

PHA 5127 – Fall 2003
Homework # 5

1. B.C., a 65-year-old, 55 kg, 6'1" tall male with a serum creatinine of 1.6mg/dL, is about to receive drug X orally (assume: absorption is so fast that we can use IV bolus model). Design a dosing regimen (calculate dosing interval, dose, average concentration) that will produce a steady-state peak concentration of 20mg/L and a steady-state trough concentration of 10mg/L. How would you give the drug if only tablets of 200mg are available? Show all calculations. ($V_d=0.7L/kg$, $CL=CrCL$)

2. A.S., a 43-year-old, 50kg female has received an oral dose of 500mg of theophylline for several weeks. Her steady-state plasma concentration was measured and turned out to be 12mg/L.
What is the fluctuation F in this patient?
(Assume that the absorption of this tablet is so fast that we can use IV bolus models for describing plasma levels.)
($V_d=0.5L/kg$, $CL=40mL/h/kg$)

3. 5mg of a drug are given as an IV bolus every 4 hours for several days. Mean pharmacokinetic parameter of this drug are

| Pharmacokinetic parameter | |
|----------------------------------|------|
| CL (L/h) | 30 |
| Vd (L) | 75 |
| t_{1/2} (h) | 1.73 |

For the following scenarios determine what will happen to the average steady-state concentration, the peak concentration and the fluctuation. Use arrows to mark if it increases, decreases or stays the same.

| | CL (L/h) decreases to 15 L/h | Vd (L) increases to 100 L | τ changes to 12 h |
|----------------------------------|--|-------------------------------------|---|
| C_{ss,ave} (mg/L) | | | |
| C_{max} (mg/L) | | | |
| F | | | |