PAL Worksheet
Week 8 Problem Set 2

GLOMERULAR FILTRATION RATE

1) On your white board draw a renal corpuscle and then list the 3 forces (determining NFP), that are involved in glomerular filtration. Also, for each pressure, state whether they promote filtration or oppose filtration.

2) How can podocytes and mesangial cells also affect GFR independent of changes in NFP?

4) Would the following factors (a) increase, (b) decrease, or (c) not affect the glomerular filtration rate (GFR). If everything else remained constant?

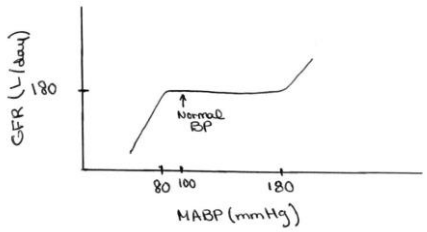
_____ a rise in Bowman's capsule pressure
_____ a fall in plasma albumin concentration due to liver failure
_____ a dramatic fall in arterial blood pressure following severe hemorrhage
_____ increase in sympathetic activity to the afferent arterioles
_____ an obstruction in the PCT

5) If an individual's GFR is known, one can determine how the kidney handles any solute by measuring the solute's plasma concentration and its excretion rate. By comparing the amount of solute filtered to that of its excretion rate, one can tell how the nephron handled that substance. Based on this information, complete the following sentences:

* if filtration rate of substance X is greater than the excretion rate of substance X, then there is net _____ of X.
* if excretion rate of substance X is greater than the filtration rate of substance X, then there is net _____ of X.
* if filtration and excretion rates of substance X are the same, then X passes through the nephron without _____ or _____.

6) Draw a concept map that illustrates the intrinsic and extrinsic regulation of GFR:

7) Re-draw the graph below and clearly label where intrinsic and extrinsic regulation of GFR occurs:



8) What is the main determinant of whether GFR is regulated intrinsically by the kidneys, or extrinsically by the endocrine and nervous systems?

9) What is the major goal of extrinsic regulation of GFR?

10) List several "players" (hormones/ NS) that are involved in extrinsic regulation of GFR: