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Basics of Chronic Pain and Chronic Pain Evaluation

¹Daniel P. Alford, MD, MPH

¹Seddon Savage, MD

²Roger Chou, MD

²Kevin A. Sevarino, MD, PhD

²Melissa Weimer, DO, MCR

¹These individuals were involved in the planning of the original 2017 content.

²These individuals were involved in the 2021 review, update, and approved rerelease of this activity.

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Matthew J. Blair, MD, MS



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Educational Objectives

At the conclusion of these activities participants should be able to:

- Identify pain mechanisms
- Describe how to perform a pain assessment
- Review the impact of psychosocial factors on the pain experience
- Recognize the effect of mental health on the pain experience

Case 1

- 45 year old female with obesity, essential hypertension, tobacco use disorder, and 20 years of constant low back pain that radiates down her left leg.
- Pain is described as aching and burning in the low back, and pins and needles in both feet. Pain is worst in low back.

Case 1

- Previous work up showed
 - MRI with L4-5 disc herniation, no lumbar stenosis
- Patient is prescribed Extended Release morphine 15mg twice a day and acetaminophen as needed.
- Pt attempts to walk daily for 15 minutes.

How do you assess this patient's pain?

Pain Assessment Principles

- Evaluate for comorbid conditions and psychosocial factors
 - Medical, mental health, social and substance use histories
- Perform a thorough history and physical
 - Pain and functional assessment
 - Nature, location, duration, intensity of pain, aggravating and alleviating factors
 - Past or current pain treatments
 - Effect of the pain on patient's life functioning (work, activities of daily living, quality of life, relationships, recreation, and sleep)
 - Patient's expectations
- Evaluate for vitamin deficiencies
 - Vitamin B12, Vitamin D, and iron are frequently deficient
- Evaluate physical conditioning and core strength

Low Back Pain Foot Pain Headache

These are not diagnoses but symptoms – one must identify the pain generators and the type of pain to guide the where, what and how of treatment

The Two Pain Classifications

- Nociceptive
 - Somatic
 - Visceral
- Neuropathic

Nociceptive Pain

Perception
Modulation

To Brain

- Multiple synapses
- Rich interconnections
- Modulation by
 - Meaning
 - Thoughts
 - Feelings
 - Memories

Afferent nociceptive pathway

Afferent non-nociceptive sensory pathway

Spinal modulation

- norEpi, serotonin
- + glutamate, NMDA

Nociceptors:

Polymodal, high threshold \

Sensitized by:
kinins,
H⁺,
norEpi
hypoxia,
prostaglandins

Transmission
Modulation

Lateral and Anterolateral
Spinothalamic tracts

Dorsal Horn

Mixed fiber neurons

A-delta, c-fibers

Transduction
Modulation

In nociception, high intensity stimulation transduces a pain signal in receptors which transmits along nerves across synapses in the spinal dorsal horn to the brain where it has rich synaptic interconnections and moves on to perception. Along the way modulation (physical, psychological, behavioral) can amplify or inhibit the signal.

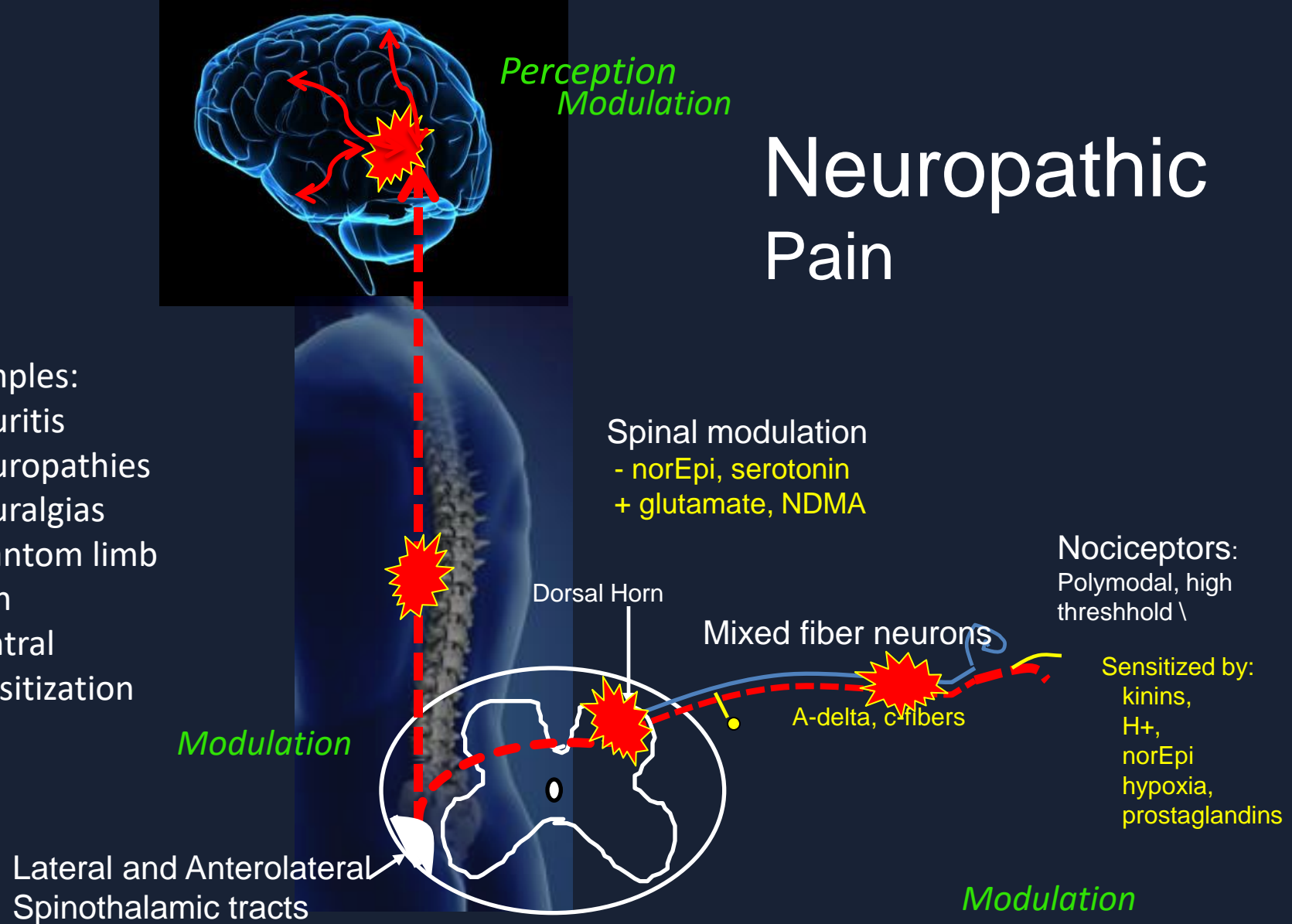
Nociceptive Pain

- Somatic Pain
 - E.g. Low back pain, Osteoarthritis, Myofascial pain
 - sharp, stabbing, localized, aching, burning, or throbbing
- Visceral Pain
 - E.g. Peptic ulcer disease, Myocardial infarction, Pancreatitis
 - Generalized, ache, cramp, pressure

Neuropathic Pain

Examples:

- Neuritis
- Neuropathies
- Neuralgias
- Phantom limb pain
- Central sensitization



Neuropathic pain occurs due to aberrant, sometimes spontaneous conduction along nociceptive pathways with or without active tissue injury.

Neuropathic Pain: Common Etiologies

- Central Sensitization
- Diabetic Peripheral Neuropathy
- Post Herpetic Neuralgia
- Radicular Pain
- Peripheral Nerve Injury
- Complex Regional Pain Syndrome
- Chronic Postoperative Pain
- Phantom Limb Pain
- AIDS related neuropathy
- Spinal Cord Injury
- Post-stroke pain

Neuropathic Pain: Diagnosis

- History
 - Burning, tingling, electric, numb, or shooting pain
 - Sensitivity to cold, heat, and touch
 - Changes in hair, nails, skin
 - Balance problems
- Physical Exam
 - Touch, Vibration, Pinprick, Cold and warmth
 - Assess for allodynia and hyperalgesia
- Rule out known causes
- Consider nerve conduction study or MRI

Chronic Pain Assessment Components

- Subjective Pain Assessment
- Sociopsychobiological assessment
 - Quality of Life
 - Suffering
 - Sleep
 - Function
- Mental Health and Substance Use Assessment
 - Depression
 - Anxiety
 - PTSD
 - Alcohol and drug use (current and history)

Subjective Pain Assessment

- Unidimensional pain scales
 - Numeric rating
 - Visual analog
 - Faces scale
 - Multidimensional instruments
 - McGill Pain Questionnaire
 - Brief Pain Inventory (BPI)
 - Pain, Enjoyment, General activity (PEG) scale
- } Impractical for routine use in primary care

Sociopsychobiological Assessment*

- Quality of Life
- Sleep
- Health literacy
- Conditioning and function
- Life experiences, suffering, and meaning
- Self-efficacy
- Coping and Acceptance
- Environmental stressors
- Friend and Family dynamics and support
- Work history
- Biogenetics

Mental Health and Substance Use Assessment

- Depression
- Anxiety
- PTSD
- Personality Disorders
- Screening for past or present substance use disorder
- Family history of substance use disorder
- See also [ACP Quality Connect: Chronic Pain and Mental Health Assessments Video](#) by Matthew J. Bair, MD, MS

Quick Assessment: PEG Scale

1. What number best describes your pain on average in the past week:

0 1 2 3 4 5 6 7 8 9 10

No pain

Pain as bad as
you can imagine

2. What number best describes how, during the past week, pain has interfered with your enjoyment of life?

0 1 2 3 4 5 6 7 8 9 10

Does not
interfere

Completely
interferes

3. What number best describes how, during the past week, pain has interfered with your general activity?

0 1 2 3 4 5 6 7 8 9 10

Does not
interfere

Completely
interferes

Screening for Depression

PHQ2

Over the *last 2 weeks*, how often have you been bothered by any of the following problems?

1. Little interest or pleasure in doing things
2. Feeling down, depressed, or hopeless

- **Positive if ≥ 3 points** ➤ **If positive, administer PHQ9**
 - Test Sensitivity: 83%
 - Test Specificity: 92%

Assess for other Mental Illness (anxiety, PTSD, personality disorders, suicidality)

Additional Depression Assessment Tools

- Beck Depression Inventory (BDI)
- [Inventory of Depressive Symptomatology](#) (IDS/QIDS)
 - 30/16 item self-rating questionnaire
 - Available online for free

Primary Care PTSD Screen

*In your life, have you ever had any experience that was so frightening, horrible, or upsetting that, **in the past month**, you:*

- 1) Have had nightmares about it or thought about it when you did not want to? YES / NO
- 2) Tried hard not to think about it or went out of your way to avoid situations that reminded you of it? YES / NO
- 3) Were constantly on guard, watchful, or easily startled? YES/ NO
- 4) Felt numb or detached from others, activities, or your surroundings? YES / NO

POSITIVE SCREEN: Any 3 YES Answers



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Screening for Unhealthy Substance Use



*Substance Use Disorders

Alcohol

“Do you sometimes drink beer, wine or other alcoholic beverages?”

“**How many times** in the past year have you had 5 (4 for women) or more drinks in a day?”

(positive: > never)

Drugs

“**How many times** in the past year have you used an illegal drug or used a prescription medication for non-medical reasons?”

(positive: > never)



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Case 1: History Results

- Patient has pins and needle sensation in a stocking distribution
- Family history of Diabetes mellitus, type 2
- Noted to have gained 20 lbs in the last 5 years
- PEG results with 8/10 average pain, 1/10 enjoyment of life, and 8/10 pain interference with activity
- PHQ-2 result = 4
- PTSD screen = positive
- Answers “no” to screening questions for alcohol and drugs
- Denies family or personal history of substance use disorder
- States she sleeps 3-4 hours a night
- Has a history of aggravated sexual assault when she was 21 and never married as a result

Case: Physical Exam Findings

- Normal vital signs
- Weight is 265lbs
- Appears depressed and is tearful at times, rubbing back throughout exam, denies suicidal ideation
- Normal cardiopulmonary exam
- Spine normal alignment, no point tenderness, positive straight leg test
- Muscle strength is 5/5 in upper and lower extremity but tender to touch
- Unable to walk heel to toe, normal gait otherwise
- No Achilles tendon reflex bilaterally
- Diabetic foot exam
 - No lesions/ulcerations, Normal pulses
 - Loss of protective sensation by vibration and pressure

Case: Lab Results

- Hemoglobin A1c 9.5%
- Vitamin D <10
- Vitamin B12 200
- Normal liver function, kidney function, and electrolytes

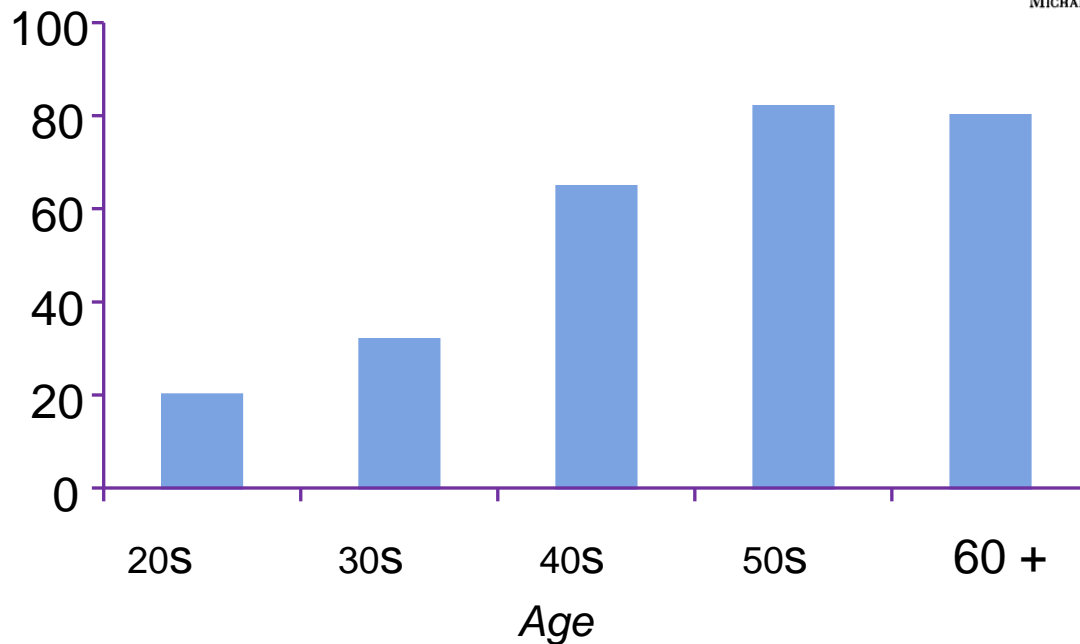
Diagnoses

- Myofascial low back pain (nociceptive pain)
- Lumbar radiculopathy (neuropathic pain)
- Diabetic neuropathy (neuropathic pain)
- Central sensitization (neuropathic pain)
- Low Vitamin D and B12
- Physical deconditioning and obesity
- Depression, needs further evaluation
- PTSD, likely
- Reduced quality of life
- Poor sleep

Sociopsychological Impact of Pain and Psychiatric co-morbidities

Pathology Does not Always Correlate with Pain

% of 100 pain-free adults with lumbar disc bulge or protrusion on MRI



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MAGNETIC RESONANCE IMAGING OF THE LUMBAR SPINE IN PEOPLE WITHOUT BACK PAIN

MAUREEN C. JENSEN, M.D., MICHAEL N. BRANT-ZAWADZKI, M.D., NANCY OBUCHOWSKI, Ph.D., MICHAEL T. MODIC, M.D., DENNIS MALKASIAN, M.D., Ph.D., AND JEFFREY S. ROSS, M.D.



Expectations of pain can change the pain experience



“A builder aged 29 came to the accident and emergency department having jumped down on to a 15 cm nail. As the smallest movement of the nail was painful he was sedated with fentanyl and midazolam. The nail was then pulled out from below.”

“When his boot was removed a miraculous cure appeared to have taken place. Despite entering proximal to the steel toecap the nail had penetrated between the toes: the foot was entirely uninjured.” - Fisher JP et al. *BMJ* 1995;310:70

“The meaning of pain” can inhibit pain



As a medic at Anzio Beachhead Italy in WWII, Harvard surgeon Henry Knowles Beecher speculated why three quarters of men badly wounded in battle declined morphine while similarly injured accident patients in Boston required high doses. He perceived the **meaning of injury modulated the pain.** “Strong emotions can block pain...For the soldier...the woundreleases him from an exceedingly dangerous environment ...to the safety of hospital...his troubles are over he believes...and becomes euphoric”



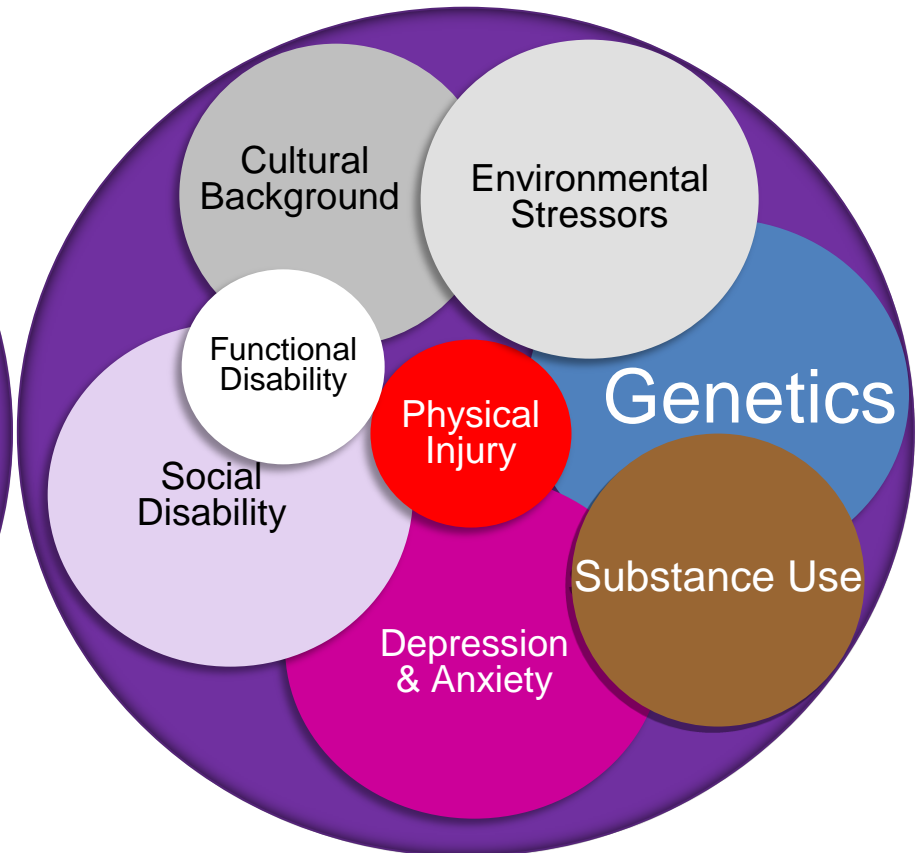
Henry Knowles Beecher
Pain in Men Wounded in Battle,
Annals of Surgery, January 1946

Chronic Pain is Complex

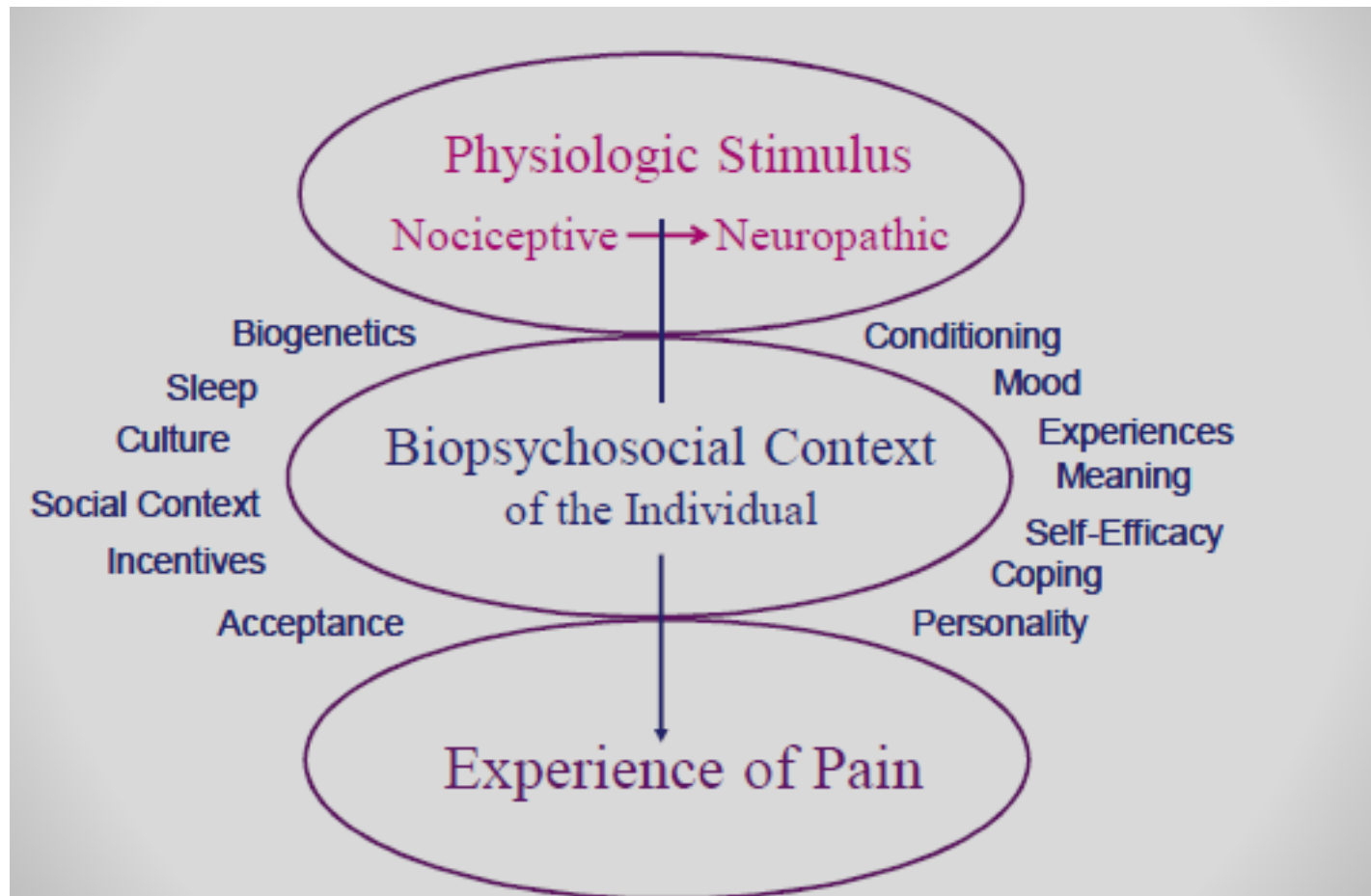
Patient “A” Pain 8/10



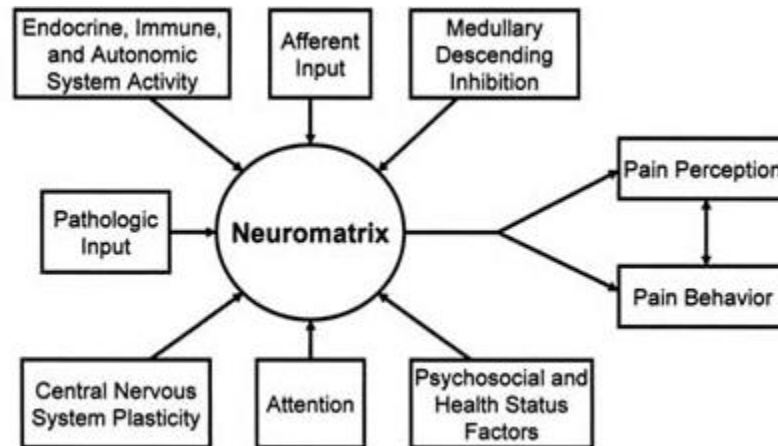
Patient “B” Pain 8/10



Chronic Pain is Shaped by Several Different Factors: Socio-psycho-biological Factors



Another biopsychosocial conceptual model: The Pain Neuromatrix



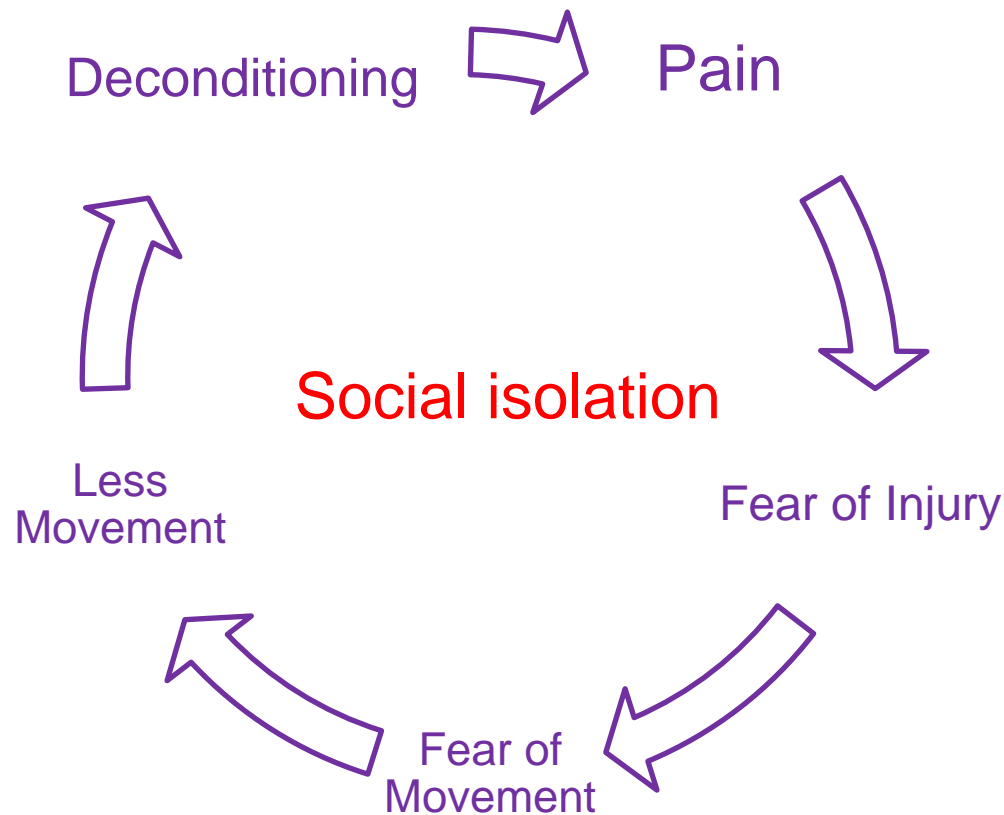
Chronic Pain is Shaped by Several Different Factors: Central Sensitization

- Definition: Heightened dorsal horn excitability due to increased peripheral nociceptor activity
- Features of central sensitization:
 - Reduced threshold for dorsal horn neuron activation
 - Increased receptive field of dorsal horn neurons
 - Increased response of dorsal horn neurons to painful stimuli

Adaptive vs. Maladaptive Pain

- Adaptive pain contributes to survival by protecting the organism from injury or promoting healing when injury has occurred.
- Maladaptive pain is an expression of the pathologic operation of the nervous system; it is pain as disease.
- Maladaptive pain is the expression of abnormal *sensory processing* and usually is persistent or recurrent.
- Essentially, in maladaptive pain, the fire alarm system is constantly switched on even though there is no emergency, or repeated false alarms occur.

Fear Avoidance Cycle → Disability



Risk Factors for Chronic Disease Development

- Concomitant mental health diagnosis
- Marginally employed/vocationally dissatisfied
- History of abuse or interpersonal violence
 - Abandonment, emotional neglect or abuse
- Personal or Family history of substance use disorder
- Concomitant medical conditions

Psychiatric Co-Morbidities

Condition	Prevalence In Patients with Chronic Pain	References
Depression	33 - 54%	Cheatle M, Gallagher R, 2006 Dersh J, et al., 2002
Anxiety Disorders	16.5 - 50%	Knaster P, et al., 2012 Cheatle M, Gallagher R, 2006
Personality Disorders	31 - 81%	Polatin PB, et al. 1992 Fischer-Kern M, et al., 2011
PTSD	49% veterans 2% civilians	Otis, J, et al., 2010 Knaster P, et al., 2012
Substance Use Disorders	15 - 28%	Polatin PB, et al. 1992 Cheatle M, Gallagher R, 2006

Psychiatric Symptom Overlap with Pain

- Negative affect and pain are correlated
- Difficulties sleeping
- Poor concentration
- Low Energy
- Psychomotor retardation
- Decreased interest
- Suicidal ideation

How are patients with depression and chronic pain different from patients with pain without depression?

Compared to patients with pain without major depressive disorder (MDD), patients with co-morbid MDD and disabling chronic pain had the following characteristics:

- Significantly poorer quality of life
- Greater somatic symptom severity
- A higher prevalence of panic disorder
- A six-fold greater prevalence of anxiety

Is there a difference in treatment response in patients with pain and co-occurring depression?

- Poor adherence to treatment
- Worse satisfaction with treatment
- Higher likelihood for relapse
- Less chance for function improvement

PTSD and Chronic Pain Amplify Each Other

- Pain serves as a reminder of trauma
 - Amplification of PTSD avoidance behavior
- Physiological arousal in response to traumatic recollection
 - Amplification of pain related avoidance
- Physical deconditioning
- Increased odds of pain experience

Psychiatric Co-Morbidity and Chronic Pain Summary: Impact of Co-Occurring Disorders

- Depression and anxiety are the most common psychiatric disorders seen in patients with chronic pain
- These patients report more severe pain and disability, are less likely to adhere to treatment and have poorer outcomes
- Attention to assessment and treatment of chronic pain and concurrent psychiatric disorders is necessary to improve treatment outcomes

Summary

- A comprehensive pain evaluation has several components including a thorough history of pain, sociopsychobiological assessment, mental health and substance use assessment, and physical examination
- Sociopsychological factors and psychiatric comorbidities are important mediators of pain origin, pain experience, and pain treatment

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- PCSS Mentor Program is designed to offer general information to clinicians about evidence-based clinical practices in prescribing medications for opioid use disorder.
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American Academy of Pain Medicine	Association for Multidisciplinary Education and Research in Substance use and Addiction
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Educate. Train. Mentor



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