PHAR 750 Quiz I - A

PHAR 750: Biopharmaceutics/Pharmacokinetics
October 5, 2006

This quiz is worth 25 points. Please CIRCLE your final answers.

1. a. Is the following data zero-order or 1st order? (2 pt)
   b. What is the elimination rate constant (k)? (2 pt)
   c. What is the \( C_p^0 \)? (2 pt)
   d. What is the equation for this data? (3 pt)
   e. What will the \( C_p \) be after 6 hrs (3 pts)?

   \[ \text{Plasma Drug Concentration (mg/L)} \]

   \[ \begin{array}{c|c}
   \text{Time (hr)} & \text{Concentration (mg/L)} \\
   \hline
   1 & 2.0 \\
   3 & 1.13 \\
   5 & 0.70 \\
   7 & 0.43 \\
   10 & 0.20 \\
   18 & 0.025 \\
   \end{array} \]

   \[ \text{Hours} \]

TRUE or FALSE for questions 2 - 4 below (2 points each).

2. The half-life \( t_{1/2} \) decreases with increasing dose for drugs that display first-order pharmacokinetics.

3. The half-life \( t_{1/2} \) increases with increasing dose for drugs that display non-linear pharmacokinetics.

4. The half-life \( t_{1/2} \) is dependent on the amount/concentration of drug in zero-order pharmacokinetics.

SHORT ANSWERS – Answer ONLY ONE of the questions below (a, b, or c). Please be thorough as possible with your answers. (3 points)

5a. How can one optimize drug therapy by utilizing the PK and PD of a drug?
5b. How can the dosage form affect the bioavailability of a drug?
5c. How can the enzymes and/or transporters affect the bioavailability of a drug?
6. Below is a graph of 3 different dosage forms (A, B, C) of the same amount of drug. Using the graph below to answers questions 6a and 6b and give YOUR BEST ESTIMATE for the following questions.

![Graph showing average serum concentration over time for different dosage forms A, B, and C.]

a) If the minimum effective concentration is 3.0 mcg/mL, which dosage(s) forms (A, B, or C) will NOT be effective? Why? (2 pts)

b) For Drug A above, what is the $C_{\text{max}}$ and $T_{\text{max}}$ (2 pts)?