

PHA 5127
Case Study 6
Fall 2007

SET I:

True or False

- T F 1: For a multiple IV bolus regimen, if the dosing interval is the same, the shorter the half-life the more pronounced the differences between peak and trough concentrations.
- T F 2: For a multiple IV bolus regimen, the longer dosing interval, the longer it will take to achieve steady state.
- T F 3: For a multiple IV bolus regimen, AUC at steady state within one dosing interval increases with the increase in dose.
- T F 4: For a multiple IV bolus regimen, the accumulation degree is larger in patients with higher clearance.
- T F 5: It takes more time to reach steady state for a drug with a higher degree of accumulation. (Assuming loading dose is not given, and dosing interval is the same.)

SET II:

A clinical study for drug X was conducted in 120 healthy volunteers. Drug X was given via IV bolus. The pharmacokinetics of Drug X can be described by linear one-compartment model. Volume of distribution of this drug is 13.3 L, and its half-life is 4 hr. If M.J was administrated this drug every 8hr (TID),

1. Calculate the accumulation factor at steady state.
2. Calculate the average concentration for a dose of 200mg.
3. Calculate the maximum and minimum plasma concentrations (C_{max} , C_{min}) in the body at steady state if dose of 40mg.

SET III:

For a multiple IV bolus regimen in a one-compartmental model, under following conditions,

- a) Decrease clearance by two-fold
- b) Increase volume of distribution by two-fold
- c) Double each dose amount
- d) Change dosing interval from twice a day (BID) to once a day (QD)

Discuss the change of the average steady-state concentration, the peak concentration, and the fluctuation

scenarios	$C_{ave,ss}$	$C_{max,ss}$	F
a) $CL \downarrow 2$ folds			
b) $V_d \uparrow 2$ folds			
c) $D \uparrow 2$ folds			
d) (τ halved \downarrow)			