Homework #3
PHA 5127
2007

1. a. Estimate the volume of distribution if the volume of plasma is 3L, the volume of tissue is 20L, and the fraction unbound in plasma is twice as much as the fraction unbound in tissue (2pts).

b. What will the effect be on the volume of distribution if the patient has a decrease in albumin in the plasma(1pt)?

c. Predict the starting concentration if a 500 mg dose were given (1pt).

d. How long would it take for the drug concentration to drop out of therapeutic range if the therapeutic window was 15-5mg/L, and the ke is $0.2\ hr^{-1}$?(2pts)

2. Please state whether the following drugs are likely to displya permability limited distribution, perfusion limited distribution, limited by both, or have the ability to freely distribute. (1pt each)

a. Drug B is a lipophilic base with a pka of 3, which exerts its effect on the heart.

b. Drug X is not an acid or base, has a partition coefficient of 12, and displays its effect in the brain.

3. Please state whether the following statements are true or false(1pt each).

a. If a drug displays a high amount of tissue binding the volume of distribution will be very large.

b. Drug B is lipophilic, displays a 98% plasma protein binding, and a fut of 0.02. This drug has a therapeutic window of 0.3-0.5 mg/L for free drug. A patient who is taking 800 mg of Drug B daily also started taking Drug X which competes with Drug B for binding sites in plasma. The plasma protein binding for Drug B is now 96%. A dose adjustment is not needed for Drug B when taken with Drug X. Calculate the pharmacologically active concentration of drug B in plasma. With the administration of drug X is a dose adjustment needed for drug B (2pts)?