

**PHA 5128**  
**Case Study 5**

1. L.E., a 80 kg male patient (6'2", 52 y.o., SeCr 0.9 mg/dl) received a 30 mg methotrexate loading dose iv followed by a 30 mg/h infusion over 36 hours. At 36 h, leucovorin rescue (10 mg/m<sup>2</sup> q6h ) was started. The following levels were monitored:

36 h	12 μM
48 h	0.7 μM
60 h	0.4 μM

Make a recommendation how to continue therapy. When do you expect the methotrexate level to fall below 0.1 μM?

2. M.K. is a 25 year old 60 kg chronic asthmatic who is hospitalized with severe asthma. She is treated there with aerosol albuterol, but has a poor response. She is then given 375 mg of IV aminophylline over 30 minutes. Thirty minutes after the loading dose was administered (60 minutes from time zero) the theophylline concentration was 10 μg/ml. She has normal liver, kidney, and cardiac function and is afebrile. After the loading dose, M.K. was started on an IV aminophylline of 60mg/h and albuterol nebulization. Eight hours after the first serum level, a second level was 16 μg/ml.

Using M.K.'s actual volume of distribution, calculate her expected steady state theophylline concentration for this infusion rate.

3. Doug Durango is 37 year old male executive with uncontrolled hyperthyroidism with PAT. He has no history of previous illnesses and is not currently receiving any medications. He is 6'3 and weighs 198 lbs. Lab: serum potassium = 4.8 mEq/L, serum creatinine = 0.7 mg/dl. Design a loading and maintenance dosage regimen for IV or PO digoxin as you are not sure what the physician will prescribe. Three days after the patient receives your recommended regimen IV, the physician requests a serum digoxin conc. It is reported by the lab to be 0.9 ng/ml (1 hour before the next dose). The physician asks 3 questions: 1. What should be the dose IV if I want the trough to be 1.4 ng/ml at steady-state? 2. What should be the dose if we later switch to PO and keep 1.4 as the target trough for Lanoxicaps or Lanoxin tabs? 3. He plans to have surgery next week to control his hyperthyroidism. Will there need to be a change in his digoxin dosage at that time? If so what should be the recommended dosage regimen and a follow-up TDM plan?
4. P.M., a 55 year-old, 70 kg male, was admitted to the coronary care unit with a diagnosis of heart failure, probable myocardial infarction (MI), and premature ventricular contractions (PVCs). Calculate a bolus dose of lidocaine that should achieve an immediate response for P.M. At what rate should this dose be administered? Calculate a maintenance infusion rate that will achieve a steady-state plasma lidocaine concentration of 2 mg/L for P.M.

P.M.'s PVCs were controlled by the bolus dose of lidocaine and an infusion of 1 mg/min was begun. Fifteen minutes later, PVCs were again noted. What might account for the reappearance of PVCs? What is an appropriate course of action at this point?

5. L.P., a 66-year-old, 72 kg male (SrCr 1.6mg/dL), has been taking 0.25mg of digoxin tablets orally for his CHF, and at 9.00am on the day of admission, a digoxin plasma concentration of 1.1 $\mu$ g/L was measured. He was continued on his outpatient maintenance dose. On the fifth day, just before his morning dose (four doses of digoxin have been administered each day at 9.00am), a second digoxin sample was obtained. Using the expected pharmacokinetic parameters, calculate L.P.'s digoxin concentration on the morning of the fifth day.