



Aerobic Power and Functional Independence in Older Adults

By Jennifer Salter, MSW, RSW, ACE-AHFP, ACE-PT, AAHFRP

We all know that keeping fit as we age is important, but what does this truly mean? Often the focus is on strong muscles, which makes sense – more muscular strength leads to increased stamina and an improved ability to carry out activities of daily living. Until fairly recently, however, the contribution of aerobic capacity (VO₂ max, also known as maximal oxygen consumption, or aerobic power) has been less understood.

VO₂ max is the highest rate at which oxygen can be consumed, or taken in, during exercise. The more oxygen you are able to take in, the higher your threshold for exercise intensity will be. Picture competitive runners, or even the fit runner passing you on the street – they are working hard yet their breathing is controlled and even. They are able to take nice deep breaths yet still continue to exercise at a fairly high intensity. Contrast this with an unfit person trying to run for the first time – short, raspy, rapid breaths. That person

cannot yet supply his muscles with enough oxygen to produce sufficient adenosine triphosphate (ATP) – the energy molecule that is the foundation of everything our bodies are able to do. VO₂ max can be compromised by various medical conditions, including heart disease, chronic obstructive pulmonary disease, asthma, diabetes, cancer, osteoporosis, and osteoarthritis.

Maximal oxygen consumption is not just a boring subject in exercise physiology – it is critical to the maintenance of functional independence in older adults. Research demonstrates that aerobic power declines steadily in sedentary males by almost half between the ages of 20 and 60 (from about 45 ml/kg/min to 25 ml/kg/min). In females, the decline generally begins at around age 35 and drops by one-third by age 60 (from about 38 ml/kg/min to 25 ml/kg/min). The evidence suggests that older adults whose VO₂ max has dropped to about 12-15 ml/kg/min are very challenged to complete the activities of daily living necessary to live autonomously. Seniors who live independently tend to have VO₂ max values of at least 18 ml/kg/min for men, and or 15 ml/kg/min for women. An inactive lifestyle can, over the course of years, insidiously chip away at maximal oxygen consumption – rendering independent living a pipe dream. Given that the most prevalent fear in the senior population is losing independence, maintaining sufficient VO₂ max is critical in order to avoid and/or delay the move to assisted living or long-term care.

The good news is that it is possible to increase maximal oxygen capacity in older adults, just as in younger individuals. In fact, a 12.9% increase can be realized after just 8-10 weeks of training; a 14.1% increase after 12-18 weeks; and a 16.9% increase after 24-52 weeks. Gradually increasing aerobic training can boost the aerobic power of the elderly by at least 10 ml/kg/min, potentially delaying the loss of independence by as much as 20 years. When seniors exercise at a higher intensity, even more dramatic gains are realized.

EXERCISE SPECIALIST RECOMMENDATIONS FOR OLDER ADULTS:

- **Have older clients exercise at a moderate intensity.** This is about a 6 or 7 out of 10 in terms of intensity on the Borg Scale of Perceived Exertion - meaning that your client can carry on a conversation, but not sing a song. The Borg Scale has been shown in research to be quite accurate, and utilizing a heart rate monitor as well allows you to ascertain what moderate intensity actually means for individual clients in terms of hard data.

- **Incorporate interval training.** Even older adults can do intervals! Have your clients do them informally by walking faster for 15 seconds to 2 minutes, then dropping back down to the previous intensity. Take advantage of fitness equipment which has adjustable speed and incline settings. Even though fresh air is beneficial, some clients require a controlled environment in which to safely engage in this type of technique safely.

- **Insist that your clients take the stairs whenever the opportunity presents.** Although the stairs may be more tiring, encourage clients to not opt for the easy way out by taking the escalator or elevator. Teach your clients to view stairs as one of the keys to a life of prolonged independence.

- **Help your client determine the time of the day when energy level is highest, and have her schedule workouts accordingly.** While most people tend to experience higher adherence to an exercise program when working our first thing in the morning, those with arthritis or other musculoskeletal conditions may need to wait a few hours for synovial fluid inside joints to warm up, facilitating ease of movement.

- **Always include strength training in your program design.** By lifting weights and participating in other exercises that improve muscle strength, the foundation for higher intensity cardiovascular training - the kind that increases functional capacity - is established. Not everyone enjoys strength training, so be clear with your clients that weight training is "good medicine", as opposed to a leisure activity.

I love this Chinese proverb because it is so, so true: "The best time to plant a tree was 20 years ago. The second best time is now." This applies perfectly to exercise, because it is never too late to start. Every single client, regardless of age or physical condition, can increase their fitness level. That is the magic of the overload principle and muscle fibre adaptation! Increasing aerobic capacity does not have to mean running a marathon; as our clients age, it most often means having the ability to be active with grandchildren, the energy to carry out activities of daily living with ease, and remaining independent for as long as possible.

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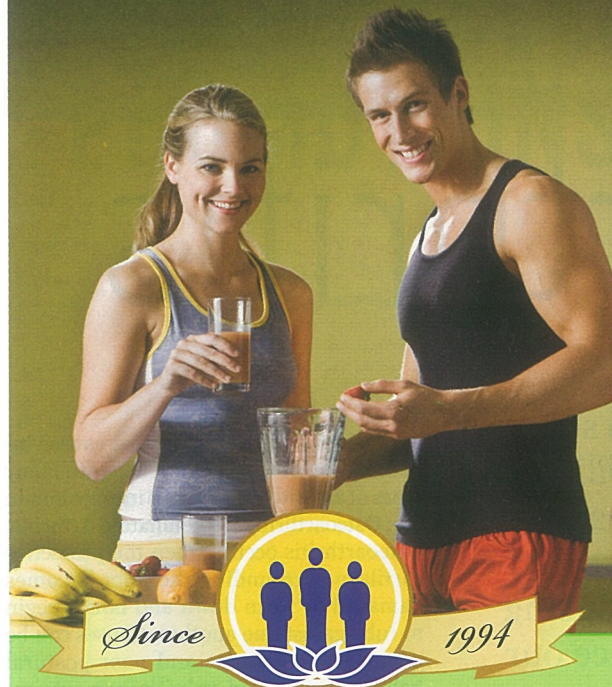
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