1. An 80 kg patient receives 500 mg theophylline i.v. by bolus injection every 6 hr. Assume that $V_d = 0.5 \text{ L/kg}$ and $t_{1/2} = 6.4 \text{ h}$. Predict steady state peak and trough concentration.

2. GB is a 56-year-old renal transplant recipient stabilized on oral tacrolimus as his immunosuppressant. He is also taking 100 mg ketoconazole per day to decrease tacrolimus cost and to provide the antimicrobial benefits of the ketoconazole. GB is admitted to the hospital and is put on IV tacrolimus with the dose determined by assuming a bioavailability. Discuss the potential problems with this and what you would expect to happen to GB’s tacrolimus concentrations.

3. PT is a patient stabilized on chronic phenytoin therapy. She has just been diagnosed with rheumatoid arthritis and her physician would like to start her on high dose aspirin therapy. However, the physician is concerned about a possible drug interaction with aspirin. You find in your pocket reference that high dose aspirin is known to displace phenytoin from its plasma protein binding sites. Describe (as you would to the physician) the clinical relevance of this interaction and your therapeutic recommendations.

4. C.S., a 10-year-old, 32 kg female, is receiving valproic acid sprinkles 250 mg (2x125mg) po Q 8 hr for her seizure disorder. Calculate her average valproic acid level at steady state.

5. E. A., (37y, 70 kg, male) had been taking 300mg/day of phenytoin; however, his dose was increased to 350 mg/day because his reported plasma concentration was only 8 mg/L. Now his reported plasma phenytoin concentration is 20 mg/L. Both of the reported plasma concentrations represent steady-state level. Calculate a new daily dose of phenytoin that will result in a steady state level of 15 mg/L (Salt factor = 0.92).