



2020

Understanding Health & Fitness

Education Series 2c

Improve your Aerobic Fitness

Why should you improve your aerobic fitness?

Everyone who is able should aspire to increase their aerobic fitness. The benefits of increased aerobic fitness are linked to decreased risk of many conditions, including obesity, heart disease, high blood pressure, type 2 diabetes, metabolic syndrome, stroke and certain types of cancer. There is also research that suggests it helps with brain and emotional health. A very important recent study in 2018 highlighted below suggest that higher levels of aerobic fitness was inversely associated with all-cause mortality without an observed upper limit of benefit. In other words the fitter you are the longer you live.

How do you improve aerobic fitness?

Key Points:

- To increase aerobic fitness perform aerobic activity (walking, running, biking, stair climbing elliptical etc.) moderately for 20-30 minutes when starting an aerobic program (base training). This can be split in two multiple sessions. Try to do most days of the week.
- After a few weeks of base training perform aerobic activities vigorously at points where the intensity is Somewhat Hard to Difficult for 30 seconds or more. To improve aerobic fitness you need to work vigorously than what you are use to.
- Vigorous activities may cause the heart to beat faster, sweating, muscle burn, breathing to become labored, and talking to become difficult.
- Vigorous activity can be performed with most forms of aerobic activities
- One of the best forms of vigorous activities is interval training (some call it High Intensity Interval Training). It is a sequence of 2 or more intervals of high and low intensity aerobic activity.
- Two or four sessions of vigorous activity is suggested per week in combination with two or more sessions of moderate activity
- The best way to judge exercise intensity if through RPE (rating of perceived exertion)-see how to use RPE and monitor exercise in section below.
- Vigorous activity is relative to the individual and should not approach a RPE of 10 (extremely hard) unless highly fit.
- When adding vigorous activity keep RPE to a 4-5 (somewhat hard to hard) is suggested for most
- Keep aerobic activity to no more than 1 hour a day to avoid overuse injuries
- It is always important when doing vigorous activities to warm up before and could down after

Why Vigorous exercise?

Studies have shown just few minutes a day of vigorous activities like stair climbing and interval training can improve aerobic fitness. One study found vigorously climbing three-flight stairwell, three times per day, separated by one to four hours of recovery three or more days a week increased aerobic fitness. Another found that a stair climbing test predicts the risk of death from cardiovascular disease, cancer, and other causes. Good performance on the test equates to climbing three floors of stairs very fast, or four floors fast, without stopping. See the benefits of interval training below.

[Read more for details](#)

Where to start?

If healthy start a steady state continuous base of moderate aerobic exercise for 20 minutes at a constant speed such as walking or biking for a few weeks. After that low and high intensity intervals should be incorporated into your program. Studies have found that higher intensity effort is needed to improve aerobic fitness. This can be simply accomplished by increasing intensity of effort where it is somewhat difficult to exercise for 1 or more minutes. Several of these intervals accompanied by recovery intervals is one of the best ways to improve aerobic ability. Typically people do 5 to 10 - one minute high intensity interval with the same amount of steady state continuous intervals when performing interval training. A warm up and cool down of 5 minutes should be incorporated as well. Progression is typically suggested to be a 5% increase per week of time or intensity or both. See below to learn about judging intensity and HIIT.

What are Aerobic Activities and is Interval Training Aerobic Activity?

Aerobic activities are those which are rhythmical and continuous (examples: walking, running, biking) which can be sustained for prolonged periods of time (generally greater than 1 minute). Less time than that is typically termed anaerobic. A moderate form of aerobic conditioning is termed continuous (steady state) where intensity does not change and is typically done between 45 to 55% of maximum (zone 1). A form of noncontinuous training is called interval training or High Intensity Interval Training (HIIT). Interval training is a system of organizing cardiorespiratory training which calls for repeated bouts of short duration, high-intensity exercise intervals intermingled with periods of lower intensity intervals of active recovery. Interval training requires participants to work at a vigorous intensity of 65 to 85% of maximum or within zone 2 (VT1) or zone 3 (VT2) between intervals of recovery. One minute intervals have been suggested to be superior to intervals of shorter duration. Moderate training is typically good for most while those aspiring to increase performance and are healthy should perform vigorous aerobic activity once or more times per a week. That being said it would be highly suggested that most who are healthy should try to get a few minutes a couple times a week of vigorous activity like stair climbing. Stair climbing 3-4 flights of stairs 2-4 times a day to be a potent form of vigorous aerobic activity. High Intensity Interval training using vigorous activity is a mix of aerobic and anaerobic activity.

What are the basic cardiorespiratory endurance recommendations

From the ACSM (American College of Sports Medicine) a leader in exercise research. Adults should get at least 150-300 minutes of moderate-intensity exercise per week or 75-150 minutes of vigorous exercise. Exercise recommendations can be met through 30 to 60 minutes of moderate-intensity exercise five days per week or 20 to 60 minutes of vigorous-intensity exercise three to 3-5 days per week or a combination. One continuous session and multiple shorter sessions of at least 10 minutes are both acceptable to accumulate the desired amount of daily exercise. To improve your aerobic fitness you should meet these recommendations and try to increase the intensity that you work at periodically. For weight loss it is highly suggested to attain more activity up to or surpassing 300 minutes of moderate-intensity exercise per week. I would suggest no more than 3 to 4 days a week of vigorous exercise. Just remember any exercise is better than no exercise. So if you can only do five minutes do it.

Monitoring Intensity

How can you know if you are working at the right intensity? As mentioned using an RPE (Rating of Perceived Exertion) chart can help you to determine the appropriate intensity easily and some consider it the best way.

[Read more for details](#)

The scale uses a 1 to 10 rating system. One is very light, such as walking around the house while ten would be maximal exercise. Ten would be indicative of not being able to take another step without fear of collapse. It is not recommended for anyone to work at a rate of 10 without strict supervision by a healthcare provider. Moderate intensity is the level of exercise that is most recommended, and can be determined by a rating between a 3 and a 4. When doing vigorous activity (such as HIIT) you can go higher on the RPE chart. Another useful way to monitor intensity is the Talk Test. If it is easy to talk then you are exercising moderately. When talking becomes somewhat difficult you have reached the ventilatory threshold (VT1). When it becomes difficult to very difficult you have reached ventilatory threshold 2 (VT2). This range is considered the high portion of interval training. Breathing can also be used to monitor intensity. If it is comfortable to breathe then you are exercising moderately. When breathing becomes noticeable you have reached the ventilatory threshold (VT1). When it becomes deep and somewhat rapid you have reached ventilatory threshold 2 (VT2). Heart rate is one of the most common used ways to judge intensity. The more fit you get the slower your heart rate will be at rest and when doing the same exercise you are accustomed to. Most exercise machines have a built in heart rate monitors and give you ranges based on your age. Unfortunately the equations that are used to predict these ranges uses estimates of maximum heart rate that are widely inaccurate, including the old version $220 - \text{age}$ as well as newer versions such as the Tanaka: $208 - (0.7 \times \text{age}) = \text{MHR}$. Therefore a better way to use heart rate is find the heart rate at a RPE of 4 to 5, where breathing is noticeable and it is somewhat difficult to speak. Use that heart rate as your upper limit of your training range and go 20-30 beats less as the lower portion.

Warm Up and Cool Down

Every session of aerobic exercise should include a warm-up and cool-down. The warm-up period should not just focus on static stretching, but should instead be a gradual increase in pace and intensity of the exercise. This allows for the body to increase blood flow to the muscles, and decreases the likelihood of a muscle or joint injury. The warm-up should last between 5 and 10 minutes. The cool-down session should last a similar amount of time as the warm-up, with the pace gradually decreasing. Stretching exercises would be appropriate after aerobic exercise.

Progression of aerobic exercise

Progression to higher intensities of exercise should be based on individual exercise tolerance. There are 3 methods for challenging aerobic fitness:

- Increase the speed
- Increase the resistance
- Increase the duration

Any of these methods, or a combination of these methods, will improve aerobic fitness. Increasing intensity should be done very gradually. Generally progression should be done only by 5% or less a week. You should challenge yourself for only a few minutes at a time. After a period of progression just try to maintain your new gained level of fitness.

Understanding Exercise Intensity Simplified

HIIT or Vigorous Zone is where aerobic fitness cardiorespirated the most

RPE	Talking	Breathing	% Heart Rate Max
3 Moderate	Easy	Comfortable	55
4 VT-1 Somewhat Hard	Somewhat Difficult	Noticeable	65
5-VT2 Hard	Difficult	Deep but Steady	75
6-VT2	Difficult-Very Difficult-Lactic Acid Burn	Deep and Somewhat Rapid	85



Moderate exercise: RPE of 3 Easy, talking is easy, breathing is comfortable and you are probably working at 55 % maximum of heart rate.

Vigorous exercise: RPE of 4/5 Somewhat Hard- difficult, breathing is deepened and you are probably working at 70 % maximum of heart rate.