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 $CL = CrCL$.

$$IBW = 45.5 \text{ kg} + 2.3 \times 6 = 59.3 \text{ kg}$$

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

$$k_e = 0.00293 \times (79.3) + 0.014 = 0.246 \text{ h}^{-1}$$

$$t_{1/2} = \frac{0.693}{0.246} = 2.81 \text{ h}$$

$$C = \frac{(\text{Dose} / V) \times e^{-k_e t}}{V = 0.25 \text{ L/kg} \times 60 \text{ kg} = 15 \text{ L}}$$

$$1 \text{ mg/L} = \frac{(\text{Dose} / 15) \times e^{-0.246 \times t}}{Dose = 19.2 \text{ mg}}$$

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?

$$IBW = 50 + 2.3 \times 11 = 75.3 \text{ kg}$$

Patient may be considered obese, therefore check to see if total body weight is 20% over IBW.

$$75.3 \times 0.2 = 15.06$$

$$15.06 + 75.3 = 90.36 \text{ kg} \ll 140, \text{ therefore use Absolute body weight.}$$

$$ABW = 75.3 + 0.4 \times (140 - 75.3) = 101.2 \text{ kg}$$

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

$$k_e = 0.00293 \times (99.5) + 0.014 = 0.305 \text{ h}^{-1}$$

$$t_{1/2} = \frac{0.693}{0.305} = 2.3 \text{ h}$$

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.**