PHA 5127 Dose Optimization I

Case Study V

1. **List the assumptions that apply to a one-compartment-body model (IV-bolus administration)**
   - Immediate Distribution
   - Elimination is a first-order process
   - Linear pharmacokinetics

2. **Indicate with an arrow, (-), or (?) for how a change in the given parameter would affect the other parameters.**

CL	VD	Dose	AUC	k_e
↑	-	-	↓	↑
-	↓	-	-	↑
-	-	↑	↑	-
?	-	?	↑	?
?	?	?	?	↑

3. **TRUE (T) or FALSE (F)**

   The clearance of a drug relates the dose with $AUC_{0\text{-tlast}}$ (assume IV-bolus administration)

   T **F**

4. **Patient A receives 100 mg of drug A. Patient B 200 mg of drug B. Evaluate the following statements. (Assume IV-bolus administration).**

   The AUC_∞ of patient A must be as double as high as the AUC_∞ of patient B

   T **F**

   Both patients must show the same free concentrations at time point zero if the volume of distribution of drug B is as double as high the volume of distribution of A

   T **F**

   If patient B received 400 mg of drug B instead of 200 mg, his AUC_∞ is likely to be twice as high.

   T **F** (if we assume linear pharmacokinetics)

5. **On slide 227, there is the following equation:**

$$CL_{total} = CL_{ren} + CL_{bil} + CL_{met}$$

   Could you think of a situation for which this equation would not be correct?

Is equation might be incorrect if the drug is cleared from the body by other pathways. For instance, by sweat or breathing