Name:

PE 9A: Fit or Fat   In-Class Activity 3a: Cardiorespiratory Fitness

Cardiorespiratory fitness is one of the best all-around indicators of physical fitness because it measures your ability to function – it is a measure of the endurance capacity of the cardiorespiratory system and working skeletal muscles. The following table shows cardiorespiratory standards by gender and age.

	VERY POOR	POOR	FAIR	GOOD	EXCELLENT	SUPERIOR
Women						
age 18-29	< 30.6	30.6-33.7	33.8-36.6	36.7-40.9	41.0-46.7	> 46.7
30-39	< 28.7	28.7-32.2	32.3-34.5	34.6-38.5	38.6-43.8	> 43.8
40-49	< 26.5	26.5-29.4	29.5-32.2	32.3-36.2	36.3-40.9	> 40.9
50-59	< 24.3	24.3-26.8	26.9-29.3	29.4-32.2	32.3-36.7	> 36.7
60 & over	< 22.8	22.8-24.4	24.5-27.1	27.2-31.1	31.2-37.4	> 37.4
Men						
age 18-29	< 37.1	37.1-40.9	41.0-44.1	44.2-48.1	48.2-53.9	> 53.9
30-39	< 35.4	35.4-38.8	38.9-42.3	42.4-46.7	46.8-52.4	> 52.4
40-49	< 33.0	33.0-36.7	36.8-39.8	39.9-44.0	44.1-50.3	> 50.3
50-59	< 30.2	30.2-33.7	33.8-36.6	36.7-40.9	41.0-47.0	> 47.0
60 & over	< 26.5	26.5-30.1	30.2-33.5	33.6-38.0	38.1-45.1	> 45.1

 The most accurate method of determining cardiorespiratory fitness is direct measurement of oxygen uptake (VO_2 max). However, this laboratory method requires expensive equipment, and is time-consuming for a class setting. Fortunately, there are several reliable field methods. Depending on weather and number of students, we will use either the Mile walk or the Single Stage Treadmill protocol. Both protocols are suitable for those with relatively low fitness levels. Both protocols depend on your gender, body mass, age, speed (treadmill) or elapsed time (mile walk) and average heart rate during the test. As an example, VO_2max for the 1-Mile Walk is based on the following equation:

VO_2max =   132.85 – (0.077 x body weight in pounds)

- (0.39 x age in years)

+ (6.32 x gender where F = 0; M = 1)

- (3.26 x elapsed time in minutes)

- (0.16 x average HR in bpm)

It's a daunting equation, but only here for refrerence.   I developed a database that will do the computations with the data you provide.

Objectives

Learn healthy ranges of cardiorespiratory fitness. Learn a cardiorespiratory fitness testing protocol. Determine your level of cardiorespiratory fitness.

Equipment

Stopwatch	Measured Level Distance (track or treadmill)
Calculator	Heart Rate Monitor (optional)

Wear clothes suitable for vigorous, weight-bearing physical activity.

Before beginning the test, practice taking your heart rate at either your carotid artery in your neck, or radial artery in the wrist. Press your index and middle fingers gently on the correct spots – you may have to adjust your fingers to find the best position. Don't: use your thumb – it has a pulse of its own that may confuse our count; press too hard, especially on the carotid artery – strong pressure on this artery may trigger a reflex that decreases heart rate.

Procedures: 1 Mile Walk Protocol

Walk one mile as fast as is comforatable – you should be able to speak but not sing. In general, this will be near your upper thrz. Ideally, you should track your average heart rate during the test, however, this may not be possible. In this case, measure your 15-second pulse rate immediately upon completion of the test.

Did you walk on the ____track or ____treadmill?

Heart rate readings: _____ _____ _____ _____ Average: _____

Record your time in minutes and seconds _____:_____

Convert your time into hundredths of minutes (ex: 14 minutes, 25 seconds would be 14 + 25/60 = 14.4 minutes).

_____ min + _____/60 = _____ . _____ min

Procedures: Single Stage Treadmill Protocol

Warm up: 2-4 minutes at 0% grade, 2.0-4.5 mph. Find a speed at the upper border of your comfort level.

What is your treadmill speed? _____ mph

Test: walk 4:00 at the established speed at a 5% grade. Measure your heart rate at the end of 4:00.

What was your heart rate after 4:00 at 5% grade AND the above speed? _____ bpm

Cool down: 2-4 minutes at a comfortable pace.

Report the above results to me so that I can input it into my database and give you your VO$_2$max.

Results

What is your VO$_2$max?

Based on the table on the preceding page, what is your aerobic fitness classification?

Is your aerobic fitness higher, lower, or about what you expected? Why?

In retrospect, do you think you could have maintained a quicker pace over the course of the mile?

How do you think your own perceptions during the walk influenced the outcome of this test? In other words, do you think you picked a good pace for the test?