

Case Study 5
Fall 2004

- 1. A patient with pulmonary disease is receiving IV bolus injections of theophylline. The dose is 200 mg every 6 hr with satisfactory response. Recently, steady state theophylline plasma concentrations were determined to be 15 mg/L, 1 hour after the last dose administration and 8.2 mg/L 6 hr after the last dose administration (trough).**
 - a. Determine the elimination rate constant.
 - b. Volume of distribution.
 - c. Determine the clearance.
 - d. Estimate also the average steady state theophylline concentration ($C_{p_{ss}}$) with this regimen.

- 2. The population pharmacokinetics of a drug for a 70kg person are: $V=260$ liters, $Cl=5L/hr$. If a patient (69kg) take 40 mg of this drug daily after breakfast.**
 - a. The accumulation factor at steady state.
 - b. How long it takes to achieve 50% of the steady state.
 - c. The maximum and minimum amount in the body at steady state.

- 3. True and False**
 1. The smaller elimination constant, the bigger fluctuation.
 2. The higher dose, the higher steady state average concentration.
 3. The longer dosing interval, the longer to achieve steady state.
 4. The longer half life, the smaller degree of accumulation.
 5. The higher clearance, the smaller AUC during one dosing interval at steady state.