

Cannabinoids and Health

Module 5

Lecture 1: What Is Chronic Pain?

Acute Pain

- Everyone has experienced short term pain
 - A stubbed toe
 - A slap in the face
 - A sore throat
 - Touching a hot pan
 - A toothache
- When you twist an ankle, neural signal travels up spinal cord to brain and creates the experience of pain
- Pain can be protective communication to brain
- “Acute pain”
 - short lived, lasts a few seconds to several days, weeks, (maybe) months
- We **recover** from acute pain
 - A broken leg heals
 - A headache goes away



Chronic Pain

- Chronic pain lasts much longer
 - It is defined as pain lasting 3-6 months or longer
 - Can often last for years
- Chronic pain is often not “treated” successfully
- Chronic pain is often puzzling to both patient and health care provider
 - Not always an obvious source of the pain
- **An Important Question:** “Why do some people develop chronic pain (e.g., following an injury) while others do not?”

Examples of Chronic Pain

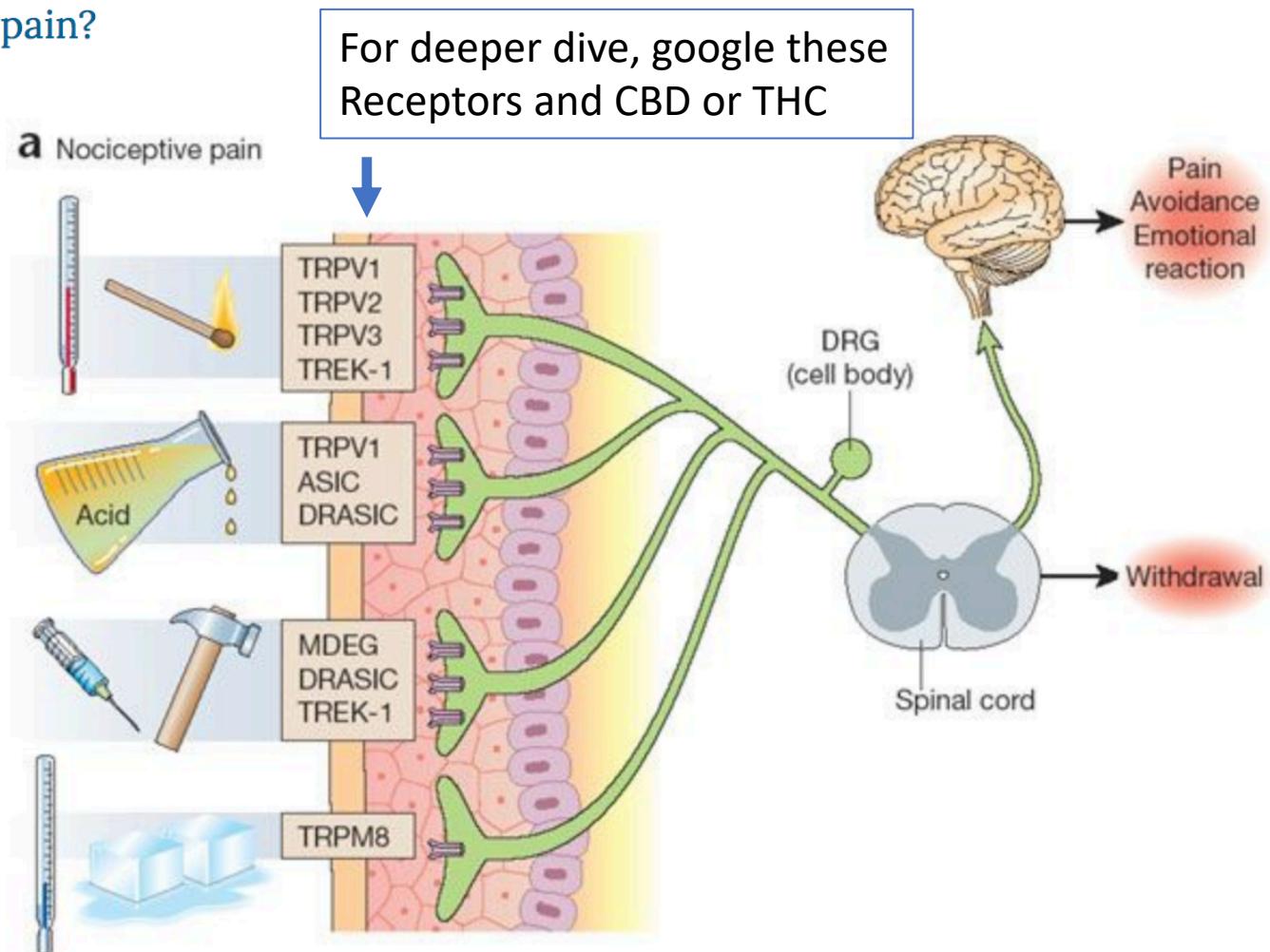
- Back pain
- Neck pain
- Jaw pain
- Knee pain
- Limb pain
- Headache
 - Migraine
 - Cluster headache
 - Tension headache
- Rheumatoid arthritis
- Osteoarthritis
- Cancer pain
- Fibromyalgia (widespread pain and fatigue due to unknown causes)
- Neuropathic pain (pain due to dysfunction in the pain nerves are sending pain signals to the brain)
- Visceral pain (e.g., pain in an internal organ such as stomach or bowel)

Types of Chronic Pain: Nociceptive, Inflammatory, Neuropathic and Dysfunctional

- Immediate, stimulus-dependent pain (aka, nociceptive) triggered by hurtful stimuli like heat, pressure, chemical substances
- Illnesses like arthritis or cancer can produce persistent nociceptive pain
- Nociceptive pain is normally adaptive
 - It motivates protective avoidant responses—e.g., withdrawing one's hand from a burning object
 - People born with congenital insensitivity to pain may die of unfelt injuries
 - Same is true for diabetics
- Three other types of pain are inflammatory pain, dysfunctional pain, and neuropathic pain

Figure 1 : Nociceptive, inflammatory and neuropathic pain.

From: [Can we conquer pain?](#)



Nature Neuroscience volume 5, pages 1062–1067 (2002)

Inflammatory Pain

- After tissue injury and inflammation occurs, sensory nervous system undergoes a change in its responsiveness such that even innocuous stimuli produce pain
- In addition, responses to genuinely painful stimuli are pronounced and prolonged
- Inflammatory pain usually disappears after the initial injury is resolved
 - However, in some chronic conditions, pain will persist after the inflammation is no longer active
- Thus, inflammatory pain is a form of pain hypersensitivity
- Animal studies demonstrate a link between pathological pain and immune function in the CNS and periphery
- Peripheral inflammation can also impact neuroimmune signaling

Neuropathic Pain

- Pain can be associated with neural damage
 - Peripheral neuropathic pain
 - Central neuropathic pain
 - Neuropathic pain can occur in the absence of identifiable pain stimuli
 - So where does it come from?
 - Damage to peripheral or central nervous system from infection, tumors trauma, metabolic disease, spinal cord injury, stroke, MS
 - People with neuropathic pain may experience
 - burning pain,
 - “pins and needles”
 - pain when clothes touch their skin

The Chronic Pain Mystery

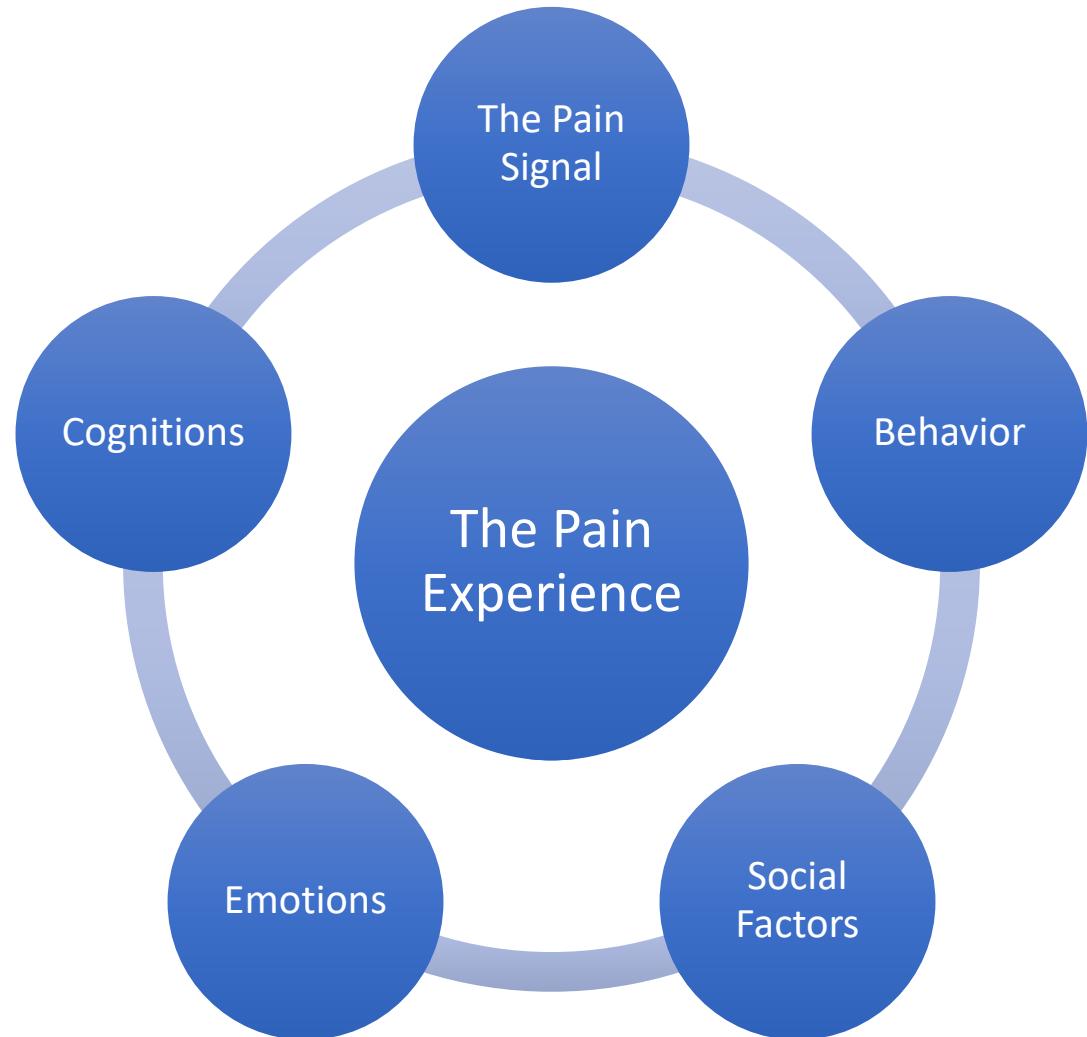
- The persistence of chronic pain is often difficult to understand for patients and health care providers
- Why do some people recover from acute pain while others experience lasting pain?
- To understand that, it is important to understand the pain experience itself



Factors that Impact the Pain Experience

Many factors influence the pain experience

These other factors can magnify the intensity of the pain



Emotions

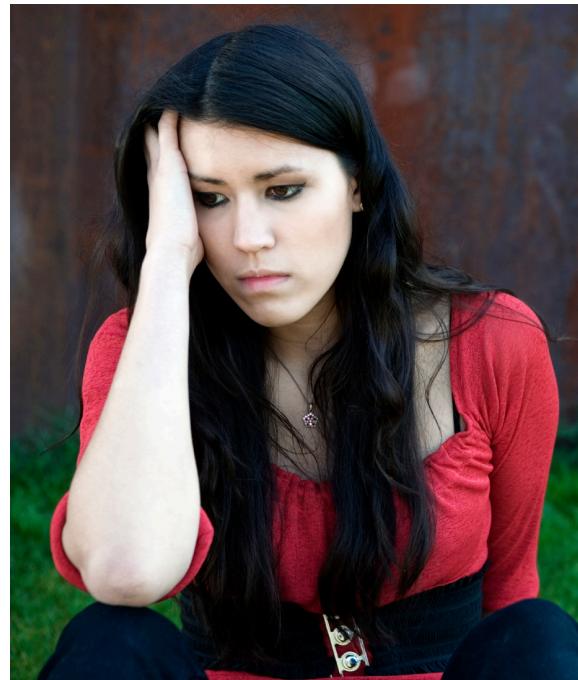
- Pain is an emotional experience
 - Negative emotions such as fear, depression, anger often accompany pain
- Negative emotions are another source of information for the brain (along with pain signal)
- The stronger the emotion, the greater the perceived level of pain
- Strong negative emotion actually makes pain feel worse

Cognitions

- Thoughts like: “This is horrible”, “I’ll never get better”, “I can’t survive this pain”, or “My life is ruined” strengthen the pain signal and make pain feel worse
- Besides amplifying the pain signal, negative thoughts can decrease the person’s self-efficacy, making it less likely that he or she will do what is needed to manage pain

Social Responses to Pain

- Pain often takes place in an interpersonal context
- Other people's responses can make pain worse
 - Overprotective
 - Overly solicitous
 - Ignoring
 - Negative
 - Punishing



Common Social Responses to Pain

- If family/friends are overbearing
 - reduces person's sense of control and self-efficacy, making pain management more difficult
- Discouraging the person with pain from exercise or activity so as to “protect” the person from further injury is likely to lead to deconditioning and worsening health
- Criticizing, abandoning, or spending less time with the person with pain leads to feelings of depression and loneliness

Behavior

- Some behavior makes pain worse
 - It is natural to favor the area that is hurt
 - Over the long-run, this can be counterproductive
 - Injured part of the body becomes weaker and more prone to injury
 - People with pain may avoid situations that they fear may make their pain worse
 - Avoidance may have physical as well as psychological and social costs
 - Pain may make it difficult to sleep and lack of sleep will worsen the experience of pain
 - Misuse or abuse of alcohol or drugs, especially opioids, poses multiple health risks and may make pain worse over time

The Burden of Chronic Pain

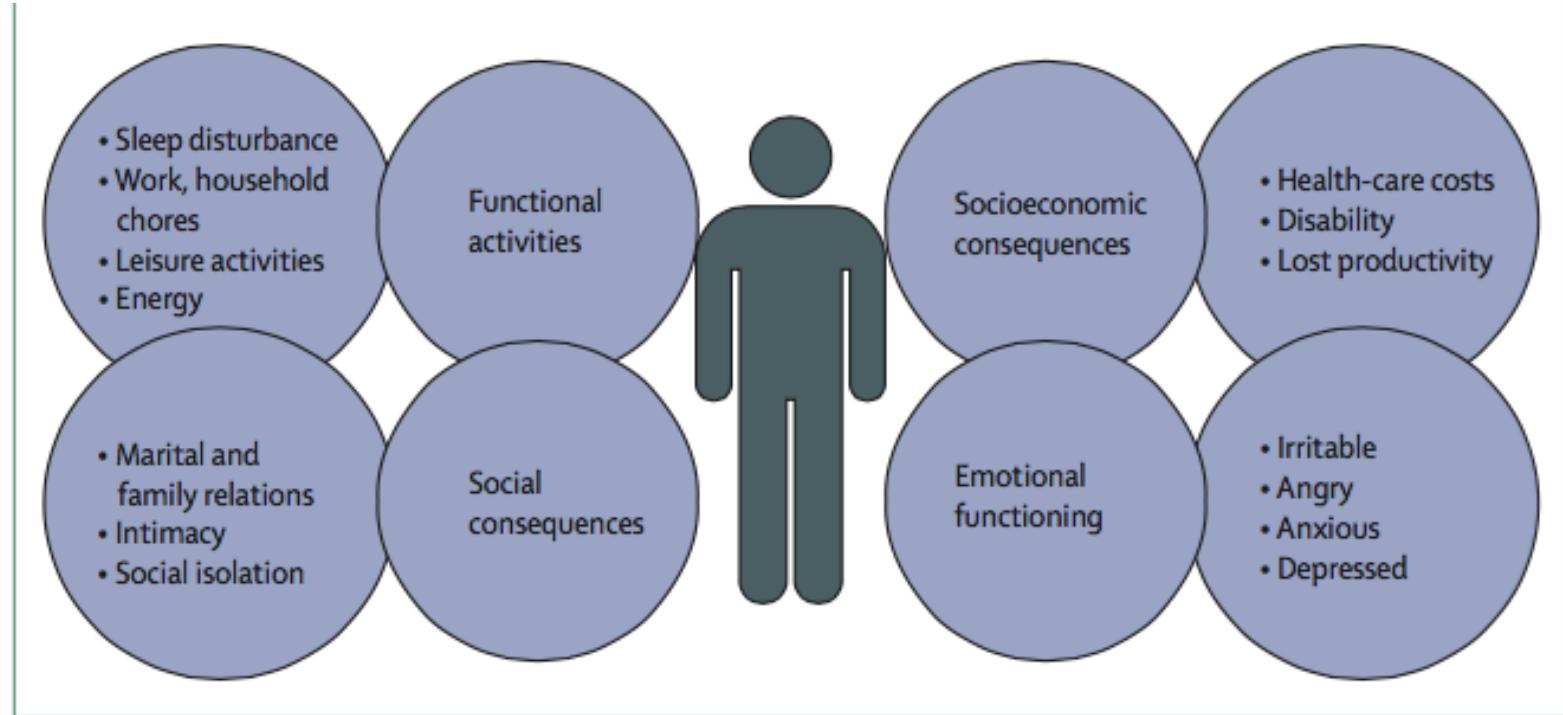


Figure 1: The effect and burden of chronic pain

Chronic pain affects every aspect of a patient's life, contributing to a loss of both physical and emotional function, affecting a patient's levels of activity (ability to work at home and job and engage in social and recreational pursuits); additionally, there are often serious economic consequences as a result of health-care bills and potential

Summary

- Chronic pain can last for months or years
- Chronic Pain is complicated at a biological and psychological level and the etiology varies from person to person
- Chronic pain has a number of impacts at the social, emotional, and behavioral levels
- Chronic pain can be very debilitating and carries an enormous burden to the individual, family, and society