(Patho) Physiology and Treatment of Chronic Pain

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“CHRONIC PAINS”

- Angry
- Argumentative
- Mistrustful
- Anxious
- Depressed
- Entitled
- Self-destructive behaviors
- Non-compliance
- Idiosyncratic reactions to interventions or meds
- Focus on “passive interventions” such as meds
- Clingy/Dependent
History
Medical Understanding of Pain

Fig. 1
Line diagram shows the principle of pain transmission as described by René Descartes (1596-1650) in Tractatus De Homine (Treatise of Man), the definitive French version of which was first published in 1664.
Today
Understanding of Pain

- EEG, PET, SPECT, fMRI
Current IASP Definition of Pain:

An unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.
Today
Understanding of Pain (cont.)

- Ronald Melzack (Presentation at the 3rd World Congress of World Institute of Pain, 2004):

  Pain is not injury; the *quality of pain experiences* must not be confused with the physical event of breaking skin or bone. Warmth and cold are not “out there”; temperature changes occur “out there”, but the *qualities of experience* must be generated by structures in the brain. There are no external equivalents to stinging, smarting, tickling, itch; the *qualities* are produced by built-in neuromodules whose neurosignatures innately produce the qualities.
NEUROMATRIX:

Brain Areas Most Involved/Studied in Pain

Primary SSC (S1)
Secondary SSC (S2)
Anterior Cingulate Cortex (ACC)
Insular Cortex (Insula)
Thalamus
Pre-frontal Cortex (PF)
Periaqueductal Gray
Amygdala
Research

- *Empirically supported therapies*
- *Evidence-based treatments*

Recent imaging studies support past clinical research and observation.
Empirically Supported Evidence Based Treatments

- Multidisciplinary Program (MD/DO, PT, Psych)
- Cognitive Behavioral Therapy
  - Cognitive Re-structuring
  - Relaxation Training
  - Biofeedback
  - Hypnosis
  - Self-hypnosis
  - Imagery
  - Mindfulness
Pain Summary

- All pain is real.
- All pain is centrally mediated.
- To manage pain, both sensory and emotional factors must be considered.
- Pain management cannot aim exclusively at modifying the sensory experience.
- Pain is not always amenable to treatments aimed at blocking the perception of tissue damage.
- Modifying sensory experience doesn’t necessarily lead to better function or quality of life.
Pain Summary

- Pain can be treated by influencing the downstream modulation of sensory events.
- Patients can use to varying degrees cognitive and behavioral techniques to modify pain.
- The human brain has the neural circuitry to accomplish this modulation.
- Environmental factors that do not reside within the patient can play a large role in how pain is modulated.
- A sensory experience is not required for pain to occur.
Pain is affected by:

- Expectations
- Depression
- Anxiety
- Low acceptance of pain
- Hypervigilance
- Catastrophizing

- Responses to stress
- Individual’s goals
- Past trauma
- Past pain experiences
- Spirituality
- Culture
What’s the explanation for CHRONIC PAIN?

- Phantom Limb
- Chronic Low Back
- Fibromyalgia
- Reflex Sympathetic Dystrophy (CRPS)
- Irritable Bowel
- Chronic Pelvic Pain
CHRONIC PAIN
Explanations

Plasticity/maladaptive changes in:

- Peripheral Nervous System (fiber recruitment, collateral sprouting, sodium & calcium channel changes)
- Spinal cord (reduced thresholds, increased response to synaptic input, sprouting of sympathetic neurons/fibers, “windup”)
- Brain (metabolic, apoptotic changes)
- Immune and endocrine systems
Clinical Implications

- Some changes may be reversible, others permanent
- Importance of downward modulation
- Need to consider peripheral, spinal, and supra-spinal interventions.

*Peripheral: NSAIDS, regional analgesia, neural ablation, counter stimulation*

*Spinal cord: opioids, adrenergic agonist (clonidine), TCAs*

*Supraspinal: CBT, BFB, hypnosis, relaxation, [acupuncture]*
CHRONIC PAIN
Risk Factors

- Pain duration
- Age, Gender
- History of major psychopathology or mood disorder
- Job dissatisfaction
- Prolonged recovery from previous pain experiences
- Pattern of reduced activity and/or excessive pain behavior
- Related litigation
CHRONIC PAIN
Risk Factors

- *Family or other social contacts either too solicitous or too harsh*

- *History of psychological or physical trauma*

- *Negative beliefs about the meaning of pain*

- *Explanatory model of pain*

- *Reliance on maladaptive and/or passive coping strategies*

- *Lack of understanding of the source of pain.*
PAIN TREATMENT

Pain management/prevention requires

Biopsychosocial Model

*Chronic* pain management/prevention *demands*

Biopsychosocial Model

(model is Psychologist, Physical Therapist, MD/DO)
Medications

Depends on presumed etiology:

*examples*

- Nociceptive – opiates, acetaminophen
  (In general, ~3 weeks; long-term causes *opiate-induced hyperalgesia*)
- Inflammatory – NSAIDs
- Neuropathic – anti-seizure meds
- Centralized – antidepressants, anti-seizure meds.

All pain eventually becomes centralized.
Most long-term pain involves combos of the above.
Case Study

Ms. Smith, 56yo

- Primary complaint – pain in multiple body parts/areas, >3 months
- Edema – primarily LE
- Type II diabetes
- Hypothyroidism
- History of depression
- Seen by: neurology, orthopedics, rheumatology, psychiatry
- Diagnostics: x-rays, CTs, MRIs, blood work
- Pain etiology remains unidentified
- Tearful, sleeps 2-3 hours
- Tried multiple pain meds, antidepressants, NSAIDs, sleep aids – little help or side effects
- Uses increasing amounts of Vicodin; minimal pain relief
- Admits taking friend’s Norco, says it helped and wants a prescription.
- Focused on obtaining long term disability
Case Study

Ms. Smith:

- Depressed (affects sleeping, eating, motivation, view of the world, relationships, energy, mood, concentration/attention)
- Onset of pain: associates it with MVA, mother died after long-term care, just lost house, husband drinking, daughter pregnant
- Early treatment: felt “blown off” by providers/family, worried about possibility of cancer or other disease, mistrust of medical field, little knowledge about body/physiology
- Past history: childhood chaos, alcoholic father, in car accident with sibling who later died, recurring depression
- Current: sedentary, little social support, only friend has fibromyalgia, husband threatening to leave, little education/training, concerned about livelihood
Treatment Plan – Ms. Smith

- Identify most urgent problem (suicidal?)
- Research meds and diagnostics histories (hypothyroidism?)
- Identify & refer for appropriate medical interventions
- Develop appropriate medication regime including tapering as needed
- Treat or consult for depression
- Specify cognitive behavioral therapy (includes BFB, relaxation, stress mgmt, skills trng), marital issues, and possible PTSD
- Get her moving – classes, PT (active, not passive)
- Enroll her in weight management classes at some point
- Don’t over-diagnose & don’t try too many changes at one time
- Educate, provide educational materials, and project hope/optimism
- Appointment with Social Services
- Schedule regular appointments
PREVENT/TREAT CHRONIC PAIN

- Listen, validate, summarize concerns (agreement is not necessary)
- Normalize patient’s experience
- Communicate hope and positive attitude
- Check out expectations and fears
- Check patient’s understanding of condition
- Outline a preliminary plan, including rule out diagnostics
- Use a multimodal approach, not meds alone
PREVENT/TREAT CHRONIC PAIN

- Get the patient moving ASAP (classes, PT, HEP)
- Treat anxiety or depression
- Restore sleep (sleep hygiene, relaxation, antihistamines, and/or antidepressants)
- **Educate** patient/family – verbal, visual, written, electronic
- Offer only medically appropriate intervention; explain your rationale
- Set boundaries - what you are/are not willing to do and why
PREVENT/TREAT CHRONIC PAIN

- Define “cure”
- Partner/Team with the patient and with other appropriate providers
- Provide positive reinforcement* for even very small steps in a healthy direction
- Empower - CP treatment is primarily about empowering/motivating use of active strategies
- Refer - know when and how to refer to a pain management program*
CHRONIC PAIN
“Difficult” Patients

Characteristics:
- Angry
- Argumentative
- Mistrustful
- Anxious
- Depressed
- Entitled
- Self-destructive behaviors
- Non-compliance
- Idiosyncratic reactions to interventions
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CHRONIC PAIN
“Difficult” Patients

Provider Reactions:

- Frustration
- Anxiety
- Guilt
- Dislike
- Anger
- Avoidance
Why are they like that?

- Stressors (marital/family, financial, vocational)
- Mood disorders
- Fear of abandonment
- Social isolation/loneliness
- Poor self-esteem due to condition
- Unmet expectations
- Poor functioning
- Lack of restorative sleep
Why are they like that?

- Narcotic and other meds use
- Fatigue
- Perceived dismissiveness/skepticism from provider
- Pain itself
- Triggering of past trauma
- Personality disorders
- Dependence/withdrawal
- Frustration, disappointment with medical system
- Lack of adaptive coping skills стратегии
Were they like that before the pain?

- Sometimes yes
- Sometimes no
Can any/all of us develop some of these characteristics under the same conditions?

- Yes
Pain is Inevitable,
Suffering is Optional.
Questions?

Complete list of reference available upon request
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