PHA 5128 dose Optimization II
Spring 2011

Homework 2

1. True or False **(0.5 points each, total 3 point)**

A. Compared to adults, neonates usually have significantly more adipose tissue (as % of body weight)
B. Drugs with a high octanol/water lipid partition coefficient (LPD) will often exhibit a larger volume of distribution in obese patients
C. The effect of body weight on the volume of distribution depends on the lipophilicity of the drug.
D. Obese patients may experience an overdose of a weakly or moderately lipophillic drug, since they have a higher percentage of body fat.
E. Ideal body weight should always be used when determining the regimen for obese patients.
F. The degree of renal function can be quantified by the creatinine clearance

2. A 55-year- old female patient is treated with 100mg gentamicin i.v. short-term infusions (30min) TID. The steady-state clinical pharmacokinetic data is shown below:
   A) In 1 h after the infusion was started, the gentamicin concentration is 8.2 mg/L
   B) 30 mins before the next infusion, concentration is 1.8 mg/L
   Predict the Vd,Cmax, and trough concentration based on the given information **(2 points).**

3. A male patient (50-year-old, 67kg, Cpcreat=1.0mg/dL, 165cm) is treated with 300mg Amikacin i.v. short-term infusions (30mins) every 12hrs. Assuming linear pharmacokinetics (Vd=0.25L/kg, Cl=Clcreat).
   Calculate "new" Cmax and compare it to the previous one when
   A) Interval time is changed to 8hrs
   B) Infusion time is changed to 45mins
   (3 points)

4. A patient (75kg) is admitted with an acute drug X overdose. Serum concentration is measured at 35 μg/ml. Assuming linear pharmacokinetics (Vd=0.25L/kg, Cl=2.5L/h) and no further drug absorption, how long will it take for the serum level to drop to the upper limit of the therapeutic range (10μg/mL)? **(2 points)**