



Physical Activity : for Elderly people with sarcopenia

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Physical activity

Physical activity refers to all movement. Popular ways to be active include walking, cycling, sports, active recreation (dance, yoga, tai chi) and play, and can be done at any level of skill and for enjoyment by everybody (WHO 2023).



Physical Activity

- Regular physical activity is proven to help prevent and manage noncommunicable diseases (NCDs) such as heart disease, stroke, diabetes, dementia and several cancers.
- It also helps prevent hypertension, maintain healthy body weight and can improve mental health, quality of life and well-being of elderly people .
- Physical activity has been shown to protect against the incidence of activities of daily living disability.

Effect of inactivity

- ❖ Bed rest (Limb immobilization & Muscle atrophy)
- ❖ Frailty
- ❖ Sarcopenia
- ❖ Risk of falls
- ❖ Self-esteem
- ❖ Cognitive decline.



What is Sarcopenia?

1 Definition

Sarcopenia refers to the progressive loss of muscle mass and strength that occurs with aging.

2 Consequences

As sarcopenia develops, elderly individuals experience a decline in their **functional abilities** and overall **quality of life**.

Effects of Sarcopenia

1 Decreased Strength

Sarcopenia leads to a decline in muscle strength, making it difficult to perform **ADL** and increasing the **risk of falls**.

2 Impaired Balance

Loss of muscle mass can negatively affect the body's ability to maintain balance, predisposing elderly individuals to accidents.

3 Reduced Physical Function

Sarcopenia restricts mobility, limiting independent living and compromising overall physical function.

Preventing Sarcopenia

1

Exercise Therapy

Engaging in regular exercise specially strength-training and aerobic exercises

2

Active recreation

Participating in (dance, yoga, tai chi)

3

Balance and coordination Exercises

Practicing activities that improve balance and reduces the risk of falls and supports physical stability.

Properties of Exercise Therapy for Geriatrics

- **Exercise modality**
- **Exercise frequency**
- **Exercise volume**
- **Exercise intensity**

Exercise modality

A **multicomponent exercise** program is considered the most adequate for older people.

A multicomponent exercise program includes:

- Aerobic
- **Progressive Resistance**
- Balance
- Assistive Technology
- Coordination
- Mobility training exercises
- Cognitive training during the exercise training session.

Exercise frequency

The international guidelines of PA for older people recommend **5 days per week**, which in this particular situation could be increased to **5–7 days per week** with adaptation in volume and intensity.

Exercise volume

- It could be suggested to increase to **200–400 min per week** distributed among **5–7 days** to compensate for the decrease in the normal daily PA levels.
- The guidelines recommend at **least 150 to 300 min per week of aerobic exercise** and **2 resistance training sessions per week**.

Exercise intensity

- The guidelines suggest **moderate intensity** for most of the sessions and some **amount of vigorous** exercise per week.
- It is well-known that exercise at **moderate intensity improves the immune system**, but **vigorous intensity** may **even inhibit** it, especially in sedentary people.
- Thus, moderate intensity (**40–60% heart rate reserve or 65–75% of maximal heart rate**) should be the ideal choice for older people to enhance the protective role of exercise.

Exercise Prescriptions in Older Adults

PEARL GUOZHU LEE, MD, MS; ELIZABETH A. JACKSON, MD, MPH; and CAROLINE R. RICHARDSON, MD
University of Michigan School of Medicine, Ann Arbor, Michigan

Regular physical activity and exercise are important for healthy aging and are beneficial for chronic disease management. Exercise prescriptions for older adults should account for the individual's health status and functional capacities. Assessment of exercise is better than being sedentary even if health status prevents a person from

Review Article

Medical & Clinical Research

Prescription of Exercise in Older Adults, Physiotherapeutic Approach

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Submitted: 10 Aug 2017; Accepted: 20 Aug 2017; Published: 05 Dec 2017

Proceedings: Exercise and Physical Activity in Aging

Evidence-Based Exercise Prescription for Balance and Falls Prevention: A Current Review of the Literature

Tiffany E. Shubert, MPT, PhD

Basic Principle of Exercise Prescription for elderly

Warming up/flexibility (minutes)		10
Aerobic Exercise	Frequency	5 days/week
	Duration	150 min/week
	Intensity	Moderate
Resistance Exercise	Frequency	2 days/week
	Duration	60-90 min/week
	Intensity	Moderate
Flexibility exercise	Frequency	2 time/week
	Duration	60 min/week
	Intensity	Moderate
Balance exercise		2 -3 time/week
Cooling down (minutes)		10



***“THOSE WHO DO NOT FIND TIME FOR EXERCISE
WILL HAVE TO FIND TIME FOR ILLNESS.”***

EDWARD STANLEY

Exercise therapy

- Exercise therapy is safe and highly effective for **sarcopenia**
- Exercise, especially progressive resistance exercise (**PRE**), is the cornerstone of any treatment program to battle the ravages of aging.

Exercise protocol for sarcopenia

- **Intensity:**

- Should be moderate.

- **Repeats:**

- To be doing **8 to 12 repeats** .

- **Velocity**

- Speed should be cautious and controlled.

- The range of time to complete one repetition of an exercise is **about 6 to 9 seconds**, with a **1- to 2-second rest** between repeats.

- **Sets:**

- **One set** of each exercise is all you should be doing **in the beginning**.

- Moving up to two to three sets is necessary to gain maximal strength.

Rest

- The most important rest interval with PRE is the **day between workout sessions**.
- If you're doing more than one set, 3- to 5-minute rest between sets is necessary

Frequency

- One PRE session per week has a significant gains in muscle strength and combat sarcopenia.
- Two per week will enhance muscle strength and mass.

Varying Your Routine

- **Vary the exercises:** Periodically change the exercises
- **Vary the intensity:**
- **Vary the body regions worked:** you can do all 8 to 10 exercises on one region.

Exercise program based on The American College of Sports Medicine

Week 1

Monday: Warm-up, 15 minutes PRE, cool-down

Tuesday: Rest, stretching, or moderate-paced exercise

Wednesday: Warm-up, 10 minutes HIIT, cool-down

Thursday: Balance exercises, yoga, tai chi

Friday: Warm-up, 15 minutes PRE, cool-down

Saturday: Rest, stretching, or moderate-paced exercise

Sunday: Warm-up, 10 minutes HIIT, cool-down

Week 2

Monday: Rest, stretching, or moderate-paced exercise

Tuesday: Warm-up, 15 minutes PRE, cool-down

Wednesday: Balance exercises, yoga, tai chi

Thursday: Warm-up, 10 minutes HIIT, cool-down

Friday: Warm-up, 15 minutes PRE, cool-down

Saturday: Rest, stretching, or moderate-paced exercise

Sunday: Warm-up, 10 minutes HIIT, cool-down

Warming Up and Dynamic Stretches

- You only need a 10- to 15-minute warm-up by dynamic stretches
- Recommend starting with 5 minutes of light aerobic exercise—walking, cycling, or just moving in place—
- Do about 10 repetitions of each movement (on each side)

Arms and Shoulders

Arm Circles

1–2. Sit or stand with good posture. Bring both arms straight up and, in a continuous motion, bring them backward, down, then forward, forming a circle.



Wrist Circles

1. Sit or stand with good posture. Clasp your hands together in front of your chest with fingers interlaced, palms touching, and thumbs on top. Keep your shoulders relaxed and elbows bent at about 90 degrees.



2–3. Rotate your clasped hands in a full circle, then immediately retrace the circle in the reverse direction to return to starting position.



Shoulder Blade Mobility

1. Start on all fours with your hands beneath your shoulders. Bring your left hand up and lightly place it on the back of your head with your elbow pointing to the side.



2. Now bring your left elbow down so that it points toward the floor, rotating your head and shoulder with it.



3. After a brief pause, move your elbow back up as far as you can comfortably go, rotating your head and shoulder with it, until your elbow is parallel to or above the floor, if possible.



Switch sides and repeat.

Upper and Lower Back

Trunk Side Bend

1. Stand with your feet shoulder-width apart. Raise your left arm straight over your head and place your right hand on your hip. Bend your trunk laterally to the right as far as it will comfortably go.



2. Return to the center, switch arm positions, and then bend laterally to the left.



Return to starting position.

Trunk Rotation

1. Stand with your feet shoulder-width apart, arms out to the sides and parallel to the ground, elbows fully bent, and fists touching your chest. Rotate your upper body and head to the right as far as you can comfortably go so that you're looking over your right shoulder.



2. In a smooth motion, move back to the center and continue rotating to the left.



Return to starting position.

Core

Glute Bridge

1. Lie on your back on the floor with knees bent, feet flat on the ground, and arms by your sides.



2. Press your weight into your heels and lift your pelvis up off the floor, creating a straight line from your trunk to your knees. Keep your head and neck relaxed as you tighten your glutes.



Hold briefly, then slowly lower your pelvis back down to starting position.

Inchworm

1. Start in a downward dog yoga pose, with your legs and arms straight and your hips high up in the air.



2. Keeping your legs and arms straight, walk your hands forward until your arms are under your shoulders (and your body forms a straight line from head to toe (top position of a push-up)).



3. After a brief pause, walk your feet forward until they reach your hands, then slowly raise your body until you're standing tall.



4. Bending at the hips, not your lower back, reach your hands to the floor. Bend your knees if necessary.



Walk your hands forward until you return to downward dog and repeat.

Lower Body

Hip Swings

1. Stand with your legs hip-width apart and hold onto a counter, wall, or other stable object for support. Keeping your left leg straight, slowly swing it forward to a comfortable height.



2. Keeping your upper body straight and abdominals slightly tightened, allow your leg to slowly come back down before swinging it behind you.



Repeat and then switch sides.

Knee to Chest

1. Stand with good posture and bring your right knee up toward your chest, grabbing your shin if you can as it comes close.



2. After a brief pause, let the right leg go and bring the left knee up.



Knee Circles

1. From a standing position, your feet a couple of inches apart, bend slightly at the hips and knees and place your hands on your thighs just above your knees. (Remember, whenever you bend at the hips, you should be aware of your butt sticking out behind you and your lower back being straight.)



2. Slowly begin to make small- to medium-sized circles with your knees, first clockwise, and then counterclockwise. (Don't worry if you hear some minor pops and clicks coming from your joints as you do the exercise.)



Do 10 to 15 circles in each direction.

Progressive Resistance Exercise

- PRE really do improve muscle strength and power.
- Elastic band resistance training could be safely used to improve muscle quality even in old people with impaired health status.
- PRE reduce the post-hip-fracture mortality rate.

Overhead Press with Weights



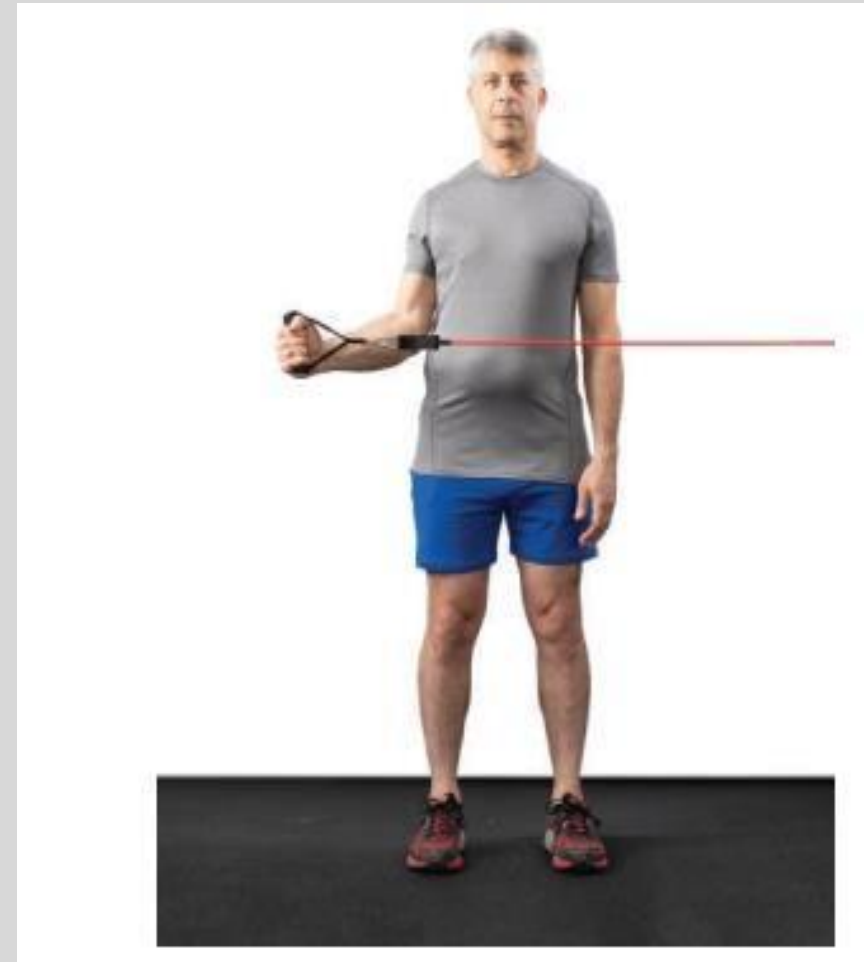
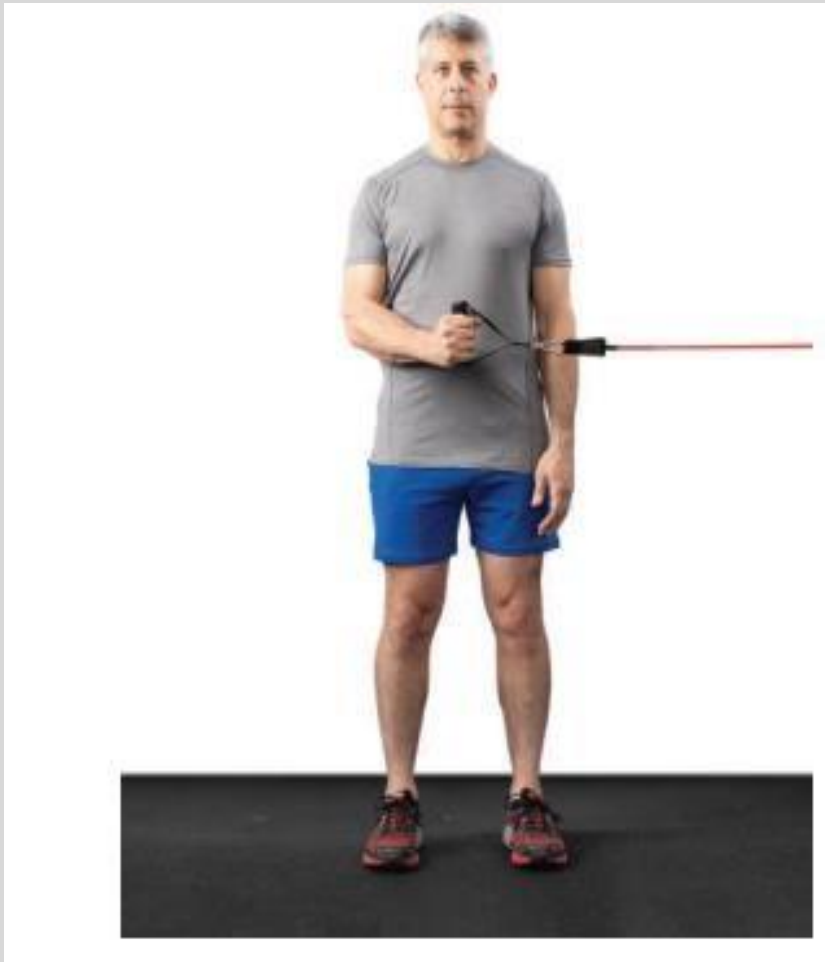
Overhead Press with Resistance Tube



Tennis Backhand with Weights (Ext. Rot)



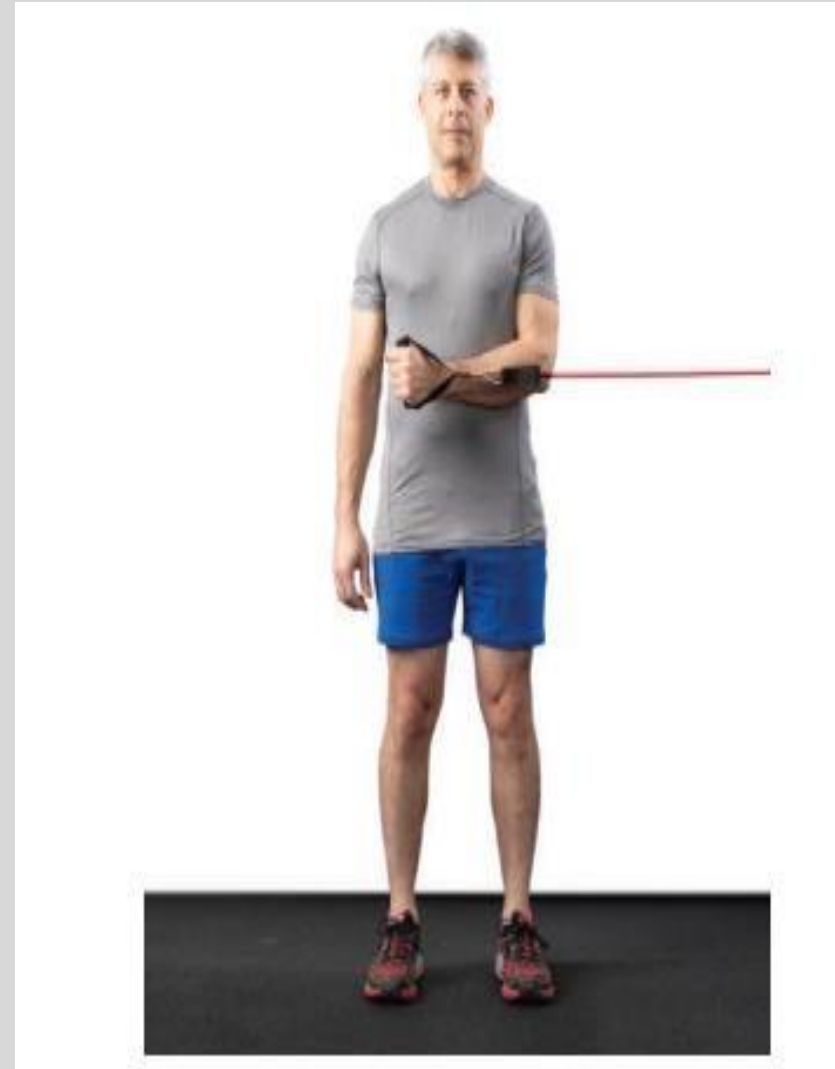
Tennis Backhand with Resistance Tube (Ext. Rot)



Tennis Forehand with Weights (Int.Rot.)



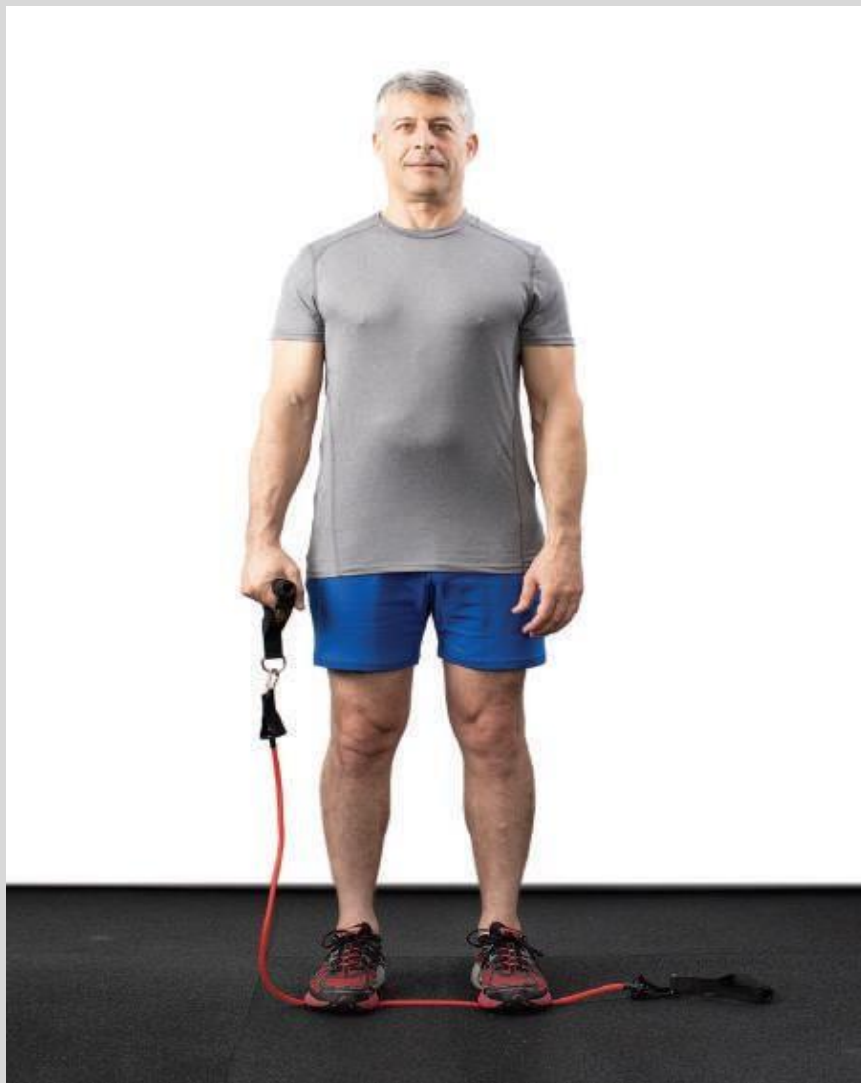
Tennis Forehand with Tubes (Int. Rot)



Thumbs Up with Weights (Scaption plane)



Thumbs Up with Resistance Tube (Scaption plane)



Chest Press with Weights



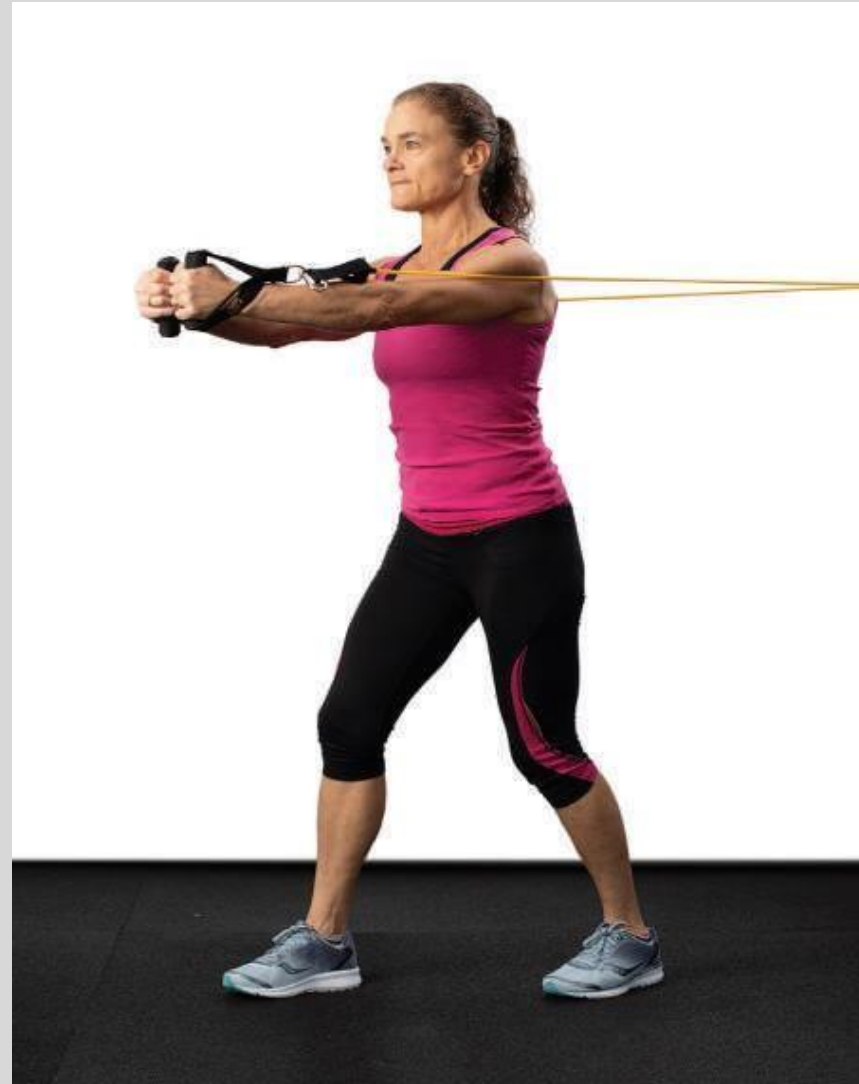
Standing Chest Press with Resistance Tube



Chest Fly with Weights



Chest Fly with Resistance Tube



Reverse Fly with Weights



Seated Row with Resistance Tube



Single-Arm Row with Weights



Biceps Curl with Weights



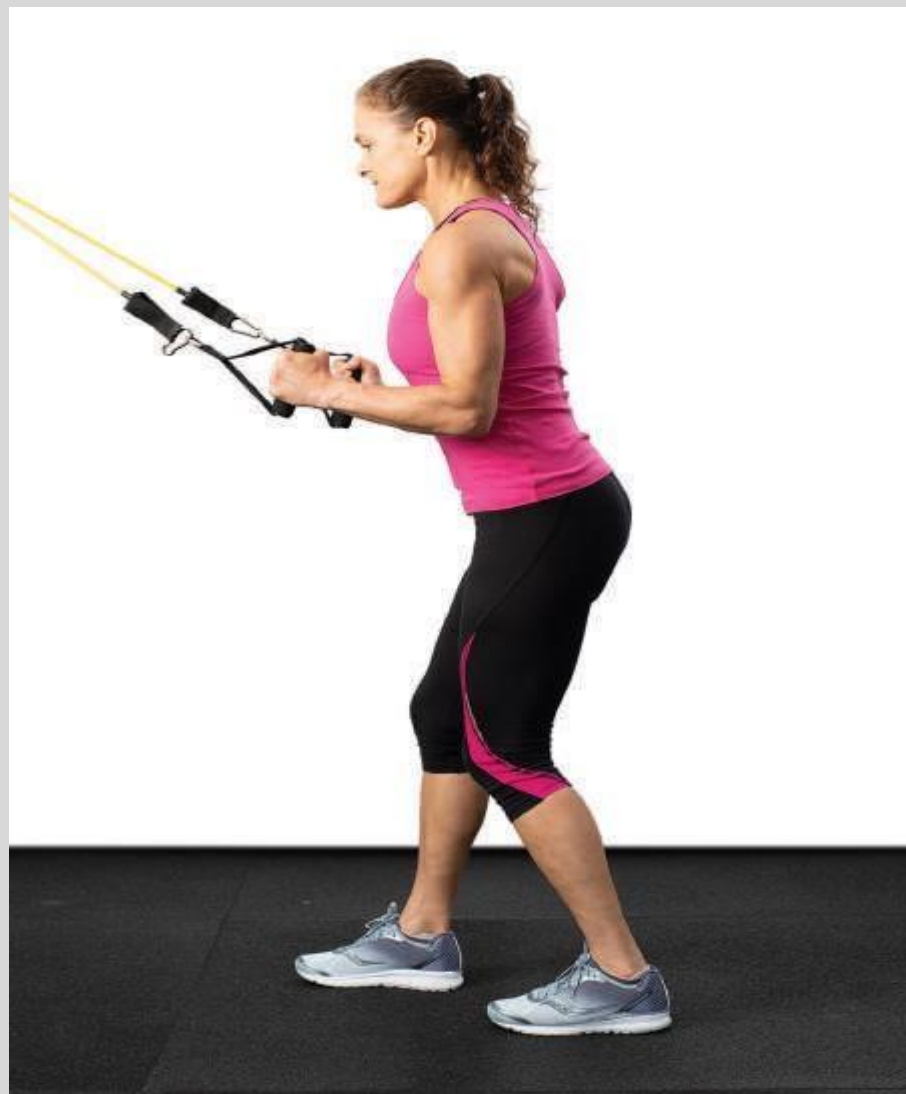
Biceps Curl with Resistance Tube



Bent-Over Triceps Kick-Backs with Weights (Triceps extensions)



Standing Triceps Kick-Backs with Resistance Tubes



Curl-Up with Weights (Core)



Bird Dog with Weights



Prone Extension with Weights



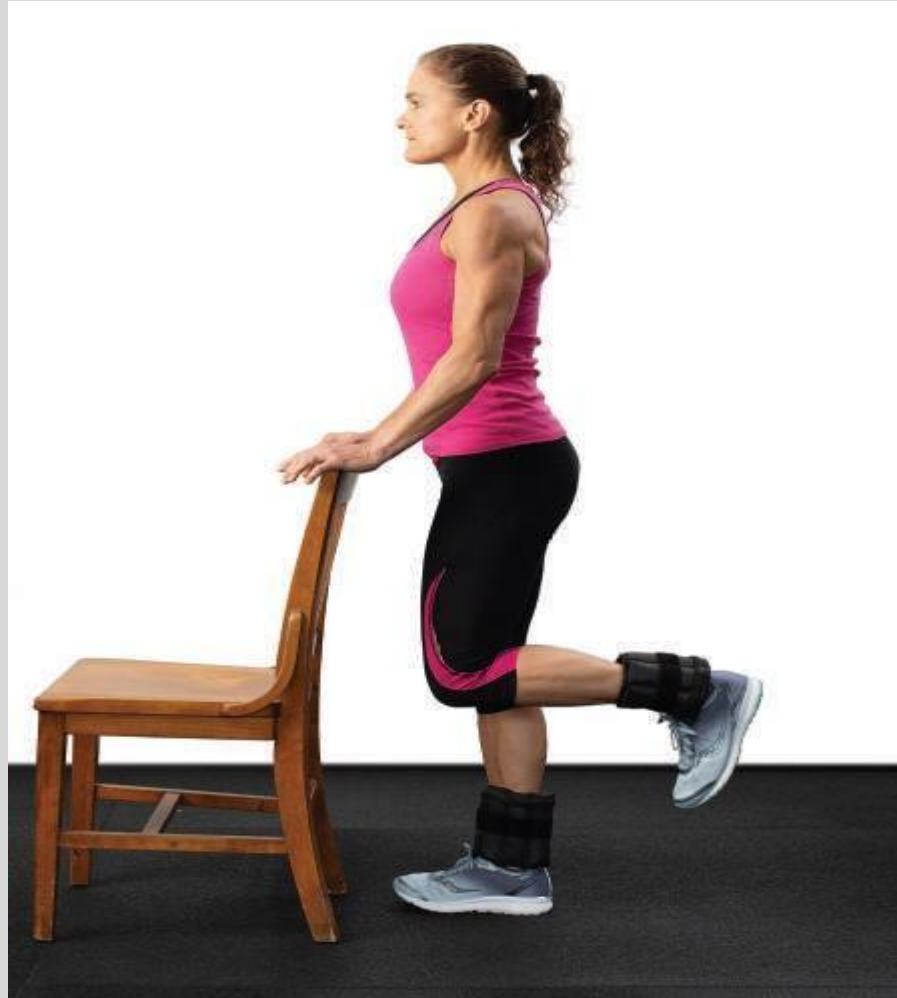
Prone Extension with Weights



Seated Leg Raise with Weights



Standing Leg Curl with Weights



Prone Leg Curl with Resistance Tube



Chair Squat with Weights



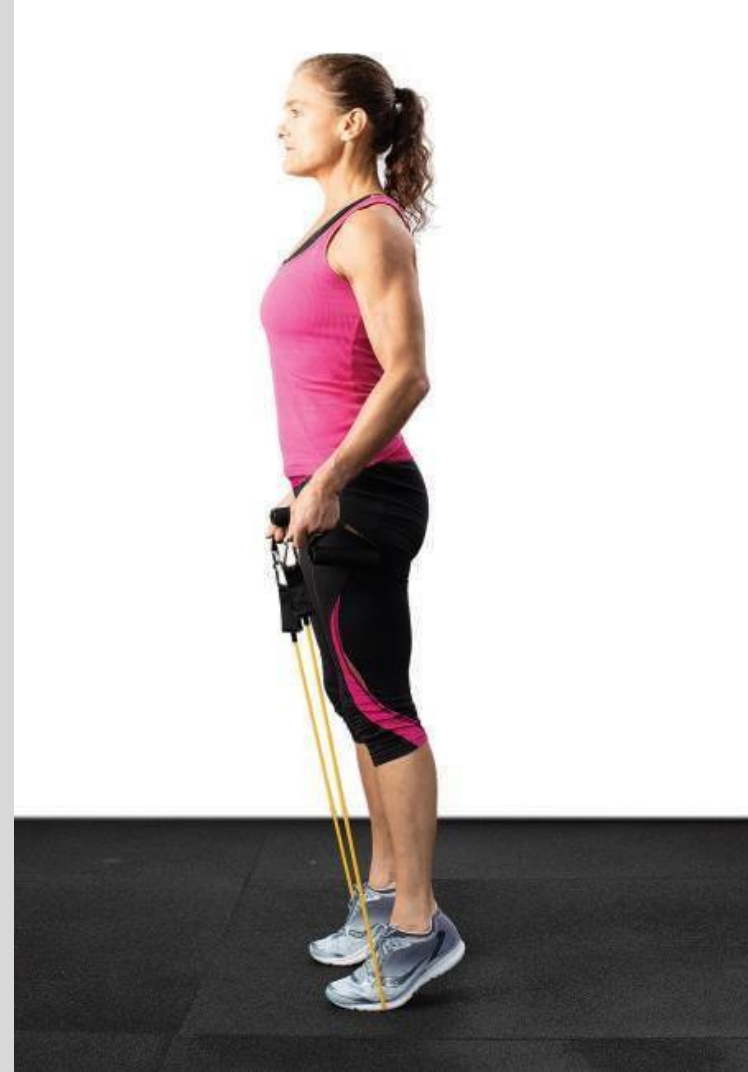
Squat with Weights



Seated Leg Extension with Resistance Tube



Heel Raise with Weights & Tubs



Cooling Down and Static Stretches

- 5- to 10-minute cool-down is usually all you need to slow down the vascular system, heart rate, and breathing rate.
- Cooling down is a good time to do some flexibility exercises.

Neck Stretch

The Position: Lie on your back on the floor and let your head relax for a few seconds. Reach back and place the fingers of both hands in the space behind your neck, with your fingertips touching or fingers interlocked, and very gently move them up along the floor until they contact the back of your resting head. Keep moving your fingers up, pushing—or sliding—the back of your head up, feeling the back of the neck elongating. You may also notice that this movement tilts your head down and tucks your chin slightly.



Shoulder Stretch

The Position: Lie on the floor face up and extend your arms straight out to the sides.



Lower-Back Stretch

1. Lie flat on your stomach with your forehead resting on the backs of your crossed hands. Relax your belly and feel the natural curve of your lower back. This may provide a sufficient stretch on its own.



2. Come up onto your elbows (the sphinx pose in yoga) or the palms of your hands (the cobra yoga pose). Remember, it's more important to relax the belly and let the lower back stretch gently than it is to try to go up higher.



Hip Stretch

1. Sit in a chair and rest your left ankle on top of your right thigh, just above the knee.



2. Gently hinge at the waist, leaning your upper body forward until you feel a stretch in your thigh/butt area. Make sure to keep your upper and lower back straight rather than letting them round. In other words, don't slump!



Switch sides and repeat.

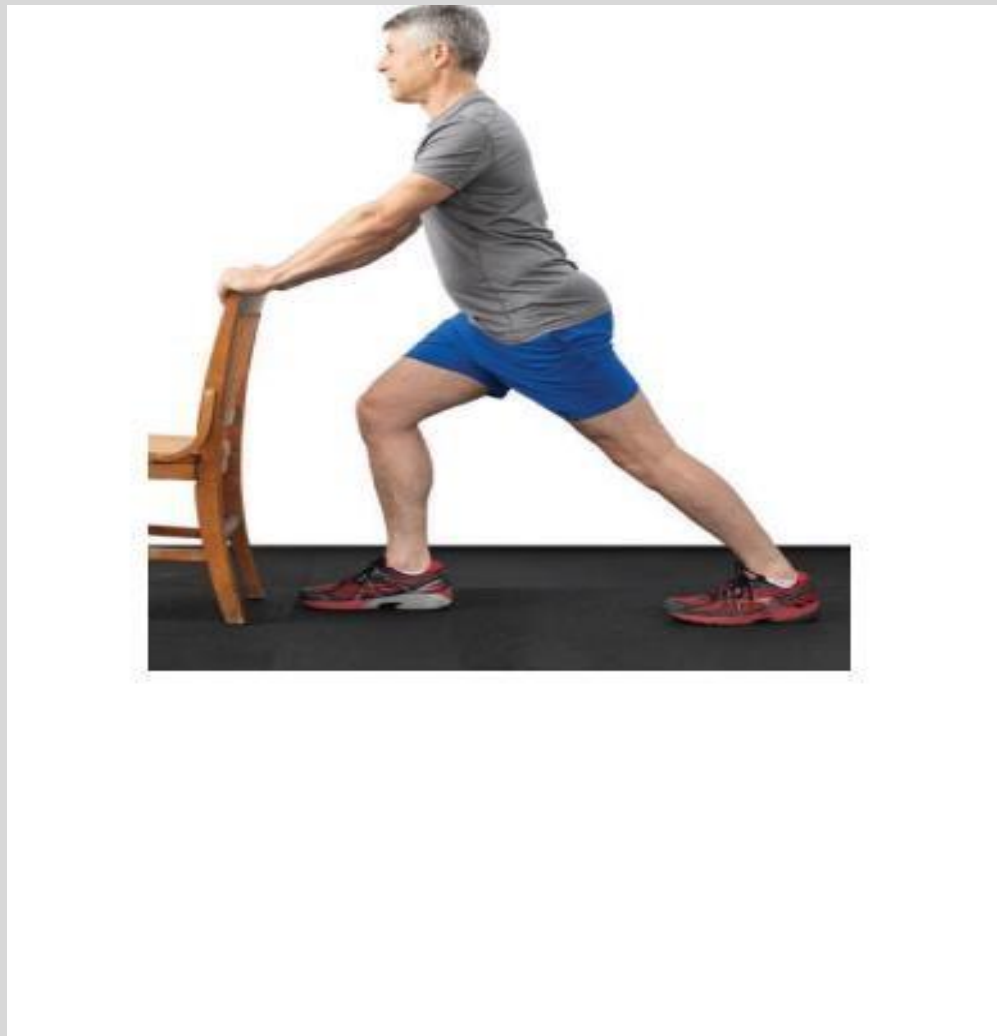
Front of the tight stretch



Back of the tight stretch



Calf Stretch



Shine stretch



Contraindication

1. Do you have a **heart condition** or have you suffered a **stroke**?
2. Do you have unexplained **chest pain** or pressure during activity or at rest?
3. Do you ever feel faint or have **dizzy spells** during exercise, resulting in a loss of balance?
4. Have you had an **asthma** attack that required urgent medical assistance in the last 12 months?
5. If **diabetic**, have you had difficulty controlling your blood sugar levels in the last three months?
6. Do you have a **muscle, bone, or joint problem** that your doctor told you may worsen by engaging in physical activity?
7. Do you have a recent injury or healing **wound, swelling, redness, or skin that's warm to touch**?
8. Do you have any **other medical problems** or take medications that may make exercising dangerous for you?