A Complete Exercise Program for Healthy Older Adults

Q: What types of exercises are recommended for healthy older adults? Is a walking program sufficient for improved health? Are there any benefits for resistance training during this phase of life?

A: “Older adults” typically refers to anyone age 65 years or older, but it is important to realize that this age group includes a wide range of fitness and health. Unfortunately, age-related physiological changes result in declines in functional capacity that can impact activities of daily living (5) (see examples of physiological changes in Box 1). In addition, physical activity levels, both aerobic and muscular, decline across the life span (Fig. 1) (4). Thus, the aging process includes factors related to the passage of time (primary aging) and effects caused by lifestyle behaviors and chronic disease (secondary aging) (5). Genetic influences are another potential factor, with potential interactions with both age-associated declines and secondary aging (5).

One of the goals related to exercise throughout the life span is “healthy aging,” which means minimizing the impact of chronic conditions (e.g., heart disease, stroke, diabetes mellitus) on day-to-day life. Individuals with higher fitness during midlife often experience a delayed onset of chronic conditions. Specifically, higher midlife fitness was related to a lower burden of chronic diseases within the last 5 years of life (11). Strength and aerobic-based training can improve functional fitness (8). Thus, a complete exercise program is important throughout the life span (1).

Support for a comprehensive exercise program for older adults can be found in the 2007 American Heart Association and American College of Sports Medicine (ACSM) recommendations (9) as

Box 1. Select Physiological Changes Typically Observed With Advancing Age (5)

- Muscular strength and power decline
- Muscular endurance declines
- Reaction time increases/lengthens
- Muscle and tendon elasticity declines
- Maximal heart rate, stroke volume, and cardiac output decline
- Maximal oxygen uptake ($V\text{O}_{2\text{max}}$) declines
- Blood pressure increases at rest and during exercise compared with younger individuals
- Total body water and total plasma volume decline
- Work of breathing increases
- Fat-free mass declines and body fat increases
- Bone mass declines

Figure. Aerobic and muscular activity across the life span (data compiled from 4).

Wouldn’t You Like to Know

by Barbara A. Bushman, Ph.D., FACSM

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As well as the 2008 Physical Activity Guidelines for Americans (10). These publications have been pivotal in supporting the many benefits of exercise for health and reflect the growing scientific knowledge base related to exercise in older adults. Highlights from each of these documents, relating to older adults, are included in Table 1. Overall, these recommendations are quite similar and include a focus on aerobic activity and muscular fitness, along with balance training for older adults at risk of falling (9,10).

In 2009, ACSM released a position stand “Exercise and Physical Activity for Older Adults” (5) (replacing a previous position stand published in 1998). The position stand can be found at http://www.acsm.org/access-public-information/position-stands. Although reviewing the list of physiological changes in Box 1 may seem disheartening, the position stand provides three evidence statements that should encourage physically active older adults (5):

1. “Healthy older adults are able to engage in acute aerobic or resistance exercise and experience positive adaptations to exercise training.”
   ○ Examples of potential positive adaptations caused by aerobic training: increases VO2max, reduces rise in blood pressure during exercise, reduces total body fat, counteracts age-related declines bone mineral density in postmenopausal women
   ○ Examples of positive adaptations possibly caused by resistance training: increases muscular strength and power, improves muscular endurance, increases fat-free mass and decreases fat mass, preserves or improves bone mineral density

2. “Regular physical activity can favorably influence a broad range of physiological systems and may be a lifestyle factor that discriminates between those individuals who have and have not experienced successful aging.”

### Box 2. Benefits of Physical Activity and Exercise for Older Adults Who Have an Established Program (i.e., Chronic Adaptations) (5)

- Those with vigorous long-term aerobic exercise training are able to sustain exercise with less cardiovascular stress and muscular fatigue than sedentary peers and appear to delay age-related accumulation of central body fat.
- Those who engage in resistance training have higher muscle mass, are stronger, and are typically leaner than sedentary peers. In addition, resistance training (compared with only aerobic training) results in greater total muscle mass, higher bone mineral density, and maintenance of higher muscle strength and power.

### Table 1: Exercise Recommendations for Older Adults (9,10)

<table>
<thead>
<tr>
<th>Activity</th>
<th>AHA/ACSM Recommendations (9)</th>
<th>Physical Activity Guidelines for Americans (10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerobic activity (cardiorespiratory endurance)</td>
<td>Perform moderate-intensity aerobic physical activity at least 30 minutes on 5 days per week or vigorous aerobic physical activity at least 20 minutes on 3 days per week or a combination of moderate and vigorous activity. Moderate activity is considered to be a level 5 or 6 on a 10-point scale (1 being the easiest) of exertion; vigorous intensity is a 7 or 8.</td>
<td>Perform 150 minutes per week of moderate-intensity activity or 75 minutes per week of vigorous-intensity activity or an equivalent combination of moderate and vigorous physical activity. For additional health benefits, increase activity to 300 minutes per week of moderate-intensity activity or 150 minutes per week of vigorous-intensity activity or an equivalent combination of moderate and vigorous physical activity.</td>
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<tr>
<td>Muscular fitness</td>
<td>Muscle strengthening activities targeting the major muscle groups should include 8–10 exercises on 2 nonconsecutive days each week. Level of effort should be moderate to high, including 10–15 repetitions.</td>
<td>Muscle strengthening of moderate to high intensity, involving all major muscle groups, should be included 2 or more days per week.</td>
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<tr>
<td>Flexibility</td>
<td>Flexibility activities should be included on a minimum of 2 days per week for at least 10 minutes each day.</td>
<td>Flexibility activities are an “appropriate component” but do not count toward meeting the aerobic or muscular guidelines.</td>
</tr>
<tr>
<td>Balance</td>
<td>Balance activities should be included for older adults at risk of falling.</td>
<td>Older adults at risk of falling should include balance training on 3 or more days per week.</td>
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</tbody>
</table>
3. “Regular physical activity reduces the risk of developing a large number of chronic diseases and conditions and is valuable in the treatment of numerous diseases.”

As is evident from these conclusions, as well as the benefits highlighted in Box 2 (a contrast to the list in Box 1), “successful aging” is promoted with a regular exercise program including both aerobic and resistance training.

In addition, a comprehensive exercise program typically includes flexibility exercises and balance training (2), which more recently was expanded to neuromotor exercise training (7) as covered in a previous “Wouldn’t You Like to Know” article in the 2012 November/December issue (3). Putting all the pieces of an exercise program together may seem overwhelming. An example of a program for healthy older adults that are just starting an exercise program is found in Table 2 (1).

Many excellent (and free) resources related to exercise and older adults also are available (Box 3).

### TABLE 2: Sample Beginner Exercise Program for Older Adults*

<table>
<thead>
<tr>
<th>Week</th>
<th>Aerobic</th>
<th>Resistance</th>
<th>Stretching</th>
<th>Balance</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>3 days per week; 10-20 minutes per day; light intensity (level 3 or 4)</td>
<td>2 days per week; 1 set, 10-15 reps of 6 different exercises (hips, legs, chest, back, shoulders, low back, and abdominals)</td>
<td>2 days per week; 10 minutes of stretching activities</td>
<td>2 days per week; 10 minutes of balance activities</td>
<td>An easy beginning aerobic activity is walking. Select a comfortable pace. If previously inactive, target 10 minutes at a time for aerobic activity. Include some stretching activities after walking. For resistance training, beginners should select one exercise for each of the following body areas: hips and legs, chest, back, shoulders, low back, and abdominals. For balance training, consider activities that challenge the base of support and/or proprioception.</td>
</tr>
<tr>
<td>4-6</td>
<td>3 days per week; 20-30 minutes per day; light to moderate intensity (level 4 or 5)</td>
<td>2 days per week; 1 or 2 sets, 10-15 reps of 6 different exercises (hips and legs, chest, back, shoulders, low back, and abdominals)</td>
<td>3 days per week; 10 minutes of stretching activities</td>
<td>2 or 3 days per week; 10 minutes of balance activities</td>
<td>The focus for the next 3 weeks will be getting comfortable with at least 20 minutes of aerobic exercise at least 3 days per week. Gradually increase intensity to a moderate level by the 6th week. Continue with the resistance training program and add an additional set by week 5. Add an additional session of balance training by the 6th week.</td>
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<tr>
<td>7-9</td>
<td>3 or 4 days per week; 30-40 minutes per day; moderate intensity (level 5)</td>
<td>2 days per week; 2 sets, 10-15 reps of 6 different exercises (hips and legs, chest, back, shoulders, low back, and abdominals)</td>
<td>3 days per week; 10 minutes of stretching activities</td>
<td>3 days per week; 10 minutes of balance activities</td>
<td>For the next 3 weeks, increase total time spent in moderate aerobic activity (either 40 minutes per day 3 days per week or 30 minutes per day 4 days per week). Continue with the resistance training program, completing 2 sets per exercise and adding more weight if able to do 15 repetitions relatively easily.</td>
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<tr>
<td>10-12</td>
<td>3 or 4 days per week; 35-50 minutes per day; moderate intensity (level 5 or 6)</td>
<td>2 days per week; 2 sets, 10-15 reps of 6 different exercises (hips and legs, chest, back, shoulders, low back, and abdominals)</td>
<td>3 days per week; 10 minutes of stretching activities</td>
<td>3 days per week; 10 minutes of balance activities</td>
<td>The past couple of months of activity have promoted the development of a good aerobic and muscular fitness base. For some variety, can consider other activities such as stationary biking or swimming. If walking is enjoyed, that is also a good aerobic exercise to continue. For the resistance training program, consider adding some variety and trying some other exercises.</td>
</tr>
</tbody>
</table>

*All activity sessions should be preceded and followed by a 5- to 10-minute warm-up and cooldown.

(Adapted from: Bushman B., editor. ACSM's Complete Guide to Fitness & Health. Champaign [IL]: Human kinetics; 2011, 239 p. Used with permission. This also is a source for examples of resistance training, flexibility, and balance exercises.)
Many wonderful, and free, resources exist to help older adults develop a regular exercise program.

- U.S. National Institute on Aging Go4Life program that is a campaign designed to help older adults fit exercise and physical activity into their daily lives. This Web site is an excellent resource, with tip sheets and information for both participants and professionals. [http://go4life.nia.nih.gov/](http://go4life.nia.nih.gov/)


- U.S. National Institutes of Health provides information on the benefits of physical activity, including some inspirational videos of healthy active older adults. [http://nihseniorhealth.gov/exerciseforolderadults/healthbenefits/01.html](http://nihseniorhealth.gov/exerciseforolderadults/healthbenefits/01.html)

- U.S. Centers for Disease Control and Prevention provides information on physical activity guidelines, including videos. [http://www.cdc.gov/physicalactivity/everyone/guidelines/olderadults.html](http://www.cdc.gov/physicalactivity/everyone/guidelines/olderadults.html)

Knowing what to recommend is an important step, but fitness professionals also must be aware of factors that may challenge adherence. Barriers to exercise for older currently nonactive adults have some common themes, including lack of time, potential for injury, self-discipline, motivation, boredom, and intimidation (6). When asked to describe an ideal physical activity program, older adults cite ease of access and knowledgeable staff as important factors (6). Fitness professionals, therefore, are pivotal in helping provide safe and effective programs for older adults.

Given the many benefits, developing a comprehensive exercise program is a valuable tool in the quest for successful aging. A comprehensive exercise program includes cardiorespiratory (aerobic) exercise, resistance training, flexibility and neuromotor exercise training (7). Older adults unable to meet minimum recommendations because of chronic health conditions should try to be as active as abilities and conditions allow (1,10).

### References


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