The Role of Exercise in Pain Management
Pan Am Pain Clinic
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Outline
- Definition of pain
- Acute Vs. Chronic Pain
- Fear of Injury/Harm
- Why Exercise?
- Types of Exercise
- Exercise Guidelines
- Pacing Your Activities
- Posture and Body Mechanics

What is PAIN?
- The International Association for the Study of Pain defines Pain as:
  - "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage."
- Pain does NOT = damage
- Pain protects you – alerts you of danger

Acute versus Chronic Pain
- Acute pain is a reliable indicator of the severity of the threat/injury occurring
- Chronic pain: Pain alarm continues to sound although harm has passed
- The more the alarm sounds, the easier it is to trigger
  - Malfunction of the pain system itself (nervous system)
  - Nerve fibers easier to stimulate
  - Normal pain threshold has dropped

Chronic Pain
- Used to be defined as pain that has lasted > 6 months
- Now chronic pain is defined as pain that has persisted longer than the normal course of time associated with a particular type of injury
- Example: soft tissues such as ligaments and muscles takes about 6 weeks to heal
Sensitized Nervous System

- Enlargement of pain pathways in spinal cord
- Spinal cord amplifies pain - converts normal sensation of movement/touch/pressure to pain
- No actual damage but the brain perceives that it may!
- Brain becomes much more aware and sensitive in hearing pain messages
- Brain feels pain based on potential threat value based on beliefs, memories and past experiences
- Chronic pain is an overprotective, learned response
- Neurotag - pattern of activity that creates perception of pain

What does Nerve Sensitization Pain Feel Like?

- Pins and needles
- Burning pain
- Increased pain by small movements e.g. slight bending
- Increased pain by sustained postures e.g. sitting, lying
- Increased by no particular reason e.g. unpredictable zaps
- Trivial incidences cause flare-ups e.g. getting out of car
- Pain is increased by stress and anxiety
- Pain gradually spreads, even to opposite side
- Pain may move around the body
- Night pain

What Can You Do?

- Good news: you can modify/unlearn these overprotective patterns
- Gradual stimulation is the key (gradual activity/movement) – slowly teaches the nervous system not to overreact
- Start a gentle but progressive exercise program
- Studies have shown that patients who learn to actively cope with, and not fear pain, have better recovery than those who passively cope with pain

But the last time I exercised....

- My pain got worse
- I was too tired to do anything else
- It didn’t help
- Fear of re-injury causes you to avoid exercise

Fear of Injury

- Increased pain does not necessarily equal tissue injury in Chronic Pain
- Do Not Ignore Pain
- Do Not Always Listen to Your Pain
- Do Understand Pain and Do Not Fear Pain - Accept that persistent pain is often a result of the physiological changes in the nerves, spinal cord and brain, in order to protect you
- Slowly Pace Yourself Back to Activity
### Why Exercise?
- "Motion is lotion"—joints, spinal discs thrive on regular movement and reasonable compression
- By not moving you place yourself at more risk of re-injury
- Includes Activities of Daily Living
- Balancing Act

### Exercise and Chronic Pain

### Side Effects of Inactivity
- Loss of bone and muscle mass
- Muscle stiffness, shortening
- Loss of joint flexibility
- Increased pain with movement
- Loss of activity tolerance, decreased energy
- Depressed mood
- Impaired sleep

### Benefits of Regular Exercise
#### Decreased Risk Of:
- Obesity
- Diabetes
- Heart disease
- Hypertension/Stroke
- Osteoporosis

### Benefits of Regular Exercise
- Improved cardiovascular fitness
- Improved strength and muscular endurance
- Greater lean body mass and less body fat
- Reduction in pain (endorphins)
- Reduced anxiety, depression
- Improved sleep

### Types of Exercises
- Aerobic (cardiovascular exercise)
- Muscular strength and endurance
- Flexibility—stretches
Aerobic (Cardiovascular) Exercise

- Aerobic means in the presence of oxygen
- Activity that helps to improve blood flow and oxygen to all tissues (muscles, bones, and ligaments)
- Exercise for the heart and lungs
- Requires the use of the larger muscle groups (legs, arms) in a continuous, rhythmic motion.
- Choose low impact activities such as walking, swimming, cycling, or aquasize.

Muscle Strength and Endurance

- Strength: the ability to do work
- Endurance: the ability to do work for long periods of time
- Strength and endurance increase with resisted exercise
- Weight/Resistance training - using free weights, machines, stretchy bands, household items, or body weight
- Tasks around the home and yard

Benefits of Strengthening

- Develops bracing action - increased support and protection of joints
- Makes daily activities easier
- Muscles become less prone to trauma, meaning less pain

Flexibility

- Stretching: Lengthening of muscles in order to increase muscle flexibility and/or joint range of motion
- Benefits:
  - Decreases pain by relieving pressure throughout the muscle as well as on your joints and nerves
  - Increases blood supply to muscles and nutrients to joints
  - Improves balance and coordination, overall functioning
  - Prevents post exercise muscle soreness; decreases risk of injury
  - Relieves Stress

Flexibility - How to Stretch

- Do gentle warm up first
- Proper stretches are done in a slow controlled fashion, there should be no bouncing!
- Stretch to the point of mild tension, hold 30 seconds; repeat 3 times
- Remember to breathe throughout the stretch!!
Neck stretch

Guidelines for Activity

- Frequency (How many times per week)
- Intensity
- Time (Duration of the activity)
- Type of activity
- Discuss individualized guidelines with a doctor or physiotherapist

Frequency

- Stretching: Daily, before and after exercise or other physically demanding activities
- Strength: 2-3 times/week with at least 1 day of rest between workouts
- Aerobic Exercise: Canadian Physical Activity Guidelines - 150 minutes of moderate exercise per week, in bouts of 10 minutes or more
- Examples of moderate intensity activities: brisk walking, biking, swimming, mowing the grass, heavy yard work, dancing, exercise machines such as elliptical, stationary bike or treadmill, sports, Tai Chi, Yoga

Intensity

- How hard should you go at it?
  - Aerobic Exercise: low to moderate intensity
  - Moderate Intensity: You breathe a little harder, heart beats a little faster, sweat a little
  - Heart rate max: 220 – your age (50-70% of HRM)
  - Rating of Perceived Exertion Scale
  - Talk Test: should be able to carry on a conversation while exercising
  - Strengthening: use a resistance level that allows you to do 8-12 repetitions comfortably

Rating of Perceived Exertion Scale

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Time: How Long?

- Find your “easy activity” level
- Gradually increase time
- If starting at less than 5 min., try 2-4 times a day
- Keep a daily log of exercises and chart the progress
Sample Progressive Program

Day 1 - Walk 3 minutes (easy activity)
Day 2 - Walk 3 minutes and climb up/down 2 steps
Day 3 - Walk 4 minutes and climb up/down 3 steps
Day 4 - Walk 5 minutes and climb up/down 4 steps
Day 5 - Walk 5 minutes and climb up/down 5 steps
Day 30 - Walk 30 min. and climb up/down 30 steps
Day 60 - Walk 60 min. and climb up/down 60 steps

Consensus

■ Symptoms vary day to day
■ Low to moderate intensity exercise is better tolerated than exercise of higher intensity
■ Brief exercise is better tolerated than prolonged durations
■ Intermittent sessions are better than continuous bouts

Pain with Exercise

■ Increased activity will often increase aches and pains but this is temporary and will improve with continued activity.
■ Don’t ignore pain…appreciate that the pain exists, but that it is a false alarm
■ 2 Hour Pain Rule
  Modify your exercise program by reducing the frequency (days per week) or duration (amount of time each session) until pain improves.
  Change the type of exercise to reduce impact on the joints – for example switch from walking to water aerobics.
  Do proper warm-up and cool-down before and after exercise.
  Exercise at a comfortable pace
  Make sure you have good fitting, comfortable shoes.

Exercise Tips

■ Make exercise a part of your day – Routine is important
■ Limit “Screen Time”
■ Join a club or team; exercise in a group or with a friend
■ Set short and long term goals
■ Every step counts!
■ If your exercise is comfortable and enjoyable, it will be easier to keep up with.

Exercise Resources

■ Canada’s Physical Activity Guide
■ Winnipeg in Motion
  www.winnipegimotion.ca
■ Winnipeg Leisure Guide
  www.winnipeg.ca/leisureonline
■ The Arthritis Society
  www.arthritis.ca/manitoba
■ Get Better Together
  sogh.ca/wellness/get-better-together/
Pacing

- Determine your baseline:
  - How long/how much can you do before discomfort starts or increases?
- Stop before you become exhausted
- Set a schedule:
  - How important is the job?
  - Schedule most important jobs first
  - Plan at least one enjoyable activity each day
- Include a plan for good and bad days based on pain levels (0-10)
  - 1-4 exercise as planned; 5-7 decrease amount/intensity; 8-10 gentle stretches/short walk; 10 don't exercise

Pacing (continued)

- BREATHE throughout activities
- Work at an easy, relaxed pace
- Plan work/exercise for times when you feel better
- Plan rest periods throughout the day
- Alternate between light and heavy tasks
- Change positions frequently (use timer)
- Listen to your body

Posture

- Posture is defined as the position in which you hold your body upright against gravity while standing, sitting, or lying down.
- Holding your body in positions where the least strain is placed on the supporting muscles and ligaments.

Importance of Proper Posture

- Keeps bones and joints in correct alignment so that muscles are used properly.
- Decreases stress on the ligaments supporting your joints and also prevents abnormal wearing of joint surfaces.
- Prevents the spine from being fixed in abnormal positions.
- Prevents fatigue.
- Prevents backache and muscle pain.
- Contributes to a good appearance.

Poor Posture

- If one body part is out of alignment, others move out of alignment to balance it.
- This strains muscles, over-stretches ligaments and can damage joint cartilage making you prone to arthritis and injury.
Proper Sitting Posture

- Keep shoulders relaxed.
- Sit with feet flat on the floor.
- Elbows should be at a 90-degree angle.
- Body weight should be distributed evenly.
- Adjust chair height to keep feet flat on the floor.
- Keep knees at a right angle.
- Have back support for lower back.
- No cell phones on the desk.
- Elbows should be lower than shoulders.
- Stomach should be in front of desk.

Postural Exercise

1. Stand up straight.
2. Breathe in.
3. Exhale.

Body Mechanics

- Performing activities correctly in a way that uses the least amount of energy/effort e.g. lifting, pushing, or moving objects.
- Maintaining proper body positioning during movement.
- Using muscles efficiently to prevent muscle pain & joint strain.

Proper Body Mechanics

- Minimize bending and twisting.
- Store heavy and frequently used items at waist height.
- Avoid reaching out over an obstruction to lift, hold or lower an object.
- Change positions, walk and stretch.
Keep your curves!

- The back muscles located along the spine are in their strongest position when the three curves are maintained.
- When you work without keeping the curves (due to poor posture or awkward movements), your muscles can't support the spine as well and the compression on the discs is uneven.
- This increases your risk of back injury, so be sure to maintain the curves in your back when lifting or lowering an object!

Incorrect vs. Correct Lifting

To demonstrate this, think of your back as a lever.

With the fulcrum (hinge) in the center of the lever, how many pounds would it take to lift a ten pound object?

With the fulcrum in the center, it takes 10 pounds to lift the 10-pound object. However, if you shift the fulcrum to one side, it will change... If you think about it, when you bend over to pick something up, your waist acts as the fulcrum point in a lever system; and it is certainly not centered.

When the object is shifted away from the fulcrum, it takes more force to lift the object. In fact, the human back operates on a 10:1 ratio.

Bending over to lift a ten pound object actually puts 100 pounds of pressure on your lower back.

When you add in the 105 pounds of the average human upper torso, you see that lifting a ten pound object actually puts 1,150 pounds of pressure on the lower back.

Is the load height located inside your "safe lifting zone"?

The safe lifting zone is between knees and shoulders.

If the load is below knee level - bend your knees and lift with your legs.

If the load is above your shoulders - use a stool or ladder.

Better yet, rearrange the contents on the shelves so that heavier and more frequently needed items are placed on the mid-level shelves. If it is heavy - get help.
Summary

The following will help to decrease pain & prevent future injury/pain:

- Participating in regular exercise/activity
- Remembering to pace yourself
- Maintaining good posture
- Practicing proper body mechanics

Thank you!

Questions?