

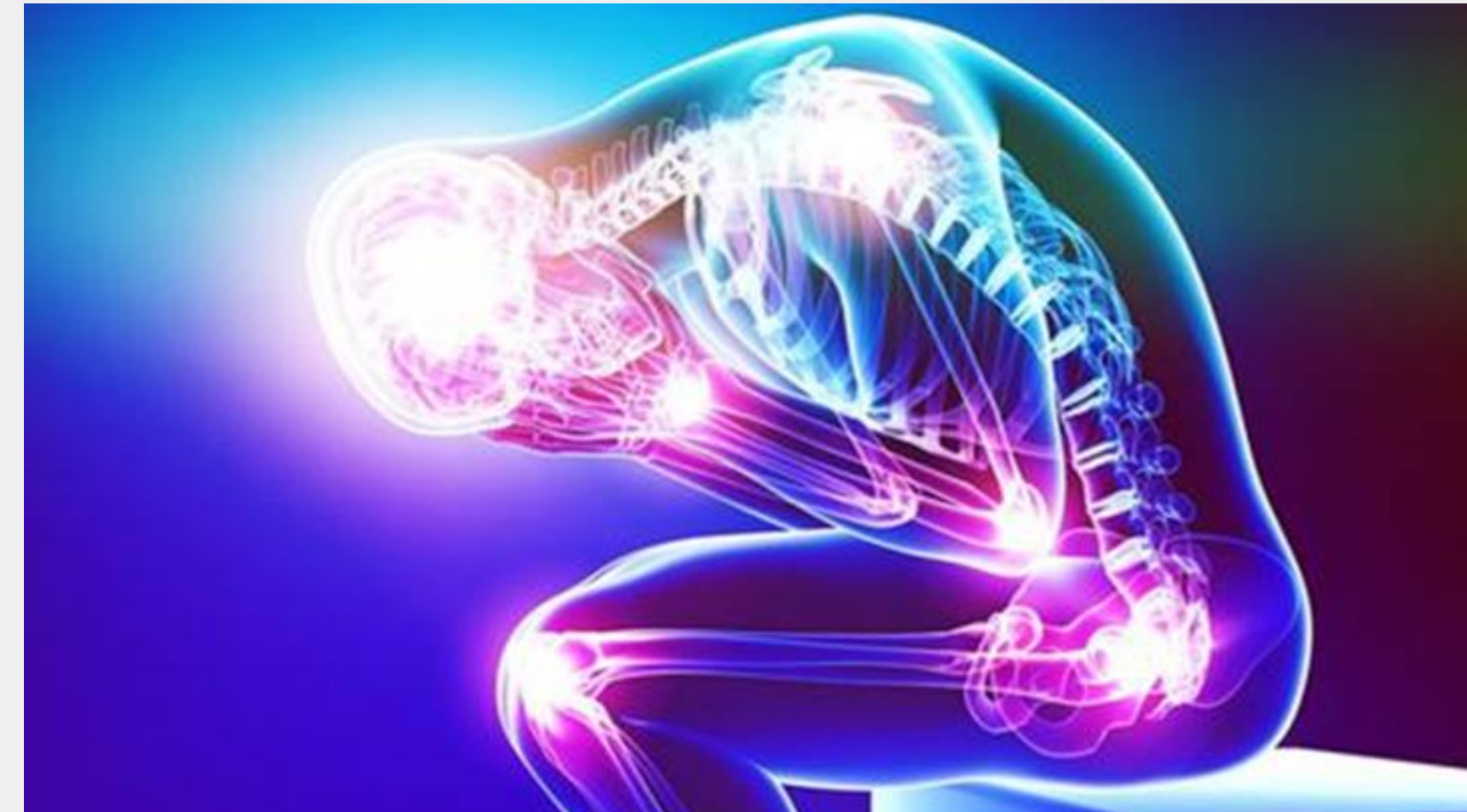
Chronic Pain, Current Treatments, and Virtual Reality Interventions

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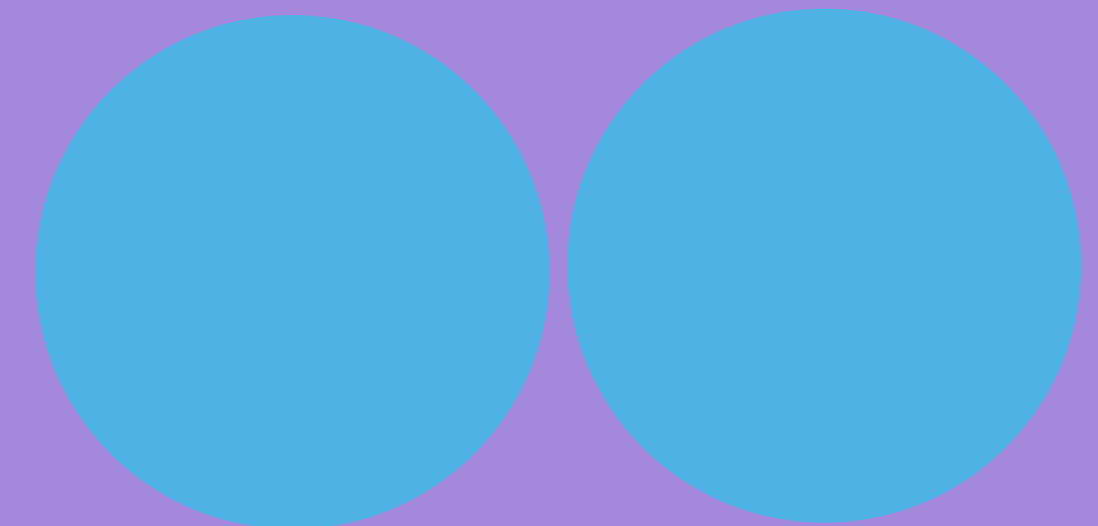
What is pain?

- Term used to describe uncomfortable sensations of the body
- Comes from activation of the nervous system carrying signals to and from the brain
- Highly subjective person to person
- Descriptors:
 - Comes and goes, constant, occasional
 - Annoying to debilitating
 - General or localized
 - Achy, burning, shooting, stinging, throbbing, shooting, stiffness, etc.



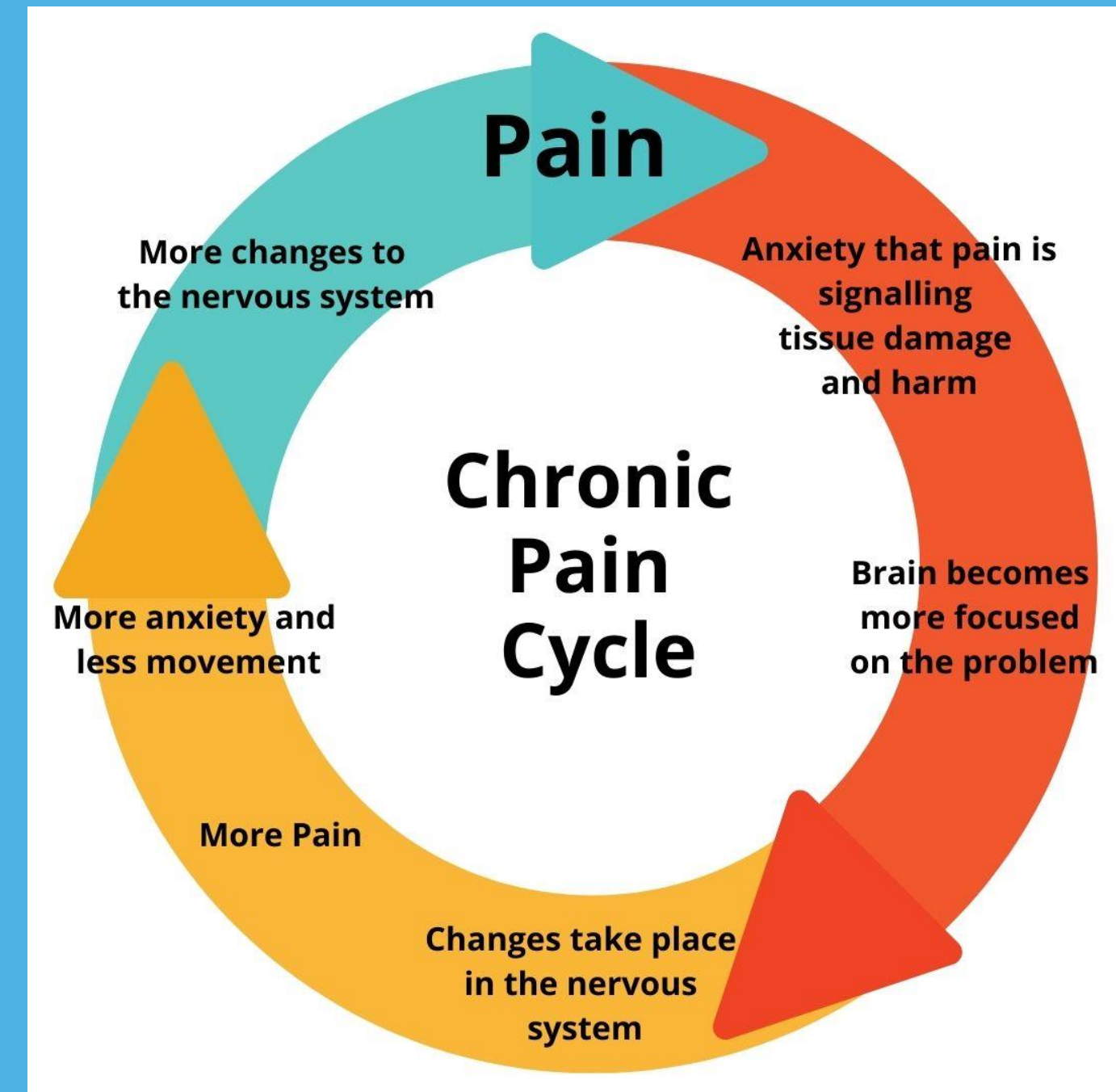
Types of Pain

	Acute	Subacute	Chronic
Cause	usually has a specific cause		can originate from specific cause or not, can linger beyond actual injury.
Duration	Lasts less than 6 weeks	Usually lasts between 6 weeks and 3 months.	Lasts longer than 3 months,



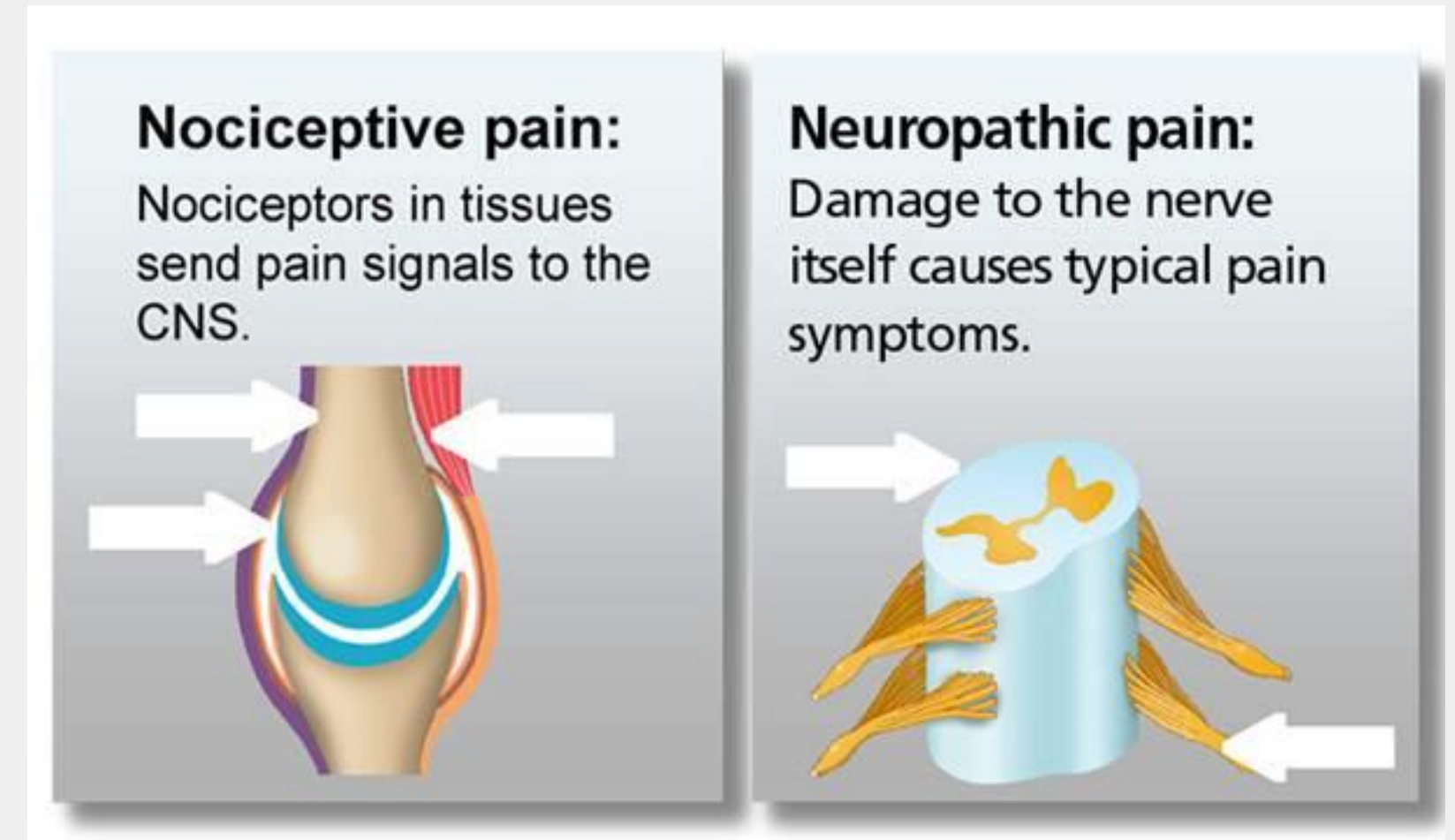
What is Chronic Pain?

- Pain lasting longer than 3 months
- Can have an easily defined cause, but not always
- Can be tied to illness or disease – physical or mental (i.e. Fibromyalgia, Depression, Arthritis, Neuropathy, etc)
- Causes changes in sensitivity to pain



Types of Chronic Pain

- **Nociceptive pain:** pain from sensory nerves in soft tissues, 2 types
 - **Somatic**
 - **Visceral**
- **Neuropathic pain:** Caused by nerves not functioning normally, nerve disturbances and spontaneous pain signal transmissions
 - Stabbing, burning, sharp, shooting, electrical
 - **Causes:** Nerve irritation, nerve damage, neuroma



Types of Chronic Pain

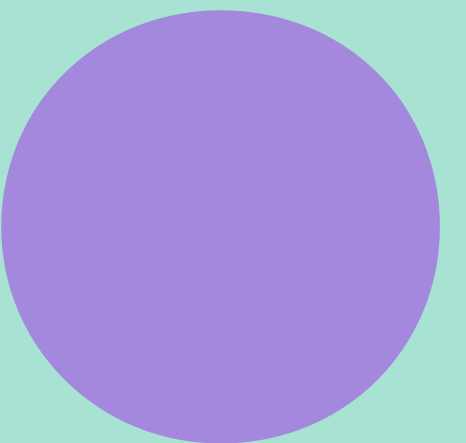
- **Psychogenic pain: Pain caused by a psychological disorder**
 - **Many psychological/mental health disorders have a physical component, but not a physical origin.**
 - **Requires different treatment approach**
- **Idiopathic pain: pain that has no known physical or psychological cause and more common with pre-existing pain disorders**
 - **Difficult to treat and requires multifaceted approach**



What Causes Chronic pain?

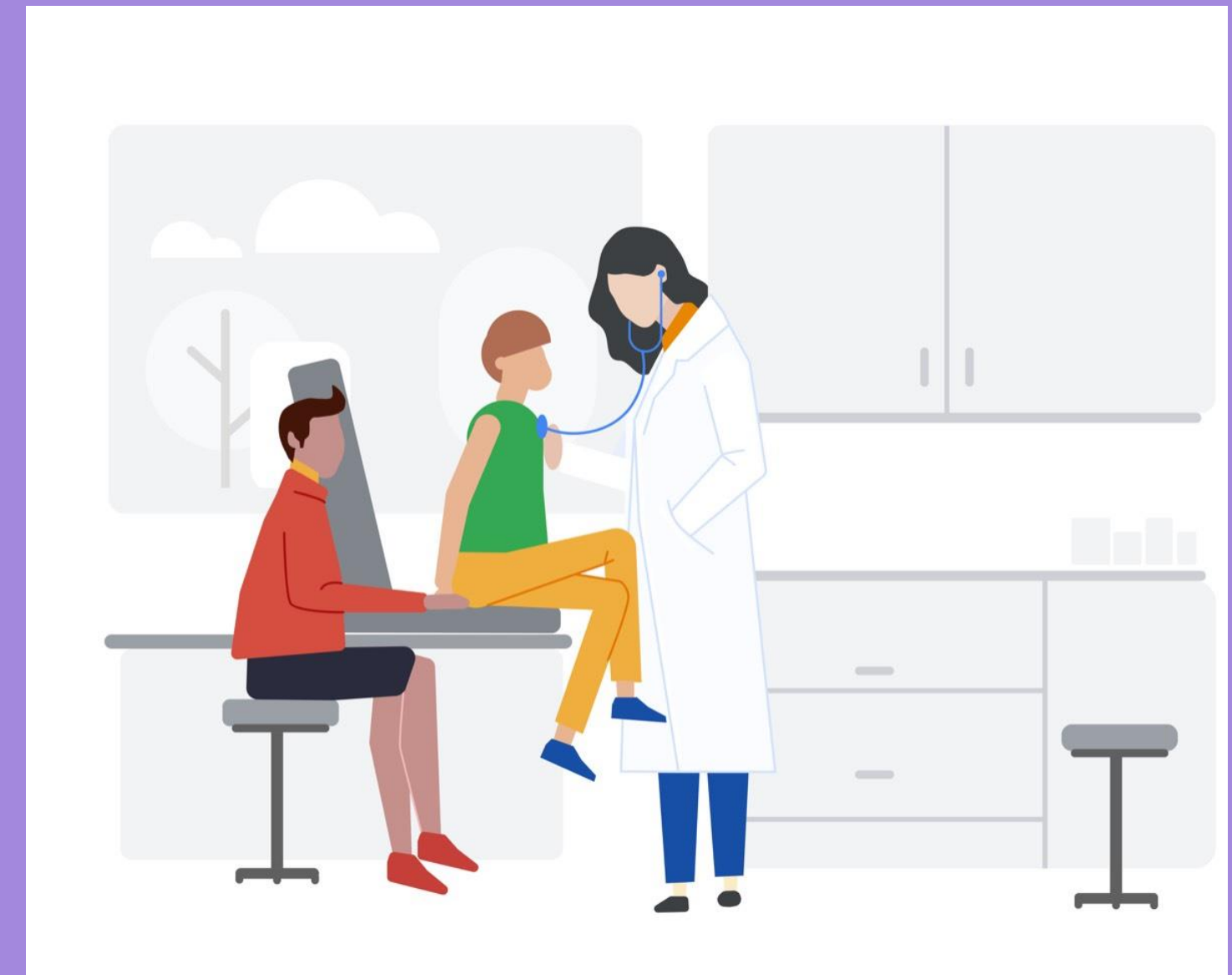
- Structural / specific injury
- Non-structural / illness
- Nerve component
- Psych component

****Causes can overlap****



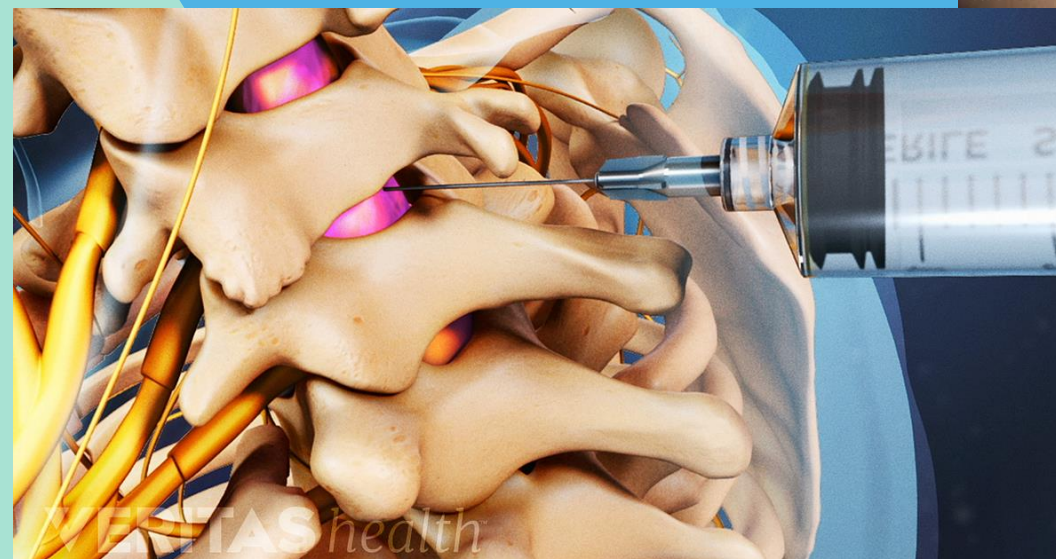
Current Treatments

- Pharmacological / Medications / Injections
- Nutrition modifications
- Physical and Occupational Therapy
- Psychotherapy / Mental Health Counseling
 - Acceptance and Commitment Therapy
 - Cognitive Behavioral Therapy



Pharmacological/Medications/Injections

- NSAIDs
- Opioids
- Muscle Relaxers
- Topical Analgesics
- Anticonvulsants
- Antidepressants
- Sedatives
- Fluoroscopy guided injections
- Trigger point injections



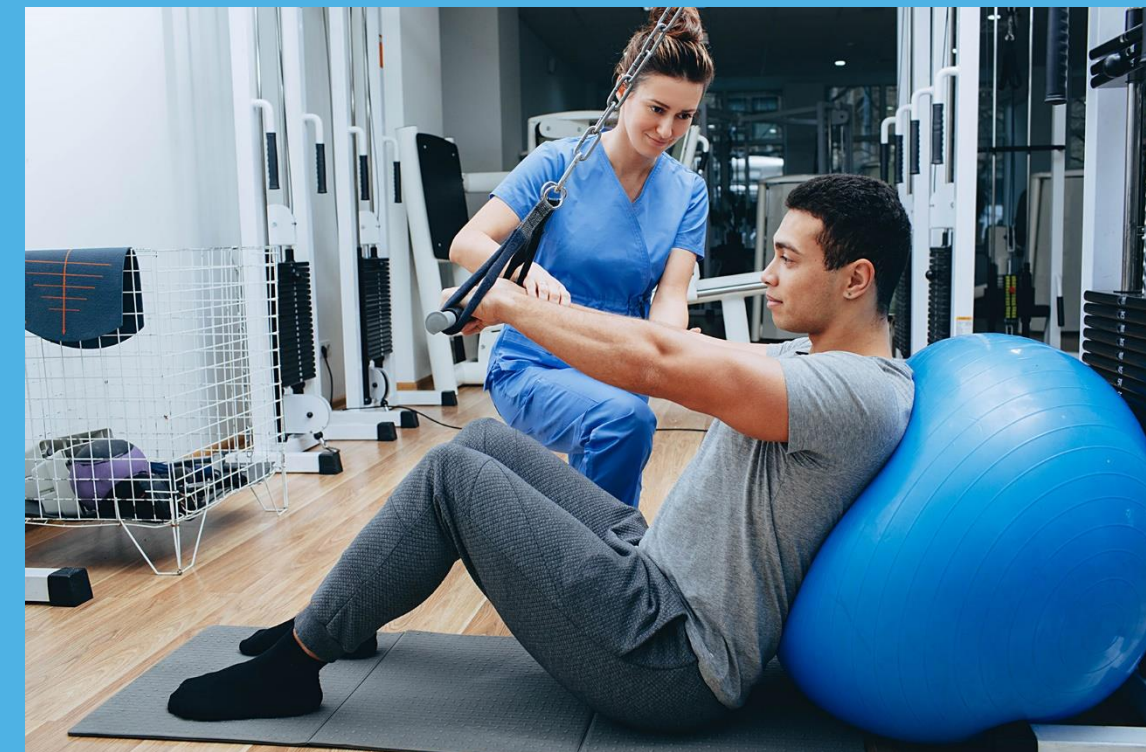
Nutrition Modification

- Chronic pain is association with pro-inflammatory states
- Western Diets cause increased production of pro-inflammatory mediators.
- Dietary modifications can help decrease pro-inflammatory mediators and effect chronic pain in the process.
- Research suggests specific nutrient supplementation may help alleviate pain.
- Gut Microbiome health can affect chronic pain as well.



Physical and Occupational Therapy

- Exercises utilized to address patient's impairments
 - Movement exercises to decrease fear of moving and improve flexibility.
 - Strengthening exercises to improve ability to perform ADLs and functional activities.
 - Balance exercises to increase balance safety during daily activities and decrease falls.
- Pain education to decrease pain focus and improve movement and quality of life.



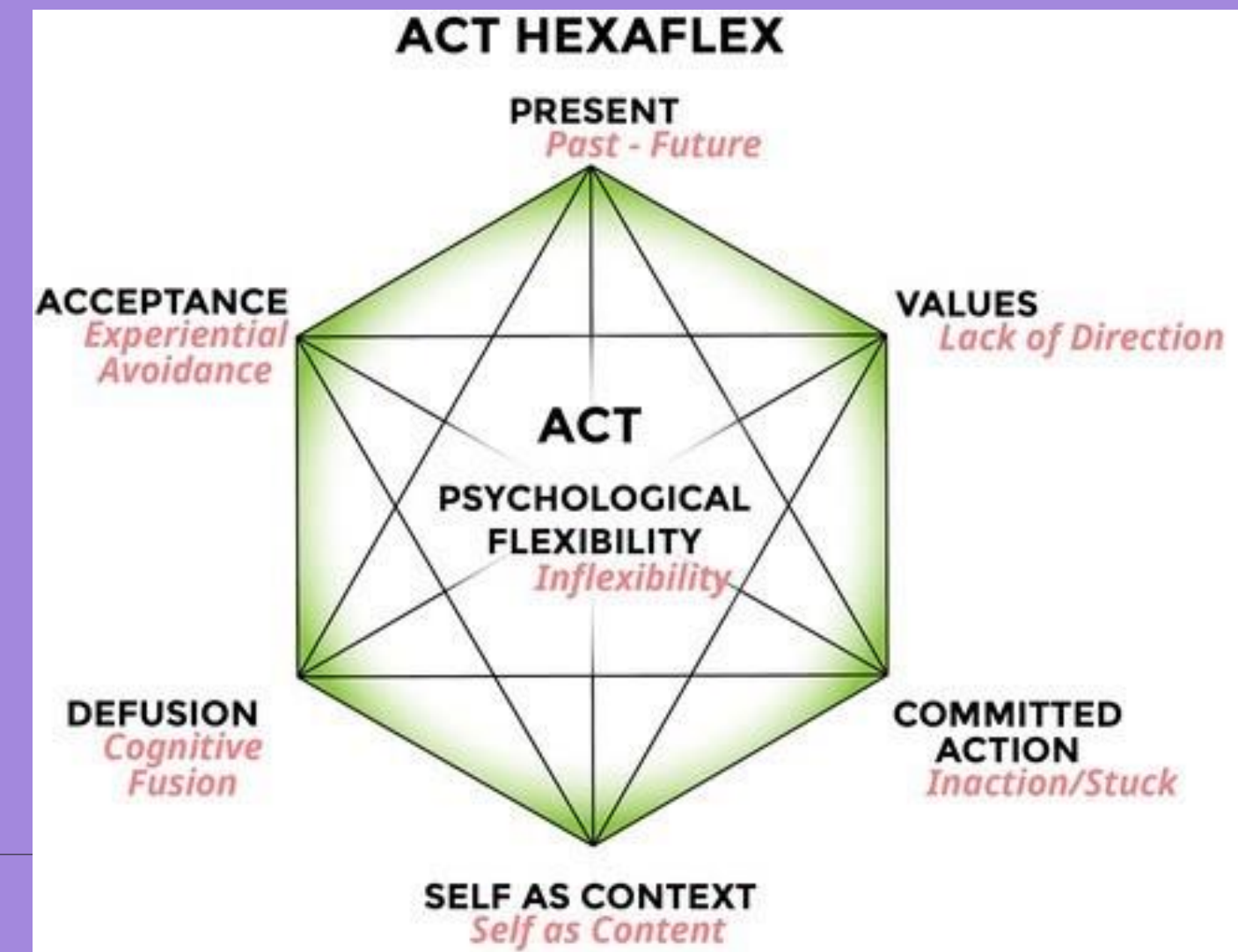
Psychotherapy / Mental Health Counseling

- Treat patient's psychological disorders
- Help change negative behaviors and improve problem solving
- Acceptance and Commitment Therapy (ACT)
- Cognitive Based Therapy (CBT)



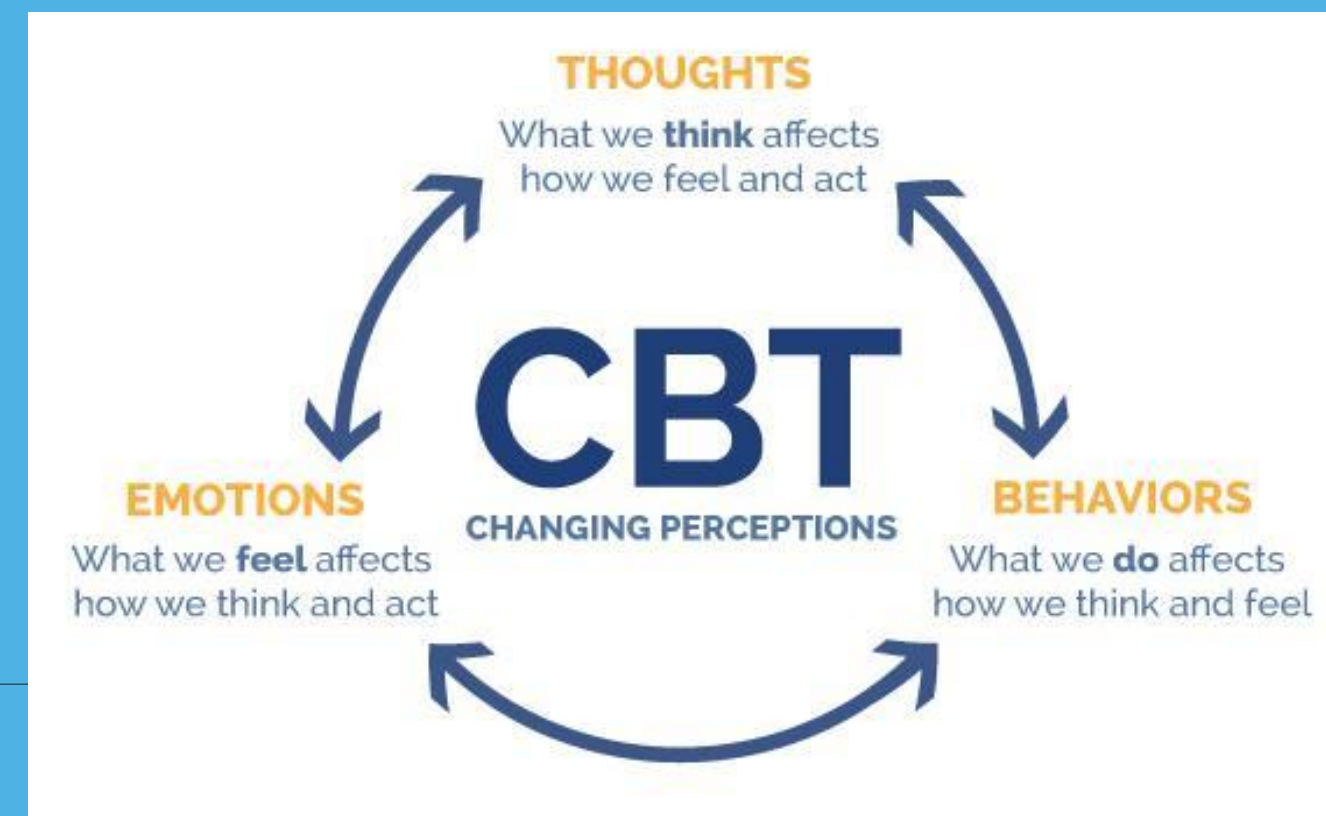
Acceptance and Commitment Therapy

- ACT is a form of psychotherapy that encourages individuals to embrace their thoughts and feelings, rather than fighting or feeling guilty for them.
- Focus Areas:
 - Accept your reactions and be present
 - Choose a valued direction
 - Take action
- Goal: Start to make behavioral changes that affect life situations in positive ways and stop repeating negative thought patterns.



Cognitive Based Therapy

- Focuses on the way a patient thinks about pain and teaches coping mechanisms
- Core Principles:
 - Problems are based on faulty/unhelpful ways of thinking
 - Psychological problems are based on learned pattern of unhelpful behaviors
 - Learn coping mechanisms to improve unhelpful thoughts and behaviors to relieve symptoms and be more effective in their lives.



Alternative Treatments

- **Acupuncture**
- **Aromatherapy**
- **Biofeedback**
- **Hypnotherapy**
- **Mindfulness training**
- **Music / Art / Pet therapy**
- **Meditation or Guided Imagery**
- **Stress reduction**

VR Treatments

- Virtual reality treatments can also help with chronic pain by refocusing the brain's attention away from chronic pain signals.
- It can change the way we think about pain , and to deal with pain more effectively.
- It has become more widely used in conjunction with other treatments – i.e. PT, OT, Counseling



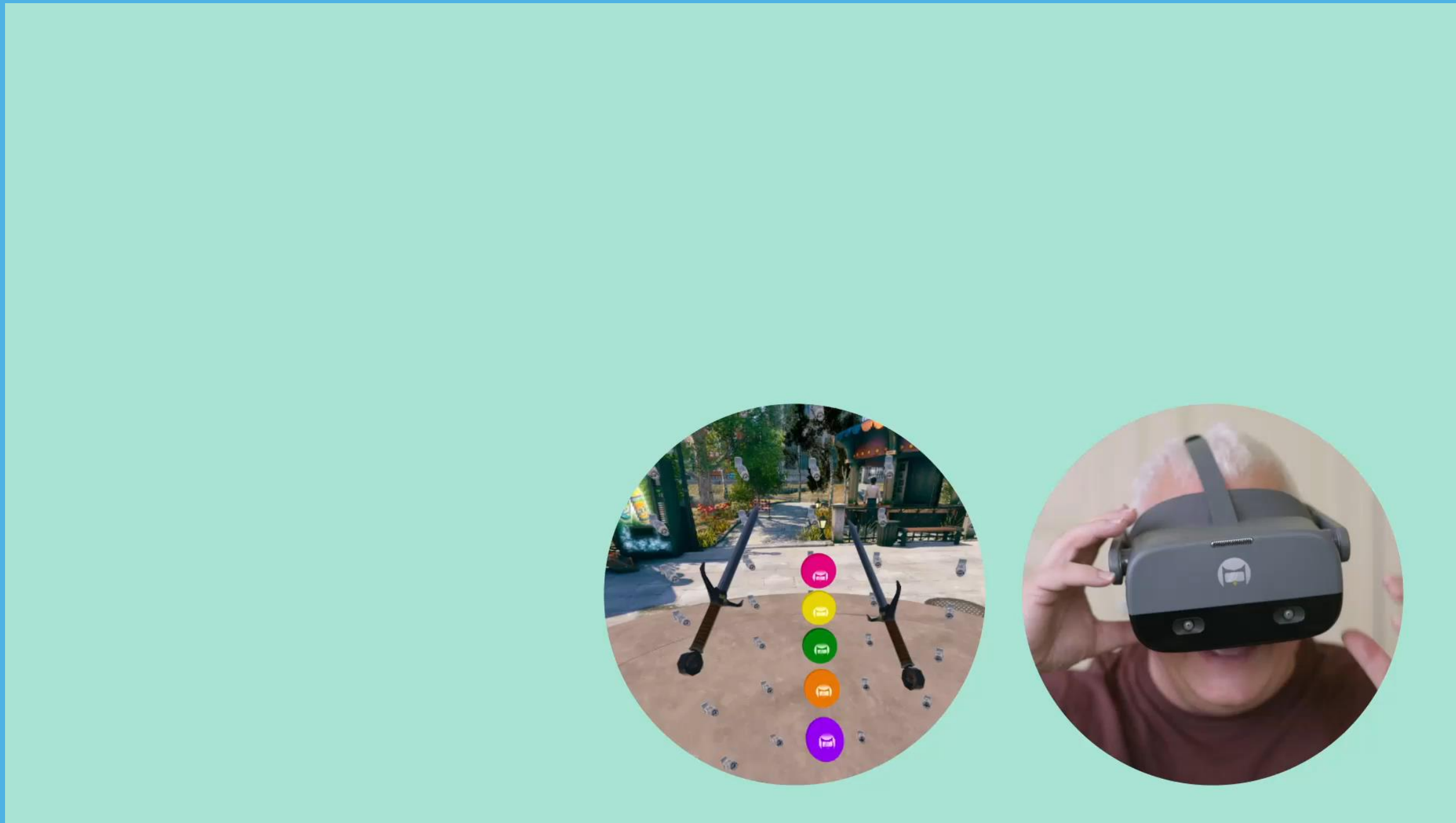
VR Treatments

- Multiple studies have shown reduction of chronic pain with VR interventions.
- Stanford University: 100 patients with CLBP or Fibromyalgia underwent 21-day VR-treatment and found significant reduction in pain outcomes.
- Systematic review showed that VR treatment was effective in treating acute and chronic pain.
- VR treatments are continuing to be researched for long term benefits.



VR Treatments - John's Story

John suffered multiple mini strokes and injuries after a major truck accident.



VR Treatment Applications

- **Reducept**
- **Luna**
- **Relax8**
- **BehaVR**
- **Flowly**
- **EaseVRx**
- **RelieVRx**
- **Pain Relief on Oculus**



Chronic pain is an ongoing epidemic around the world. It is continuously being researched for new and innovative treatments to decrease reliance on opioid medications. Virtual reality applications have been shown to be an effective new tool to decrease pain in conjunction with other therapeutic treatments, but continues to be researched to show the extent it can benefit patients.



XRHealth Patient Testimonials

“After 3 weeks of therapy following a lateral meniscectomy, my knee **pain has gone from an 8 to a 2!**”

“The XRHealth program was life changing. Previously, **I was in pain every day**, but through the VR training and traditional physical therapy, **I’m in a much better place now.**”

“I have **learned how to manage pain** (through paced breathing via the VR Luna app), but more importantly, I have **learned how to move my body and mitigate pain, even prevent it.**”

“I have **IC and Fibromyalgia, which causes me a great deal of pain. I take meds** and tried different ones to help, also have an Interstim in my back too. One of my doctors recommended XRHealth, and I was able to try. **It is a miracle device. Going on my second month and my pain in my neck, shoulders, back has decreased.**”

“I have **cancer and tumors on my spine and ribs cause considerable pain** and even after radiation and surgery I was unable to do many things. I am very pleased with the care I received. While I'm not sure I will ever be completely pain free, my level of **pain has gone from an average of 7 down to 2.**”

“This has helped me so much in my life. **My pain has diminished to almost nothing** and I can exercise again.”

Thank You!



Resources:

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