Renal Tests

1. Define glomerular filtration rate (what is glomerular filtration rate?)
2. In order for the clearance of a factor \( x \) to equate with glomerular filtrate rate, \( x \) must have the following properties:

   a.
   
   b.
   
   c.

Creatinine clearance may be calculated using the Cockroft-Gault formula: Cockcroft DW, Gault MH. 
1244564.

\[(140 - \text{age}) \times \text{ideal weight}\]
\[72 \times \text{creatinine}\]

Multiply by 0.85 if female

This gives you creatinine clearance in ml/minute

You can also calculate creatinine clearance by collecting urine for 24 hours. Measure the serum 
creatinine and the urine creatinine values and then use the formula:

\[
\frac{\text{Urine volume (ml)} \times \text{urine creatinine concentration}}{\text{Serum creatinine} \times \text{time (minutes)}}
\]

http://www-users.med.cornell.edu/~spon/picu/calc/crclcalc.htm

3. Why do we use creatinine clearance to estimate glomerular filtration rate?

4. What is a normal glomerular filtration rate for men and women?
5. What are the limitations of using creatinine clearance to estimate glomerular filtration rate?

6. What does MDRD stand for?


http://mdrd.com/

7. Why does the lab not report estimated GFR > 60?

8. What is the relationship of creatinine to creatine?

9. Why is a serum creatinine of 1.0 mg/dl a 80 year old female with a weight of 45 kg not equal to the serum creatinine of 1.0 mg/dl in a 27 year old male with a weight of 70 kg?

Describe individuals are expected to have a low serum creatinine if their kidney function is normal?

Describe individuals who are expected to have a higher serum creatinine if their kidney function is normal.
10. Below-draw how urine protein excretion may change over the course of a 20 year exposure to poorly controlled diabetes

11. Define microalbuminuria

12. Define macroalbuminuria

13. Does the presence of microalbuminuria reflect kidney disease?

14. How much protein is normally in the urine?
<table>
<thead>
<tr>
<th>No diabetes</th>
<th>10 years diabetes</th>
<th>15 years diabetes</th>
<th>20 years diabetes</th>
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</thead>
</table>