Foundations of Pain Management

BioPsychosocial Issues

MiCCSI

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Disclosures

- Consultant to Community Health Focus Inc.
- President of the American Pain Society
- Funded for research by NIH

There will be no use of off-label medications in this presentation.
People have mixed reactions to learning about the Biopsychosocial influence on pain

I assume he’s going to tell me about
• Depression
• Anxiety
• Personality Disorders
• Addiction
• Problem patients

This is the really important stuff
100 Million Individuals in the U.S. have Chronic Pain
More people have **Chronic Pain** than Diabetes, Heart Disease, and Cancer Combined

<table>
<thead>
<tr>
<th>Disease</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Pain</td>
<td>100 Million</td>
</tr>
<tr>
<td>Diabetes</td>
<td>29.1 Million</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>27.6 Million</td>
</tr>
<tr>
<td>Cancer</td>
<td>13.7 Million</td>
</tr>
</tbody>
</table>

= 1 Million individuals
Most Pain Care Visits occur within Primary Care

Pain Medicine Versus Pain Management: Ethical Dilemmas Created by Contemporary Medicine and Business

John D. Loeser, MD† and Alex Cahana, MD, PhD†

Biomedical Model
Interventional
Pain Medicine

- Procedure Driven
- Focus on curing/fixing
Patient is passive recipient

Biopsychosocial model
Interdisciplinary
Pain Management

- Focus on multidisciplinary teams
- Focus on pain management
Patient is active participant

How good is our black bag for treating chronic pain?

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Impact on Chronic Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long term opioids</td>
<td>32% reduction</td>
</tr>
<tr>
<td>Pain drugs generally</td>
<td>30% - 40% get</td>
</tr>
<tr>
<td>(across classes)</td>
<td>40% - 50% relief</td>
</tr>
<tr>
<td>Spinal fusion</td>
<td>75% still have pain</td>
</tr>
<tr>
<td>Repair herniated disk</td>
<td>70% still have pain</td>
</tr>
<tr>
<td>Repeat Surgery</td>
<td>66% still have pain</td>
</tr>
<tr>
<td>Spinal cord stimulators</td>
<td>61% still in pain after 4 yrs.</td>
</tr>
<tr>
<td></td>
<td>average pain relief 18% across studies</td>
</tr>
</tbody>
</table>

**Facet blocks:** Limited evidence


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**Epidural steroid injections:** Limited evidence


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**Biomedical Model Generally:** Limited evidence


If Patients don’t respond to the BioMedical model...

- They must be crazy
- The pain is all in their heads
- They don’t want to get better
If Patients don’t respond to the BioMedical model...

- They must be crazy
- The pain is all in their heads
- They don’t want to get better

OR perhaps

- We don’t fully understand pain
- Treatment of pain requires a different approach than the traditional biomedical model
- Effective pain treatment requires a different financial model
Thinking Differently about Pain

- Chronic pain is not just extended acute pain
Thinking Differently about Pain

- Chronic pain is not just extended acute pain
- Nociception is NOT pain
Thinking Differently about Pain

- Chronic pain is not just extended acute pain
- Nociception is **NOT** pain

- **Pain is an experience**
  - Much like hunger
  - The experience is not equivalent to the biological processes
  - Fixing the identified biology won’t fix the perceptual process or the perception itself
  - You have to “fix” the whole experience
Nociception is just a neural signal
Nociception needs context to become pain
Chronic Pain has Three Components: The BioMedical Model addresses 1 of them

Sensory
(where it is and intensity)

Historical Biomedical Emphasis

Affect
(emotional valence)

Cognitive
(evaluation and meaning)

Neurobiological perspective

Brain regions associated with pain processing involve both sensory and affective/cognitive regions

- **Sensory / discriminative dimension**
  - Somatosensory cortices (S1, S2)
  - Dorsal posterior insula

- **Affective / Cognitive dimensions**
  - Anterior insula
  - Prefrontal cortex
  - Anterior cingulate cortex
  - Thalamus
  - Amygdala
  - Hippocampus

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I still feel pain
Chronic Pain

- Similar in mechanism to an emotion but experienced as a bodily sensation

CNS Neurotransmitters Influencing Pain

**Facilitation**
- Glutamate and EAA
- Substance P
- Nerve growth factor
- Serotonin (5HT<sub>2a, 3a</sub>)
- Gabapentinoids, ketamine
- Anti-migraine drugs (− triptans), cyclobenzaprine

**Inhibition**
- Descending anti-nociceptive pathways
  - Norepinephrine-serotonin (5HT<sub>1a,b</sub>), dopamine
  - Opioids
  - Cannabinoids
  - GABA
- Tricycles, SNRIs, tramadol
- Low dose naltrexone
- No knowledge of endocannabinoid activity but this class of drugs is effective
- Gammahydroxybutyrate, moderate alcohol consumption

Neurotransmitters for Pain Processing

Norepinephrine
Concentration
Circadian rhythms
Attention
Stress
Energy
Neurotransmitters for Pain Processing

Norepinephrine
- Concentration
- Circadian rhythms
- Attention
- Stress
- Energy

Serotonin
- Well-being
- Sleep
- Affect /Mood
- Appetite
Neurotransmitters for Pain Processing

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**Dopamine**
- Attention
- Pleasure
- Reward
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- Well-being
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Cognitive Function
Neurotransmitters for Pain Processing

**Glutamine**
Major Exciter of CNS, Synaptogenesis and neurogenesis

- **Norepinephrine**
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Major Exciter of CNS, Synaptogenesis and neurogenesis
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**GABA**
Major Inhibitor of CNS, Sleep/wake cycle
Shared Neurotransmitters Explain

- The complexity of chronic pain presentation

Shared Neurotransmitters Explain

- The complexity of chronic pain presentation

- Sleep, Pain, Affect, Cognition, Energy

Shared Neurotransmitters Explain

- The complexity of chronic pain presentation
- By considering associated symptomatology, Clinicians have more targets upon which to intervene.

# How is Pain Classified?

<table>
<thead>
<tr>
<th>Time</th>
<th>Body Location</th>
<th>Suspected Etiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Vs Chronic</td>
<td>Head, Neck, Back, Pelvis</td>
<td>Cancer, Rheumatic, etc.</td>
</tr>
</tbody>
</table>

## Newest Classification: Pain Mechanisms

<table>
<thead>
<tr>
<th>Adaptive Pain $^{1,2}$</th>
<th>Pain as Disease State $^{3,4}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Alert to Danger</td>
<td>- Damage to the nervous system</td>
</tr>
<tr>
<td></td>
<td>Nociceptive Pain</td>
</tr>
<tr>
<td>- Facilitate immobility / healing</td>
<td>- Augmented central pain processing</td>
</tr>
<tr>
<td></td>
<td>Inflammatory Pain</td>
</tr>
</tbody>
</table>

A Closer Look at Central Pain
# Chronic Overlapping Pain Conditions

<table>
<thead>
<tr>
<th>COPCs</th>
<th>US Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irritable Bowel Syndrome</td>
<td>44 Million</td>
</tr>
<tr>
<td>Temporomandibular Disorder</td>
<td>35 Million</td>
</tr>
<tr>
<td>Chronic Low Back Pain</td>
<td>20 Million</td>
</tr>
<tr>
<td>Interstitial Cystitis / Bladder Pain Syndrome</td>
<td>8 Million</td>
</tr>
<tr>
<td>Migraine Headache</td>
<td>7 Million</td>
</tr>
<tr>
<td>Tension Headache</td>
<td>7 Million</td>
</tr>
<tr>
<td>Endometriosis</td>
<td>6 Million</td>
</tr>
<tr>
<td>Vulvodynia</td>
<td>6 Million</td>
</tr>
<tr>
<td>Fibromyalgia</td>
<td>6 Million</td>
</tr>
<tr>
<td>Myalgic Encephalopathy / CFS</td>
<td>4 Million</td>
</tr>
</tbody>
</table>

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Central Sensitization

Clinical Assessment:

• Pain disproportionate to nature and extent of injury (not nociceptive)
• Not due to lesions or damage within CNS (not neuropathic)
• Wide-spread pain distribution
• General hypersensitivity of senses, stress, emotions, mental load,
• S.P.A.C.E.

Action of Non-Pharmacological Interventions across COPC’s

- Interventions that are successful at desensitizing or calming CNS activity associated with central sensitization are likely to be beneficial across conditions.

- Interventions that diminish “central load” are likely to be helpful over time. It takes time to calm (reset) a sensitized CNS.

So what’s a doctor to do?
Dually Focused Management of Chronic Pain

Symptoms of Pain, Fatigue, etc.
- Nociceptive processes (damage or inflammation of tissues)
- Disordered sensory processing

Functional Consequences of Symptoms
- Increased Distress
- Decreased activity
- Isolation
- Poor sleep
- Maladaptive illness behaviors

Pharmacological therapies to improve symptoms

Nonpharmacological therapies to address dysfunction

# Non-Pharmacological Therapies for Chronic Pain States

<table>
<thead>
<tr>
<th>Evidence Level</th>
<th>Therapies</th>
</tr>
</thead>
</table>
| **Strong Evidence** | - Education  
                          - Aerobic exercise  
                          - Cognitive behavior therapy |
| **Modest Evidence** | - Strength training  
                          - Hypnotherapy, biofeedback, balneotherapy |
| **Weak Evidence**   | - Acupuncture, chiropractic, manual and massage therapy, electrotherapy, ultrasound |
| **No Evidence**     | - Tender (trigger) point injections, flexibility exercise |

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How to ERASE S.P.A.C.E.

Exercise & Energy
Reframing & Relaxation
Affect & Action
Sleep & Social
Education

Sleep, Pain, Affect, Cognitive changes, Energy deficits
# Topics in Psychosocial Pain Interventions

Exercise/Energy, Reframing/Relaxation, Affect/Action, Sleep/Social, Education (ERASE)
Multiple reviews and meta-analyses, and professional society guidelines recommend exercise and physical activity for the treatment of chronic pain and fatigue.

- Increase Fitness
- Increase Function
Lifestyle Physical Activity
Behavioral Time-Based Pacing
Reframing
If Novel Learning is Negative, Automatic Thinking becomes Negative

Acute pain is awful
- Feels better with rest, avoiding tasks, withdraw socially
- Prepares self for the worst
- Catastrophizing – produces negative emotions

When pain becomes chronic
- Tendency to retain acute pain thinking
- Don’t revisit assumptions about pain
- Physiological toll - deconditioning
- Need to focus on challenging old assumptions
The Relaxation Response

PMR

Visual Imagery

Meditation

YOGA

Biofeedback
Psychiatric Co-Morbidities
# Psychiatric Co-Morbidity in Chronic Pain

<table>
<thead>
<tr>
<th></th>
<th>Depression</th>
<th>Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Population:</td>
<td>6.6%</td>
<td>18.1%</td>
</tr>
<tr>
<td>Chronic Pain:</td>
<td>30-54%</td>
<td></td>
</tr>
</tbody>
</table>

## Personality Disorders in Chronic Pain Patients

<table>
<thead>
<tr>
<th>Personality Disorders</th>
<th>gen. pop: 5%-15%</th>
<th>chronic pain: 51%-58%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cluster A:</strong> Odd/Eccentric</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Paranoid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Schizoid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schizotypal</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cluster B:</strong> Emotional/Erratic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antisocial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Histrionic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narcissistic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Borderline</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cluster C:</strong> Anxious/Fearful</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Dependent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCPD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Cluster A:** Odd/Eccentric: 44%
- **Cluster B:** Emotional/Erratic: 31%
- **Cluster C:** Anxious/Fearful: 25%

### Personality Disorders
- Predictive of transition from acute to chronic status
- Sub clinical P.D. impacts pain and treatment compliance

Patients do not need to be mentally ill to have chronic pain.
Approaches to Resolve Negative Affect Influencing Chronic Pain

- Emotional Awareness and Expression Therapy (EAET)
- Pleasant Activity Scheduling
- Traditional Psychotherapy
Sleep
Social Challenges

Dr. - Patient

Friends

Family

Employer and co-workers
Education
Web-based self-management “FibroGuide”

http://fibroguide.med.umich.edu/
Intervening in the PCP Encounter
Where’s the patient?
Are we losing touch — literal touch — in the doctor-patient relationship?

Sacha Pfeiffer  August 18, 2014

https://hms.harvard.edu/news/

Patients Lose When Doctors Can’t Do Good Physical Exams

By Sandra G. Boodman  May 20, 2014

This KHN story was produced in collaboration with  The Washington Post

Are Doctors Losing Their Touch?

Comment /  Share /  Tweet /  Stumble /  Email

Last Updated May 13, 2011 1:07 PM EDT
Three things you can Practice Tomorrow

1. Maximize the power of touch through physical exam

2. You don’t always need to have a psychologist deliver emotional support to patients. Just listen to the story. You will be treating the affective and social components of pain.

3. If you recommend self-management (exercise, relaxation, sleep hygiene etc.), ask about it with the same enthusiasm and regularity that you ask about drugs. Patients learn what you think is really important by what you ask about.