Pre-lab Quiz Results
You scored 75% by answering 3 out of 4 questions correctly.

1. If all other variables are kept constant, how does the afferent arteriole radius affect the rate of glomerular filtration (select all that apply)?
   You correctly answered: c. An increased afferent arteriole radius will increase the rate of glomerular filtration. d. A decreased afferent arteriole radius will decrease the rate of glomerular filtration.

2. If all other variables are kept constant, how does the efferent arteriole radius affect the rate of glomerular filtration (select all that apply)?
   Your answer: c. An increased efferent arteriole radius will increase the rate of glomerular filtration. d. A decreased efferent arteriole radius will decrease the rate of glomerular filtration.
   Correct answer: a. An increased efferent arteriole radius will decrease the rate of glomerular filtration. b. A decreased efferent arteriole radius will increase the rate of glomerular filtration.

3. If all other variables are kept constant, how does blood pressure affect the rate of glomerular filtration (select all that apply)?
   You correctly answered: b. If blood pressure goes up, the rate of glomerular filtration goes up. d. If blood pressure goes down, the rate of glomerular filtration goes down.

4. In the absence of other renal processes (including tubular reabsorption and secretion), more glomerular filtration leads to a larger urine volume.
   You correctly answered: a. true
Experiment Results

Predict Question:
Predict Question: What will happen to the glomerular capillary pressure rate and glomerular filtration rate if both of these arteriole radii changes are implemented simultaneously with the low blood pressure condition?
Your answer: c. Glomerular filtration rate and pressure will only increase to the levels measured in the constricted efferent arteriole experiment.

Stop & Think Questions:
If blood pressure were to drop (for example, as the result of blood loss), what changes in the nephron would allow the kidney to maintain its normal glomerular filtration rate (select all that apply)?
You correctly answered: a. afferent arteriole dilation  d. efferent arteriole constriction
Comparing the glomerular filtration rate and glomerular capillary pressure with the baseline values (from the first run), how effective was the increased afferent arteriole radius in compensating for the low blood pressure?
You correctly answered: c. The afferent arteriole dilation returned the low glomerular capillary pressure and filtration rate almost to baseline values.
Comparing the glomerular filtration rate and glomerular capillary pressure with the baseline values (from the first run), how effective was the decreased efferent arteriole radius in compensating for the low blood pressure?
You correctly answered: b. The efferent arteriole constriction improved the low glomerular capillary pressure and filtration rate marginally.

Experiment Data:

<table>
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<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>
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Post-lab Quiz Results
You scored 25% by answering 1 out of 4 questions correctly.

1. If all other variables are kept constant, when blood pressure decreases, glomerular filtration
   You correctly answered: c. decreases.

2. If afferent arteriole radius decreases in response to an increase in blood pressure, then glomerular filtration
   Your answer: a. increases.
   Correct answer: b. remains approximately the same.

3. If all other variables are kept constant, when the efferent arteriole radius decreases, glomerular filtration
   Your answer: c. decreases.
   Correct answer: a. increases.

4. With blood pressure held at a constant value, which of the following combinations will raise the glomerular filtration rate above baseline values?
   Your answer: a. afferent arteriole constriction and efferent arteriole dilation
   Correct answer: b. afferent arteriole dilation and efferent arteriole constriction
Review Sheet Results

1. List the several mechanisms you have explored that change the glomerular filtration rate. How does each mechanism specifically alter the glomerular filtration rate?
   Your answer:
   The glomerular filtration rate is affected by the blood pressure, the radii of the afferent and the efferent arteriole and the change in afferent arteriolar resistance. When increasing the blood pressure the glomerular filtration rate is also proportionally increased, because the when the blood has a higher pressure entering the capillary beds of the Bowmans capsule enhancing the diffusion, making the glomerular filtration rate increase. The radii of the afferent and efferent arteriole also affects the glomerular filtration rate, by increasing the size of the radii, then more bloods is allowed to enter into the capillary beds, thereby increasing the glomerular filtration rate. The change in afferent resistance also affects the glomerular filtration rate. The myogenical and glomerular tubular are the names of the mechanisms.

2. Describe and explain what happened to the glomerular capillary pressure and glomerular filtration rate when both arteriole radii changes were implemented simultaneously with the low blood pressure condition. How well did the results compare with your prediction?
   Your answer:
   When both arteriole radii changes were implemented simultaneously with the low blood pressure conditions, then the glomerular capillary pressure and glomerular filtration rate levels went almost back to baseline values. This means that when there is a decrease in the blood pressure in our body, an increase in the radius of the afferent arteriole and a decrease in the efferent arteriole will help to stabilize the glomerular capillary pressure and glomerular filtration rate, which is one of the protective mechanism the body has, to protect itself from to low blood pressure.

3. How could you adjust the afferent or efferent radius to compensate for the effect of reduced blood pressure on the glomerular filtration rate?
   Your answer:
   By adjusting the afferent arteriole the body will compensate for the effect of reduced blood pressure on the glomerular filtration pressure. By dilating the afferent arteriole, more blood is allowed to enter the capillary beds of the bowmans capsule by the dilation of the afferent arteriole. By reducing the radii of the efferent arteriole the blood will not be removed from the capillary beds as the normal rate, thus remaining the glomerular filtration rate normal.

4. Which arteriole radius adjustment was more effective at compensating for the effect of low blood pressure on the glomerular filtration rate? Explain why you think this difference occurs.
   Your answer:
   The afferent arteriole dilation was the most effective compensatory mechanism for the effect of low blood pressure. This mechanism brought the glomerular filtration rate back to the base line values where the blood pressure was normal.

5. In the body, how does a nephron maintain a near-constant glomerular filtration rate despite a constantly fluctuating blood pressure?
   Your answer:
   It may be caused by extrinsic or entrinsic regulatory mechanism. There can also be a stimulation of the sympathetic nervous system, which may constrict the afferent arteriole as a response to an increase in blood pressure.