Pain in MS
A Biopsychosocial Approach to Management

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Objectives

• Understand the nature of pain in MS
• Describe pain in multiple sclerosis
• Recognize self-management strategies
• Discuss pharmacologic and nonpharmacologic pain management strategies
Pain in MS

What do we Know?

• Recognized by Charcot in 1875

• **Affects as many as** (Oconnor et al, 2008)
  • 20% at disease onset
  • 50% at any given time
  • 75% of patients within 3 preceding months

• **Risk factors for development of MS pain** (Boneschi, 2008; Nurmikko, 2010, Hadjimichael et al, 2007)
  • older age
  • longer disease duration
  • lower education level
  • greater duration of pain
  • Increased disability (musculoskeletal pain)
  • progressive course (dysesthetic pain and spasm)
  • depression or mental health impairment
  • Being female (headache pain)
Pain Experience in MS

- Psychosocial and psychological factors have greater impact than other variables on pain intensity (Jensen et al, 2010; Osbourne et al., 2006; Griswold et al, 2004; Archibald et al, 1994; Kalia & O’Connor, 2005)
  - Associated with increased fatigue
  - Anxiety
  - Depression
  - Concentration and memory

- Most common pain syndrome: continuous burning in extremities, headache; back pain; painful tonic spasms (Solaro et al, 2004; Moulin et al, 1987; Pollmann et al, 2004)

- Insufficiently treated (Pollmann, 2004)

- Greater health-care utilization (Hadjimichael et al., 2007)
Pain is an individualistic, physiologic, learned and social response to a noxious stimuli.

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.
Pain is...

“Whatever the experiencing person says it is, existing whenever he/she says it does” (McCaffery, 1984)
MS Pain is Mixed

- **Nociceptive**: disability of living with MS. Pain that arises from actual or threatened damage to non-neural tissue and is due to the activation of nociceptors.
  - Caused by any mechanism that stimulates a pain response: mechanical, thermal, chemical, electrical

- **Central neurogenic pain**: Pain caused by a lesion or disease of the central somatosensory nervous system and may be **intermittent** or **steady**; **spontaneous** or **evoked**
  - **Steady pain**: burning, tingling, aching, throbbing (dysesthetic extremity pain)
  - **Intermittent**: shooting, stabbing, electric knife-like, searing (trigeminal neuralgia)

IASP Taxonomy at http://www.iasp-pain.org/AM/Template.cfm?Section=Pain_Definitions&Display.cfm&ContentID=1728
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Intermittent (Paroxysmal) MS Pain Syndromes

- **Trigeminal neuralgia** Prevalence 1.9%-4.9%; 20X general population; 11-31% are bilateral

- **Glossopharyngeal neuralgia** (rare) severe, lancinating pain of the posterior pharynx, tonsillar fossa and base of the tongue.

- **Episodic facial pain** dull and almost continuous pain, originating from an ill-defined site, with the absence of trigger points.

- **Paroxysmal limb pain**
  - Painful tonic spasms (11-17%) Triggered by touch, movement, hyperventilation, emotions; Occur several times in a day for < 2 min

- **Headache** prevalence: 13%-34%; 54% at dx; 22% migraine- 3x more common than population; not associated with disability; or lesion burden

- **Lhermitte’s** experienced by approximately 40%; little need for tx.
Steady MS Pain Syndromes

- **Dysesthetic extremity pain**
  - Most common chronic pain syndrome
  - Persistent, burning, tingling, dull, nagging, prickling-associated with warmth
  - Worse at night and after exercise
  - Aggravated by changes in temperature

- **Musculoskeletal pain**
  - Back pain
  - Pain of disability
  - Causes: weakness, stress on bones, joints and muscles, immobility, improper use of compensatory muscles, steroid induced osteoporosis, avascular necrosis, DJD

- **Painful tonic spasms**
  - Triggered by touch, movement, hyperventilation, emotions
  - Occur several times in a day for < 2 min
Step one - Assessment

- Identify the hurt
- Identify psychological factors that may affect well-being
  - Depression
  - Anxiety
  - Stress
- Identify social factors that may affect well-being
  - Social support
Goals of Pain Management

- Mood
- Sleep
- Function
- Quality of life
MOS Pain Effects Scale (PES)

In the past 4 weeks, how much did pain interfere with your...

- Mood
- Sleep
- Ability to walk or move around
- Normal work
- Recreational activities
- Enjoyment of life
Pain Journal

OLD CART

- **ONSET**: When did your pain begin?
- **LOCATION**: Where is your pain?
- **DURATION**: How long does your pain last?
- **CHARACTERISTICS**: Describe your pain
- **AGGRAVATORS**: What makes it worse?
- **RELIEVERS**: What relieves your pain?
- **TREATMENT**: What medicine do you take?
Pain Assessment

- Pain is the fifth vital sign; a patient right
- Self-report of pain is single most reliable indicator of pain
- Functional measures: mood, sleep, work, enjoyment of life
- VAS and pain rating scales
- Cognitive impairment limits use of pain scales

1. No Pain
2. Mild Pain
3. Discomforting
4. Distressing
5. Intense
6. Excruciating
**Brief Pain Inventory**

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Time</th>
</tr>
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</table>

1. Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, toothaches). Have you had pain other than these everyday types of pain today?
   - Yes
   - No

2. On the diagram, shade in the areas where you feel pain. Put an X on the area that hurts the most.

3. Please rate your pain by circling the one number that best describes your pain at its worst in the past 24 hours.
   - 0: No pain
   - 10: Pain as bad as you can imagine

4. Please rate your pain by circling the one number that best describes your pain at its least in the past 24 hours.
   - 0: No pain
   - 10: Pain as bad as you can imagine

5. Please rate your pain by circling the one number that best describes your pain on average.
   - 0: No pain
   - 10: Pain as bad as you can imagine

6. Please rate your pain by circling the one number that tells how much pain you have right now.
   - 0: No pain
   - 10: Pain as bad as you can imagine

7. What treatment or medication are you receiving for the pain?
   - 
   - 
   - 

8. In the past 24 hours, how much relief have pain treatments or medication provided? Please circle the one percentage that most shows how much relief you have received.
   - 0%: No relief
   - 100%: Complete relief

9. Circle the one number that describes how, during the past 24 hours, pain has interfered with your:
   - A. General activity
     - 0: Does not interfere
     - 10: Completely interferes
   - B. Mood
     - 0: Does not interfere
     - 10: Completely interferes
   - C. Walking ability
     - 0: Does not interfere
     - 10: Completely interferes
   - D. Normal work (includes both work outside the home and housework)
     - 0: Does not interfere
     - 10: Completely interferes
   - E. Relations with other people
     - 0: Does not interfere
     - 10: Completely interferes
   - F. Sleep
     - 0: Does not interfere
     - 10: Completely interferes
   - G. Enjoyment of life
     - 0: Does not interfere
     - 10: Completely interferes
   - H. Ability to concentrate
     - 0: Does not interfere
     - 10: Completely interferes
   - I. Appetite
     - 0: Does not interfere
     - 10: Completely interferes
Pain Experience

- Different patients experience different levels of pain in response to comparable stimuli
- Heredity, energy level, coping skills, prior pain experience-variation in tolerance
- Patients with chronic pain are more sensitive to pain and other stimuli
- Pain is a sensory, motivational and cognitive experience
Pain Experience

Sensory/Discriminative

- information of strength, intensity, temporal and spatial aspects

- mediated through afferent nerve fibers, the spinal cord, the brain stem and higher brain centers

- results in prompt withdrawal from painful stimuli
Pain Experience
Motivational/Affective

- Conditioned or learned approach/avoidance behaviors
- Mediated through interaction of the reticular formation, limbic system, and brain stem
- Life preserving behavior, “escape”, affective impulse (mood)

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Pain Experience
Cognitive/Evaluative

- Over-rides learned behavior to block, modulate or enhance the pain experience

- Interpretation of appropriate behavior r/t culture, gender, and experience, role
Experience of Pain

- Perceptual dominance
  - the brain is capable of processing only so much information at a time

- Pain threshold
  - the point where a stimulus is perceived as pain

- Pain tolerance
  duration of time or intensity of pain that is endured before initiating a response. Influenced by cultural experiences, expectations, role behaviors, and general physical and mental health. Decreased by exposure, fatigue, anger, boredom, sleep deprivation. Increased by alcohol, medication, hypnosis, warmth, distraction, strong beliefs (faith)
Biopsychosocial Model


- Psychological and environmental factors are associated with pain intensity and interference with function
  - Perceived social support
  - Pain beliefs
  - Pain coping strategies
  - Pain-related catastrophizing

Pain Coping

- Thoughts influence how we do

- Cognitive restructuring: recognizing maladaptive thinking and replacing with adaptive thoughts

- Adaptive
  - Rest and relaxation
  - Exercise
  - Reinterpreting pain sensation (burn=warmth)
  - Acceptance
  - Coping self-talk
  - Building self-efficacy for coping with pain

(Ehde, 2010, in press)
Disabling Beliefs

- Shared by patients who are overwhelmed by pain:
  - Belief that objective evidence of disease/injury is required for pain to be “real”
  - View of pain as the only problem
  - Expectation that urgent pain relief is the major goal of treatment
  - Overconfidence in medical solutions
  - Provider is the “expert” responsible for outcomes
  - Pt. is helpless “victim” of underlying disease/injury

- Patient thoughts about pain
  - Pain catastrophizing
  - Pain beliefs (ability to control)
  - Self-efficacy
Recognizing Influences....

- Depression: People who are depressed are less likely to engage in self-management
- High levels of anxiety or fear of pain
- High levels of pain interference with activities, including sleep, relationships, physical activity
- High pain catastrophizing or very negative thinking about pain management (benefit from cognitive behavioral therapy)
- Low self-efficacy for pain management
Building
Self-management Skills

• Acceptance
  • Allowing some pain some of the time
  • Consists of both thinking and doing
  • Two facets:
    • Willingness to experience pain
    • Engagement with life
• Mindfulness
  • Non-judgmental awareness of pain
  • Acting with intention
Pain Acceptance

- Acceptance is related to positive adjustment
  - Less: pain intensity, psychological distress, physical disability, & attention to pain
  - Greater: task persistence, physical functioning, general mental well-being, self-efficacy, motivation, and engagement with daily activities

- Interventions exist targeting pain acceptance
  - Acceptance and Commitment Therapy (ACT), Mindfulness-based interventions
Cognitive Behavioral Therapy

**Therapeutic Objectives:** Increase mastery and control over fear, anxiety, stress reaction, environmental pain triggers

- Based on cognitive behavioral theory of pain, in which thoughts and behavioral responses to pain influence adjustment and functioning

- Common ingredients include:
  - Relaxation training
  - Cognitive therapy
  - Behavioral strategies, including adaptive coping strategies, pacing, & activation

Slide compliments of Dawn Ehde PhD
Hypnotic Analgesia

- Relaxation, focused attention, here and now experiencing, rich imaginative experience

- Induction:
  - Attempts to focus attention on a single stimuli (such as the therapist’s voice), induce relaxed state

- Example Suggestions:
  - Alter pain experience, decreased unpleasantness
  - Sensory substitution (e.g., “warm” for “burning”)
  - Increased comfort and control over pain

- Has empirical support for its efficacy in MS (Jensen et al., 2005; 2009)
Encourage Behavioral Activation

• One of the most important ways to treat both pain and emotional suffering is “activation”

• Behavioral activation may include:
  • Increasing physical activity
  • Increasing activities which are enjoyable, meaningful, or pleasurable
  • Increasing participation in activities consistent with values and goals
Activity Pacing & Goal-Setting

• Systematic increases in activity
• Activity scheduling
• Setting specific, measurable, & attainable goals

Slide compliments of Dawn Ehde PhD
Implementing Goal Setting

• Provide tools (e.g., worksheets) for setting goals outside the clinic visit

• Use a written plan of goals set & progress

• Expect patients to not achieve their goals: learning how to deal with setbacks is part of self-management

• Ask about their progress towards activity or pain self-management goals at office visits

Slide compliments of Dawn Ehde PhD
Goal Setting: Example Framework

“I will __________________________ (Specific action) for ___________________________ (How long, How many, How far) on ___________________________ (Which Day or Days) at ___________________________ (What Time or Times/What Situation). I feel confident that I can do this, and even ___________________________ (Barriers) come up, I will deal with them by ___________________________ (Solutions) and I will still work on my goal!”
Encourage the use of relaxation skills

Breathing

Imagery

Progressive muscle relaxation

Self-hypnosis

Slide compliments of Dawn Ehde PhD
Relaxation Implementation

- Provide a rationale for its use with pain
- Encourage regular practice so that skill becomes natural and habitual
- Discuss how to apply – such as when they have a pain flare up, are fatigued, stressed, etc.
- Encourage the use of audio recordings & other resources such as:
  
  [http://health.ucsd.edu/specialties/psych/mindfulness/mbsr/audio.htm](http://health.ucsd.edu/specialties/psych/mindfulness/mbsr/audio.htm)
  [http://students.georgiasouthern.edu/counseling/relax/OnlineRelax07.htm](http://students.georgiasouthern.edu/counseling/relax/OnlineRelax07.htm)
  [http://www.olemiss.edu/depts/stu_counseling/relaxation.html](http://www.olemiss.edu/depts/stu_counseling/relaxation.html)

Slide compliments of Dawn Ehde PhD
Consider Mindfulness Approaches

- Involve a focus on non-judgmental awareness and acceptance of the present moment and any feelings, sensations, or thoughts that arise (mindfulness)

- Interventions prescribe regular practice of mindfulness, often via meditation

Center for Mindfulness in Medicine, Health Care, and Society (www.umassmed.edu/cfm)

Slide compliments of Dawn Ehde PhD
Pharmacologic Management of Neuropathic Pain

• Topical agent

• Membrane stabilizing agents
  • Antiepileptics
  • Antiarhythmic
  • Corticosteroids

• Modulating agents
  • Antidepressants
  • Opioids
  • Cannabis

• Dorsal horn inhibition
  • Antiepileptics
  • Antidepressants
  • GABA agonists-baclofen

• NMDA antagonists
  • Ketamine
  • Dextromethorphan
  • Methadone

• Antispasticity Medications
Recommendations for Treatment of Trigeminal Neuralgia - Classic TN

- **Carbamazepine**  
  Level A recommendation  
  FDA approved indication  
  200-1600 mg  
  First line

- **Oxcarbazepine**  
  Level B rating  
  600-2400 mg  
  First line

- **Lamotrigine**  
  400 mg/d  
  Class I study, NNT 2.1

- **Baclofen**  
  30-80 mg/d  
  Class I and II studies

Other options with lower level of evidence:  
phenytoin, clonazepam, valproic acid, pregabalin, gabapentin, intranasal lidocaine

Attal et al. 2006\(^1\), Sindrup and Jensen 2002\(^2\),  
Pöllmann and Feneberg 2008, Backonja 2002,  
O’Connor AB et al. 2008

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Evidence based recommendations (Pöllman and Feneberg 2008)

<table>
<thead>
<tr>
<th>DRUG</th>
<th>REC.</th>
<th>DOSAGE PER DAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitriptyline</td>
<td>A</td>
<td>25-150 mg</td>
</tr>
<tr>
<td>Gabapentin</td>
<td>A</td>
<td>800-3600 mg</td>
</tr>
<tr>
<td>Pregabalin</td>
<td>A</td>
<td>75-600 mg</td>
</tr>
<tr>
<td>Lamotrigine</td>
<td>B</td>
<td>slow increase, begin 25 mg, max 400 mg</td>
</tr>
<tr>
<td>Duloxetine</td>
<td>B</td>
<td>30-60 mg</td>
</tr>
<tr>
<td>Opioids</td>
<td>B</td>
<td>Weak opioids: Tramadol 50-400 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strong: Fentanyl 200-1600 ug po, Buprenorphine 0.2-0.4mg, oxycodone 10-400 mg</td>
</tr>
<tr>
<td>Carbamazepine</td>
<td>B</td>
<td>200-1600 mg</td>
</tr>
<tr>
<td>Topiramate</td>
<td>C</td>
<td>25-400 mg</td>
</tr>
<tr>
<td>Cannabinoids</td>
<td>B</td>
<td>oromucosal: THC 2.7/CBD 2.5mg/spray at avg 9.6 sprays/d [range 2-25]</td>
</tr>
<tr>
<td>IV morphine</td>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>
Opioids in Chronic Pain

When Are Opioids Indicated?

- Pain is moderate to severe
- Pain has significant impact on function
- Pain has significant impact on quality of life
- Non-opioid pharmacotherapy has been tried and failed
- Patient agreeable to have opioid use closely monitored (e.g. pill counts, urine screens)
- Patient has acceptable risk profile
Drug Treatment Recommendations

- Start with a low dose and gradually increase or titrate to efficacy
- If partial pain relief occurs with one drug, a combination of two or more drugs can often yield better results with fewer side effects
- In general, when pain free for 3 months on treatment, consider a slow taper.
Nonpharmacologic Treatments

• **Psychological**
  • Cognitive-behavioral approaches (education, relaxation, psychotherapy, imagery, hypnosis, biofeedback; support groups; distraction; recreation; laugh therapy; meditation)

• **Physical agents**
  • superficial heat and cold; physical therapy; stretching; reconditioning to improve strength, endurance, flexibility; pressure; counter-irritation; massage; exercise; attention to ergonomics; immobility; electroanalgesia; acupuncture; sound nutrition; yoga; tai chi; music

• **Surgical**
Role of Cannabinoids in MS

- Multiple clinical trials of Class I evidence of benefit in **spasticity**, **pain** and **sleep** disturbance and Class II evidence in reducing incontinence (oromucosal delivery, incl. THC, CBD, and combinations THC/CBD)

- Side effects mild

- Potential neuroprotective

- Potential to slow progression

- Recommendations:
  - how sx interact with disabiity from pt perspective
  - Clinical trial design
  - Account for placebo effect (12mo)
  - Reducing cannabinoid side effects... psychoactivity

Zajicek and Vicentiu (2011) CNS Drugs 25(3): 187
Cannabinoids in Multiple Sclerosis

- ADE: dry mouth, dizzy, nausea, intoxication, somnolence
- Comparison with codeine similar effect but THC > psychotropic ADE (Kinzbrunner et al, 2002).
- Conclude: modest treatment effects; consider as add on drug; mild ADE; well tolerated; uncertain for long term use
- IASP (2007): level A evidence, but second line:
  - lack of long-term f/u data
  - Limited availability
  - Concern for precipitating psychosis/schizophrenia

- Neuropsychological deficits of inhaled cannabis
  - MS cannabis users twice as likely classified as globally cognitively impaired; poorer performance on cognitive testing
CAM for Pain

- Acupuncture
- Reflexology
- Massage
- Chiropractic
- Cannabis
- Relaxation techniques
- Hypnosis
  - self-hypnosis training (Jensen et al., 2009)

Most commonly utilized
Alternative Therapies used by Patients for Pain Management

- CAM
  - What is the treatment?
  - What does it involve?
  - How does it work?
  - Why does it work?
  - Are there any risks?
  - What are the side effects?
  - Is it effective? (Ask for evidence or proof!)
  - How much does it cost?
Summary and Conclusions

Taking ownership of your Pain

• Keep a pain diary

• Talk about your pain at each doctor visit
  • When does it begin; Where is it located; How long does it last
  • What does it feel like; what aggravates your pain
  • What makes your pain better
  • What are you using to treat your pain- meds, alternative treatments, over-the-counter etc

• How does your pain affect your life: Mood, sleep, relationships, ability to work and play?

• Are you having any side effects from medications you use for pain?

• What is your self-talk…identify your coping strategy
Educate and Provide Resources

National Multiple Sclerosis Society (Search terms “pain” or “fatigue”)  www.nationalmssociety.org

Paralyzed Veterans of America  www.pva.org

International Association for the Study of pain  www.IASP-pain.org

American Chronic Pain Association  www.theacpa.org

American Pain Foundation  www.painfoundation.org

American Pain Society  www.ampainsoc.org
“Health is a state of being in which an individual does the best with the capacity that he has and acts in a way to maximize his capacity” (Henrik Blum, 1983).
“Resilience is accepting a new reality” (Elizabeth Edwards, 2009)

Thank you