Pre-lab Quiz Results
You scored 100% by answering 4 out of 4 questions correctly.

1. Which of the following forces promotes filtration?
   You correctly answered: c. blood pressure in the glomerular capillaries

2. The glomerular filtration rate can be altered by
   You correctly answered: b. changing the afferent arteriole resistance.

3. In 24 hours human glomerular capillaries can filter as much as __________ liters of filtrate.
   You correctly answered: c. 180

4. Which of the following statements about the filtrate in the renal corpuscle is false?
   You correctly answered: d. Normally, more than 40% of the blood that enters the glomerular capillaries becomes filtrate.
Experiment Results

Predict Question:

Predict Question 1: What will happen to the glomerular capillary pressure and filtration rate if you increase the blood pressure in the left source beaker?
Your answer: a. Both pressure and filtration rate will increase.

Predict Question 2: What will happen to the filtrate pressure in Bowman’s capsule (not directly measured in this experiment) and filtration rate if you close the one-way valve between the collecting duct and the urinary bladder?
Your answer: d. Pressure will increase and filtration rate will decrease.

Stop & Think Questions:

What is the important relation that underlies the observed increase in glomerular filtration rate when the blood pressure is increased?
You correctly answered: c. pressure and flow are directly proportional.

What medical condition is analogous to the closed valve?
You correctly answered: b. a tumor obstructing the renal tubule

Experiment Data:

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<tr>
<th>Afferent Radius (mm)</th>
<th>Efferent Radius (mm)</th>
<th>Beaker Press. (mm Hg)</th>
<th>Glomerular Press. (mm Hg)</th>
<th>Glom. Filt. Rate (ml/min)</th>
<th>Urine Volume (ml)</th>
<th>Valve Status</th>
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Post-lab Quiz Results
You scored 100% by answering 4 out of 4 questions correctly.

1. In humans, the glomerular filtration rate normally ranges from
You correctly answered: b. 80 to 140 ml/min.

2. Which of the following does not have a significant impact on the glomerular filtration rate?
You correctly answered: d. renal tubule length

3. In the absence of any regulatory mechanisms, what do you think would happen to the glomerular filtration rate of a person who experiences an increase in blood pressure?
You correctly answered: a. The glomerular filtration rate could increase.

4. What would happen to the glomerular filtration rate of a person who experiences a large hemorrhage?
You correctly answered: b. The glomerular filtration rate would decrease.
Review Sheet Results
1. As blood pressure increased, what happened to the glomerular capillary pressure and the glomerular filtration rate? How well did the results compare with your prediction?
Your answer:
As blood pressure was increased, the glomerular capillary pressure and the glomerular filtration rate was both increased, as my prediction indicated. When there is an increase in blood pressure, then more blood enters the capillary beds of the Bowmans capsule per unit time, which leads to an increase in glomerular capillary pressure, and the filtration rate is also increased due to higher pressure in the glomerular capillary beds, which allows for more products to diffuse into the renal corpuscle, which is an important aspect of the kidneys, to filtrate the blood.

2. Compare the urine volume in your baseline data with the urine volume as you increased the blood pressure. How did the urine volume change?
Your answer:
As the blood pressure increased, the urine volume increased as well. This increase in urine volume can be described as an effect of the increased blood pressure which lead to an increase in the glomerular capillary pressure, which leads to an increased diffusion into the renal corpuscle of the waste products. When there is a higher presence of waste products in the renal corpuscle, then the waste products are removed more frequently by increasing the urine passage.

3. How could the change in urine volume with the increase in blood pressure be viewed as being beneficial to the body?
Your answer:
An increase in blood pressure causes an increase in urine volume, which could be beneficial for the body, because more waste products are removed faster from the body than they are normally supposed to. However an increase in blood pressure may lead to hypertension, which is a risk factor for many other diseases. Also increasing the urine output by increasing the blood pressure, also means that one have to supply the water lost in increasing the urine passage by drinking more water.

4. When the one-way valve between the collecting duct and the urinary bladder was closed, what happened to the filtrate pressure in Bowmans capsule (this is not directly measured in this experiment) and the glomerular filtration rate? How well did the results compare with your prediction?
Your answer:
When closing the one-way valve between the collecting duct and the urinary bladder, the filtrate pressure in the bowmans capsule remained the same, while the glomerular filtration rate decreased. My prediction was that the pressure would increase and the filtration rate would decrease. The filtration rate will decrease because the valve is closed, meaning that there is no urine outpur. This lead to urine being stuck in the urinary tract leading to negative feedback to the filtration rate. The filtration rate is decreased, because the system cannot filtrate as much, because there is already a certain amount of filtrate already present in the system.

5. How did increasing the blood pressure alter the results when the valve was closed?
Your answer:
The increase in blood pressure did not alter the pressure when the valves was closed. The glomerular pressure remained the same, wheter the valve was open or closed but the glomerular filtration rate was decreased when the valve was closed.