Psychological Considerations in Pain

Supraspinal Pain Modulation and Implications for Optimal Treatment of the Patient in Pain

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*No Disclosures
The Pain Experience

- **Pain Scale** – YouTube

- **Pain**
  - Subjective experience

- **Nociception**
  - Nerve transmission
    - Nociceptors

http://www.cerebromente.org.br/n16/history/mind-history_i.html
Modulation of Pain

Cognition, Attention, Emotion, Coping

Inhibitory Processes
Exercise

Facilitation Processes
Sunburn

Noxious Input
Physiological pathway for supraspinal influences on pain

1. Psychological variables
   (Emotion, Attention, Cognition, Coping)
   - PAG -> RVM -> Dorsal Horn

2. Conditioned Pain Modulation
   (Diffuse Noxious Inhibitory Controls)
   - Noxious stimulus -> ventrolateral quadrant of spinal cord -> Subnucleus Reticularis Dorsalis-> Dorsal Lateral Funiculus -> Dorsal Horn
Conditioned Pain Modulation

**Baseline**

Heat 1  Heat 2  Heat 3  Heat 4

Move thermode

**DNIC**

Cold Water

Heat 1  Heat 2  Heat 3

+
CPM in 7-12 year-old girls with IBS

n = 21

n = 22
PSYCHOLOGICAL FACTORS
Emotion

Pain Report

Unpleasant | Neutral | Pleasant

-0.5 | 0.0 | 0.5
Depressed mood
Anxiety
Somatization
Fear
Anger/Frustration
Operant Conditioning

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Consequence</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take tylenol for a headache</td>
<td>headache goes away</td>
<td>more likely to take tylenol</td>
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Add Something: + reinforcement, + punishment
Remove Something: - reinforcement, - punishment
Operant Conditioning

### Pain Behavior
- **Positive Reinforcement**
  - Social attention
- **Negative Reinforcement** (escape/avoidance conditioning)
  - Temporary reduction in pain
  - Avoidance of dis-liked tasks or situations (like school, chores, work)
  - Temporary reduction in worry (after seeking reassurance from physician)

### Well Behavior
- **Positive Punishment**
  - Increased pain
  - Social ridicule
  - Interpersonal stress
- **Negative Punishment**
  - Loss of social attention
  - Loss of resources (disability)
Catastrophizing

Children who catastrophize have more pain disability

In children who catastrophize, parents can help reduce their pain disability by promoting coping

Reinforcement: Caregiver Empathy

• Responding with reassurance, apologies, and empathy actually *increases* pain

  – Tells patient that caregiver is worried
  – Reinforces pain behavior by temporarily reducing distress
  – Gives permission to express distress – which increases their experience of pain
Distraction

- repetitive, pleasant, engaging
- Anterior Cingulate Cortex

Physiological Arousal

• Hypothalamus – ANS

Pain During Relaxed Breathing

**Sleep**

- Psychological and behavioral factors can lead to sleep deprivation

- Impaired pain inhibitory processes?
- Mediated by prostaglandins?

*Positively associated with symptoms and functioning*
What does this have to do with my patients?

Psychological Conceptualization of the patient in pain
Conceptualization

• Patients *do* have pain
  – They are *not* faking and it is *not* “all in their head”

*But*...

• Psychosocial factors can alter pain perception, disability, and medical treatment effectiveness
  – accounted for 59% of variance in disability following low back injury
Conceptualization: Pain and Disability

- **Improved pain ≠ improved functioning**
  - Pain intensity does not predict physical activity
  - Psychosocial job factors predict return to work independent of injury severity
  - Weak relationship between decreased pain and increased functioning or return to work

Patients need to return to activities before pain is gone and may require directed intervention to return to previous activities even after pain is gone

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Athlete recovering from injury – rehabilitation approach
Conceptualization: Acute vs. Chronic Pain

• Acute Pain

– Adaptive Response
  • Withdraw and protect from injury
  • Rest & avoid things that can exacerbate pain
  • Parental attention & accommodation
Conceptualization:
Acute vs. Chronic Pain

• Chronic Pain
  – Adaptive response
    • Acceptance of pain presence
    • Maintain normal activities
    • Active pain coping strategies
    • Reduce factors that exacerbate long-term pain
    • Manage pain exacerbations
Conceptualization

Patient Mindset
- Acute pain vs chronic pain mindset
- Identification with illness

Exacerbating Factors
- Behaviors/cognitions that enhance or maintain pain and disability
- Negative emotional states that contribute to pain
- Quality and quantity of sleep

Functioning & Disability
- General functioning
- Work/school
- Adherence to medical recommendations

Pain Management Strategies
- Active vs. passive coping strategies
STRATEGIES WITHIN THE PHYSICIAN OFFICE
Acknowledge Symptoms and Promote Coping

- Some empathy is good
  - Reflect the patients concerns
    - “Sounds like this has been really difficult for you.”
    - “Your pain is really interfering with your job lately.”

- Switch to focus on functioning
  - “let’s work on developing a plan so you can get back to enjoying your life.”
  - “Sounds like you would like to be able to play tennis again. I would like to help you with that goal.”
Teach the Mind-Body Connection

• Chronic Pain is a nerve mis-fire or faulty signal
• Many factors contribute to pain
  – Effective treatment involves multiple approaches
Manage Reassurance-Seeking

• Excessive reassurance can increase symptoms
  – Have regular scheduled visits rather than frequent emergency calls/visits
  – Avoid unnecessary tests
  – Provide an explanation for symptoms
    • Negative test results rule out specific conditions and point us towards a functional problem rather than a structural problem
  – Recognize catastrophizing and somatization and help them reframe
    • Or refer for psychotherapy
Focus on Functioning

- Minimize your inquiries about pain
  - Instead inquire about functioning
- Help caregivers to reduce inquiries about pain
- Promote rehabilitation model
  - Functioning is not a direct result of pain level
  - Pain tends to get better after your functioning improves
  - If we wait until our pain gets better to function we usually only get worse
- Set functional goals
  - “After last session you were able to walk for 10 minutes each day. I recommend we increase that a little this week. How many minutes do you think we should set as your goal this week?”
Provide a Pain Plan

• Can prevent/reduce
  – Frequent phone calls or last-minute appointments
  – Frequent use of or over-reliance on pain medications
  – Urgent care or ED visits for acute exacerbations

• Algorithm for responding to pain
  – Step-wise instructions
  – Ex., stretching, gentle exercise, heat/cold, distraction/pleasant activities, relaxation, medications, call doctor
When to Refer for Psychotherapy

- Comorbid mental illness
- Functional interference
- Exacerbated by psychosocial factors
- Medical interventions are not providing expected benefits
- Seeking miracle cure
- Strong personal identification with illness
- Non-adherence to physician recommendations
- Assess for barriers to medical/surgical outcomes
  - Before escalating treatment
  - Not seeing expected improvement
Does CBT Really Help?

• Grey matter changes after CBT for chronic pain
  – Increased bilateral dorsolateral prefrontal, posterior parietal, subgenual anterior cingulate/orbitofrontal, and sensorimotor cortices, hippocampus,
  – Reduced supplementary motor area

• Decreased pain catastrophizing associated with
  – increased left dorsolateral prefrontal and ventrolateral prefrontal cortices, right posterior parietal cortex, somatosensory cortex, and pregenual anterior cingulate cortex
ACUTE/PROCEDURAL PAIN
Early Pain Experiences

• Management of procedural pain in infancy childhood is crucial

• Frequent painful procedures in infancy/childhood associated with changes in somatosensory processing related to pain
  – More pain in future

• How to manage infant pain during injections
  – The Power of a Parent's Touch
Needle Pain

• Needle phobias develop around 4-5 years of age after negative needle experience
  – # of injections predictive of phobia
  – Phobias predict decreased medical treatment seeking throughout life

• How to manage needle pain in childhood
  – *It Doesn't Have to Hurt*
Acute Pain in Adults

• Some limited opportunity for control
• Relaxation
• Distraction
  – Non-procedural talk
• Positive self-statements
• Imagery
  – Pleasant imagery
• Avoid empathic statements
• Avoid apologies
References


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