Benefits of Exercise for Chronic Pain

Handout for Treatment Session #5

Home Education Program

1. Watch Dr. Kathleen Sluka
    a. https://uihc.org/health-topics/exercise-treat-chronic-pain
2. Review handout and take online quiz
3. Answer questions on handout/online
4. Complete exercise log

How do cells in the brain contribute to chronic pain?

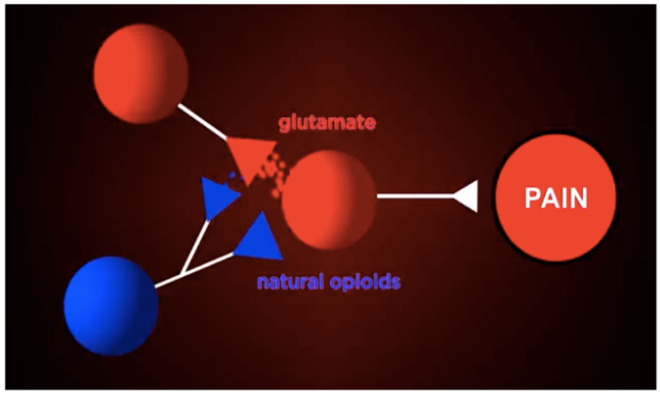
- Cells in the brain are called neurons and they can turn on pain OR turn off pain. When you don't feel pain there is a balance between neurons that "turn on" and "turn off" pain.

- With chronic pain there is more activity in cells that "turn on" pain that release chemicals such as neurotransmitter glutamate (**Figure 1**)

- With chronic pain there is less activity in cells that "turn off" pain and release chemicals such as natural opioids (**Figure 1**)

- These changes in the nervous system are **NOT** permanent and there are ways to restore balance and relieve pain.

Figure 1. With chronic pain there is an imbalance between cells that "turn on" and "turn off" pain. *Reproduced from Exercise to treat chronic pain.*



How do cells in the immune system contribute to chronic pain?

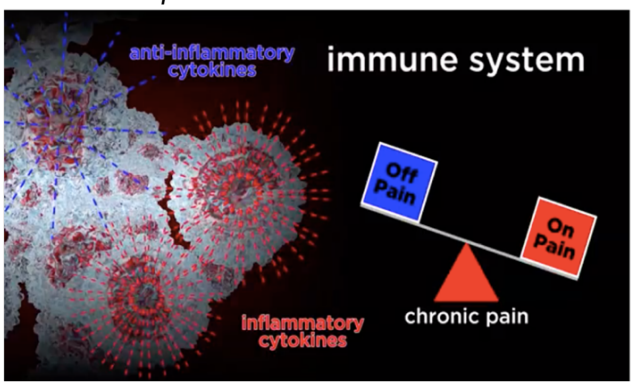
- Chronic pain is also associated with change in the body's **immune system**, or your defense against infection and sickness. **Figure 2.**

- Like the nervous system, a balance in chemicals impacts pain.

- The chemicals that assist with decreasing pain are called **anti-inflammatory cytokines** and the chemicals that increase pain are called **inflammatory cytokines**.

- Again, like the nervous system, these changes are not forever, and a simple way to assist your body with restoring a balance is through exercise.

Figure 2. With chronic pain there is an imbalance between cells that "turn on" and "turn off" pain. *Reproduced from Exercise to treat chronic pain.*



Benefits of Exercise for Pain

- Exercise reduces pain in many ways:
  - Decreases activity of neurons that turn on pain and reduces chemicals that turn on pain
  - Increases activity of neurons that turn off pain and increases the release of chemicals such as natural opioids and serotonin to decreases pain
  - Decreases inflammatory cytokines and increases the anti-inflammatory cytokines in the immune system
  - Anti-inflammatory cytokines also promote tissue healing

Exercise Intensity

- The intensity at which you exercise is an important concept as you do not want to create flare-ups of your symptoms. Flare-ups of your pain tell you that you've completed too much at that time and your tissues were not ready. **It does not mean you have injured yourself.**
- Exercising into pain, or avoiding activities all together which cause pain are not beneficial. Instead, over time, if you complete exercise with respect to your symptoms, and understand your tissue tolerance, you will be able to gradually increase your level of activity and return to things you once were unable to complete.

Physical Activity Guidelines for Adults

- The Department of Health and Human Services has developed the following physical activity guidelines for Americans:

    - Adults should move more and sit less throughout the day. **Some physical activity is better than none.** Adults who sit less and do any amount of moderate-to-vigorous physical activity gain some health benefits.

    - For substantial health benefits, adults should do at least 150 minutes (2 hours and 30 minutes) to 300 minutes (5 hours) a week of moderate-intensity, OR 75 minutes (1 hour and 15 minutes) to 150 minutes (2 hours and 30 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity. Preferably, **aerobic activity should be spread throughout the week**.

    - **Additional health benefits are gained by engaging in physical activity beyond the equivalent of 300 minutes (5 hours) of moderate-intensity physical activity a week**.

    - Adults should also do **muscle-strengthening activities** of moderate or greater intensity and that involve all major muscle groups on **2 or more days a week**, as these activities provide additional health benefits.

- In summary, **adults should exercise 5 days per week for at least 30 minutes per day** depending on exercise intensity.

Individualizing Exercise Goals

Step 1: *Reflect on how you used to be*
Name an important activity that you used to do a lot prior to having Achilles tendinopathy: _____

- For how long could you do that activity without pain? _____

Step 2: *Respect your current tissue tolerance*
Tissue tolerance = Activity level that can damage tissues.

When you push too hard or too fast, then you might injure the Achilles tendon. You (and your tendon) may not be quite as strong as you once were due to a variety of factors

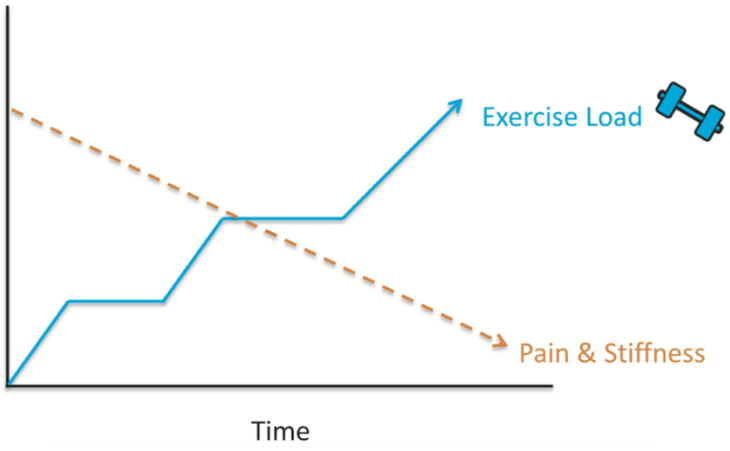
Factors that may slightly lower your tissue tolerance:

- Lower activity level
- Poor quality sleep
- Aging
- Medications
- Diet

Step 3: *Identify at what activity level you protect with pain*
Protect with pain = Activity level that first starts to cause discomfort/pain

Your brain will protect you with pain before you reach the tissue tolerance level, making it safe for you to gradually increase activity while respecting your pain.

Step 4: Plan your goals
Once you have established your "protect with pain" and your "tissue tolerance" activity levels, then you can start to set goals in between these points. As your tendon gets stronger and stronger these respective activity levels will get higher and higher.



Resources

- ***Physical Activity Guidelines for Americans | HHS.gov.***
  https://www.hhs.gov/fitness/be-active/physical-activity-guidelines-for-americans

Review Questions

Multiple Choice Questions:

1. When there is a balance in activity between neurons that "turn on" pain and neurons that "turn off pain" then you experience
    a. Higher pain
    b. No pain
    c. Lower pain
    d. No sensation at all

2. What is the name of the substances that are transmitted from nerve to nerve to help increase or decrease pain in the body?
    a. Neurotransmitters
    b. Nerve cells
    c. Immune cells

3. The way in which exercise assists with decreasing pain include all of the following except
    a. Normalizing processing of pain signals
    b. Promoting chemical release to turn off pain
    c. Healing tissues that are injured
    d. Turning off your brain's perception of pain

4. The minimum duration of exercise recommended 5 times per week by the US Department of Health & Human Services is how long??
    a. 30 minutes
    b. 60 minutes
    c. 15 minutes
    d. None

5. Please list a few examples of simple ways you can increase your overall activity level without taking too much time out of your day.
    a. _____
    b. _____
    c. _____

Short response questions:

My activity goal:

How much (time, number, etc) would it take to really flare me up?

How much (time, number, etc) does it take to hurt me now?

My goal (activity and amount) for this week is:

My goal (activity and amount) for weeks 7-8 is:

My goal (activity and amount) for weeks 9-10 is:

My goal (activity and amount) for weeks 11-12 is:

Home Exercise Program

Your goals for home exercise until your next visit include:

- Isometrics: _____
- Heel-lifts: _____
- Spring-phase: _____
- Other: _____

Day 1
Type of heel raise exercise performed (circle)

- Sitting bilateral
- Body-weight bilaterally
- Body-weight unilateral
- Machine bilaterally
- Machine unilateral

Number of repetitions and sets: _____

Day 2
Type of heel raise exercise performed (circle)

- Sitting bilateral
- Body-weight bilaterally
- Body-weight unilateral
- Machine bilaterally
- Machine unilateral

Number of repetitions and sets: _____

Day 3
Type of heel raise exercise performed (circle)

- Sitting bilateral
- Body-weight bilaterally
- Body-weight unilateral
- Machine bilaterally
- Machine unilateral

Number of repetitions and sets: _____

Day 4
Type of heel raise exercise performed (circle)

- Sitting bilateral
- Body-weight bilaterally
- Body-weight unilateral
- Machine bilaterally
- Machine unilateral

Number of repetitions and sets: _____

Day 5
Type of heel raise exercise performed (circle)
- Sitting bilateral
- Body-weight bilaterally
- Body-weight unilateral
- Machine bilaterally
- Machine unilateral

Number of repetitions and sets: _____

Day 6
Type of heel raise exercise performed (circle)
- Sitting bilateral
- Body-weight bilaterally
- Body-weight unilateral
- Machine bilaterally
- Machine unilateral

Number of repetitions and sets: _____

Day 7
Type of heel raise exercise performed (circle)
- Sitting bilateral
- Body-weight bilaterally
- Body-weight unilateral
- Machine bilaterally
- Machine unilateral

Number of repetitions and sets: _____