PHA 5128 dose Optimization II
Spring 2011

Case study 2

1. **Neonates VS Adults**

   True or false:

   A. The total body water (in % of body weight) in neonates is usually smaller than in adults
   B. The extracellular water (in % of body weight) in neonates is usually smaller than in adults
   C. The glomerular filtration rate (GFR) in neonates is usually smaller than in adults
   D. The gastric emptying time of neonates is usually shorter than adults'

2. **Body surface area and body weight**

   Patient A: male, 40- year-old, 170cm, 70kg

   Patient B: Female, 40-year-old, 158cm, 50kg

   Please calculate the body surface area, ideal body weight for them.

3. **Clearance of creatinine**

   For the patients in question 2, assume concentration of serum creatinine is 1.2 mg/dL, please calculate their Cl_{cr} based on the Cockcroft-Gault-Equation

4. A 45-year-old male patient (65kg, Cpcreat=1mg/dL, 170cm) is treated with 100mg Gentamicin i.v. short-term infusions (45min) TID. Assuming linear pharmacokinetics (Vd=0.25L/kg, Cl=Clcreat), please predict the measured peak concentration one hour after the infusion was started and the measured trough concentration 30min before the next infusion at steady state.

5. Determinate a regimen (dose and dosing interval) for Amikacin to treat a patient (CL=5L/h, Vd=0.25L/kg, 80 kg) that suffers from a pulmonary infection if the "true" peak and trough concentrations at steady state are supposed to be 30 mg/L and 5 mg/L, respectively? Assume a short-term infusion over 45 minutes.