

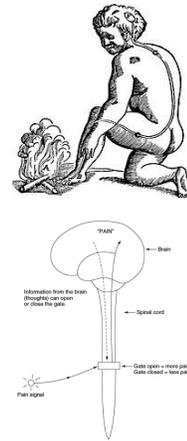
# Pain Science Review

Overview of Current Concepts of Pain Science

Prepared by Eugene Katsnelson PT, DPT

## What We Knew Then

- ★ In his 1664 *Treatise of Man*, René Descartes theorized that the body was more similar to a machine, and that pain was a disturbance that passed down along nerve fibers until the disturbance reached the brain.
- ★ 300 years later Melzack and Wall published their famous Gate Control Theory of pain. This theory also proposed that pain travels via nerve fibers through the spinal cord to the brain and that pain can be decreased by closing the “Gate” by using other non-painful stimulus.



## What We Know Now

“Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”  
-International Association for the Study of Pain (IASP)

- ★ Pain is multidimensional and cannot always be attributed to tissue damage or physical injury.
- ★ There are 3 major types of pain:
  - Nociceptive
    - Pain that is a result of input of nerves sensing “tissue damage”
  - Neuropathic
    - Pain that is related to changes in the nervous system (Peripheral nerves)
  - Other (Central Sensitization)
    - Pain that cannot be labeled into any specific category or explained by tissue or nerve damage.

THREE MAIN TYPES OF PATHOPHYSIOLOGY  
can be considered to result in chronic pain!



More than 1 type of pain may be present in a given patient

## Biopsychosocial (BPS) Model of Pain

Due to its complex nature, pain requires a multidimensional treatment approach. The biopsychosocial model of patient care takes into consideration 3 factors that may be contributing to a person's current pain state.

### ★ Biological Factors

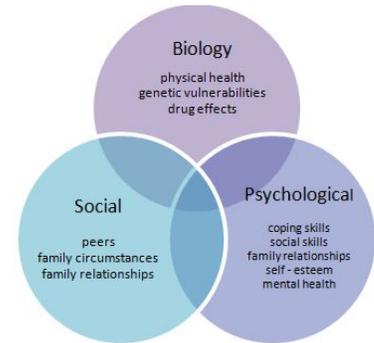
- Physical factors that can be seen by examination or imaging such as Xray/MRI or Lab Tests.

### ★ Psychological Factors

- Factors related to mental health such as coping skills or history of traumatic experiences.

### ★ Social Factors

- Things like education level, socioeconomic status, and living environment.



## Factors That May Increase Pain

- ★ Stress
- ★ Anxiety
- ★ Poor sleep habits
- ★ Poor diet
- ★ Poor coping skills
- ★ Poor understanding of the cause of pain.

## Factors that May Decrease Pain

- ★ Exercise
- ★ Relaxation techniques
- ★ Participating in meaningful activities
- ★ Good understanding and knowledge about the cause of pain
- ★ Having a good support system

## Influence of The Nocebo Effect

Nocebo effect is the opposite of the very popular Placebo effect. ..

## Possible Negative Effects of Prolonged Opioid Use on Pain

- ★ Tolerance - The need to continually increase the dose of opioid medication with prolonged use.
- ★ Opioid Induced Hyperalgesia - A phenomenon in which the patient may feel increased pain when using opioid medication.
- ★ Rebound Effect - Tapering of medication can cause an increase in pain that is often worse than the original pain for which the medication was prescribed.
- ★ Risk of Dependency and Addiction.

## How Can a Physical Therapist Help Someone Dealing with Persistent Pain

- ★ Pain Neuroscience Education (PNE)
  - Knowledge is Power - Understanding pain and its complexities can significantly help decrease the fear and anxiety that a patient may have due to pain. PNE simplifies the complex issue of pain through easier to understand metaphors, such as:
    - “Pain is an Alarm” - Pain is your body telling you about danger signals much like an alarm. Just because a smoke alarm is going off doesn’t always mean that there is a fire.
    - “Pain Does Not Equal Harm” - Often, the amount of pain does not indicate the severity of injury.
    - “The Medicine Cabinet in the Brain” - Many of the “feel good” medicines are already present in our brains so there is no need to take medications. These chemicals get released when we do things that make us feel good such as exercise, relaxation and spending time with loved ones.
    - “Resiliency” - Educating about the resiliency of the human body and its amazing ability to heal and recover.
- ★ Thorough Assessment and Examination
  - Examination of the patient's primary complaints by learning their history and evaluating their movement system, while taking into consideration all other factors that may be contributing to their current problem.

- ★ Graded Return to Meaningful Activities
  - Understanding what activities the patient is unable to perform and gradually working with them to the highest level of function through:
    - Corrective Exercise
    - Manual Therapy
    - Modalities
- ★ Teaching Proper Breathing and Relaxation Techniques.
- ★ Ability to work in concert with other healthcare providers such as primary care physicians, mental health providers and other specialists to facilitate a team approach to patient care.

## Useful Resources

- ★ MoveforwardPT.com
- ★ NOIGroup.com
  - Neuro Orthopaedic Institute - Australian pain research group.
  - [Explain Pain](#) (Butler, David S, and G L. Moseley. *Explain Pain*. Adelaide: Noigroup Publications, 2003)
- ★ ISPIInstitute.com
  - International Spine and Pain Institute - Based out of the USA, headed by Adriaan Louw. Authors of the “Why do I Hurt” series.
- ★ IASP-PAIN.org
  - International Association for the Study of Pain
- ★ BodyinMind.org
- ★ #ChoosePT