

Tackling the Pain Epidemic as an OT Practitioner

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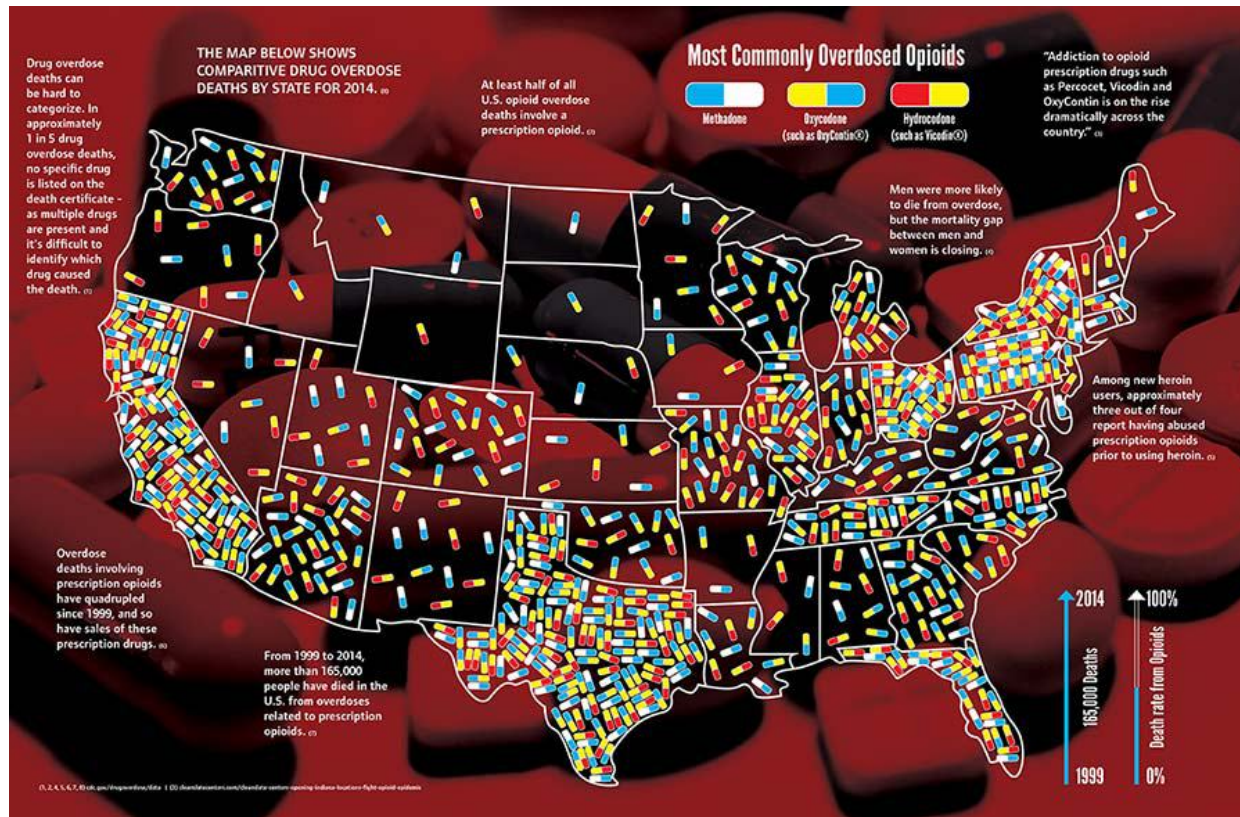
Matthew and Robin



Objectives

- ▶ Understand the current science behind the perception of pain
- ▶ Take into account the neuromatrix theory of pain
- ▶ Consider the biopsychosocial aspects of the perception of pain
- ▶ Understand the need for expansion of the OT's role in dealing with the pain epidemic
- ▶ Become aware of potential assessments to use with patients with persistent pain
- ▶ Be able to apply strategies to help patients better understand their pain experiences
- ▶ Be aware of potential interventions that can be used with patients with persistent pain

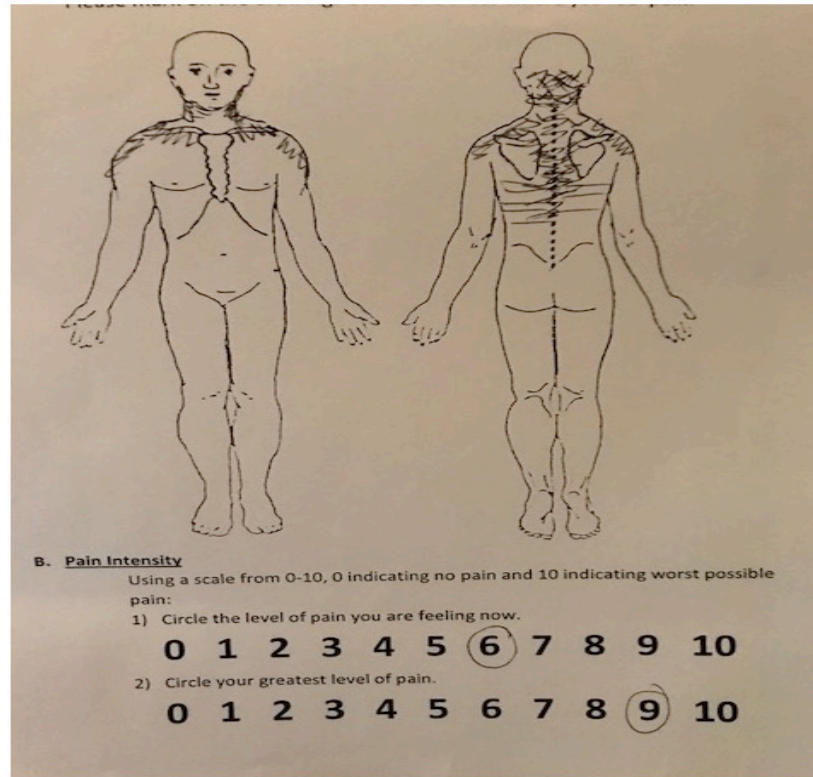
Opioid Epidemic



So What?... Why Do We Need to Talk About Pain?

- ▶ You will encounter pain in every clinical setting
- ▶ Arthritis is the most common cause of disability. Of the 53 million adults with a doctor diagnosis of arthritis, more than 22 million say arthritis causes them to have trouble with their usual activities.
(<http://www.cdc.gov/chronicdisease/overview/index.htm>)
- ▶ One study estimated that the national cost of pain ranges from \$560 to \$635 billion (Darrell J. Gaskin, Patrick Richard, 2012)
 - ▶ This is more than the cost of the nation's priority health conditions.

Body Diagram



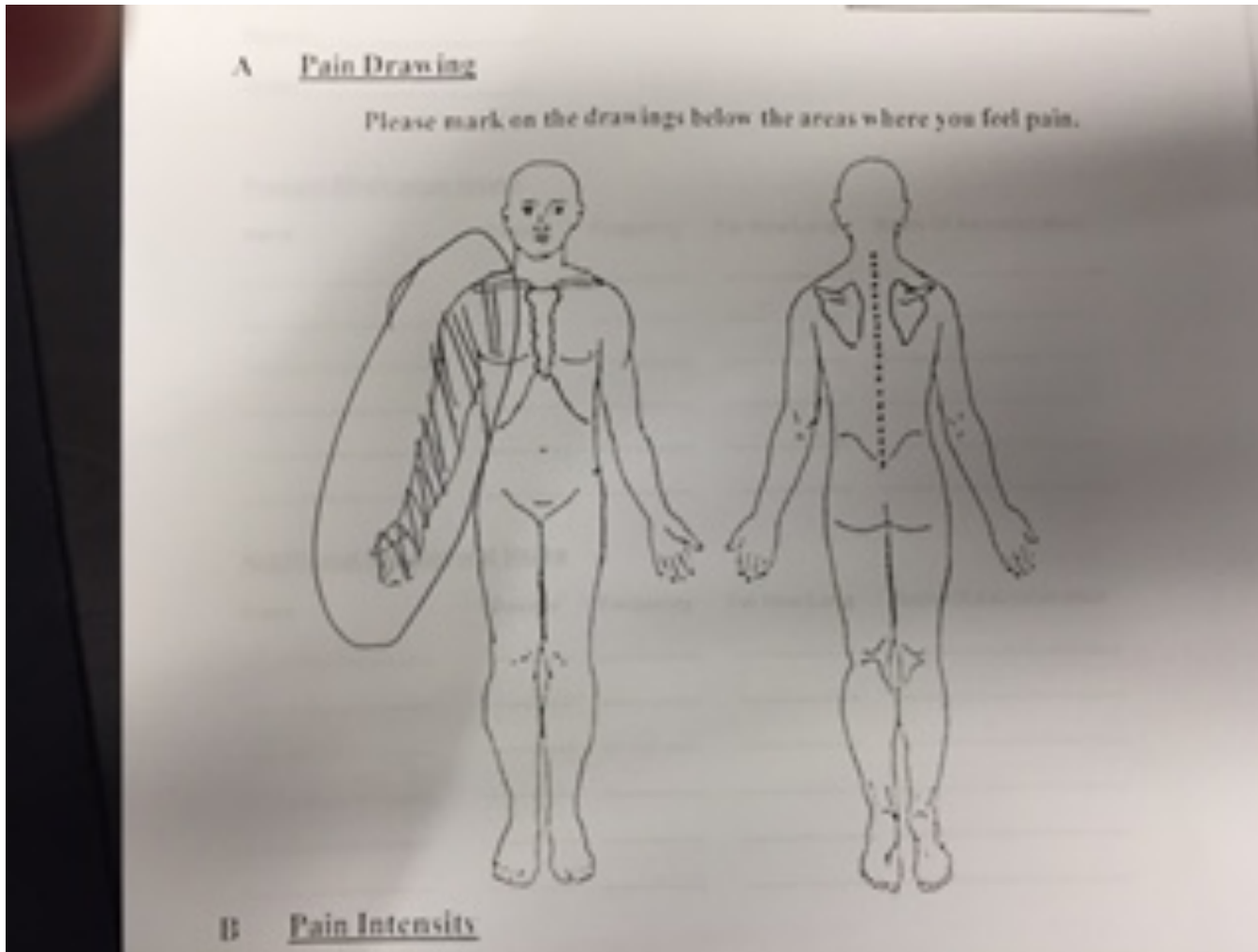
The image shows a body diagram with two views: a front view on the left and a back view on the right. The back view has a shaded area on the upper back, indicating pain. Below the diagrams is a section titled "B. Pain Intensity" with instructions and two scales.

B. Pain Intensity
Using a scale from 0-10, 0 indicating no pain and 10 indicating worst possible pain:

1) Circle the level of pain you are feeling now.
0 1 2 3 4 5 6 7 8 9 10

2) Circle your greatest level of pain.
0 1 2 3 4 5 6 7 8 9 10

Body Diagram



Definitions of Pain

- ▶ “Pain is an unpleasant sensory and emotional experience that is associated with actual or potential tissue damage or described in such terms.” (International Association for the Study of Pain (IASP))
- ▶ “Pain is an important, evolutionarily conserved physiological phenomenon that is necessary for survival. At the same time, pain is one of the most frequent symptoms of a variety of pathological disorders and represents a major clinical challenge” (Gangadharan, V., & Kuner, R. (2013))
- ▶ “Pain perception takes place in a context of an individual’s environment, including the physical, social and emotional contexts” (Jones, L. E., & O’Shaughnessy, D. F. P. 2014).

There's something in my shoe...



What is Persistent Pain?

- ▶ Pain beyond the expected times of tissue healing
- ▶ When pain persists beyond 3 months of a specific injury then the condition can be considered persistent, recurrent, and/or chronic
- ▶ Start to consider pain as it's own disease entity
 - ▶ Not necessarily a passive process
 - ▶ Can become self mediated
 - ▶ Remember, activation of nociceptors has an immediate response on the local environment of tissues and central processing
- ▶ Enhanced sensitivity can be a key feature of persistent pain

(Siddall, P. J., & Cousins, M. J. 2004).

Tame the Beast

- https://www.youtube.com/results?search_query=Tame+the+Beast

BIOMEDICAL MODEL

- Focus on tissues and pathogen/injury



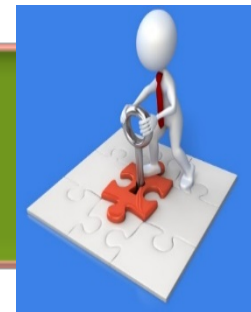
- Greater pathology = greater symptoms



- Correct/treat pathology to eliminate symptoms and restore normal function



- Lock and Key Metaphor



BioMedical Model

FALSE ASSUMPTIONS

Associate pain with tissue damage

- *Site of pain is cause of pain*

Equate Nociception/nerve impulses with pain

- *PNS sends signals to CNS/brain*

Focus on acute pain

- *Does not explain persistent pain*

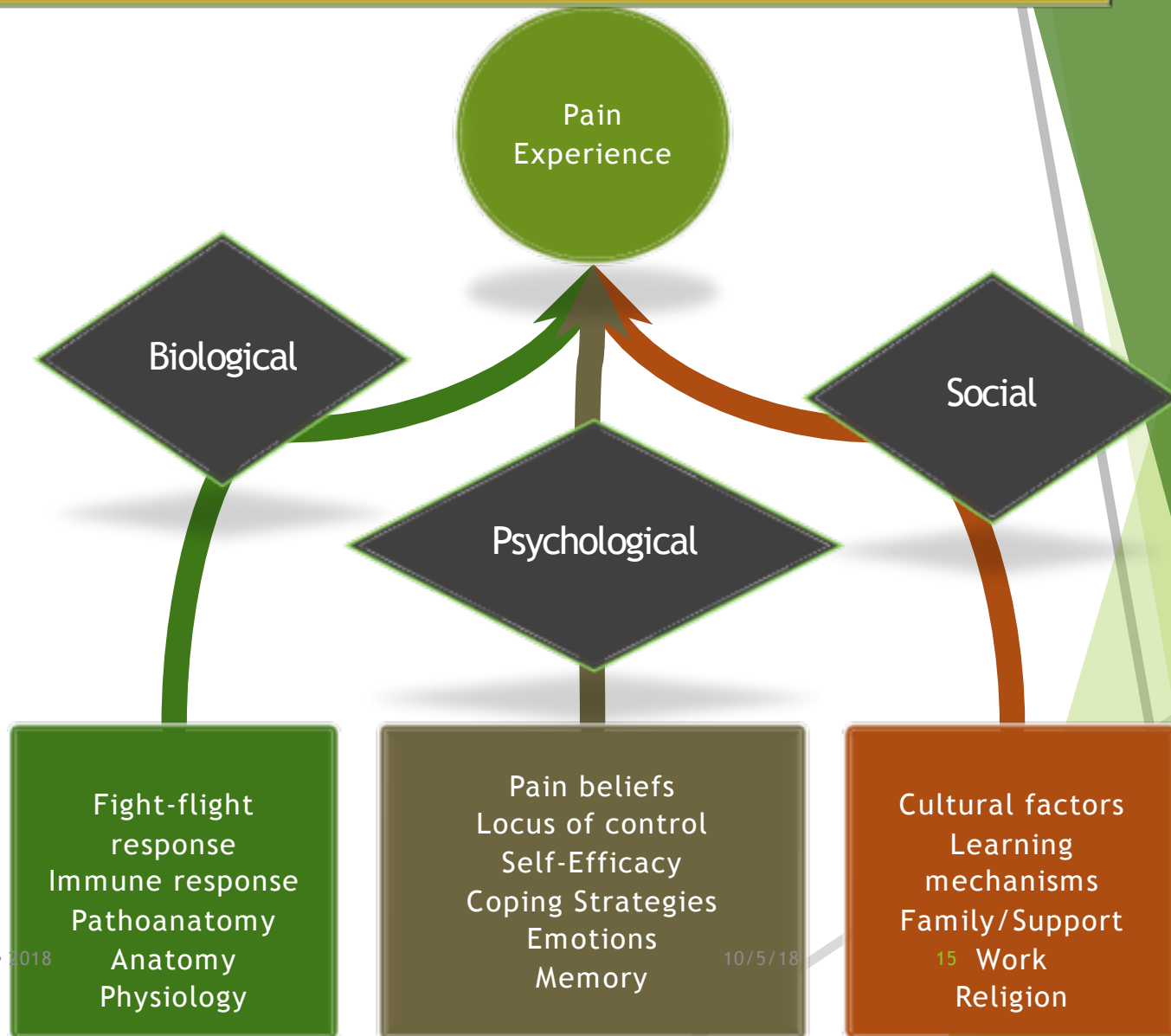
TRUTHS

Poor correlation between tissue damage and pain

Pain experience is an output of various parts of CNS

Pain can persist after tissues heal

Biopsychosocial Model (Linton & Shaw, 2011)





Yellow Flags

Psychosocial factors that correlate with pain and disability

4

FAULTY BELIEFS/ BEHAVIORS

Impact of pain perceptions on functional levels (work, recreation, daily activities) (Wijma et al., 2016)

DEPRESSION

“Disorder marked... by sadness, inactivity, difficulty in thinking and concentration... feelings of dejection and hopelessness, and sometimes suicidal tendencies”
Merriam-Webster’s collegiate dictionary

1

2

FEAR

“An unpleasant often strong emotion caused by anticipation or awareness of danger.”
Merriam-Webster’s collegiate dictionary

PAIN CATASTROPHIZATION

“A maladaptive response to pain intensity, increased disability and difficulty disengaging from pain.”
(Seminowicz & Davis, 2005)

3

We also must consider...

- ▶ Nocebo Effects
 - ▶ Adverse outcomes from negative expectations
 - ▶ The negative side of the placebo effect
 - ▶ What expectations do people have about OT?
 - ▶ If expectations don't equal experience, what is most likely outcome?
 - ▶ Result of psychosocial variables, the perceived therapeutic environment, brain, and body
 - ▶ Must consider past experiences and therapeutic alliance
 - ▶ How can we minimize effect?

Minimizing Nocebo Effects

- ▶ How you talk to your patient matters
- ▶ When discussing an intervention make sure to phrase it in a positive light
 - ▶ Try to avoid producing negative expectations
 - ▶ Talk up the intervention as to help produce positive expectations
 - ▶ Make sure to know what your patients expectations and/or goals are in the first place

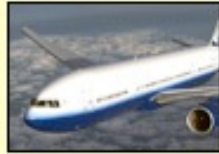



Iatrogenic Effect as it relates to therapy

- ▶ Effects on a person from acting as a healthcare professional
 - ▶ i.e. Complications
- ▶ Promoting products or procedures that are claimed to benefit health
 - ▶ Sometimes this can also create new “syndromes” new “diagnoses”
 - ▶ “Text Neck”, “People over 50 shouldn’t do...”
 - ▶ Unintentional fear mongering
 - ▶ “all bulging discs are clinically significant”

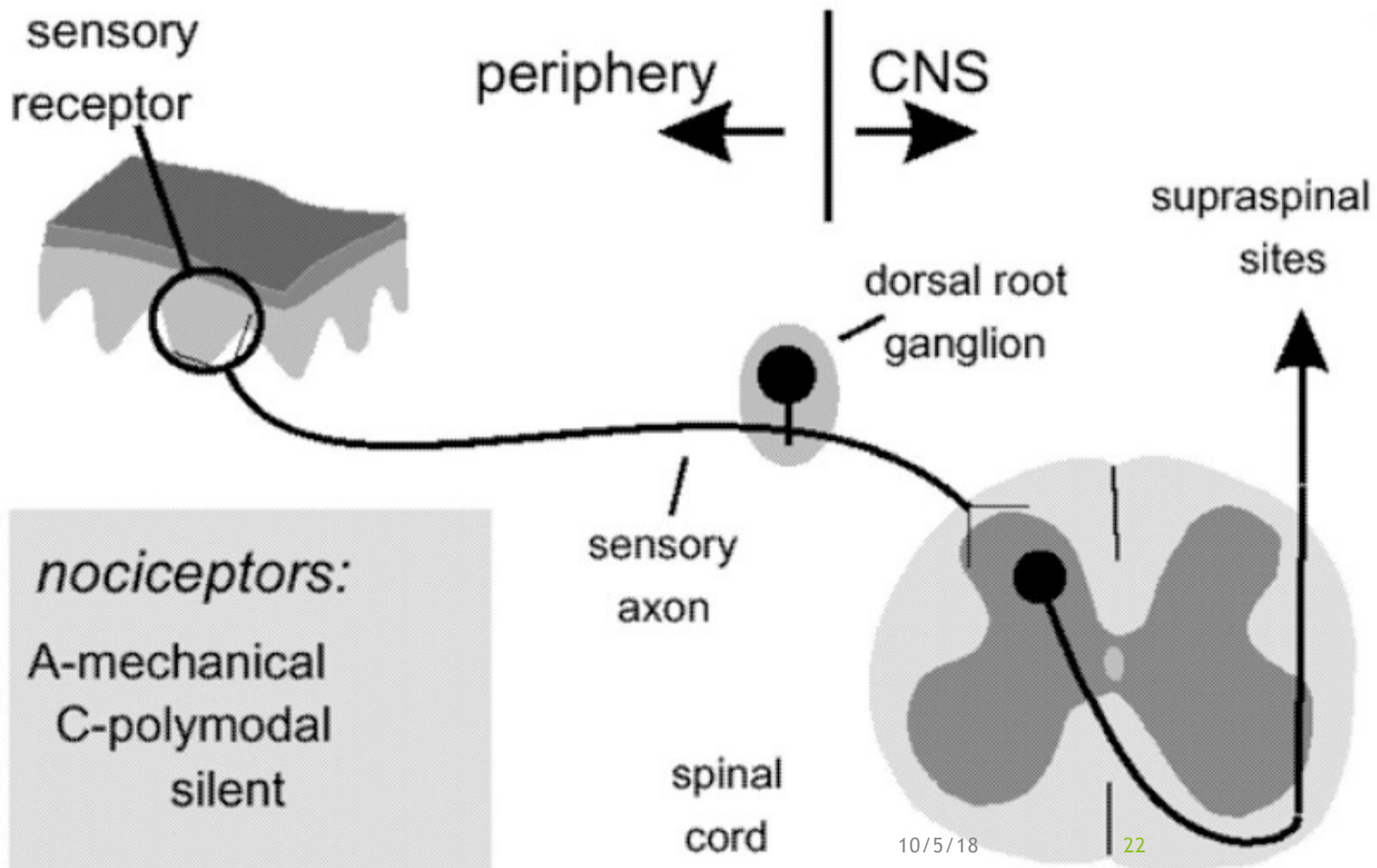
Nociception vs. Pain

- ▶ Nociception: “The neural process of encoding and processing noxious stimuli” (Sluka, 2009)
- ▶ Pain is **perceived** in the vast **neuromatrix** of the brain
- ▶ There is no such thing as pain fibers
- ▶ Nociceptors are free nerve endings located in and around innervated tissue:
 - ▶ Skin, muscles, tendons, fascia, intervertebral discs, joint complexes, periosteum, and within peripheral nerves (nervi nervorum)
 - ▶ Have silent nociceptors, which only become active following inflammation
- ▶ A-beta fibers, which are normally sensory fibers can become connected to the pain system

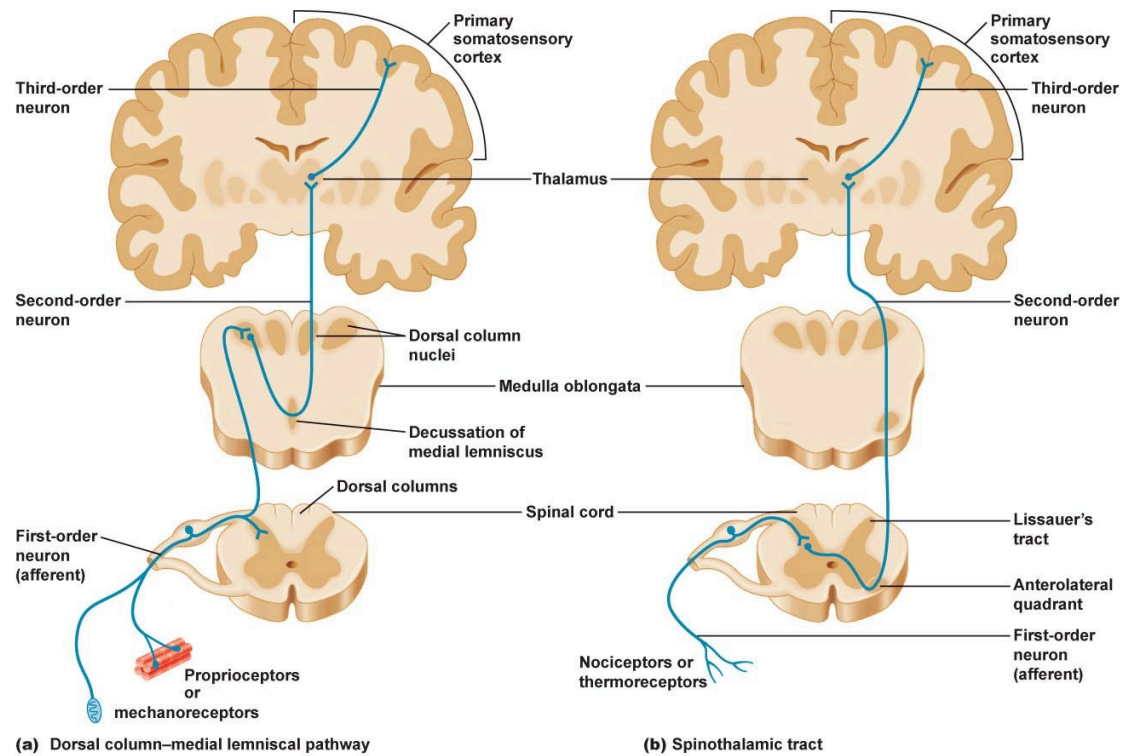
Types of Peripheral Nerve Fibers

Type of Nerve Fibre	Information Carried	Myelin Sheath?	Diameter (micrometers)	Conduction Speed (m/s)	
A-alpha	proprioception	myelinated	13 - 20	80 - 120	
A-beta	touch	myelinated	6 - 12	35 - 90	
A-delta	pain (mechanical and thermal)	myelinated	1 - 5	5 - 40	
C	pain (mechanical, thermal, and chemical)	non-myelinated	0.2 - 1.5	0.5 - 2	

Afferent Nociceptive Activation

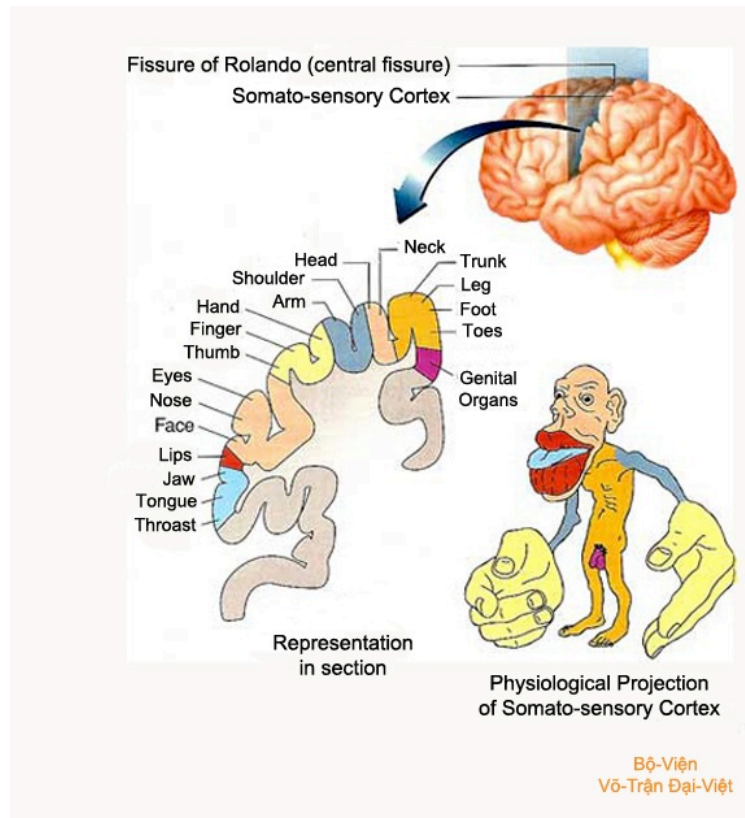


Spinothalamic Tract



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Homunculus



Process of nociception

- ▶ Activation of nociceptors from a noxious stimulus (mechanical, chemical, thermal) results in an immediate release of neurotransmitters
 - ▶ The threshold must be reached for an action potential to be propagated
 - ▶ Ion channels are opened and peptides such as substance P and calcitonin gene-related peptide are released from the peripheral axon terminals
 - ▶ Immediate increase in sensory and sympathetic nerve excitability
 - ▶ This process results in immediate local peripheral neurogenic inflammation (Siddall, P. J., & Cousins, M. J. 2004).
- ▶ The action potential then travels up the peripheral nerve towards the cell body
 - ▶ Cell body located in dorsal root ganglion

Nociception continued....

- ▶ The action potential then synapses with the second order neuron on the dorsal horn and then crosses to the contralateral side of the spinal cord and up towards the higher centers
- ▶ Once the action potential reaches the thalamus it synapses onto the 3rd order neuron, where it is then sent to various processing centers (neuromatrix) including:
 - ▶ Primary somatosensory cortex, hypothalamus, insula, cingulate cortex, amygdala, hippocampus, limbic system, prefrontal cortex...

The Neuromatrix

Chapter 1—A Conceptual Framework for Understanding Pain in the Human

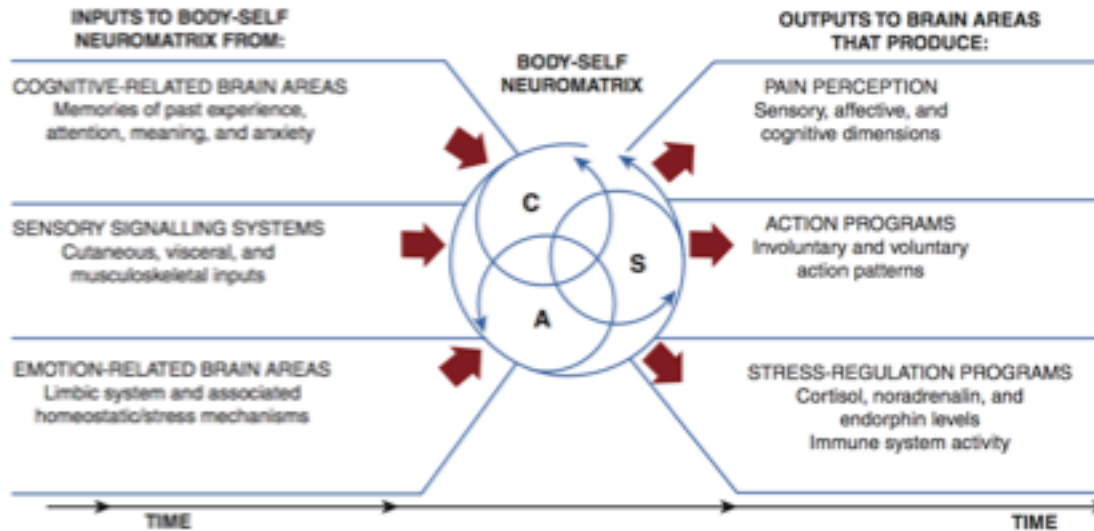


Fig. 1.3 Factors that contribute to the patterns of activity generated by the body-self neuromatrix, which is composed of sensory, affective, and cognitive neuromodules. The output patterns from the neuromatrix produce the multiple dimensions of pain experience, as well as concurrent homeostatic and behavioral responses. (From Melzack R: Pain and the neuromatrix in the brain, J Dent Educ 65:1378-1382, 2001.)

IMAGE: Updated Neuromatrix Model. Waldman SD; Pain Management, 2nd Ed. (Saunders) 2011
p. 5. Ch. 1: A Conceptual Framework for Understanding Pain in the Human. Joel Katz and Ronald Melzack

Peripheral Sensitization

- ▶ Remember, nociceptive stimulation also results in a release of peptides peripherally that make up the neurogenic “inflammatory soup”
 - ▶ Substance P
 - ▶ Calcitonin gene-related peptide
 - ▶ Neurokinin A
- ▶ Peptides are released from peripheral axon terminals of the nociceptive fibers
- ▶ Overall, the inflammatory soup results in:
 - ▶ Increase excitability of sensory and sympathetic nerves
 - ▶ Vasodilation
 - ▶ Extravasation of plasma proteins
- ▶ This process results in (neurogenic) PERIPHERAL SENSITIZATION
(Siddall, P. J., & Cousins, M. J. 2004 & Butler 2013).

Hyperalgesia

- ▶ The nervous system is highly plastic and can change within seconds to minutes
- ▶ Peripheral sensitization; clinically hyperalgesia
 - ▶ Hyperalgesia is an increased response to noxious stimulus
 - ▶ For instance, if 10 pounds of pressure on a muscle used to be rated 4/10 on a visual analogue scale and now that same 10 pounds of pressure elicits a pain of 6/10.
 - ▶ Hyperalgesia can be short or long term.

Central Sensitization (Butler, 2013)

- ▶ Remember that pain is normal, but the processes can become abnormal (Butler, 2013)
 - ▶ Pain is real to the patient, even if it seems magnified or unrealistic to the clinician
- **Central Sensitization results from increased excitability of the dorsal horn of the spinal cord or other parts of CNS**
- **Overtime, central sensitization can go from physiologically normal to abnormal**
- ▶ With central sensitization, there does not have to be target tissue damage to perceive pain
 - ▶ The brain responses are now based upon non-nociceptive information
 - ▶ This can affect:
 - ▶ Movements
 - ▶ Thoughts
 - ▶ Autonomic, immune & endocrine functions

Central Sensitization (Jones 1992, 1994, 2014)

- ▶ Increased sensitivity resulting from and maintained by changes in the central nervous system
- ▶ Usually is ongoing after the expected tissue healing times
- ▶ Symptoms are often
 - ▶ Unstable, atypical, poorly localized
- ▶ Both physical and psychosocial stress thought to be significant contributing factors
 - ▶ This is where education and understanding are huge
- ▶ Sensitization may result in many false positives

Allodynia (Butler, 2013, Jones, 2014, Siddall & Cousins, 2014)

- ▶ Allodynia
 - ▶ Innocuous stimuli become perceived as noxious
 - ▶ Allodynia and widespread hyperalgesia are important clinical findings when considering **Central Sensitization** within a patient
 - ▶ Allodynia involves the activation of A-beta nerve fibers, which are not normally involved in the perception of pain
 - ▶ Patient may complain of sheets bothering them or light touch may be excruciating but deep pressure may not be so bad

Central Sensitization and Clinical Syndromes

- ▶ RA
 - ▶ Some studies have shown increased sensitivity in and around joints
- ▶ OA
 - ▶ Degree of pain does not always correlate with the extent of joint damage or presence of active inflammation
 - ▶ May present with widespread hyperalgesia
 - ▶ Patients with high pre-op pain and low pain threshold have higher risk of persistent pain after total knee replacement, which could indicate contribution of central sensitization

Central Sensitization and Clinical Syndromes

- ▶ Chronic neck pain resulting from whiplash
 - ▶ Lowered pain thresholds in uninjured tissues
 - ▶ Local injection into myofascial trigger points resulted in an immediate increase in ROM and pain pressure thresholds; though to show a dynamic mediation of pain through afferent triggers
- ▶ Shoulder Impingement
 - ▶ Have shown widespread hyperalgesia and increased MTrp's
- ▶ Lateral Epicondylalgia
 - ▶ Increased widespread bilateral mechanical pain hypersensitivity
 - ▶ Mirror image pain

Autonomic nervous system

- ▶ Remember functional of autonomic nervous system
 - ▶ One main function is to control blood flow to certain areas
 - ▶ With sympathetic outflow vasoconstriction can result leading to ischemia of tissues
- ▶ Sympathetic division T1-L2/3
- ▶ Parasympathetic nervous system in brain stem and sacral levels S2, S3, S4
- ▶ Might see trophic changes, skin color changes (check in different positions)

Neuroendocrine

- ▶ Output responsible for providing energy to meet immediate demands
- ▶ Control of hormones
 - ▶ i.e. Cortisol with stress
- ▶ This is probable a normal process with many injuries, but if pathological can help maintain tissue recovery

How does this all help guide treatment?

- ▶ Mechanism based classification “might generate testable hypotheses for selecting treatments which interact with specific mechanisms” (Woolf et al., 1998)
- ▶ There will likely be multiple mechanisms at play, so ranking your hypothesis categories based upon a combination of subjective and objective information
- ▶ Must constantly reassess clinical reasoning categories throughout treatment

The OT's Role with People with Persistent Pain

- ▶ 2011: The Issue Is: Is Occupational Therapy Adequately Meeting the Needs of People with Chronic Pain? (Robinson, Kennedy, & Harmon, *AJOT*)
 - ▶ Paucity of evidence for occupation-based OT
 - ▶ Using inappropriate evidence, e.g., multidisciplinary interventions, e.g., CBT
 - ▶ Underuse of relevant evidence, e.g., vocational rehabilitation, fear avoidance model, occupation-based CBT
- ▶ 2015: OT interventions in chronic pain-A systematic review (Hesslestrand, Samuelsson, & Liedburg)
 - ▶ OT needs to “build up a trustworthy arsenal of evidence-based interventions...in persons with chronic pain” (p. 183)

The OT's Role with People with Chronic Pain

► Resources:

- AOTA Fact Sheet: *Occupational therapy and pain rehabilitation* (2014)
- AOTA Living Life to Its Fullest™: *Managing Chronic Pain with Occupational Therapy* (2018)
- AOTA Critically Appraised Topic (CATs) Musculoskeletal Disorders
- *Breaking the cycle: Occupational therapy's role in chronic pain management* (Driscoll & Baker. (2016). *OT Practice*, 21(19), 8-14)
 - Shift to view of pain as multi-dimensional, including cognitive-perceptual factors, environmental-behavioral factors, and psychological factors
 - Interventions include pain education, e.g., pain flares don't always indicate that something is wrong; encouraging movement

OT's Role in Countering Opioid Addiction

- ▶ Donna Costa, (2016) Occupational therapy's role in countering opioid addiction, *OT Practice*, 22(1), 12-16:
 - ▶ Setting goals
 - ▶ Addressing ergonomic issues in the workplace that may lead to pain
 - ▶ Conserving energy and managing fatigue
 - ▶ Exercising
 - ▶ Learning self-management of pain flare-ups
 - ▶ Creating distraction from pain
 - ▶ Receiving education on body mechanics and good posture
 - ▶ Using heat modalities and electrical stimulation
 - ▶ Establishing effective sleep habits
 - ▶ Managing stress
 - ▶ Making use of psychological based management strategies, including cognitive-behavioral therapy and psychotherapeutic approaches

The OT's Role: Evaluation

▶ Assessments

▶ General Occupational Performance Evaluation

▶ Canadian Occupational Performance Measure (COPM)

- ▶ Note: One study (Niewenhuizen et al., 2014) found poor construct validity of the performance scale related to detecting changes in occupational performance of people with chronic pain

▶ Specific Occupational Performance Evaluation

- ▶ Sleep: Pittsburgh Sleep Quality Index (PSQI)
- ▶ <https://www.outcometracker.org/library/PSQI.pdf>
- ▶ Sleep complaints are present in 67% to 88% of chronic pain disorders (Finan, Goodin, & Smith (2013)
- ▶ At least 50% of individuals with insomnia have chronic pain (Finan, Goodin, & Smith (2013)
- ▶ Estimated that “20% of American adults (42 million people) report that pain or physical discomfort disrupts their sleep a few nights a week or more” (The Burden of Pain on Every Day Life, para. 1).

Specific Assessments Related to Occupations

- ▶ National Institute of Health Activity Record (ACTRE, 1997)
 - ▶ Based on MOHO; focuses on volition, habituation, and performance

Instructions for Activity Record

The purpose of this questionnaire is to help understand what you are doing and how it affects how you feel. Please fill out this questionnaire on _____. In the activity space, write the activity that you feel best describes what you were doing during that half-hour of the day. If what you were doing takes longer than one half-hour, write it again for as long as you continue to do the activity. Do this for each half-hour of the day and night.

After you have completed listing all your activities, give each half-hour period a number from the key below that best describes that half-hour. Please answer the questions listed for each half-hour time period by putting a circle around the number you feel is the best answer to the question. You need not answer the questions for sleep. Please answer the following questions: _____

Key

1. During this half-hour, I was mostly lying down.
2. During this half-hour, I was mostly sitting (at work, reading, computer, TV, etc.)
3. During this half-hour, I was mostly standing, walking, lifting, or moving around.

At the end of the day, mark the category column using the categories on the back of this page to describe your activities.

Example

Day 1 Afternoon				Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7	Question 8
Key#	Half-Hour Beginning At	C A T E G O R Y	Activity	During This Time I Felt Pain: 1=Not At All 2=Very Little 3=Some 4=A Lot	At The Beginning Of This Half-Hour I Felt Fatigue: 1=Not At All 2=Very Little 3=Some 4=A Lot	I Think That I Do This: 1=Very Poorly 2=Poorly 3=Average 4=Well	I Find This Activity To Be: 1=Very Difficult 2=Difficult 3=Slightly Difficult 4=Not Difficult	For Me This Activity Is: 1=Not Meaningful 2=Slightly Meaningful 3=Meaningful 4=Very Meaningful	This Activity Causes Fatigue: 1=Not At All 2=Very Little 3=Some 4=A Lot	I Enjoy This Activity: 1=Not At All 2=Very Little 3=Some 4=A Lot	I Stopped To Rest During The Activity: 1=Yes 2=No
3	12:30 p.m.	HA	Prepare Lunch	1 2 3 ④	1 2 ③ 4	1 2 ③ 4	1 ② 3 4	1 ② 3 4	1 2 ③ 4	1 2 ③ 4	① 2
2	1:00 p.m.	SC	Eat Lunch	1 2 ③ 4	1 ② 3 4	1 2 ③ 4	1 2 ③ 4	1 2 ③ 4	1 2 ③ 4	1 ② 3 4	1 ②
3	1:30 p.m.	HA	Clean Kitchen	1 2 3 ④	1 ② 3 4	1 2 ③ 4	1 2 ③ 4	1 2 ③ 4	1 2 ③ 4	1 ② 3 4	1 ②

In question #4 - an activity may be difficult to do for several reasons. For example, it may be difficult physically while you are doing it. Or, it may be difficult because it requires a lot of advance planning or preparation, or because it takes a long time, or is very tiring or painful.

In question #5 - something can be meaningful whether you like it or not.

In question #8 - circle 1 (Yes) if you stopped to rest for a 5 or 10 minute break during the half-hour activity period; or circle 2 (No) if you did the activity for the full half-hour without a rest break.

To make remembering easier, it is recommended that you fill out this questionnaire at lunch, dinner and bedtime, rather than the whole day at one time. It is important to be accurate.

Specific Assessments Related to Occupations

▶ Robin's Assessment:

Time	Activity	Starting Pain Level	Pain Level during activity	Pain Level at end of activity	Thoughts	Feelings
6:00-7:00 AM						
7:00-8:00 AM						
8:00-9:00 AM						
9:00-10:00 AM						
10:00-11:00 AM						
11:00-12:00 PM						

➤ Occupational Understanding of Challenges- Chronic Pain Questionnaire (OUCH-CPQ)

General and specific open-ended questions about how pain affects occupations

https://www.misericordia.edu/uploaded/documents/academics/ot/ot_research/pain/ot_ouch.pdf

Specific Assessments Related to Occupations

- ▶ Pain Disability Index (Tait, Chibnall, & Krause, 1990):

- ▶ Self report of degree of pain person is experiencing during 7 areas of life activity
- ▶ Person rates self from 0 = no disability to 10 = total disability

<https://www.dropbox.com/s/7urhq46i6tr4zwn/Pain%20Disability%20Index.pdf?dl=0>

- ▶ Oswestry Low Back Pain Disability Questionnaire:

- ▶ Questionnaire about how LBP or leg pain is affecting occupations, e.g., personal care, walking, sleeping, social life, sex life
- ▶ A percentile is calculated
- ▶ Used to measure a person's permanent functional disability: from minimal to crippled

- ▶ [http://www.rehab.msu.edu/files/docs/Oswestry Low Back Disability.pdf](http://www.rehab.msu.edu/files/docs/Oswestry%20Low%20Back%20Disability.pdf)

Assessments Measuring Biopsychosocial Aspects of Pain

- ▶ Tampa Scale of Kinesiophobia (TSK):
 - ▶ 17 item scale developed in 1990 to measure fear of movement related to chronic low back pain
 - ▶ http://www.tac.vic.gov.au/_data/assets/pdf_file/0004/27454/tampa_scale_kinesiophobia.pdf
- ▶ Fear-Avoidance Beliefs Questionnaire (FABQ)
 - ▶ Assesses beliefs related to the effect of physical activity and work on LBP (some reliability and validity issues for UE injuries)
 - ▶ https://www.tac.vic.gov.au/files-to-move/media/upload/fear_avoidance.pdf

Assessments Measuring Biopsychosocial Aspects of Pain

- ▶ Pain Catastrophizing Scale (PCS)
 - ▶ Catastrophizing: “An exaggerated negative mental set brought to bear during actual or anticipated painful experience” (Sullivan et al., 2001)
 - ▶ Catastrophizing is “viewed as a multi-dimensional construct comprising elements of rumination (“I can’t stop thinking about how much it hurts”), magnification (“I worry that something serious will happen”), and helplessness (“There is nothing that I can do to reduce the intensity of the pain”) (Sullivan, 2009, p. 5)
 - ▶ Composed of 13 statements rated from 0 (not at all) to 4 (all the time)
 - ▶ <https://image.slidesharecdn.com/paincatastrophizingscale-140209161441-phpapp02/95/pain-catastrophizing-scale-1-638.jpg?cb=1391962505>

The OT's Role: Interventions within a Biopsychosocial Model

▶ Pain Neuroscience Education (NE)

- ▶ Sessions describing neurobiology and neurophysiology of pain and pain processing by the nervous system- NOT traditional model of connecting injury or nociception to pain
- ▶ Written materials, especially using metaphors e.g., *Why Do I Hurt: A Patient Book About the Neuroscience of Pain* and *Why Do I Hurt Workbook*, by Louw
- ▶ Videos, e.g., *Tame the Beast*
- ▶ Story Telling, e.g., *Painful Yarns* by Moseley

The OT's Role: Traditional Interventions

- ▶ Interventions within the biomedical model
 - ▶ Education about anatomy and biomechanics causing pain
 - ▶ UE pain reduction strategies
 - ▶ Work on occupations
 - ▶ Body mechanics
 - ▶ Activities to increase AROM and strength
 - ▶ Energy conservation, work simplification, pacing
 - ▶ Work conditioning
 - ▶ Work hardening
 - ▶ Ergonomic assessments and interventions
 - ▶ Job coaching
 - ▶ Hesselstrand, Samuelsson, & Liedburg, 2015

The OT's Role: Interventions within a Biopsychosocial Model

- ▶ Patient Neuroscience Education (NE)
 - ▶ Studies indicate that NE has:
 - ▶ decreased fear and has positively increased patients' perceptions of pain
 - ▶ Immediate effect of improvement of attitudes towards pain
 - ▶ Increased cognition and physical performance
 - ▶ Improved pain thresholds during physical tasks
 - ▶ Improved outcomes of therapeutic exercises
 - ▶ Yielded significant reduction in widespread brain activity characteristic of pain experience
 - ▶ Yielded some evidence of long term effects
 - ▶ Louw et al., 2011

The OT's Role: Interventions within a Biopsychosocial Model

- ▶ Increasing performance of pleasant occupations
 - ▶ Facilitate descending inhibitory pathway and release of endorphins
- ▶ Sensory Strategies
 - ▶ Central Sensitization Sensory Sensitivity:
 - ▶ Hypersensitivity to touch, noise, bright light, medications, high and low temperatures
 - ▶ Peripheral issues of hyperalgesia and allodynia:
 - ▶ Desensitization techniques
 - ▶ Contrast baths
 - ▶ Deep pressure for sensitivity to light touch
 - ▶ Different textures

The OT's Role: Interventions within a Biopsychosocial Model

▶ Graded Motor Imagery

- ▶ “...a structured, sequential series of cortical exercises, aimed at reestablishing cortical changes in patients with the intent of decreasing CS and the pain experience” (Louw et al., 2017, p. 1942)
- ▶ Based on the fact that cortical restructuring happens, i.e., increases or decreases of body maps in the brains and these correlate to development of CS and thus, pain and disability
- ▶ Addresses the different primary somatosensory cortex representations of the physical body in the brain of people with pain
- ▶ Been shown to decrease pain and sensitivity and improve movement in CS-dominant clinical cases (e.g., Chronic LBP, CRPS, hand function)
 - ▶ (Bowering et al., 2018; Louw et al, 2017; Priganc & Stralka, 2011)

The OT's Role: Interventions within a Biopsychosocial Model

▶ Graded Motor Imagery Sequence: Step 1

▶ Laterality: Left/Right Discrimination

- ▶ The ability to discriminate between right and left depends on an intact body schema
- ▶ People in pain often lose the ability to identify left or right images of their painful body parts and this ability appears to be important to recovery from pain
- ▶ When shown pictures of their body parts, people in pain are slower and/or less accurate in identifying left versus right sides
- ▶ Treatment: Show people pictures of body parts to determine right versus left and work on increasing accuracy and speed in order to activate premotor cortices without activating primary motor areas
- ▶ Normal responses:
 - ▶ accuracy of 80% and above
 - ▶ speed of 1.6 seconds for necks and backs; 2 seconds for hands, feet, knees and shoulders

Laterality: Basic



Laterality with context



Laterality: Abstract



The OT's Role: Interventions within a Biopsychosocial Model

- ▶ Graded Motor Imagery Sequence Step 2:
 - ▶ Motor Imagery
 - ▶ Activates motor cortical areas similar to those activated in the actual execution of that movement
 - ▶ Treatment:
 - ▶ Start with having the person visualize moving the affected body part
 - ▶ Have the person progress to moving the affected body part
 - ▶ If the person experiences pain, go back to laterality
 - ▶ Performance of Occupations
 - ▶ Have person visualize performance of certain occupations

The OT's Role: Interventions within a Biopsychosocial Model

- ▶ Graded Motor Imagery Sequence Step 3
 - ▶ Mirror Therapy
 - ▶ Activates the motor cortex and provides strong visual input to the cortex that movements are occurring normally and without impediment
 - ▶ Treatment:
 - ▶ Patients place their affected extremity inside a mirror box and watch movements of their nonaffected extremity in the mirror
 - ▶ Gives the illusion that the affected limb is moving pain free
 - ▶ Goal is for the patient to not experience pain with watching the mirrored hand
 - ▶ Patients watch the mirrored hand movements while simultaneously moving the affected extremity



The OT's Role: Interventions within a Biopsychosocial Model

- ▶ Mindfulness Meditation: patients with pain who practice it experience a reduction of:
 - ▶ Present-moment pain
 - ▶ Negative body image
 - ▶ Mood disturbance
 - ▶ Anxiety
 - ▶ Depression
 - ▶ Drug use to manage pain
 - ▶ Stress
 - ▶ Inattention (Ansara, 2013)
 - ▶ Poor self esteem (Kabat-Zinn, Morone, et al., 2008)
 - ▶ Sleep disturbance and improvement of sleep quality (Ferszt et al., 2015)
 - ▶ The time it takes to fall asleep and to be able to get back to sleep after waking up (Morone, et al., 2008)

The OT's Role: Interventions within a Biopsychosocial Model

▶ Mindfulness:

- ▶ Practice of Mindfulness Based Interventions
 - ▶ Practice being present e.g., Sitting Meditation, Body Scan (really good to help with sleep)
- ▶ Practice of Mindful Performance of Occupations, e.g., Eating Meditation, any meaningful occupation
- ▶ "Grounding" Practice: Helping self stay in the present by experiencing the environment through the senses

The OT's Role: Interventions within a Biopsychosocial Model

▶ Cognitive Behavioral Therapy

- ▶ Viewed by Explain Pain founders (Moseley & Butler, 2015) as “managing pain,” not treating it
- ▶ Some early studies didn't indicate that it was more effective than other interventions (Louw et al, 2012)
- ▶ Research support for reduction of catastrophizing that may last for a long time (Edwards et al, 2016)
- ▶ Evidence that Cognitive Behavioral Treatment for Insomnia (CBT-I) is successful for improving sleep of persons with chronic pain (Jungquist, et al., 2010)

The OT's Role: Interventions within a Biopsychosocial Model

- ▶ Cognitive Behavioral Therapy
 - ▶ Facilitates an active problem solving approach to tackling challenges
 - ▶ ABC Model:
 - ▶ A= Activating Event; B = Beliefs about the event; C = Consequences (feelings, behaviors)
 - ▶ The premise is that cognitions (thoughts) produce feelings and behaviors, not events, e.g., catastrophizing: “This pain will never end; it will go on forever!”
 - ▶ Involves identifying erroneous or irrational cognitions and then challenging or restructuring them
 - ▶ Patient is assigned homework to practice strategies and to change thoughts and consequently, behaviors

The OT's Role: Interventions within a Biopsychosocial Model

▶ Virtual Reality

- ▶ Doesn't just produce distraction from pain, but enhances cortical mechanism of pain inhibition
- ▶ Studies, e.g., Jones, Moore, & Choo (2016) are finding that virtual reality can provide a significant amount of pain relief
- ▶ Important to offer different types of experience, i.e., head mounted display may be problematic for individuals with allodynia

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Tackling the Pain Epidemic as an OT Practitioner

QUESTIONS?
THOUGHTS?