

The Psychobiology of Pain and Reasons for Holistic Care

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Conflict of Interest

No financial or other conflict of interest

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Overview

- What is pain and what are the types of pain?
- What is the impact of chronic pain?
- How do we feel pain?
- Why do people seek mind-body interventions for pain?
- What should we expect from mind-body approaches for pain management?

What is Pain?

- Pain is an unpleasant *sensory and emotional experience* that is associated with actual or potential tissue damage (IASP 2020)
- By definition pain is a *subjective experience*
- Difficult to measure – you cannot “see” pain
- Yet, it is an important part of the human experience as a **warning signal** to help keep us safe and avoid injury.



What are the types of pain?

- **Acute Pain** which can be due to injury, inflammation or medical procedures.
 - usually self limiting and resolves in a few minutes, hours, days
- **Chronic pain** is pain that lasts more than several months (defined as 3 to 6 months, but longer than “normal healing”)
 - can be related to disease or inflammation (e.g., arthritis, sickle cell disease)
 - can be a pain condition in the absence of identifiable disease/ inflammation
 - can be *musculoskeletal* (joints and muscles), *neuropathic* (nerve pain), or *visceral* (e.g., abdominal pain)

The Impact of Chronic Pain

- Chronic pain is a very common problem. Results from the 2012 National Health Interview Survey show that:
- About 25.3 million U.S. adults (11.2 percent) had pain every day for the previous 3 months.
- Nearly 40 million adults (17.6 percent) had severe pain.
- Individuals with severe pain had worse health, used more health care, and had more disability than those with less severe pain. www.nccih.nih.gov
- Impact on life – reduced ability to work, participate in recreational and social activities, dependence on pain medications/side effects, affects relationships

Unexplained Chronic Pain

What if pain persists even when disease and inflammation are under control?

Why does this happen??



The Puzzle of Pain

- Research has shown that pain can persist even when there does not seem to be any injury or obvious source of pain
- People can suffer from diffuse muscle and joint pain without underlying joint inflammation (e.g., fibromyalgia)
- Similarly people with underlying conditions (e.g., arthritis) can develop pain not tied to inflammation
- When there is no obvious sign of disease or injury people may think that maybe the pain is *“in your head”* or *“psychological”*

How We Feel Pain

- Important to understand the role of the *brain* in feeling pain
- Pain is usually a signal sent to the brain that something is wrong
- Signals picked up by special pain sensing nerves are sent to the brain

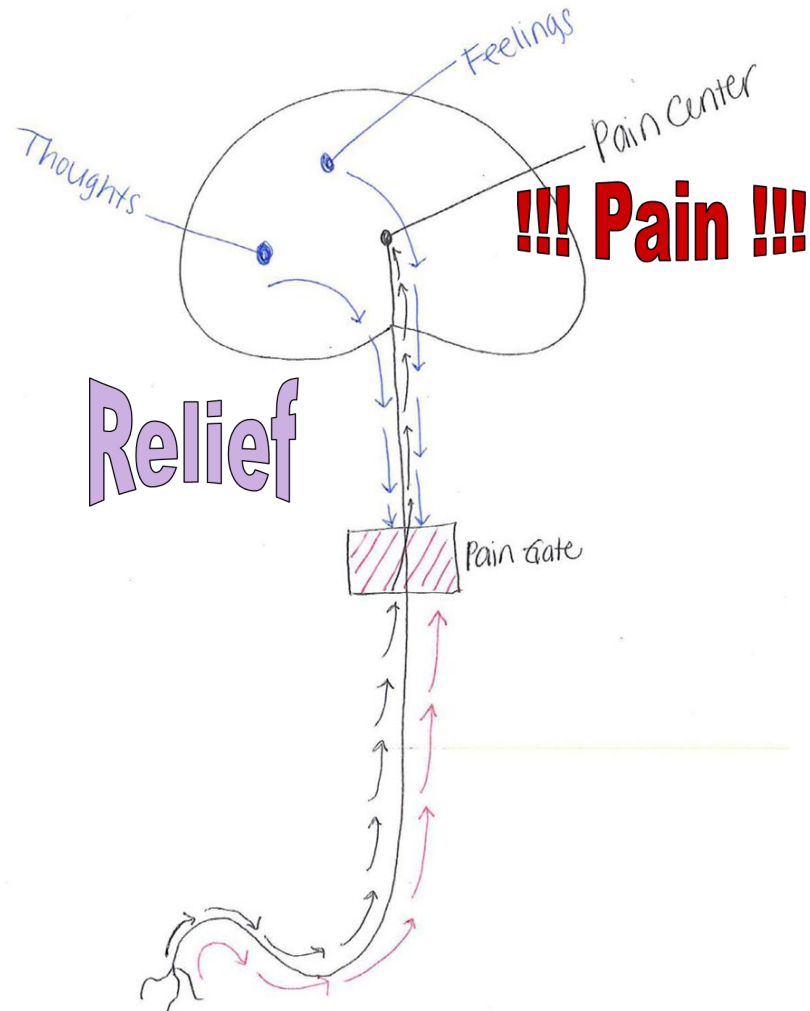


The Role of the Brain in Pain

- Pain messages are carried by nerves in the body to the brain to process the signal



Gate Control Theory of Pain



Pain is a Complex Experience

- Pain is a **sensory experience** that is also affected by many other things like our **memories, thoughts and feelings**.
- It is also affected by our **lifestyle** (sleep, exercise, hydration, nutrition)
- Pain sensitivity has a **genetic** component
- Also the body can become “**sensitized**” to pain for many different reasons
- Pain affects people differently – some react to pain more strongly than others

Biological, Psychological and Social/ Lifestyle Factors that affect the pain experience

- Genetic and biologic factors
 - disease activity, pain sensitivity, neurobiologic, endocrine
- Psychological factors
 - mood, stress, anxiety, history of trauma
- Social and Lifestyle factors
 - family environment, sleep, physical activity, substance use, diet

A Multi-Modal Approach

- Relying on pain medicine alone is often not the best way to manage pain
- Many research studies have shown that combining treatments is the most effective strategy



Why do people seek Mind-Body treatments?

- Evidence is increasing for their effectiveness and safety
- They are becoming an important part of integrative medicine approaches for chronic pain management
- Increasing awareness of downsides to long-term use of only medications (side effects, dependence, some medicines may lose effectiveness over time)
- To have a better sense of control over one's life and self-confidence in managing pain

How Do Mind-Body Techniques Work?

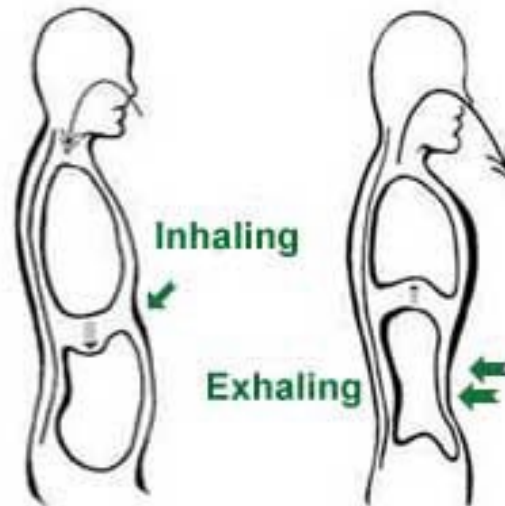
- Mind-body therapies focus on ways to influence the brain and help close the “pain gate”
- By teaching the brain ways to reduce the pain signal by using other areas of the brain
- This can be done through *relaxation, meditation, cognitive-behavioral therapy, distraction, guided imagery, yoga, biofeedback* and other methods
- We know that these tools have actual effects on the brain and body that can reduce how the brain feels pain

Most of these techniques require some training and practice!!

What is Cognitive Behavioral Therapy (CBT)?

- Well studied approach for pain management
- A training program that usually takes about 6-8 sessions
- Training in a number of mind-body techniques
 - *deep muscle relaxation and breathing relaxation*
 - *guided imagery*
 - *activity pacing*
 - *distraction*
 - *how to deal with negative emotions related to pain*
- Caregivers are trained in “coaching” techniques

A Simple Example - Deep Breathing



Breathe in slowly through the nose. Hold for 2 seconds, say the word “Relax” in your mind, and then exhale through the mouth or nose. Repeat cycle again. Each time you breathe out feel your body getting a little looser and less tense. Do this 5 times.

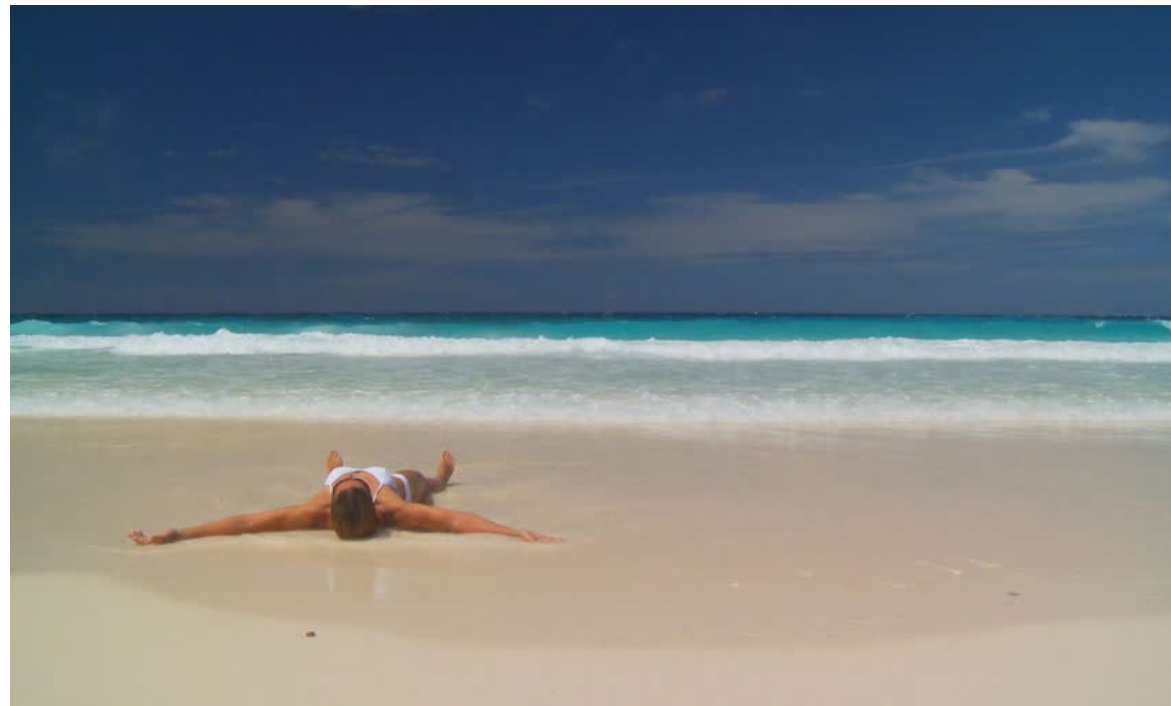
Relaxation and Distraction

Sight:

White sand
with shells

Taste:

Salt water



Hearing: Roar of waves

Smell:

Coconut
sunscreen

Touch:

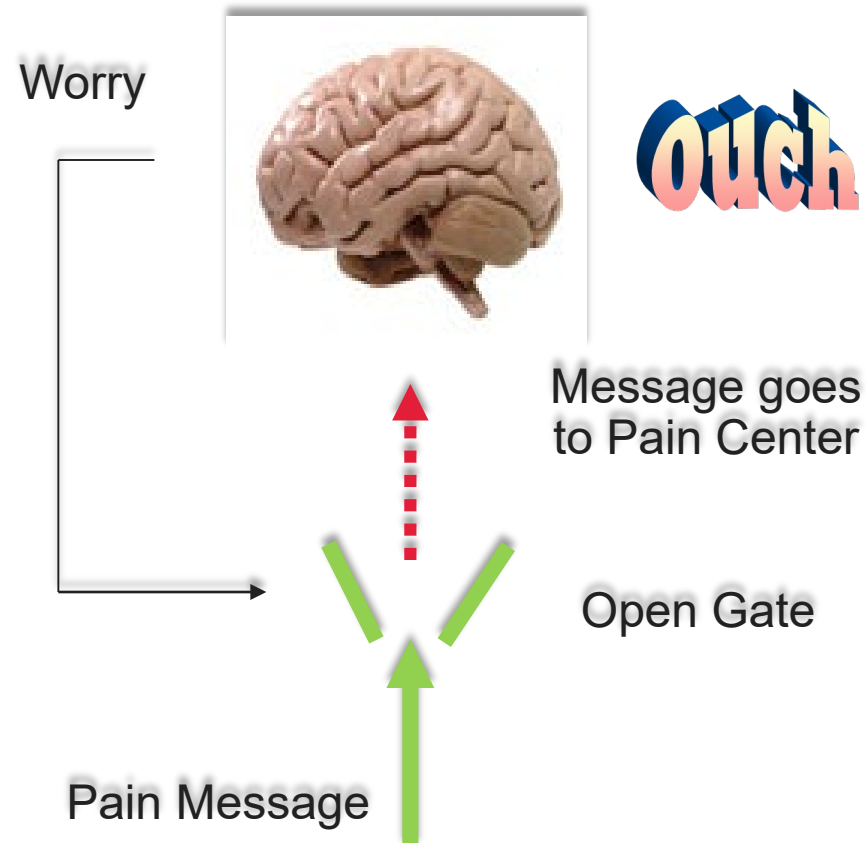
Cool water

Apps on your
smartphone or tablet!

Virtual Reality

Thinking and the Pain Gate

- Worry and negative thinking result in opening the pain gate and this can amplify pain.
- CBT Teaches ways to reduce worrying thoughts and replace them with calmer thoughts and emotions



Other Pain Coping Tools - Biofeedback



Using computer equipment to monitor body responses, such as muscle tension and surface skin temperature



Immersive
Virtual Reality with
Biofeedback

Meditation & Yoga



Benefits Of **MEDITATION**

-  Reduces pain and enhances the body's immune system.
-  Reduces feelings of depression, anxiety, anger and confusion.
-  Increases blood flow and slows the heart rate.
-  Provides a sense of calm, peace and balance.
-  Helps reverse heart disease.
-  Helps control thoughts.
-  Increases energy.
-  Reduces stress.



Effects of Mind-Body techniques

- There was evidence in a 2017 review paper that ***acupuncture, yoga, relaxation techniques, tai chi, massage, and osteopathic or spinal manipulation*** may have some benefit for chronic pain
- for ***acupuncture*** there was evidence that the technique could reduce a patient's need for opioids.
- ***Hypnosis*** can be moderately effective but effects can vary in individuals
- ***Mindfulness meditation*** has been found to have small effects
- Recent interest in studying ***music*** as a therapeutic tool – promising initial work

Setting realistic expectations

- Seeking a **cure** versus seeking **better control** over pain and getting your life back
- A focus on **function**, coping and quality of life and **returning to valued life activities**
- not a magic pill- Most techniques require **several sessions**
- Some require putting in **effort** and **regular practice!**

Healthy Mind + Healthy Body = Improved Pain Management

Thank you!



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