The Aging Spine

Functional Strength Training for the Aging Spine

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The Aging Spine

The spine, bones and joints are the frame
Helping aging adults get stronger
Encourage and empower

Attaining improved strength with
Guidance and
Instruction
Now as never before to
Get more functional everyday

Strength
Posture
Independence
New achievements
Exercise is so important!

Common Degenerative Spine Conditions

- Spinal Stenosis
- Spondylosis
- Spondylolisthesis
- Osteoporosis

Spinal Stenosis

- Spinal stenosis occurs when the spinal canal becomes narrow; so narrow that the spinal cord and nerve roots get compressed. Compression leads to increase pain and decrease function.
- The leading cause of spinal stenosis is wear and tear on the spine due to aging. The most common direct cause of spinal stenosis is osteoarthritis, where the cartilage that cushions joints starts to degenerate due to age.

Spinal Stenosis

Excessive movements will increase pain. Land exercises must be completed in neutral position or as close to whatever the client can achieve…as long as they are pain free during exercise.

Individuals with lumbar stenosis tend to be in a flexed posture. Flexion decreases pain…however physiologically speaking, flexion is NOT what these patients need.

Stenosis

With flexion comes a shortening and weakening of the anterior muscles, while the posterior muscles are elongating and weakening as well. Gravity starts playing a role, and what’s left to support the spine? Weak ligaments, definitely not muscles, both anterior and posterior and weakened due to postural changes.

Therapist tend to do single and double knee-to-chest stretches, however that action will continue to perpetuate flexed posture. What they need is strengthening. Spinal extension strengthening exercises!
Stenosis

Once a flexed posture occurs, you can place in a supported prone position to perform all the extension exercises we will see in a bit. Exercising the erector spinae muscles against gravity is essential.

For lumbar stenosis, I love the stability ball, this way the whole trunk is supported in a position of comfort and great extensor work can occur! I specifically like the ones with sand in them, so they don’t roll away.

Spondylosis

Spondylosis, also known as spinal arthritis, is a side effect of aging that most people don’t really want think about. It’s basically degeneration (wear and tear) of the spine. After years of carrying the weight of your body, absorbing shock from movement, and dealing with the demands of daily life, your spine can start to show signs of wear and tear. This is a completely normal aging process. Spondylosis can affect your cervical, thoracic or lumbar spine. Also referred to as degenerative disc disease.

Spondylolisthesis

- Anterior or posterior slipping or displacement of one vertebra or another.
- Pain, accompanied by morning stiffness, located in the lumbar-sacral region, may be severe.
- With time and exercise, this condition can improve.
- Contrary to popular belief, rest does not make it better, whereas, exercise usually eases the pain.

Spondylolisthesis

A sport most at risk for spondylolisthesis is women’s gymnastics. Think about the hyper extension occurring with floor activities and every move ends with hyper extension - or how about with each balance beam activity; how many times are they practicing that in a typical practice?

Repetitive actions are constantly placing unnatural forces on the anterior ligamentous support system.

Wear and tear abuse and misuse over a life time…

Arthritic Changes

Pain and morning stiffness are common complaints regardless of the degenerative changes. Having clients do an array of simple bed ex’s can usually alleviate pain… ankle pumps, glut sets, heel slides…just the basics are enough to increase blood flow and decrease pain.

Sitting for prolonged periods of time may cause pain and other symptoms due to compression on the lumbar vertebrae. Ambulatory exercises work the best for these clients.

Osteoporosis

- Often called the “silent disease” as it depletes bone mass without symptoms and pain.
- Bones become fragile as they deteriorate, particularly the hip, spine, and wrist, but no bone is exempt.
- As bones weaken they can break, without warning.
Typically it is referred to as an "old lady's disease."

However, the bone losing process begins much earlier in life and doesn’t reveal its ugliness until later years.

This debilitating physical change can be prevented with early intervention; as early as starting in the teen years.

The prevalence of osteoporosis is currently estimated to be 7% in white men, 5% in African American men, and 3% in Hispanic American men.

Osteoporosis is not just a women's health issue—are rising rates of osteoporosis among men, which are projected to increase by nearly 50% during the next 15 years, with rates of hip fracture expected to double by 2040.

National Osteoporosis Foundation has recommended that men 70 years of age and older undergo bone mineral density (BMD) testing.

Bone is living, growing, regenerating tissue.

Weight-bearing and resistance exercises place healthy demands on bone, just like muscles.

Active lifestyle improves bone strength, make every step count.

Lack of exercise can contribute to lower bone mass and/or density...use it or lose it.

The World Health Organization established the following guidelines for white post-menopausal women:

- Normal: T-score at -1.0 or above
- Low Bone Mass (Osteopenia): T-score between -1.0 and -2.5
- Osteoporosis: T-score below -2.5

About 85-90% of adult bone mass has been acquired by age 18 in girls and age 20 in boys. Building strong bones during childhood and adolescence can be the best defense against developing osteoporosis later in life.

A balanced diet rich in calcium and vitamin D

Weight-bearing and resistance-training exercises
Osteoporosis Controllable Risk Factors

- Inactive lifestyle
- A diet low in calcium and vitamin D
- Cigarette smoking and excessive alcohol consumption
- Excessive cola (diet) consumption*
- Excessive weight loss leading to amenorrhea.

A Word About Cola’s

* Cola consumption is extremely problematic especially with teen girls. Colas contain phosphoric acid and as with all soft drinks, carbonation; which depletes bone minerals. If young girls are concerned about weight issues, they are drinking diet colas, and NOT drinking calcium fortified beverages…creating a deficit when they should be making deposits into their bone bank for later use. Sadly, this deficit may not be able to be made up later in life.

Osteoporosis Uncontrollable Risk Factors

- Being female * Asian or Caucasian
- Having a small bone frame
- A family history of Osteoporosis
- Postmenopausal
- Long-term use of medications that decrease bone minerals
- Low testosterone levels in men

To Stretch or Not to Stretch… That is the Question

NO Passive Stretches
(I don’t want my forces on their aging joints)

Antagonistic Active movements ONLY
(Unless Self-Assisted Active is necessary)

Prioritizing of Exercise Types

Approaches to an exercise program depends on…

- Does the client already have postural changes?
- What is the degree of degeneration on the spine or do they have osteoporosis?
- How old is the client?
- What are their physical limitations?
- How hard are they willing to work? What is their level of motivation to be compliant?

Reps or Resistance?

Depending on your goals will determine the focus of the exercise program. If your goals are strength gains - which it vital at any age; resistance is more important. That being said, many therapists write increase strength as a goal, but are asking for 2-3 sets of 20-30. That is NOT going to increase strength! Strength gains will occur when the patient is struggling to reach 10-12 reps.
Tips for Pain-Free Exercises

- Slow and controlled movements
- Start slow and GRADUALLY increase activities
- Avoid high joint stress movements
- Vary the routine
- Muscle soreness the next day is normal... joint pain is NOT
- Exercises should NEVER increase pain
- The Arthritis Foundations states, pain that does NOT relieve itself within 2 hours is indication exercise session was too intense

Abdominals and Back Exercises

Guidelines for safe abdominal exercises

- Spine is ALWAYS supported.
- The slower the better. All exercises MUST be done slow and controlled!
- Client MUST communicate with you...
- NO pain, no gain is B.S. you NEVER want back pain with abdominal exercises.
- Start with very few repetitions...endurance is developed over time, and NEVER rushed.

Postural Modifications

Modifications are necessary when posture effects normal position and can create other challenges/pains if not corrected.

Every effort should be made to correct postural challenges before initiating exercises. It will not only reduce overall pain, but also re-educate the body as to what “normal” is and the body will learn to adjust to the new corrected alignment.

Use of pillows, towel rolls, etc... can be used to help improve postural deficits.

Defining “Neutral Spine”

In its natural alignment, the spine is not straight. The vertabrae’s and stacked in a lordotic curve. This "not straight" position is referred to as “Neutral Spine”

Neutral spine is therefore defined as the natural position of the spine when all body parts are in good alignment. This is the strongest position for the spine when we are standing or sitting. Knowing how to find and maintain the neutral spine position is crucial for doing many exercises and more importantly ADL’s safely. In neutral spine posture, the body is able to function in its strongest, most balanced position.

How to Find Neutral Spine

- Lie on the floor on your back. Bend your knees so that your feet and knees are hip distance apart about 6-10 inches away from the back of the legs with your feet flat on the floor.
- Place your hands on your pelvic bones and visualize a glass of water balanced between your fingers.
- Using the muscles of the abdomen, rotate the pelvis so the lower back is flat on the floor. This is a posterior tilt of the pelvis and the glass on water would spill onto your belly.

How to Find Neutral Spine, cont’d

- Release the pelvis back to neutral, then over-arch the low back in the opposite direction. This is an anterior tilt of the pelvis and the glass of water would spill out between your legs.
- Neutral spine is the relaxed position in between the two extremes of the pelvis.
- Emphasis is to make sure the rib cage is NOT doing the tilting. Anterior and posterior pelvic tilts MUST come from the pelvis.
Neutral Spine

While finding neutral spine is ideal, real life comes into play. Many older adults simply lose the ability to complete pelvic tilts. It can be due to osteophyte over growth causes a “fusion” due to the arthritic changes. That’s OK - as long as they have NO back pain, they can stay in whatever position they are in. We will still be successful, as you create stability within their limitations.

Abdominals Without Flexion

The abdominal exercises selected for this exercise program are important for maintaining posture and stability of the lumbar spine.

The latest research all indicate performing lower abdominal exercises rather than the classic sit-up or curl, which involve flexion of the spine and places undo stresses on the neck, are best.

Thank You

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