

Protocol for Cardiovascular Fitness Test

To determine the cardiovascular health of a person, you will need to measure resting heart rate, exercise heart rate, and exercise recovery time. (This protocol has been adapted from a similar protocol available from Vernier, Inc. that aligns with the use of their heart rate monitors.)

Reclining heart rate

1. Have the subject lie on a clean surface or table. Begin collecting heart rate data. While laying, count the number of breaths the subject takes in one minute.
2. Record the subject's heart rate **after two minutes** in the cardiovascular fitness table.
3. Assign fitness points to the subject based on Table 1 and record the value in the cardiovascular fitness table. Also, record the subject's respiratory rate in the cardiovascular fitness table.

Table 1: Reclining Heart Rate Fitness Points

Beats/min	Fitness Points
50–60	6
61–70	5
71–80	4
81–90	3
91–100	2
101–110	1
> 110	0

Step test

4. Before performing the step test, have the subject stand still for 30 seconds. Record the subject's heart rate at 30 seconds as the subject's PRE-EXERCISE heart rate.
5. Perform a step test using the following procedure:
 - a. Place the right foot on the top step of the stool.
 - b. Place the left foot completely on the top step of the stool next to the right foot.
 - c. Place the right foot back on the floor.
 - d. Place the left foot completely on the floor next to the right foot.
 - e. Repeat the cycle as quickly as possible for 30 seconds
6. Record the heart rate in subject's cardiovascular fitness table. **DO NOT STOP DATA COLLECTION!** Start timer and quickly move to Step 7. When steps have been completed, measure their respiratory rate in 30 seconds and multiply that number by 2. (You can start Step 7 and then begin measuring respiratory rate.)

Exercise recovery time

7. Have the subject remain standing and keep relatively still. Monitor the heart rate readings and stop timing when the readings return to the pre-exercise heart rate value recorded in Step 4. Record the recovery time in the subject's cardiovascular fitness table
8. Locate the subject's recovery time in Table 2 and record the corresponding fitness point value in the cardiovascular fitness table. Also, record the subject's respiratory rate when they have reached their recovery heart rate.

Table 2: Recovery Time Fitness Points

Time (sec)	Fitness Points
0–30	6
31–60	5
61–90	4
91–120	3
121–150	2
151–180	1
>180	0

4. Subtract the subject's pre-exercise heart rate from their heart rate after 5 stepping cycles of exercise. Record this heart rate increase in the endurance row of subject's cardiovascular fitness table. Do the same subtraction for the respiratory rate.
5. Locate the row corresponding to the pre-exercise heart rate in Table 3 and use the heart rate increase value to determine endurance fitness points. Record the subject's endurance fitness points in the cardiovascular fitness table.

Table 3. Endurance Fitness Points

Reclining Heart Rate (Beats/Min)	Heart rate increase after exercise (Beats/Min)				
	0–10	11–20	21–30	31–40	41+
50–60	6	5	4	3	2
61–70	5	4	3	2	1
71–80	4	3	2	1	0
81–90	3	2	1	0	0
91–100	2	1	0	0	0
101–110	1	0	0	0	0
>110	0	0	0	0	0

Cardiovascular Fitness Table

Subject Number: _____ Gender: _____ Age: _____

Frame Size: _____ Height: _____ Factor: _____

Condition	Rate or time or value	Fitness Points	Respiratory Rate
Reclining heart rate	beats/min		breaths/min
Pre-exercise heart rate	beats/min		breaths/min
Step test	beats/min		breaths/min
Exercise recovery time	seconds		
Endurance	beats/min		breaths/min
		Total:	

Cardiovascular Fitness Table

Subject Number: _____ Gender: _____ Age: _____

Frame Size: _____ Height: _____ Factor: _____

Condition	Rate or time or value	Fitness Points	Respiratory Rate
Reclining heart rate	beats/min		breaths/min
Pre-exercise heart rate	beats/min		breaths/min
Step test	beats/min		breaths/min
Exercise recovery time	seconds		
Endurance	beats/min		breaths/min
		Total:	