PHA 5127
Case study #4

1.) Sarah C. is a 55-year-old woman on aminoglycoside therapy. She is 5'6" tall and weighs 60 kg. Her serum creatinine level is 0.75 mg/dl. What is her creatinine clearance? What is the patient's k_e and half-life? Calculate the i.v. bolus dose in order to achieve 1 mg/L 1 hour after administration. The V_d is 0.25 L/kg and assume that CL = CrCL.

IBW = 45.5 kg +2.3*6 = 59.3 kg

$$CrCl = 0.85 * \left[\frac{(140-55)*59.3}{72*0.75} \right] = 79.3 \; ml/min$$

k_e **= 0.00293*(79.3)+0.014 = 0.246 h^{-1}**
$t_{1/2}$ **= 0.693/0.246 = 2.81 h**

C = (Dose/V)*e^{-ke*t}
V= 0.25 L/kg *60 kg = 15 L
1 mg/L =(Dose/15)*e$^{-0.246*1}$
Dose = 19.2 mg

2.) Bob W. is a 48-year-old man on aminoglycoside therapy. He is 5'11" tall and weighs 140 kg. His serum creatinine level is 1.3 mg/dl. What is his creatinine clearance? What is the patient's k_e and half-life?

IBW = 50 + 2.3*11 = 75.3 kg
Patient may be considered obese, therefore check to see if total body weight is 20% over IBW.
75.3 *0.2 = 15.06
15.06+75.3 = 90.36 kg << 140, therefore use Absolute body weight.
ABW = 75.3 + 0.4*(140-75.3) = 101.2 kg

$$CrCl = \frac{(140-48)*101.2}{72*1.3} = 99.5 \; ml/min$$

ke = 0.00293*(99.5) + 0.014 = 0.305 h^{-1}
$t_{1/2}$ **= 0.693/0.305 = 2.3 h**

3.) A patient has overdosed on phenobarbital, a weak acid drug. If the drug is not cleared hepatically, what are two ways you could treat the patient?

1. **Make urine more alkaline.**
2. **Increase urine flow rate.**

4.) True or false:

Fluid is filtered across the glomerulus through passive diffusion. **True.**

An ionized and hydrophilic drug is more likely to cross biological membranes.

False.

Drug below is an acidic drug.   **True.**