

# Measuring Heartbeat

# 41

Have you ever wondered why a nurse or doctor takes a patient's pulse? As the heart pumps blood into arteries, vibrations result from the force of the blood moving through these blood vessels. These vibrations are called the pulse and provide an easy way of counting and timing the patient's heartbeat. The pulse, therefore, is an exact record of the heartbeat.

## Strategy

You will learn how to take a pulse on your wrist and neck and compare the rates that will be recorded.

You will measure and record the pulse for several minutes after exercise and graph the changes that occur in the pulse rate.

## Materials

clock or watch with second hand  
metric ruler

## Procedure

### Part A Wrist Pulse

1. Find the pulse in the wrist of a classmate.  
Look for a large tendon on the inside of the forearm. The pulse can be found just above the point where this tendon enters the wrist. (See Figure 41-1.) NOTE: Do not use the thumb or index finger in locating the pulse.
2. Using a clock or watch with a second hand, take your classmate's pulse for one minute. Record the results in Data Table 41-1. (See Data and Observations.)
3. Repeat Step 2 three more times and average your results. To find the average, add the four pulses and divide the total by four.
4. Let your classmate measure your pulse. Follow the procedures in Steps 2 and 3. Record the results in Data Table 41-1.

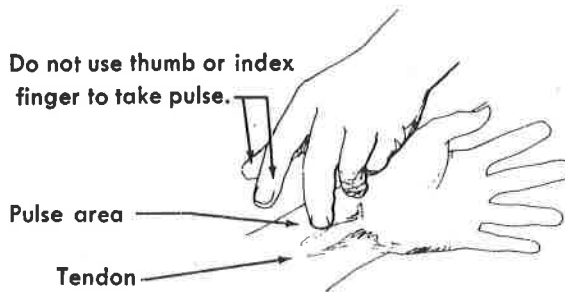


FIGURE 41-1.

### Part B Neck Pulse

1. Place your middle finger about 8 cm below your ear lobe. You are now near the carotid artery. Locate your pulse in that area using moderate to firm pressure.
2. Find this area on your classmate's neck and take his or her pulse for one minute. Record your results in Data Table 41-1.
3. Repeat this procedure three more times and average the results.
4. Let your classmate measure your pulse again. Follow the procedures in Part B Steps 2 and 3. Record the results in Data Table 41-1.

### Part C Changing the Pulse

1. Ask your classmate to run in place for one minute.
2. Count and record your classmate's pulse each minute for eight consecutive minutes after he or she stops running. Record the results in Data Table 41-2.
3. Let your classmate measure your pulse for eight minutes after you run in place for one minute. Record the results in Data Table 41-2.

### Data and Observations

1. Record your classmate's and your wrist and neck pulses in Data Table 41-1.

**Data Table 41-1**

<i>Pulse/minute</i>	<i>Trial 1</i>	<i>Trial 2</i>	<i>Trial 3</i>	<i>Trial 4</i>	<i>Average</i>
<i>Your classmate's wrist</i>					
<i>Your classmate's neck</i>					
<i>Your wrist</i>					
<i>Your neck</i>					

2. Record your classmate's and your pulses after running in place.

**Data Table 41-2**

<i>Minutes after running</i>	1	2	3	4	5	6	7	8
<i>Your classmate's pulse</i>								
<i>Your pulse</i>								

3. Prepare a line graph of your results in Figure 41-2.

### Questions and Conclusions

1. How does your average wrist pulse compare to your classmate's? \_\_\_\_\_  
\_\_\_\_\_
2. How does your average neck pulse compare to your classmate's? \_\_\_\_\_  
\_\_\_\_\_
3. Should your answers to 1 and 2 be the same? Explain. \_\_\_\_\_  
\_\_\_\_\_
4. How does running in place affect pulse? \_\_\_\_\_  
\_\_\_\_\_

5. How is pulse related to heartbeat? \_\_\_\_\_  
\_\_\_\_\_
6. How long after running does it take for your pulse to return to the average in Data Table 41-1? \_\_\_\_\_
7. How long after running does it take for your classmate's pulse to return to the average in Data Table 41-1? \_\_\_\_\_
8. Should your answers to 6 and 7 be the same? Explain. \_\_\_\_\_  
\_\_\_\_\_
9. If you rested for 30 minutes after running, would you expect the pulse rate on the graph (Figure 41-2) to approach zero? Explain. \_\_\_\_\_  
\_\_\_\_\_
10. How would you expect the pulse rate on the graph to change if you ran for 10 minutes instead of one minute? \_\_\_\_\_  
\_\_\_\_\_

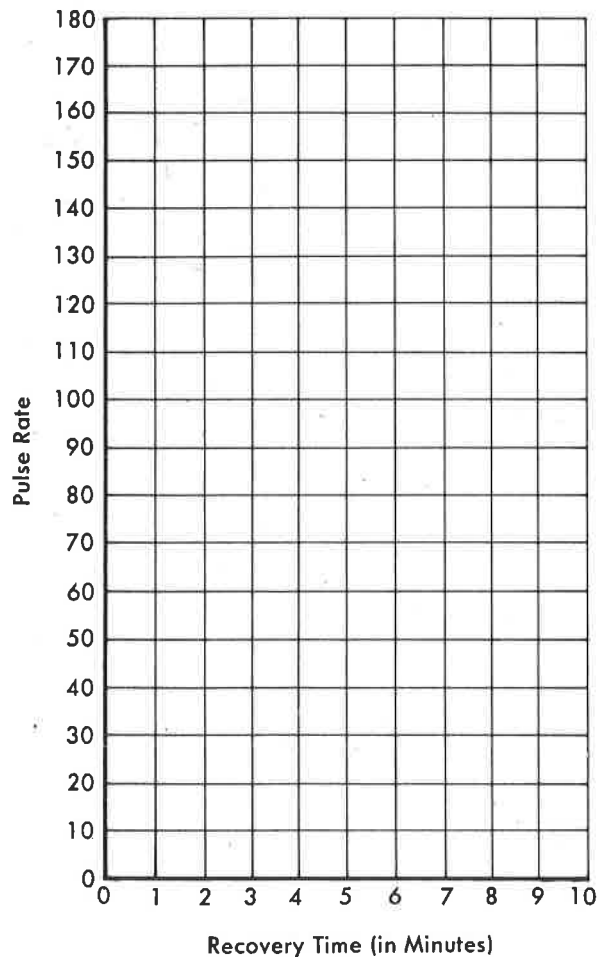


FIGURE 41-2.

Use your text to help answer these questions.

11. How much blood does the heart pump in one minute? \_\_\_\_\_

12. What vessels carry blood to the heart? \_\_\_\_\_

13. What vessels carry blood away from the heart? \_\_\_\_\_

14. Compare the structure of arteries and veins. \_\_\_\_\_

---

---

15. What does each beat of the heart do to an artery? \_\_\_\_\_

---

16. How do arteries assist the heart in pumping blood? \_\_\_\_\_

---

17. What prevents blood from flowing backward in the veins? \_\_\_\_\_

---

### Strategy Check

\_\_\_\_\_ Did you locate and record the wrist and neck pulse?

\_\_\_\_\_ Can you compare the rates of the wrist and neck pulse?

\_\_\_\_\_ Did you correctly prepare a graph of changing pulse after running?