Tanvi sheth Design laboratory 002602
020

How Exercise Affects Heart Rates

Teacher's Instructions: Design a lab to show the effect of exercise on one parameter of your body.

AIM:

To see how different types exercises cause different heart rates.

BACKGROUND:

When a person exercises, they start respiring differently, greater amount of blood is pumped into their heart, which causes a significant increase in their heart rate. Through this experiment one will see how exercise affects heart rate.

HYPOTHESIS:

The more rigorous the exercise, the more energy will be consumed by the body. Thus, the heart will beat faster as the intensity of the exercise increases.

VARIABLES:

-INDEPENDENT VARIABLE- The different types of exercises,

- Running up a flight of stairs for a minute
- Skipping for a minute
- Walking on a treadmill for a minute
- Lifting weights of 15kgs in each hand for a minute

-DEPENDENT VARIABLE- Different heart rates

-CONTROLLED VARIABLE-

- The time spent (i.e.: one minute on each exercise)

- The atmosphere and temperature should be the same for all exercises
- The subject's pulse rate should return to normal before another exercise

APPARATUS: To conduct the exercises we require,

1. A flight of stairs (long enough for the subject to run up it for a minute)
2. A skipping rope
3. Treadmill
4. 2 weights of 15kgs each
5. Timer

PROCEDURE:

1. Make sure the subject's heart rate is at a normal level. Measure the pulse of the subject by placing your index finger and middle finger on the back her wrist.
2. <u>For the first exercise:</u>
    - As soon as the subjects stats running up the flight of stairs start timer.
    - Once 30 seconds are up on the timer, stop the subject.
    - Put your index finger and middle finger on the back of the wrist of the subject and calculate her pulse rate for 30 seconds.
    - Take down your observations
3. <u>For the second exercise</u>:
    - Wait for the subject's pulse to return to normal rate.
    - As soon as the subject begins skipping, start the timer.
    - Once 30 seconds are up on the timer, stop the subject.
    - Put your index finger and middle finger on the back of the wrist of the subject and calculate her pulse rate for 30 seconds.

- Take down your observations.

4. For the third exercise:
   - Wait for the subject's rate to return to normal rate.
   - As soon as the subject begins to walk on the treadmill (at the speed of 4kms/hr); switch on the timer.
   - Once 30 seconds are up on the timer, stop the treadmill.
   - Put your index finger and middle finger on the back of the wrist of the subject and calculate her pulse rate for 30 seconds.
   - Take down your observations.

OBSERVATIONS:

1. The normal heart rate of the subject (18 year old female, weighing 49 kgs is 41heartbeats / 30 seconds).
2. The subject's heart beat after the fist exercise (running up a flight of stairs) is 58 heartbeats/ 30 seconds.
3. The subject's heartbeat after the second exercise (skipping) is 61 heart beats / 30 seconds.
4. The subject's heartbeat after the third exercise (walking at a speed of 4km/hr.) is 45 heart beats/ 30 seconds)

CONCLUSION:

It can be concluded from the experiment performed above that as the rigor of the exercise increases (more energy is required for that exercise); heart starts pumping more blood. This indicates an increase in the heart rate.
Walking barely requires much energy, thus the subject's heartbeat is close to the normal rate.
Running up a flight of stairs requires more energy than walking, thus the subject's heart rate increases.
Skipping requires the most energy and the subject's heart rate is the maximum whilst doing this exercise.

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