

PHA 5127
Case study III
(Fall 2003)

Case #1:

A 36 year old female patient was admitted into hospital because of gram-positive bacteria infection. She is 66 inches tall with weight of 70 Kg. The physician decided to give her gentamicin via i.v. bolus injection. Before starting the antibiotics, the physician ordered a lab test for creatinine. The serum creatinine level of this patient was reported to be 1.6 mg/dL. (K_e for aminoglycoside, $K_e = 0.00293 (\text{CrCL}) + 0.014$), Unit for K_e is (hr.^{-1}), Unit for CrCL is ml/min)

- 1.) Please calculate what is the creatinine clearance for this patient.
- 2.) Please state the reason why you need to use IBW for calculate the creatinine clearance?
- 3.) Two hours after given a iv. Bolus injection, the blood sample was taken from the patient, and drug concentration was measured as: 4.2 mg/L. How long will it take for plasma level drops down to 1 mg/L?

Case #2:

Drug X is a weak base with $\text{pK}_a=8.8$. Its unionized form is non-polar. It has a volume of distribution of 28 L with a half life 1hour. The fraction unbound (f_u) of the drug is 0.1. And we know that the renal clearance accounts for 16% of the total body clearance.

Please find out,

- 1.) what is the renal clearance.
- 2.) Is active secretion involved in the renal clearance? Why?
- 3.) If you drop the urine pH from 7.4 to 4.0, what will happen about renal clearance, based on what you learned in class? Why?