PhysioEx Lab Report

Exercise 5: Cardiovascular Dynamics

Activity 5: Studying the Effect of Blood Vessel Radius on Pump Activity

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Pre-lab Quiz Results

You scored 100% by answering 5 out of 5 questions correctly.

1. The heart is resting during

   You correctly answered: ventricular diastole.

2. The right side of the heart pumps blood

   You correctly answered: to the lungs.

3. The layer of the blood vessel that is stimulated by the autonomic nervous system is

   You correctly answered: smooth muscle.

4. In the experiment, the pump simulates

   You correctly answered: the left ventricle of the heart.

5. If the right beaker simulates the flow of blood to the systemic circuit of the body, what do the right valve and flow tube represent?

   You correctly answered: aortic valve and aorta.

Experiment Results

Predict Question

1. Predict Question: If you increase the flow tube radius, what will happen to the pump rate to maintain constant pressure?

   Your answer: The pump rate will increase.

Stop & Think Questions

1. When the piston of the pump reaches its lowest point, the volume remaining in the pump is the

You correctly answered: end systolic volume.

2 If you increase the right flow tube radius, what will happen to resistance and flow rate?

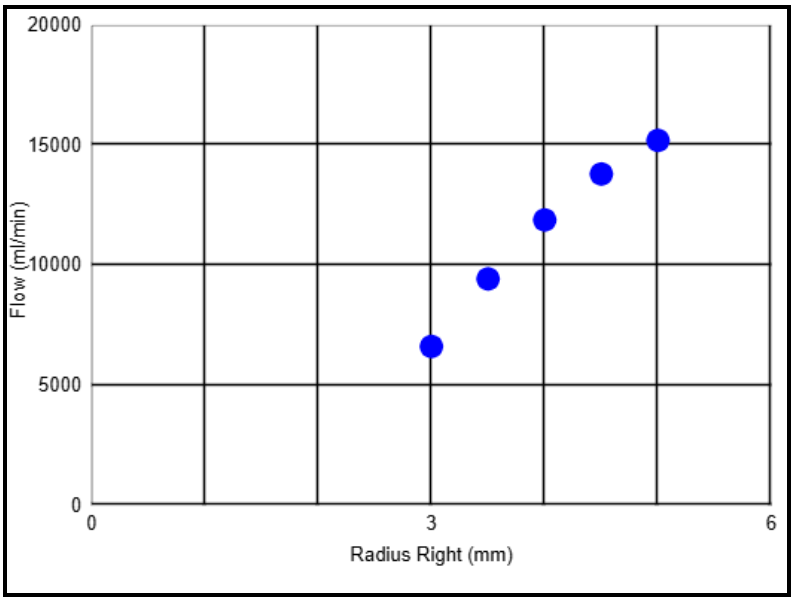
You correctly answered: Flow rate will increase and resistance will decrease.

3 If the left flow tube represents the pulmonary veins, what does the left source beaker represent?

You correctly answered: blood coming from the lungs.

Experiment Data

Flow (ml/min)	Rad. L (mm)	Rad. R (mm)	Str. V (ml)	Rate (strokes /min)	Press. L (mm Hg)	Press. Dif R (mm H
6607.2	3.5	3.0	70	94.4	40	40
9423.9	3.5	3.5	70	134.6	40	40
11882.5	3.5	4.0	70	169.8	40	40
13798.3	3.5	4.5	70	197.1	40	40
15198.7	3.5	5.0	70	217.1	40	40



Post-lab Quiz Results

You scored 100% by answering 5 out of 5 questions correctly.

1 The pump piston in the simulation is up during

You correctly answered: diastole.

2 The pump in the simulation represents the

You correctly answered: left ventricle.

3 The amount of blood flowing into the destination beaker (right beaker) with a single pump is called the

You correctly answered: stroke volume.

4 In this experiment, the increase in right flow tube radius resulted in

You correctly answered: an increase in flow rate, which increased the pump rate.

5 Which chamber should be present in the flow pattern of the experiment, given that the vessels and valves surrounding it are present (the chamber was omitted from the experiment for simplicity)?

You correctly answered: left atrium.

Review Sheet Results

1 Explain the effect of increasing the right flow tube radius on the flow rate, resistance, and pump rate.

Your answer:

My assumption was correct and was verified by the results of the experiment.

2 Describe what the left and right beakers in the experiment correspond to in the human heart.

Your answer:

The left beaker represents blood coming from the lungs into the heart and the right beaker represents blood travelling to the systemic circuit.

3 Briefly describe how the human heart could compensate for flow rate changes to maintain blood pressure.

Your answer:

Increasing the flow rate, this causes the heart to pump faster in order to maintain blood pressure.