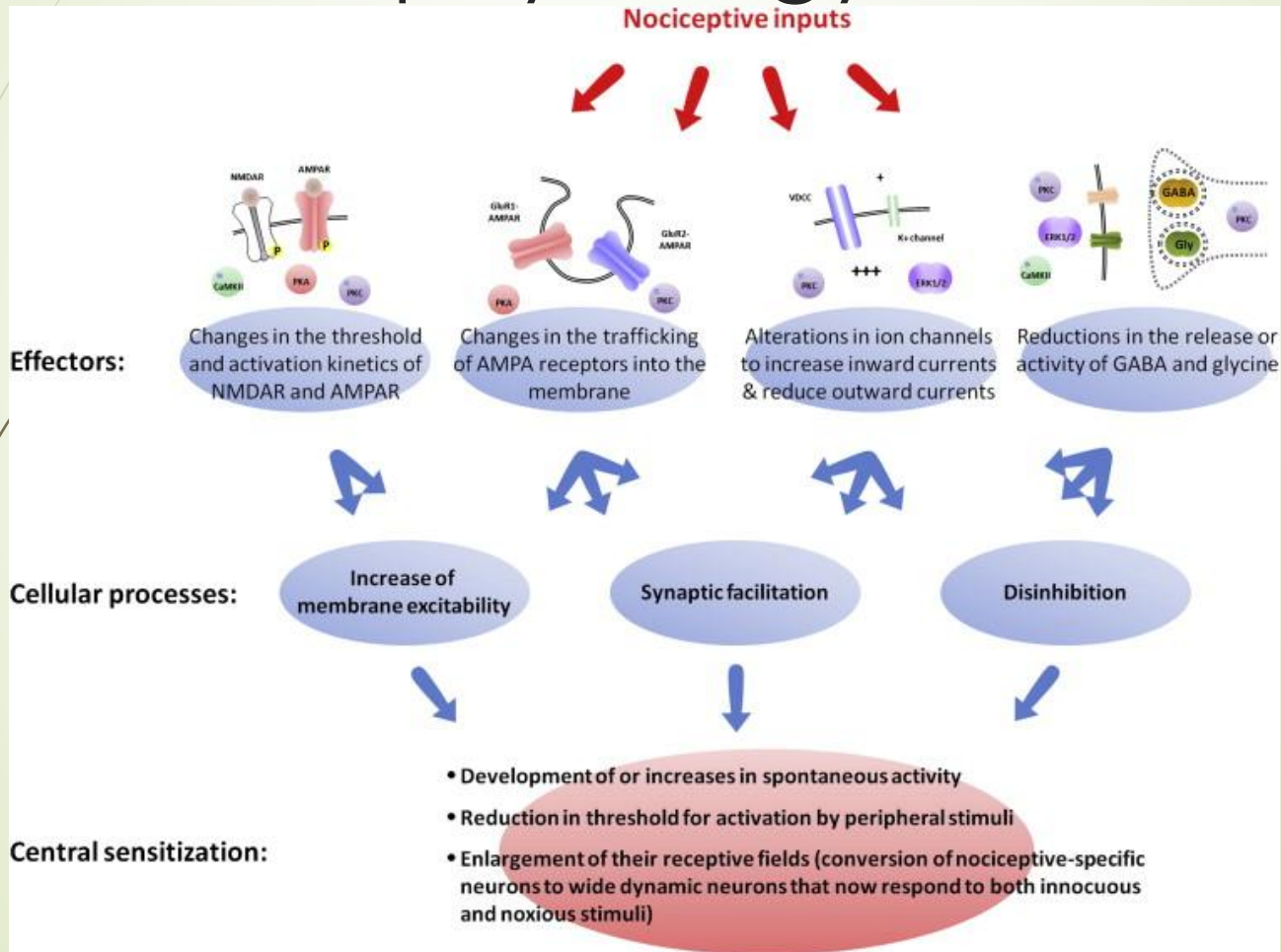
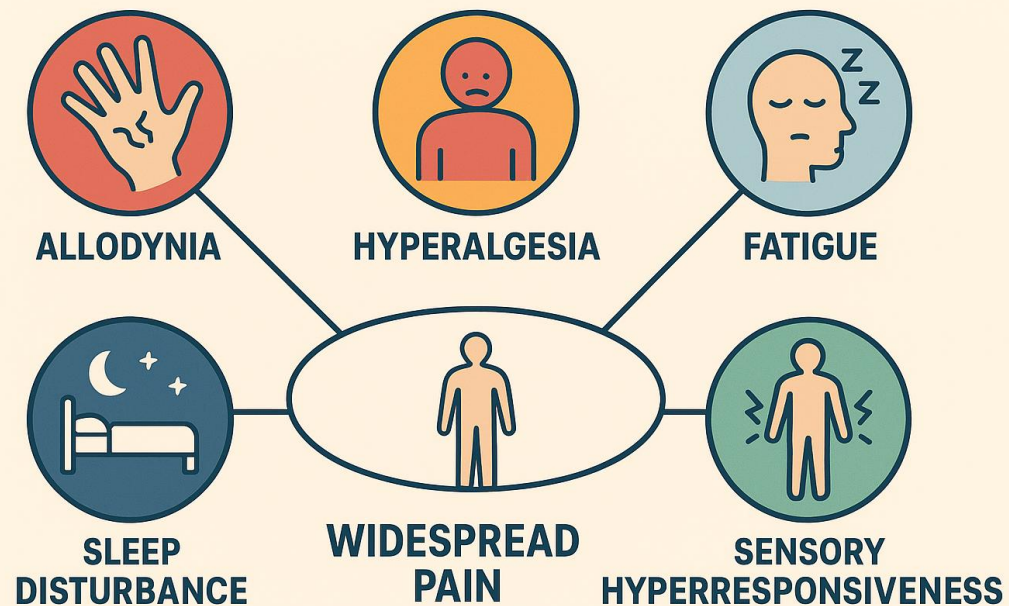


Figure 2. Graphic depiction of nerve sensitization as well as strategies to decrease nerve sensitization (Images with permission from Louw, 2013).

Central Sensitization: Pathophysiology

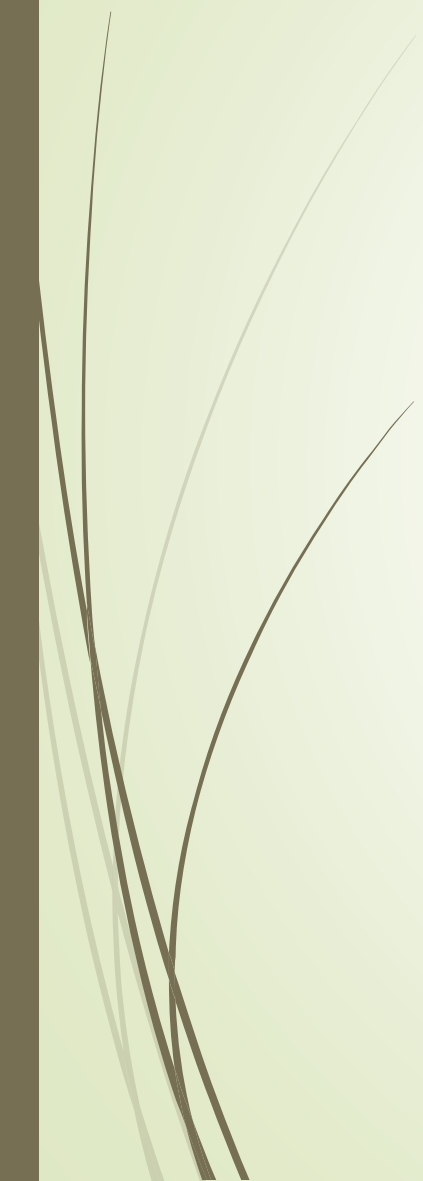


Clinical Features of Central Sensitization





Why Central Sensitization Matters

- Present in up to 70% of chronic pain patients
 - Common in fibromyalgia, CRPS, chronic low back pain, post-stroke pain
 - Associated with poor response to purely biomedical approaches
 - Requires multimodal management
- 

LIFESTYLE FACTORS



Poor sleep /
sleep
disturbance



Physical
inactivity /
deconditioning



Obesity /
high BMI



Smoking



Poor diet /
metabolic
factors

Long-term opioid use
medication overuse

EXTERNAL FACTORS



Ongoing
peripheral
nociceptive
input



Recurrent
injury /
surgical
trauma

**CENTRAL
SENSITIZATION**



Long-term
opioid use



Socioeconomic
access barriers

PSYCHOSOCIAL FACTORS



Pain
catastrophizing
& fear-avoidance



Anxiety and
depression



Low self-efficacy /
maladaptive
illness perceptions



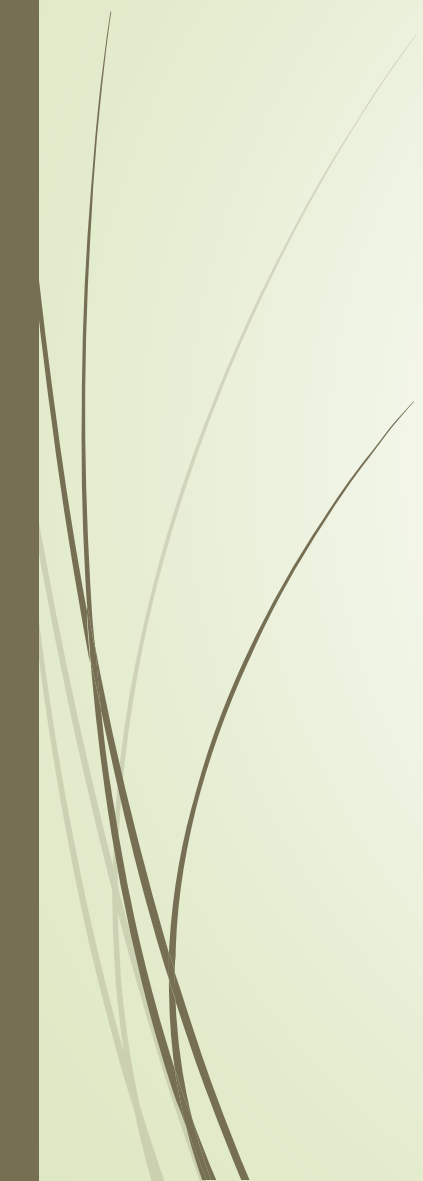
Early life adversity
/ psychosocial
vulnerability



Low social
support /
occupational stress



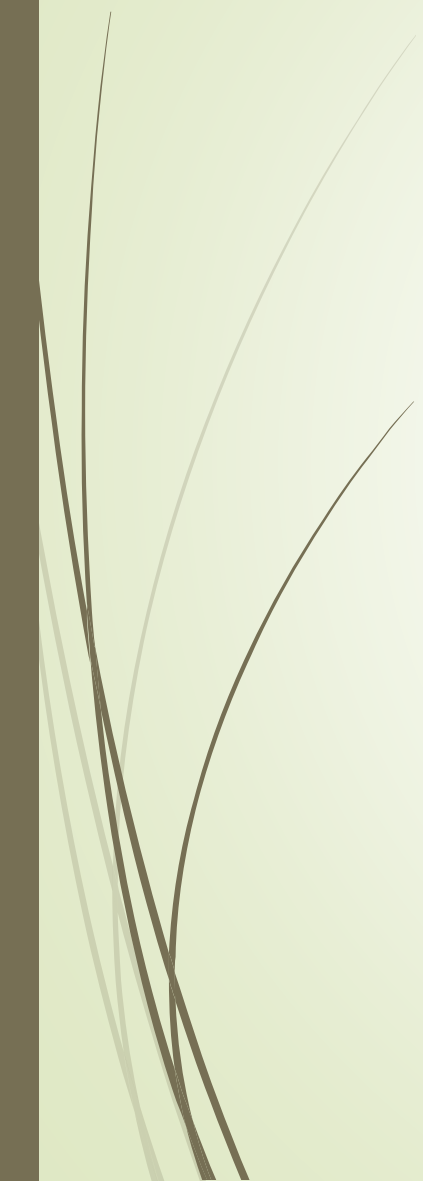
Lifestyle Factors



- Poor sleep / sleep disturbance
- Physical inactivity / deconditioning
- Obesity / high BMI
- Smoking
- Poor diet / metabolic factors
- Long-term opioid use / medication overuse



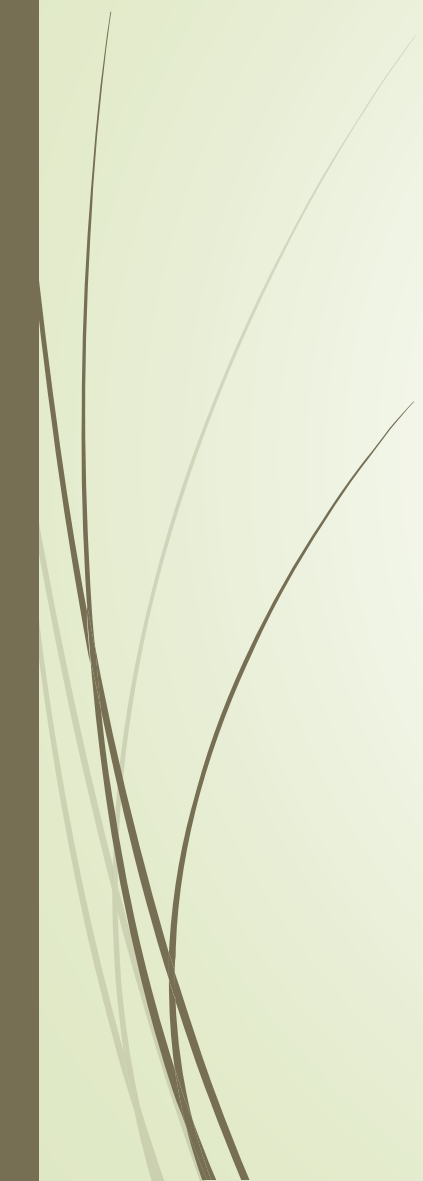
External Factors



- Ongoing peripheral nociceptive input
- Recurrent injury / surgical trauma
- Environmental stressors
- Socioeconomic / access barriers



Psychosocial Factors

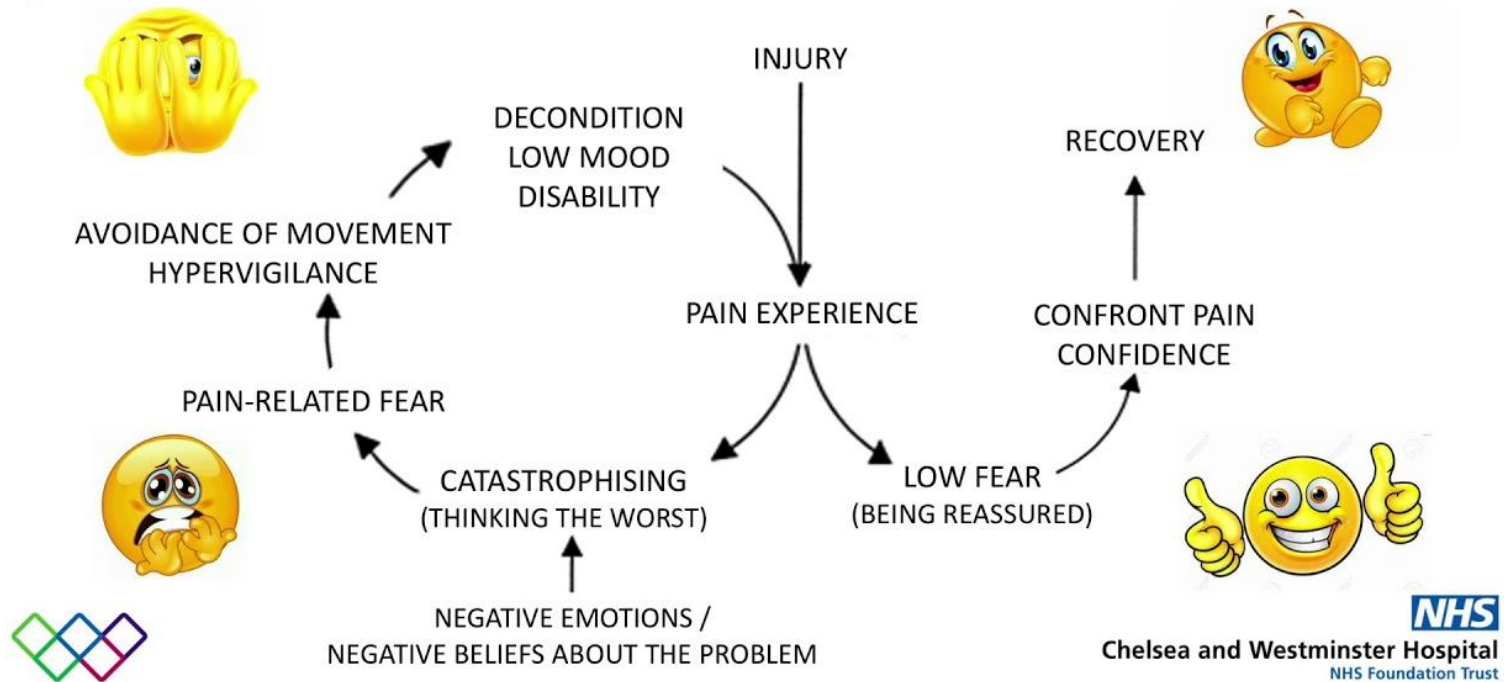
- Pain catastrophizing & fear-avoidance
 - Anxiety and depression
 - Low self-efficacy / maladaptive illness perceptions
 - Early life adversity / psychosocial vulnerability
 - Low social support / occupational stress
- 

Fear Avoidance Loop



The Fear-avoidance Model of Pain

Adapted from Vlaeyen and Linton, 2000



Assessment Tools

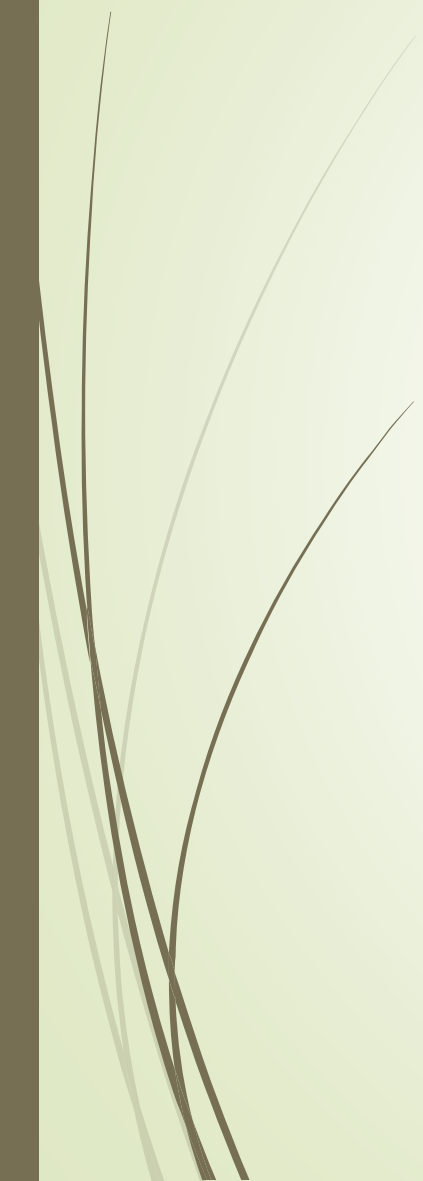
- History and exam: disproportionate pain, hypersensitivity
- Central Sensitization Inventory (CSI)
- Limited role for imaging/EMG

Central Sensitization Inventory: Part A.

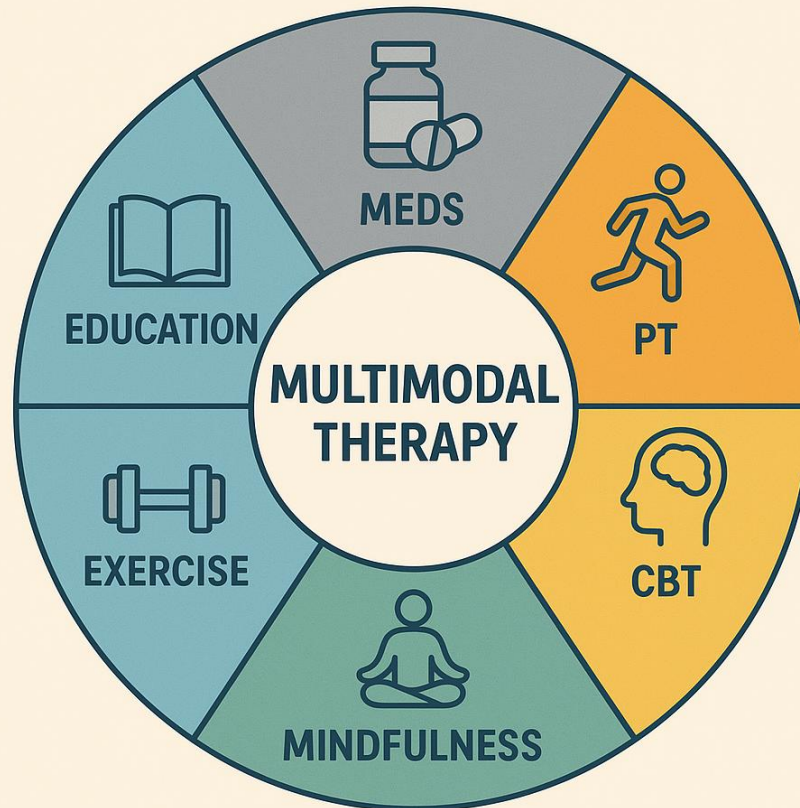
Please circle the best response to the right of each statement.						
1	I feel unrefreshed when I wake up in the morning.	Never	Rarely	Sometimes	Often	Always
2	My muscles feel stiff and achy.	Never	Rarely	Sometimes	Often	Always
3	I have anxiety attacks.	Never	Rarely	Sometimes	Often	Always
4	I grind or 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



CSI-9

- 
1. Unrefreshed in morning
 2. Muscles stiff/achy
 3. Pain all over body
 4. Headaches
 5. Do not sleep well
 6. Difficulty concentrating
 7. Stress makes symptoms worse
 8. Tension neck and shoulder
 9. Poor memory

Management Strategies



Education as Treatment



Pain neuroscience education
(PNE)



Explain pain neuroscience simply.



Shifts beliefs → reduces
catastrophizing.



Use metaphors, stories, visuals.



Provide resources (Explain Pain
books, apps, handouts).

Communicating with Patients

- Validate the pain experience
- Avoid invalidating language
- Do NOT say: 'It's all in your head.'
- Use metaphors
- Focus on empowerment – hope through neuroplasticity



Neuroplasticity



From:
Homanrehab.com

Lifestyle & Mind-Body Tools

- Sleep hygiene (critical)
- Stress management, mindfulness, breathing
- Nutrition (whole-food, plant-based, Mediterranean, and anti-inflammatory)



Movement and Graded Exposure

- Graded exposure reduces fear and sensitization.
- Start low, go slow, pace activity.
- Avoid the boom-bust cycle.



Graded Exercise

TABLE 3

Examples of graded exercise recommendations for self-management

Activity	Examples	Progression	Frequency
Flexibility	Head-to-toe stretches	Initially, may need to break up throughout the day (if too much to do in 1 session)	Once daily
Aerobic exercise	Walking, biking, swimming	Initial duration depends on the patient's comfort level (eg, may be 5 minutes) Gradually increase time by 2–5 minutes every 2 weeks	30 minutes, 3 times a week ^a
Strength training	Hand weights, resistance bands, water bottles	Start slowly Gradually increase resistance or weight	2 times a week ^a

^aAlternate aerobic exercise days and strength training days. For example, aerobic exercise could occur on Mondays, Wednesdays, and Fridays. Strength training could occur on Tuesdays and Thursdays.

From reference 44: Abril A, Bruce BK. Mayo Clinic Guide to Fibromyalgia: Strategies to Take Back Your Life. Rochester, MN: Mayo Foundation for Medical Education and Research, 2019; used with permission of Mayo Foundation for Medical Education and Research, all rights reserved.

Psychological Interventions

- CBT, ACT, mindfulness therapies.
- Reduce catastrophizing, improve coping.



Cognitive Behavioral Therapy (CBT)

TABLE 2

Central sensitization: Turning negatives into positives

Negative or distorted beliefs	Positive and rational beliefs
Because of my pain or symptoms, I am no longer the person I was. I no longer feel loved and appreciated.	I may have changed somewhat physically, but I am more than just a physical being. I am worthy of love and of being appreciated for all that I am.
People reject me because they can see I am disabled.	I am not disabled. I have goals and dreams and can accomplish many things.
I used to be able to do so many things—now I can't do anything. I am no longer competent or adequate.	I can do a lot more than I thought. Almost everything I used to do, I can still do to some degree.
I can't do anything because of my symptoms.	With moderation, I can be actively involved in life. I just need to pace myself and take breaks.
I have no control over my happiness. The pain or symptoms control me.	I can control my happiness. I can be happy and enjoy life even when I have pain or other symptoms.
People think I'm faking this.	People sometimes need help understanding medical issues. I can share what I know about chronic pain.
If my symptoms act up when I'm out with friends, I'll be embarrassed and ruin things for everyone.	I can help my friends understand. I can take breaks and still enjoy myself when I'm with them.
Medical science can do so much. Surely there must be a cure for my symptoms.	Even if medical science can't fix everything, I can choose my response and focus on self-care skills.
People at work are upset with me. I have restrictions and they think I am not doing my share.	I will do the best job I can. If people don't understand, that's their problem—I can't please everyone.

From Mayo Clinic Patient Education. Managing your Fibromyalgia (MC2593-100). Rochester, MN: Mayo Clinic, 2017, pp. 7 & 32; used with permission of Mayo Foundation for Medical Education and Research, all rights reserved.

Acceptance and Commitment Therapy (ACT)



Mindfulness



Pharmacologic Options

- Centrally acting meds: SNRIs, TCAs, gabapentinoids.
- LDN (off label)
- Use as part of multimodal strategy.

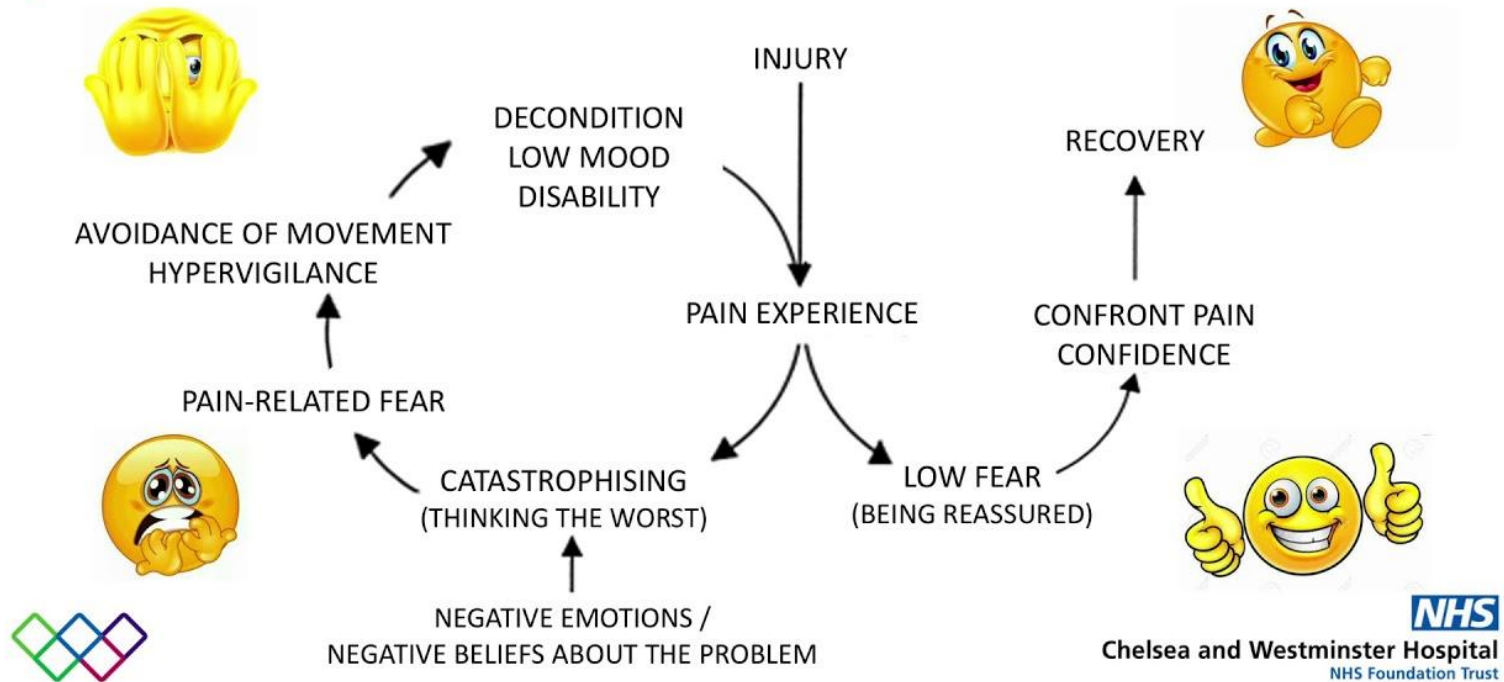


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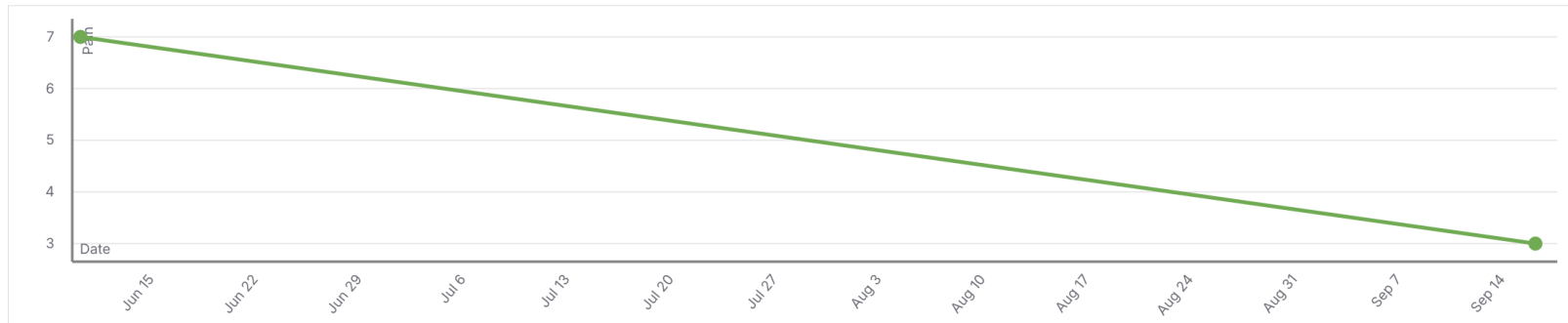


Clinical Vignette

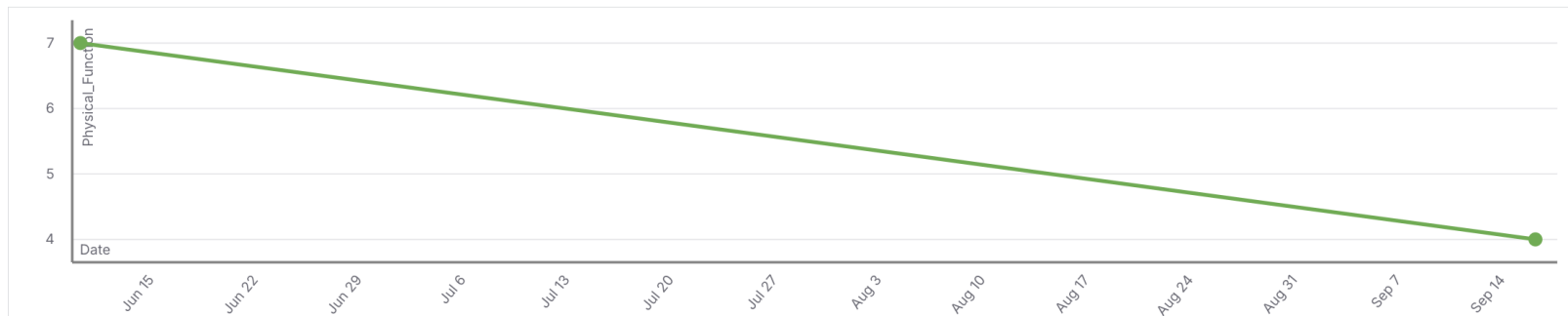
- Treated with PNE/pain coaching, pain psych, chronic pain PT, graded activity, LDN
- Significant functional improvement
- Stopped EtOH, reduced APAP intake
- Increased physical activity
- “I have a better perspective of thinking about my pain and how I react to it.”

Clinical Vignette

Pain

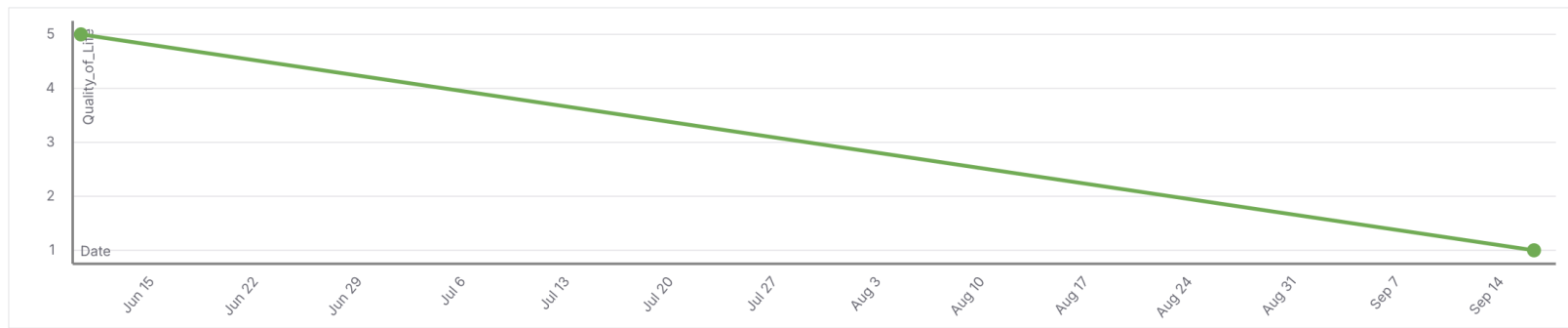


Physical_Function

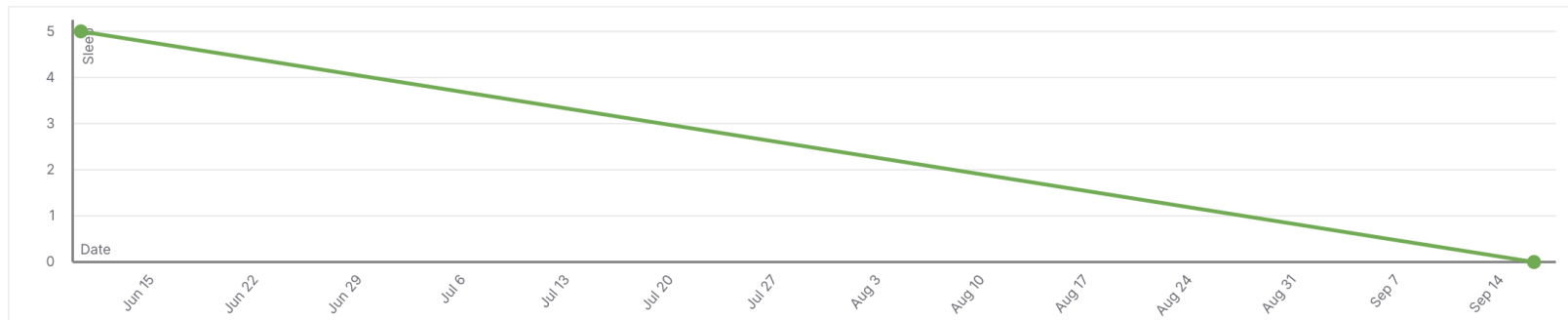


Clinical Vignette

 **Quality_of_Life**

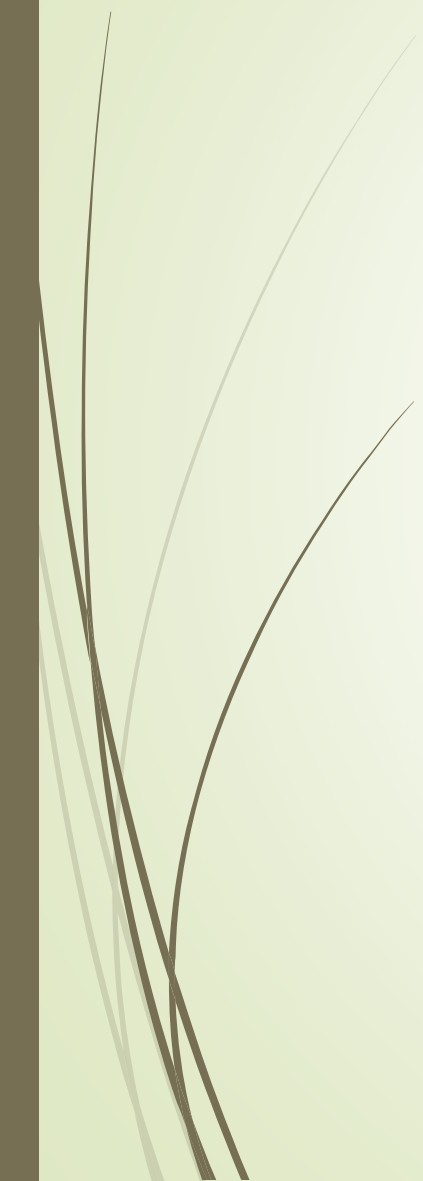


 **Sleep**





Key Takeaways

- Central sensitization underlies many chronic pain syndromes
 - Recognition is key to effective management
 - Multimodal, interdisciplinary treatment works best
 - Communication and validation are critical
 - Utilize neuroplasticity
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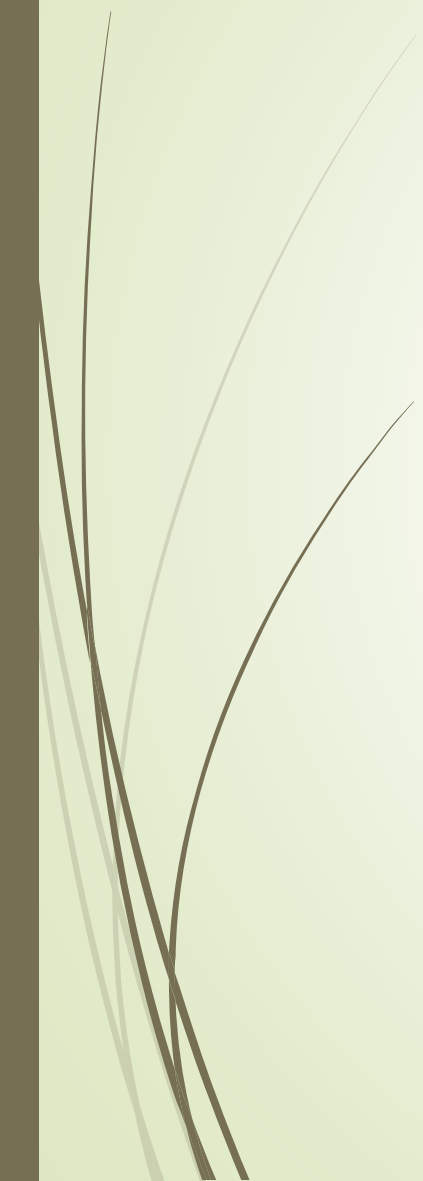


Resources for Clinicians and Patients

- Explain Pain by Butler & Moseley
- Woolf CJ, Pain 2011 (seminal article)
- Central Sensitization Inventory (CSI)
- Recovery Strategies Guidebook by Dr. Greg Lehman
- Pain neuroscience education videos
- Empowered Relief course
- Ezra Klein podcast “This Book Changed My Relationship to Pain”
- Pain: The Science of Suffering by Patrick Wall



Questions?

- Thank you for your attention
 - E-mail marissa.cohler@override.health
- 

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