

Strength and balance training: a program for older adults



Accompanying figures appear on pages 28, 30 and 32.

The Center for Physical Activity and Aging's strength and balance exercise program starts with a 10-minute warm-up, which includes flexibility exercises performed in seated and standing positions. Thirty minutes of band and balance training follows, then five minutes of cooldown and relaxation activities.

The balance exercises start with placing the feet in a series of positions that gradually reduce the base of support, holding the stance for 10–30 seconds (Figure 1):

- Semi-tandem (one foot ahead of the other as if taking a step);
- Full tandem (heel of one foot directly in front of the toes of the other foot);
- Standing up on the toes; and
- Standing on one foot.

These exercises provide subtle changes in balance similar to the challenges experienced in everyday life. And they allow the body to learn how to make appropriate responses to maintain balance while standing still.

Gradually, additional exercises that do the following are introduced:

- Add dynamic movements to perturb the center of gravity, such as leaning or stepping in different directions, lateral and forward reaching, picking up an object from the floor (Figure 2) and tandem walking (Figure 3);
- Reduce visual input by closing the eyes or dimming the lights;
- Challenge the vestibular system by moving the head side to side; and
- Challenge the somatosensory system by standing on foam pads.

These exercises can also be performed in a wide variety of combinations, i.e. standing on foam pads in the tandem

position, standing on foam pads and moving the head, stepping onto a foam pad, etc.

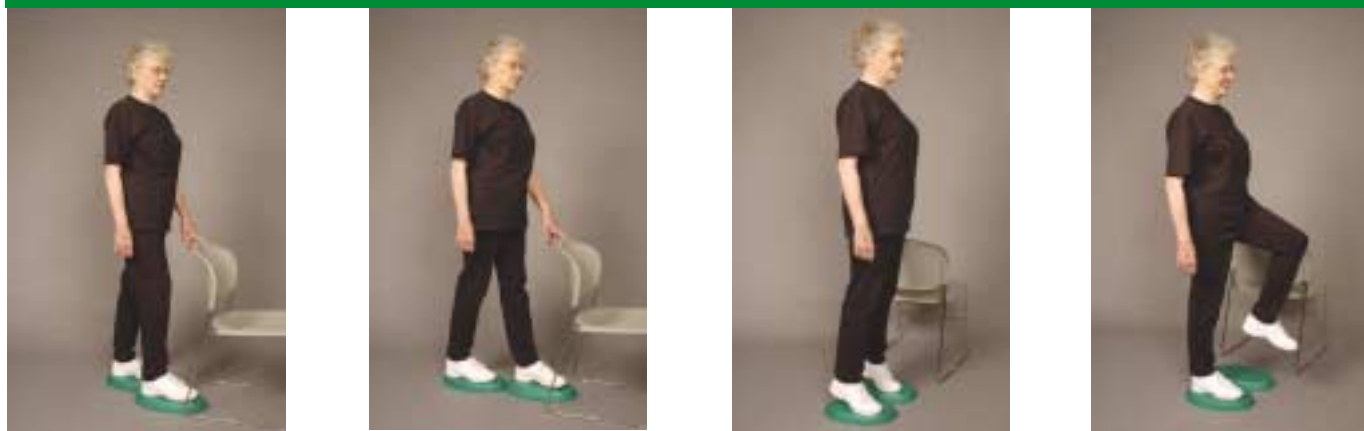
Strength exercises using bands are added to strengthen each major muscle group in the upper- and lower-body. Special emphasis is given to muscles that play an important role in the maintenance of balance, such as those of the lower leg. Each strength exercise is performed with one set of 12–15 repetitions, eventually progressing to two or three sets. Initially, strength exercises alternate with balance exercises; eventually, they are performed in tandem. For example, participants may perform the chest press while standing in a semi-tandem position (Figure 4), lateral pulldowns standing in a full-tandem position (Figure 5), chair squat (Figure 6), leg press standing on one leg (Figure 7), and leg kicks in different directions (Figure 8). Strength exercises can also be performed with a partner and combined with additional balance activities (Figure 9).

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Figure 1: static balance stances



Semi-tandem

Full tandem

Up on toes

One foot

Figure 2: center of gravity shifts



Stepping in different directions

Reaching

Object on floor

Figure 3: tandem walking



Place one foot directly in front of the other, touching heel to toe, and hold. Repeat with other foot in front.

Progress to taking a step or two by placing your heel to your toe with each step. Eventually try walking across the room.

Photographs courtesy of Hygenic Corporation, Akron, Ohio

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Figure 4: chest press in semi-tandem stance



Start



Finish

Start: stand on foam with one foot in front of the other in the semi-tandem position. Put band behind back and grasp both ends close to chest.

Finish: slowly push forward, like a bench press exercise, and return to starting position. Repeat 12–15 times.

Figure 5: lateral pulldowns in full-tandem stance



Start



Finish

Start: stand in full-tandem position with band held above the head at shoulder width.

Finish: keeping elbows straight, slowly bring the arms down to the sides, stopping at shoulder-level. Slowly return to starting position and repeat 12–15 times.

Figure 6: chair squat



Start



Finish

Start: begin with center of band under feet. Grasp ends of bands with hands by sides. Keep tension in the band with elbows straight.

Finish: slowly bend knees while leaning forward slightly at the hips. Keep back straight. Slowly return to starting position and repeat 12–15 times.

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Figure 7: leg press on one foot



Start



Finish

Start: loop middle of band around foot with your knee bent, standing on opposite foot. Hold both ends of the band above waist.

Finish: slowly straighten knee to touch foot to floor. Keep back straight. Slowly return to starting position and repeat 12–15 times. Repeat on other side.

Figure 8: leg kicks



Start



Finish

Loop center of band around one ankle and stabilize other end under the other foot. Kick band backward 12–15 times, keeping the knee straight. Repeat on other leg. These kicks can also be performed to the front.

Figure 9: exercises with a partner



Start



Finish

Tie band in a loop. Wrap around one of your and your partner's ankles. Hold your partner's shoulders. Kick band backward 12 times, keeping your knee straight. Repeat on other leg.