1. The volume of distribution of diazepam in a group of normal subjects (59 kg, ideal body weight) was found to be 91 L. In another group of patients (104 kg), the volume of distribution was found to be 292 L. Derive an equation that allows estimation of the volume of distribution based on ideal and actual body weight. (2 POINTS)

2. Estimate the half-life of gentamicin in two male patients with normal renal function (CL=0.12 L/min) if their weight is 55 kg vs. 90 kg. Assume a height of 6’. (2 POINTS)

3. H.T. is a 69 year old male who is being treated for a post surgical wound infection (gram negative) with gentamicin for a 21 day course of antibiotics. He is currently day seven of gentamicin. He is 6 feet tall and weighs 172 lbs and has been experiencing a decline in his urine output for the last 24 hours. His SCr prior to antibiotic therapy was 0.9 mg/dl. But currently, his SCr increased to 1.3 mg/dL. You suspect that his renal function may be declining due to this aminoglycosides. It is known that gentamicin is eliminated almost entirely by the renal route, so creatinine clearance can be used as an estimate for gentamicin clearance. Calculate the new creatinine clearance. (2 POINTS)

4. Drug A has the following average pharmacokinetic parameters: CL 0.24 ml/min/kg, Vd 0.16 l/kg, fb 93%, Fren 49%. For a 70 kg, 50 yo male patient with a serum creatinine of 0.8 mg/dl, calculate the necessary intravenous daily dose to produce an average unbound serum concentration of 15 mg/l. How would you have to modify the dose, if the patient develops renal problems and his serum creatinine rises to 2.4 mg/dl? (2 POINTS)

5. It is known from clinical experience that some patients do not show the expected analgesic effects after administration of codeine. Make a recommendation to screen for these patients to predict these treatment failures. (2 POINTS)