

Homework 3

1. A 30 year-old white male patient needs to take gentamicin (aminoglycosides) for his condition. The body weight of this patient is 70kg. The volume distribution of gentamicin is 16.5 L.

- a. Calculate the Creatinine Clearance (CrCL) for this patient
- b. Calculate the elimination rate constant (k_e)
- c. Calculate the total clearance (CL_T)
- d. Calculate the non-renal clearance (CL_{nonren}) (Hint: intercept k_e)
- e. Calculate the renal clearance (CL_{ren})
- f. If 100 mg of gentamicin were given to the patient by infusion over 30 minutes, after infusion stops, how long will it take for the gentamicin concentration to go down to 5mg/L. (use IV bolus, one compartment equation)

Please select correct answer(s) for following questions.

2. Forced diuresis is likely to significantly enhance the clearance of
 - a. a drug which is both polar and slowly removed from the body
 - b. a drug for which most of the filtered and secreted drug is reabsorbed
 - c. a drug for which mainly cleared via metabolism
 - d. a drug for which the ratio of its renal clearance to creatinine clearance is 1.0
3. Assume a drug is almost purely cleared via the kidney. What factors (drug properties) determine its renal clearance.
 - a. the size of drug
 - b. the free fraction in the tissue
 - c. the free fraction in the plasma
 - d. the pKa of the drug

True or False

For a lipophilic, protein bound, low extraction drug cleared by liver and kidney:

- a. Increase in plasma protein binding will increase its V_d ()
- b. Decrease in creatinine clearance will decrease its Cl_{int} ()
- c. Increase in the liver blood flow will increase its Cl ()
- d. Liver Enzyme inducer will increase its oral bioavailability..... ()
- e. Decrease in plasma protein binding will decrease its oral bioavailability ()