IDEA PTI22 #367 Contraindicated Exercises for Aging Adults

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Our clients 65 and over:

- *Who* are these clients?
- *What* shouldn't our clients be doing?
- *How* should we evaluate the exercises used?
- *Why* are certain exercises to be avoided?

8 statistics for population 65+[1]

1. 1 in 3 Americans is 50+!
2. 1 in 7 is 65+; estimated 1 in 5 by 2030
3. Over 10,000 people in the US turn 65 every day
4. Over 55.6 mil Americans 65+ in 2020
5. From 2006-2030, 65+ estimated to double from 37 mil to 71.5 mil
6. CDC says life expectancy at 65 is on average 19.6 years
   (Men: 18.2 yrs & Women: 20.8 yrs)
7. Currently 14% of 65+ today are 85+, est. 2050 will be 21%
8. By 2025, 1 in 4 drivers will be age 65 or older.

We all know best results for our clients involve *proper form/KC* and *functional*, *multi-planar* training for Activities of Daily Living (ADLs). Activity selected should have a benefit. How do we evaluate exercises?

Consider AFAA's 5 Questions™ - PESMA

1. What is the Purpose of this exercise? 🤷‍♀️
   Consider: Muscular strength or endurance, cardiorespiratory conditioning, flexibility, skill development, or stress reduction
2. Are you doing the exercise Effectively? 💪
   Consider: Proper range of motion, speed, body position against gravity, efficient posture, and safe equipment use
3. Does the exercise create any Safety concerns? 👌
   Consider: Potential stress areas, environmental concerns, or movement control
4. Can you Maintain proper form for the duration of the exercise? ⏰
   Consider: Alignment, dynamic posture, stabilization, or balance
5. For whom is the exercise Appropriate or inappropriate? 👍
   Consider: Risk-to-benefit ratio; whether the participant is a beginner, intermediate, or advanced exerciser; and any limitations (noted by participant)

Five Kinetic Chain Checkpoints (KC) for safety & functionality:

- Alignment is the base from which the body can effectively generate and accept force.
- Before movement can effectively and safely occur, it is important to consider the role of proper kinetic chain alignment both when standing, sitting, hinging, and moving.
  1. Cervical Spine-Neutral
  2. Shoulders-Neutral (For most, shoulders back and down)
  3. LPHC (Core)- Neutral, abs and glutes engaged
  4. Knees- In line 2nd and 3rd toes. Soft and extended
  5. Feet- Point ahead
- What happens with poor posture/form/KC? Loss of power.
  - ⇒ Acute pain & injuries
  - ⇒ Muscle imbalances
  - ⇒ Postural distortion(s)
  - ⇒ Chronic pain & disability

[1] https://www.aarp.org/livable-communities/info-2014/livable-communities-facts-and-figures.html

Best results for your clients involve proper form/KC. More gains, less pains!

Most Older Clients Have Multiple Postural Distortions • Forward Head Posture • Upper Crossed Syndrome • Lower Crossed Syndrome • Pronation Distortion Syndrome	Common Compensations • (Bilateral) foot external rotations • (Bilateral) knee vargus • Posterior pelvic tilt • Rounded shoulders • Forward head
Common Tight Muscles • Calf muscles • Bicep femoris • Hip flexors • Pecs/Lats • SCM/Upper traps • Adductors	Common Weak Muscles • Glutes • Hamstring complex • Rotator Cuff (supra/infraspinatus, teres minor, subscapularis) • Mid & lower traps/Rhomboids • Intrinsic core stabilizers (TA, multifidus, transversospinalis, int obliques, pelvic) • Anterior tibialis

Contraindicated Exercises

- Most dangerous during the first hours of waking, when disk/synovial hydration, internal pressure and injury risk are greatest
- Joints, especially spine is weakest at the end range of motion
- Prolonged, rapid, repeated, or ballistic movements decreases the joint's load tolerance and the supporting ligament's ability to prevent movement at the end range of motion
- Fatigued muscles are less likely to prevent movement at the end range of motion
- Risk of re-injury higher
- Pain alters motor control and normal movement resulting in compensation strategies even after recovery

Watch for signs of over exertion with aging clients

- Feeling dizzy or lightheaded
- Nausea or vomiting
- Acute pain
- Chest
- Fatigue
- Shortness of breath
- Exhaustion
- Very rapid or irregular heartbeat

⇒ Immediately stop exercising to very slow walk, or sit and gently move your hands or feet.
⇒ Breathe deeply & slowly. Hydrate.
⇒ Heat Exhaustion/Fainting-ice pack in groin, armpits, neck

Neck Contraindications

- Pivot joint, only one axis; moves predominantly in one plane of motion (transverse).
- Normal ranges of motion in cervical spine: 50° of flexion, 60° of extension, 45° of lateral, and 80° of rotation.
- Extreme cervical flexion/extension, especially if weight bearing.
- Risks, may cause:
    - Neck pain/strain
    - Dizziness
    - Fractures/breaks back part of vertebrae
    - Compression of nerves, ligaments, and blood vessels in cervical spine
    - Damage or compression of discs

❗ Contraindicated	✅ Alternative
• Donkey kicks	• One leg at a time, line from head to toe
• Full neck circles/extreme head extension	• Slow pivot left/right/ side tilts with stop at center
• Forward head e.g., bar behind neck	• Bar in front of neck
• Head extension/ tilting head back/fish pose	• Side tilt with opposite hand down
• Plow/plough/ shoulder stand	• Double knee to chest
• Sit ups while pulling on the neck	• Crunches • Dead bugs

Shoulder Contraindications

- Ball-and-socket, most mobile of joints; moves in all three planes of motion
- Normal ranges of motion: 180° for flexion and abduction and 90° for external rotation
- Caution: extreme shoulder external rotation and abduction
- Risks that may occur:
    - Stress the shoulder capsule and inferior glenohumeral ligament
    - Bones in the shoulders to rub against each other

❗ Contraindicated	✅ Alternative
• Arms raise, above shoulder, in lateral plane	• Angle to the front, in muscle direction
• Bar behind neck	• Bar in front of neck
• Tricep dip	• Modified tricep plank • Triceps with dumbbells
• Upright row to neck, elbows up & out	• Dumbbell side raise • Dumbbell High Pull
• Wide arm circles, especially weighted	• No weights • Dumbbell lateral raise

Spine Contraindications

- Low back pain (LBP) causes more disability globally than any other condition.
- Approximately 50% with BP will recur with one year, 60% by year two and 70% by year five.
- Causes range from trauma such as sports injuries, to weakened core muscles from prolonged periods of sitting, etc.
- 364 joints in your spine, mostly facet joints, primarily sagittal. Each vertebra has two sets of facet joints. One pair faces upward (superior articular facet) and one downward (inferior articular facet). There is one joint on each side (right and left). Facet joints are hinge-like and link vertebrae together.
- Normal ranges of motion:
    - Thoracic: 30° of rotation and 50° of kyphosis
    - Lumbar: 60° of flexion, 25° of extension, and 25° of lateral
- The most common source of low back pain is from the intervertebral disc since the outer one third is highly innervated with nerves
- Caution: hyperextension/compression during flexion/extension/rotation, especially loaded, dehydrated, or after waking. Rotation without lumbar stabilization.
- Risks, may cause:
    - Back pain/strain
    - Dizziness, especially with head below spine/not in alignment
    - Compression of nerves, ligaments, and blood vessels in cervical spine
    - Pressure, compression, or damage of lumbar discs
    - Fractures/breaks back part of vertebrae
- AVOID following exercises for people with spine/LBP, herniated discs

❗ Contraindicated	✅ Alternative
• Back bend	• Baby/partial cobra
• Bent over rows without support	• Supported bent over row
• Burpee (CrossFit)	• Controlled burpee with neutral spine • Plank/Side Bridges
• Cherry picker/ windmill	• Standing twist, knees slightly bent/ steam engines
• Donkey kicks	• One leg at a time, keeping long line from head to toe
• Full cobra/Back hyper-extension	• Baby cobra • Back parallel to the floor
• Flutter kicks/Leg lifts with both legs/V sits	• One leg at a time • Bicycle • Plank/stability ball
• Kettle bell swings	• Proper form • Neutral spine (needs hip mobility)
• Loaded spinal flexion with rotation	• Flexion, followed by rotation
• Sit ups	• Crunches • Dead bugs
• Shoulder bridge with hands under	• Glute bridge • Baby/partial cobra
• Superman	• Forehead on floor lift opposite sides
• Toe touch/ forward bend	• Seated/standing hamstring stretch

Knee Contraindications

- Modified hinge, uniaxial; moves predominantly in one plane of motion (sagittal)
- Normal ranges of motion: Knee Flexion ROM: 135°, Extension: 0°. Internal Rotation: 10°, External Rotation: 30-40°
- Caution 1: High load on femoral cartilage, knee joints, and posterior cruciate ligament
- Risks that may occur:
  - Excessive pressure on the knee
  - Calf and hamstrings compression stress, causing greater stress on the connective tissues of the knee joint
  - Patellar compression
- Caution 2: Knee flexion at end range of motion with *rotational forces* on hinge joint
- Risks that may occur:
  - Stress & loosens medial collateral ligament and menisci

❗ Contraindicated	✅ Alternative
• Deep squats/ lunges, knee breaking plane	• 90° • 45° knees/toes
• Hurdler stretch	• Seated ham stretch • Standing hamstring stretch, arms behind back • Standing quad
• Reclining quad stretch (both knees)	• Standing quad stretch. Hold ankle, not foot with opposite hand, avoid hip abduction.
• Standing quad, same side arm, hip abducted	• Standing quad, opposite arm, hip adducted

Wrist Contraindications

- Collection of multiple joints, main (radiocarpal) joint is condyloid, formed by the fitting of condyles of one bone into elliptical cavities of another; moves in multiple planes, but predominately in sagittal plane.
- 73° of flexion, 71° of extension, 19° of radial deviation, 33° of ulnar deviation, 140° of supination, and 60° of pronation.

Contraindicated Grips	Risks	Alternative
• Behind neck	• Exercise excessively flexes the cervical spine and loads the shoulders at the extreme of external rotation.	• Front of neck
• Lateral lifts with palms/thumb down	• Compression of the rotator cuff muscles against the bony surface in the shoulder.	• Thumbs up
• Press/load with bent wrists	• Wrist injury	• Straight wrist
• Open bench grip	• Bar can slip	• Closed grip
• Thumbs in fist/out	• Can hyperextend/break thumb	• Thumbs over fist
• Too tight grip	• Irradiation effect • Increase blood pressure • Restrict circulation to fingers • Can worsen carpal tunnel syndrome	• Loosen grip • Use two different size dumbbells

Recap:

• Arched back-chest/military press, squat, etc.	• Improper lumbar hyperextension (arched back, butt not on bench)
• Knee hyperextensions/ hyper flexion	• Tibiofemoral, increased shear forces during the last 5° to 10° of hyperextended knee • Knee flexion can increase patellar compression
• Rapid, jerky, bouncing/ballistic, high impact movements	• Jumping up and down effects joints approx. equal to 7-10 times your body weight.
• Rounded back weight bearing-chest/military press, seated row, squat, etc.	• Common lumbar spine injury (herniated discs) • Hamstring injury
• Shoulder hyperextension (e.g. Chest Fly with elbows behind shoulders)	• Hyperextension of the shoulders places the pectoralis muscles at a mechanical disadvantage • Glenohumeral instability through repetitive shoulder capsule trauma, and places excessive traction on the acromioclavicular joints

Sample exercises to evaluate:

- Jumping Jacks
- Curtsy Lunge
- Power snatch (clean)
- Others?

Common fear for aging adults, cause of annual injuries/hospitalizations

- US annually: 36 mil falls, 8 mil injuries, 3 mil ER visits, 950k hospitalizations, 32k deaths[2]
  - ⇒ Hip fractures
  - ⇒ Traumatic Brain Injuries (TBI)
- CDC's Risk Factors for Falls
  - Lower body weakness
  - Difficulties with walking and balance
  - Foot pain or poor footwear
  - Vision problems
  - Vitamin D deficiency
  - Use of medicines
  - Walking hazards or dangers e.g., uneven flooring

[2] https://www.cdc.gov/homeandrecreationalsafety/falls/adultfalls.html

Common Chronic Diseases

- Natl Council of Aging says 80% of Medicare beneficiaries have at least one chronic condition, nearly 70% have two or more.[3]
- Multiple chronic diseases account for 2/3 of all health care costs and 93% of Medicare spending.
- Less than 1% of U.S. health care dollars is spent on prevention to improve overall health.

Arthritis

- Quick facts: Most common cause of activity limitation in adults aged 45 to 65
- Inflammation of one or more joints. More than 100 different types of arthritis, most common Osteoarthritis (OA), other common types, rheumatoid arthritis (RA), psoriatic arthritis (PsA) & gout
- Joints are susceptible to injury, try to minimize unnecessary damage
- Pay attention to footwear & flooring
- Exercise Contraindications Osteoarthritis: foam rolling, high impact/repetitive jumping motions
- Stop exercising with increased swelling, sharp, stabbing, or constant pain
    - pain that causes you to limp or change your gait
    - joints that feel warm to the touch or are red
    - pain that lasts more than 2 hours after exercise or worsens at night
    - Lack of movement/exercise will make joints worse-stay active if possible

Heart Disease (High BP)

- Quick facts: HBP %
    - Men 65-74: 66.7%; 75+: 81.5%
    - Women: 74.3%; 75+: 86.0%
- Exercise Contraindications:
    - BP over 180/110
    - Recent myocardial infarction or electrocardiography changes, complete heart block, acute congestive heart failure, unstable angina, and uncontrolled severe hypertension
    - Arms overhead for long period of time
    - Unusually fast sprinting or heavy weightlifting
    - Holding breath or Valsalva maneuver
    - Positions where head is lower than the heart
    - Crossing/constriction of legs or fingers (tight grips)
    - Hot yoga, sauna, hot tubs

Diabetes

- Higher risk for complications with COVID-19 if you are diabetic (American Diabetes Assn)
- Risk of developing type 2 diabetes decreases by 26% with 150 minutes of moderate-intensity exercise weekly
- Mild post meal exercise (like walking) may lower blood glucose by 22%
- Exercise Contraindications:
    - Exercise if blood sugar is over 250 mg/dL
    - Exercise if blood sugar is lower than 90 without eating 15g carbs (15-15 rule)
    - Symptoms of anxiety, weakness, and dizziness
    - Cardio before resistance training produces a blood sugar drop (so RT first)
    - Running or high impact (joint glycation), especially with peripheral neuropathy
    - Extremely intense exercise may make it harder for your muscles to use insulin
    - Moderate to severe retinopathy—head below heart
    - Dehydrated
    - Without proper sock and shoes

[3] https://www.ncoa.org/article/get-the-facts-on-healthy-aging

Lung Disease

- Slow inhale through your nose with mouth closed and purse your lips during exhale
- Continue with supplemental oxygen if used
- Exercise Contraindications:
    - Rounded back
    - Exercising with fever or infection, nauseous, chest pain, or lack of oxygen
    - In polluted, cold, or dry air, near strong smells of chlorine or cleaning supplies
    - Exercises that involve long periods of deep breathing (long distance running, etc.)
    - Aim to keep HR at 50 to 80 percent of Max HR
    - RPE at 3 to 4

Kidney Disease (CKD)

- CKD tend to cause poor circulation, increased risk of heart attacks and strokes, muscle and whole-body protein degradation/muscle atrophy
- Usually linked to hypertension & diabetes
- Dialysis patients have a 62% greater mortality risk at 1 year compared to those who are more active/exercise
- Reduce potassium, phosphorus, and sodium intake, slightly increase protein intake, esp. BCAA
- Approximately half of patients with stage 3 CKD progressed to stage 4 or 5 in 10 years
- Exercise Contraindications:
    - Miss dialysis treatment and have excessive fluid in system
    - High intensity exercises (CKD patients with heart disease

General guidelines for working with clients with previous or existing conditions:

- Never exercise through pain.
- If the patient experiences a flare-up then decrease volume.
- Extend workout-specific warm-up and cool down periods.
- Range of Motion assessments/measurements as part of intake
  https://blog.nasm.org/measuring-joint-range-of-motion
  https://blog.nasm.org/measuring-joint-range-of-motion-part-2
  https://blog.nasm.org/upper-extremities-range-of-motion

Add progressions safely and effectively:

- If the client is still making progress, continue with current workload.
- If the client plateaued, then progress at a 2-10% increase.
- Train appropriate and perfect motion and motor patterns before adding load or other challenges.
- Take gravity out of the equation to start--supine or prone, quadruped, kneeling then standing.
- Increase intensity or time, but not both together.
- Intensity can be increased by either changing resistance or changing stability.

More gains, no pains!
Slow & steady wins the race.
Long-term adherence and exercise execution on a regular basis for the win.

Thank YOU for spending past two hours with me!!!!!
Please fill out the survey ASAP.
Post about what you learned #IDEAPTI #CertifiedPersonalTrainer & tag me!
IG: @ShalaineMac or my FB Page: ShalaineFit
Link to my handouts, pdf, & cheat sheets: www.pti22.shalainefit.com
Contact me, I'd love to hear your feedback!
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