The Effectiveness of Movement to Prevent and Relieve Chronic Pain

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Pain Modulation

There is increasing evidence regarding pathological pain states that are associated with changes in the brain itself. Heinricher M.M. (2016) states “Although teasing out individual links in a recurrent network is never straightforward, it is imperative that understanding of pain modulation be fully integrated into how we think about pain.”

The elevated emotional and cognitive load that is imposed by pain, suggest that tissue damage is associated with a high priority, autonomic pathway. This sensory pathway is capable of resisting any distractions to limit further injury and enhance tissue healing behaviours.

Regardless of nociceptive transmission, the relationship between pain and tissue damage is complex. Heinricher M.M. (2016) identifies the brainstem pain-modulating system to be composed of the periaqueductal gray (PAG) and the rostral ventromedial medulla (RVM). Both circuits are located in the midbrain therefore, it is well positioned anatomically to alter emotional and cognitive effects through the spinal nociceptive processes. The periaqueductal gray receives input from the forebrain implicating stress, arousal, attention, mood and pass this information along to the rostral ventromedial medulla. RVM also receives some information from the central nucleus of the amygdala, insula and hypothalamus, which is then projected to the dorsal horn of the spinal cord.

However, the PAG-RVM system should not be referred to as the pain modulating center, because these same brain regions also regulate other physiological factors such as heart rate, body temperature, respiration and reproduction.

Rostral ventromedial medulla is known as a dynamic system with physiological changes and functions in chronic pain models. During an acute injury the RVM is associated with a strong, sustained activation mediating a hyperalgesia effect. During a chronic injury the situation is much more complex. Unlike during acute inflammation, the RVM does not rebalance output signals during persistent pain. Despite descending pathways regulating the nociceptive processing, the modulatory pathways are closely intertwined with ascending pathways through positive and negative feedback loops.

ACUTE VS. CHRONIC PAIN

Chronic pain is a global public health concern. World Health Organization and the Centers for Disease Control and Prevention suggest that sedentary behaviour is a leading modifiable risk factor for noncommunicable diseases and death across the world. A national representative study concluded that frequent activity is a significant method to prevent chronic disease with the ability to reduce symptoms and slow disease progression.

The International Association for the Study of Pain explains that pain is “an unpleasant sensory and emotional experience, associated with actual or potential tissue damage…”. Pain is experienced among a variety of humans and because of this, the discussion between acute and chronic pain is difficult as it may differ among the individual.

Understanding the difference between acute and chronic pain is essential for both healthcare professionals and patients. The ability to accurately compare and contrast the two will result in the best treatment outcomes. In addition to pain modulation, to better understand acute and chronic pain it is important to note three things:

1. The brain processes pain.
2. Pain is produced as a protective mechanism.
3. Pain systems become hypersensitive, the longer we experience uncontrolled pain.

Scientific information regarding pain states that we can describe acute pain as a protective mechanism. Allowing us to form appropriate decisions and actions that will avoid reinjury and aid our tissues to heal as quickly as possible. Through this autonomic response the body produces a state whereby physiological processes are in full effect to create a positive adaptation to the pain and to promote healing. Fortunately, acute pain often will resolve itself in three days to twelve weeks with or without treatment.

If pain and symptoms persist for longer than three months to a year, the condition is considered chronic. Chronic pain is a maladaptive response of protective mechanisms. In other words, it is no longer protecting us from danger. The constant protective actions of the individual and autonomic physiological responses limit the recovery due to a constant state of stress and hypersensitivity.

In a typical situation, as time progresses the pain systems will adapt by becoming less responsive to the signals from injured tissues. Unfortunately, this beneficial adjustment does not occur in chronic pain. Therefore, as time progresses, the pain systems become hypersensitive and hyperresponsive causing the body to produce intense unremitting pain. Based on our knowledge of pain neuroscience, biopsychological perspective, and neuroplasticity; individuals who experience chronic pain, typically require treatment and guidance from a specialized healthcare team in order to rehabilitate effectively.

EXERCISE

Physical activity is consistently shown to be beneficial for overall health including but not limited to chronic pain, physical function, sleep, cognitive function and disease risk modification. For most chronic pain patients, the goal of participating in physical activity is to reduce pain. Healthcare practitioners should consider different types of physical activity to satisfy the demands of the individual without exacerbating their symptoms. Exercise approaches and considerations for the management of chronic pain conditions are discussed below.

Aerobic exercise
Aerobic exercise includes walking, cycling and swimming. Aerobic exercise as a treatment for chronic pain has been studied for many years. Researchers have concluded the outcomes achieved based on the intensity of the exercise. For the intent of these statistics, we refer to intensity as the amount of energy expended and does not suggest joint loading. Studies concluded that low to moderate intensity exercise tends to enhance symptoms from chronic pain conditions. While moderate to high intensity exercise is also shown to be beneficial for those who can tolerate this level of intensity.

Strength training
Strength training can be performed using free weights, resistance bands, machines, and against one’s own body weight. Recent studies confidently conclude that strength training is both safe and effective for a variety of chronic pain conditions. In addition to strength gain, the quality of life and emotional condition of patients improve.

Flexibility training
Flexibility training consists of different exercises to improve joint range of motion. It is often included in conjunction with strength training or aerobic exercise. However, flexibility training alone has been shown to be especially beneficial for managing chronic pain with a greater emotional impact.

Movement therapies
Movement therapies include yoga and Tai Chi. A lower intensity movement that has gained momentum in improving chronic pain. This type of movement in particular, consists of many other benefits including balance, mobility, joint flexibility, depression and anxiety.

Exercise is an important part of the "use it or lose it" theory of overall musculoskeletal health. Chronic pain patients are particularly susceptible to suffering from the ill effects of too little movement. If it hurts when you move, and is less uncomfortable when you don't, then you have the perfect incentive to become less active as time progresses. Although this may seem like a logical answer, it is almost certain that avoiding physical activity will make the pain become even worse over time. This knowledge comes from experienced physicians that have prescribed bed rest and inactivity. Over time they concluded that this was of no benefit and only lead to a more aggravated situation that was more difficult to treat in the long run.

We now know that if you want to relieve the physical pain of many types of chronic pain while also making yourself stronger both mentally and physically, you need to get moving. A commitment to a physical conditioning program that is approved by your doctor is important to everyone, but it is especially important to those experiencing chronic pain. Chronic pain is often described as a "psychobiological" problem, meaning that it includes both physical and psychological components. Exercise can help treat both parts of this problem, by providing a healthy means of relieving some of the frustration and sense of helplessness associated with pain, in addition to treating the problem.

TREATMENT OUTCOMES

As previously mentioned, the goal of physical activity for the majority of chronic pain patients is to reduce pain. Combining physical activity with other non-pharmaceutical modalities, such as cognitive behavioral therapy may be an effective clinical strategy for pain reduction. While improvements are often rapid, benefits are still remarkable after long-term follow up. Individualized programming and guidance show a greater success for chronic pain patients since their abilities, limitations, goals and lifestyle vary. Regardless, daily activity is highly encouraged even if it is low intensity and/or of short duration.

Unfortunately, when people develop pain, they have a tendency to want to avoid all types of exercise and become more sedentary rather than more active. Periods of acute flare up are typically temporary in their nature and often can be avoided with proper guidance and patient education. Avoiding exercise during acute symptom flares may be tempting, but sedentary behaviour may not reduce symptoms and may promote loss of strength, reduced range of motion, and physical limitations. To promote ongoing movement and a lifestyle change consider the following when creating a program:

1. Safety precautions
2. Proper posture and biomechanics
3. Good execution of exercise
4. Slow and steady progression to avoid overdoing it

Scientific literature recognizes many benefits of combining movement for pain management. Reassuring the patient that some pain with movement is okay and does not necessarily mean you are doing harm. Continuous movement will allow patients to remain active as the aging process occurs. It is shown to be excellent for general well-being and brain health. Sleep disturbances and fatigue are common symptoms for individuals with chronic pain conditions. Activity aids to manage sleep patterns, and therefore elevate mood and decrease stress levels. Improvement is also noted in the body’s ability to fight against harmful substances by recognizing and responding to antigens.

Prescribing a lifetime of activity to chronic pain patients for the improvement of pain levels, physical function, and quality of life is considered to be a representation of the art and science of medicine.

PREVENTING RE-INJURY

To prevent re-injury and hopefully avoid any recurrence of acute pain—it's important to build and maintain the strength and flexibility of the muscles, tendons and ligaments that support your body. This can be accomplished through:

Exercise

- Regular exercises that are within the interest and limitations of the individual. This can vary from low, moderate and high intensity.
- Exercises that are of low impact and easy on the joints include walking, swimming and bicycling.
- Strength and conditioning training, yoga as well as balance and agility are all different types of movement.
- If exercising outdoors is not option, consider using a treadmill or elliptical. These can be found at almost any exercise facility, or you can buy a home version at your local sporting goods store.
- Core strengthening exercises. By conditioning your abdominal you can develop a good support for the spine.

A Healthy Lifestyle

- Eat a nutrient-rich, balanced diet, with sufficient intake of Calcium, Vitamin D and Phosphorus.
- Avoid smoking and excessive alcohol use.
- Maintain a healthy weight— additional pounds may place excess strain on a variety of joints throughout the body.
- Stay hydrated. The body is 70% water, sufficient hydration contributes to many functions throughout the body. Water is used to dissolve and transport substances, helps to begin chemical reactions, lubricates our tissues, regulates body temperature and provides minerals.

Body Mechanics

When Standing

- Place feet shoulder width apart, keep a slight bend in your knees.
- Avoid arching your lower back or slumping your upper back, shoulders and neck.
- Keep your breastbone up, shoulder blades down.
- Keep your chin level, relax jaw, neck and facial muscles.

When Sitting

- Rest your feet on floor with knees and hips bent 90 degrees.

- Maintain the neutral curvature in your neck and spine.
- Keep your breastbone up, shoulder blades down.
- Keep your chin level, relax jaw, neck and facial muscles.

When Driving

- Adjust your seat so that the back is vertical. Your back should be supported by the seat. back and your head should rest against headrest with your chin level.
- Knees should be bent, and at least at the same height as your hips.
- Elbows should be slightly bent and relaxed, with your shoulders down.

When Sleeping

- Use a firm mattress.
- Lie on your back or side.
- When lying on the side, a pillow between the knees helps maintain a neutral spine.
- Use a cervical roll to support the natural curves in your neck or low back.

DISCIPLINE AND MOTIVATION

When getting started with exercise understand that you are responsible for your pain management. Daily exercise and movement are required for the rehabilitation process. Most people who start a regular exercise program give it up after a short period of time. Every situation is different as to why they choose to stop exercising regularly. However, it often comes down to the same simple reasons. I don't have the time to exercise, the motivation began to disappear, it's easy and comfortable to return to old routines. To ensure you stay on track and keep going, here are a few suggestions:

Create a routine and schedule that is realistic.
Be ready to take on the challenge and understand that some days will be easier than others. Planning ahead by creating a realistic and obtainable schedule is great method to stay organized and focused on your goals.

Find a friend and create common goals.
When your motivation begins to fade, having a partner who can motivate you and drag you along with them can be a great help. This often works best if you both have similar goals in terms of weight loss, healthy eating habits, and exercise goals that you want to achieve. Use the SMART goal setting and write your goals down. Include what you want to achieve, specific dates, how you will accomplish this, and what your reward will be upon reaching the desired goals.

Hire a personal training coach.
Personal trainers are very popular, the primary reason is because they will hold you accountable, provide you with endless amounts of encouragement, and everything with regards to exercise is scheduled for you. They may be intimidating at first, however they can be an incredible resource for you and your goals. Find one that you connect with, pay a couple months up front - you will be truly amazed with your progress, hard work and dedication.

Starting a regular paced activity is important for improving pain and quality of life. Muscle soreness is very common, typically lasting 24-48 hours and often reduces as your muscles become more accustom to exercise. This may cause an increase in body stiffness, soreness or pain.

Remember pain varies from each individual, so to ensure successful results of treatment and management aim to incorporate a combination of the following: listen to your body, pace yourself, approach pain, incorporate exercises and movements that you enjoy. Most importantly optimize your recovery through nutrition and adequate sleep. Become committed and continue to work towards your goals to move often and maintain activity.

OSTEOPATHY TREATMENT

Osteopathy is a branch of medicine that emphasizes on detecting, treating and preventing medical disorders through manual manipulation of the nervous system, bones, joints, ligaments and muscles. The Manual Osteopathy approach to treating chronic pain is outstanding from any other healthcare profession. Through manual medicine an Osteopath lays its main emphasis on the structural and functional integrity of the musculoskeletal system. Through the use of a variety of non-invasive, gentle hands-on techniques integrated with exercise, dietary and occupational advice they set their patients up for the best possible success.

A randomized controlled trial study shows that osteopathy manual treatment is effective in relieving low back pain. Especially when it is used to complement other co-treatments, such as an exercise program. A research study was conducted to determine the effectiveness of manual osteopathy. It consisted of adults aged 21- 69 years old, who were all properly screened to exclude individuals with a higher probability of lumbar radiculopathy. Individuals who noted a moderate to significant pain reduction also decreased their use of medication. The patients who receive manual osteopathy treatment in this study reported being very satisfied with their care. Scientific results continue to show the efficacy and safety of manual osteopathy treatment in relieving chronic pain.

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