

## ASSESSMENT OF ENDURANCE FITNESS

There are two types of tests to assessment of the aerobic resistance: Maximum effort and submaximal effort. In this post, we have written about the submaximal effort because it uses in physical activity and health. In this types of test, it's monitored the pulse rate and RPE (Rating of perceived Exertion Borg RPE Scale)

### Why did assessment the aerobic resistance?

- To establish a starting point to see the possible improvements
- Volume and intensity of beginning
- To have reference data
- To identify strengths and weaknesses
- To help to know short-term, medium-term and long-term goals

### What test can you use?

- According your level
- According your age
- Considering your limitations and injuries
- Adapted to his interests and hobbies (more motivation)



### When we must interrupt a stress test?

- Chest discomfort
- Systolic blood pressure <20mmHg
- Systolic blood pressure >260mmHg
- Diastolic blood pressure >115mmHg
- Paleness, headache, nausea, clammy skin.
- Failure to increase the pulse rate
- Change in heart rhythm
- You want to stop
- Severe tiredness

## Test A. YMCA step test

The purpose of this test, is provides a submaximal measure of cardio-respiratory or endurance fitness. You can to step on and off the bench for 3 minutes straight while keeping a consistent pace and then see how quickly your heart rate will come back down



Equipment: a step with 30 cm, stopwatch and metronome (96 beat per minute)

Procedure: Go up and down during 3 minutes. After you finish, take the heart rate.

Scoring: The total one-minute post-exercise heart rate is the subject's score for the test.

**Ratings for Women, Based on Age**

	18-25	26-35	36-45	46-55	56-65	65+
<b>Excellent</b>	52-81	58-80	51-84	63-91	60-92	70-92
<b>Good</b>	85-93	85-92	89-96	95-101	97-103	96-101
<b>Above Average</b>	96-102	95-101	100-104	104-110	106-111	104-111
<b>Average</b>	104-110	104-110	107-112	113-118	113-118	116-121
<b>Below Average</b>	113-120	113-119	115-120	120-124	119-127	123-126
<b>Poor</b>	122-131	122-129	124-132	126-132	129-135	128-133
<b>Very Poor</b>	135-169	134-171	137-169	137-171	141-174	135-155

**Ratings for Men, Based on Age**

	18-25	26-35	36-45	46-55	56-65	65+
<b>Excellent</b>	50-76	51-76	49-76	56-82	60-77	59-81
<b>Good</b>	79-84	79-85	80-88	87-93	86-94	87-92
<b>Above Average</b>	88-93	88-94	92-88	95-101	97-100	94-102
<b>Average</b>	95-100	96-102	100-105	103-111	103-109	104-110
<b>Below Average</b>	102-107	104-110	108-113	113-119	111-117	114-118
<b>Poor</b>	111-119	114-121	116-124	121-126	119-128	121-126
<b>Very Poor</b>	124-157	126-161	130-163	131-159	131-154	130-151

## Test B. Rockport Fitness Walking Test

The objective of this test (Kline, 1987) is to monitor the development of the VO<sub>2</sub>max of people 18 to 69 years. Suitable for sedentary and older people.

Equipment: a stopwatch and distance of 1,6 km (one mile)

Procedure: To walk 1,6 km as fast as possible. The person records the time taken for the athlete to complete the test and the heart rate immediately on finishing.

Assessment: The formula (Kilne, 1987) used to calculate VO<sub>2</sub>max is:

$$\text{VO}_2\text{max (ml/kg/min)} = 132.853 - (0.0769 \times \text{weight}) - (0.3877 \times \text{age}) + (6.315 \times \text{gender}) - (3.2649 \times \text{time}) - (0.1565 \times \text{Heart rate})$$

Gender Male= 1 or Female=0

You can calculate automatic:

<http://www.exrx.net/Calculators/Rockport.html>

Results:

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
13-19	<25.0	25.0 - 30.9	31.0 - 34.9	35.0 - 38.9	39.0 - 41.9	>41.9
20-29	<23.6	23.6 - 28.9	29.0 - 32.9	33.0 - 36.9	37.0 - 41.0	>41.0
30-39	<22.8	22.8 - 26.9	27.0 - 31.4	31.5 - 35.6	35.7 - 40.0	>40.0
40-49	<21.0	21.0 - 24.4	24.5 - 28.9	29.0 - 32.8	32.9 - 36.9	>36.9
50-59	<20.2	20.2 - 22.7	22.8 - 26.9	27.0 - 31.4	31.5 - 35.7	>35.7
60+	<17.5	17.5 - 20.1	20.2 - 24.4	24.5 - 30.2	30.3 - 31.4	>31.4

Ladies 1 mile walk fitness score

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
13-19	<35.0	35.0 - 38.3	38.4 - 45.1	45.2 - 50.9	51.0 - 55.9	>55.9
20-29	<33.0	33.0 - 36.4	36.5 - 42.4	42.5 - 46.4	46.5 - 52.4	>52.4
30-39	<31.5	31.5 - 35.4	35.5 - 40.9	41.0 - 44.9	45.0 - 49.4	>49.4
40-49	<30.2	30.2 - 33.5	33.6 - 38.9	39.0 - 43.7	43.8 - 48.0	>48.0
50-59	<26.1	26.1 - 30.9	31.0 - 35.7	35.8 - 40.9	41.0 - 45.3	>45.3
60+	<20.5	20.5 - 26.0	26.1 - 32.2	32.3 - 36.4	36.5 - 44.2	>44.2

### Men's 1 mile walk fitness score

Table reference: Heywood, V. (1998). The physical fitness specialist certification manual. Dallas (TX): The Cooper Institute of Aerobics Research.

## Test C. UKK Walk Test

This test is designed to measure the respiratory and cardiovascular performance of normally active men and women. The UKK has proven to be a useful fitness assessment tool to support the guidance of exercise for health.

**Equipment:** a stopwatch and distance of 2 km (plain and interrupted)



**Procedure:** To walk 2 km as fast as possible.

To register the heart rate every 500 meters. Then, to calculate the Walk Index.

**Assessment:** The test-result is the index-values which is calculated as follows (according to sex):

$$\text{Walk index} = 420 + (\text{age} \times 0.2) - [\text{time} \times 0.19338 + \text{HR} \times 0.56 + (2.6 \times \text{weight}/\text{time}^2)]$$

Men's index value

$$\text{Walk index} = 304 + (\text{age} \times 0.4) - [\text{time} \times 0.1417 + \text{HR} \times 0.32 + (1.1 \times \text{weight}/\text{time}^2)]$$

Ladies index value

## REFERENCES:

- ✓ Earle, R. W., & Baechle, T. R. (2008). *Manual NSCA: Fundamentos del entrenamiento personal*. Paidotribo.
- ✓ Heywood, V. (1998). *The physical fitness specialist certification manual*. Dallas (TX): *The Cooper Institute of Aerobics Research*.
- ✓ Kline, G. M., Porcari, J. P., Hintermeister, R., Freedson, P. S., Ward, A. N. N., McCarron, R. F., ... & Rippe, J. M. (1987). Estimation of VO<sub>2</sub>max from a one-mile track walk, gender, age, and body weight. *Med Sci Sports Exerc*, 19(3), 253-259.
- ✓ LUNT, H. et al. (2013) Validation of one-mile walk equations for the estimation of aerobic fitness in British military personnel under the age of 40 years. *Military medicine*, 178 (7), p. 753-759
- ✓ Nieman DC (1999) *Exercise Testing and Prescription: A Health-Related Approach* (4th Ed.). Mountain View, CA: Mayfield Publishing Company, pp 90.
- ✓ SARTOR, F. et al. (2013). Estimation of maximal oxygen uptake via submaximal exercise testing in sports, clinical, and home settings. *Sports medicine*, 43 (9), p. 865-873
- ✓ WEIGLEIN, L. et al. (2011) The 1-Mile Walk Test is a Valid Predictor of VO<sub>2</sub>max and is a Reliable Alternative Fitness Test to the 1.5-Mile Run in US Air Force Males. *Military medicine*, 176 (6), p. 669-673

