

PHA 5128  
CASE STUDY 4

Spring 2009

(Phenobarbital/Carbamazepine/Valproic Acid, Phenytoin)

1. J. P., (35y, 70 kg, male), had been taking 300mg/day of sodium phenytoin; however, his dose was increased to 400 mg/day because his reported plasma phenytoin concentration was only 8 mg/L. Now his reported plasma phenytoin concentration is 24 mg/L. Both of the reported plasma concentrations represent steady-state level. Calculate a new daily dose of sodium phenytoin that will result in a steady state level of 15 mg/L (Salt factor = 0.92).

2. A 105 kg patient is to be treated p.o. with sodium phenytoin capsules. Assuming a phenytoin volume of distribution of 0.7 L/kg,  $K_m$  of 4 mg/L and  $V_{max}$  of 5 mg/kg/day, calculate the following:
- Calculate an oral loading dose of sodium phenytoin to produce an initial phenytoin concentration of 15 mg/L.
  - Calculate a daily maintenance dose of sodium phenytoin to produce an average steady state phenytoin concentration of 15 mg/L.

3. A female patient will take Depakene Syrup (Valproic Acid) chronically. In a previous trial of a single dose of Depakene (400 mg) in this patient, it was found that an initial concentration of 48  $\mu\text{g/ml}$  had been reduced to 12  $\mu\text{g/ml}$  within 24hr. Suggest a dosing regimen for chronic treatment to maintain concentration within range from 50 to 100  $\mu\text{g/ml}$ .

4. J.T., a 71.5 kg 65 year old male, suffers seizures, and is given phenobarbital of 2 mg/kg twice a day (BID). After one month, his seizures are not controlled and his physician decided to start a concomitant therapy of carbamazepine. Calculate the daily maintenance dose of carbamazepine to produce a target steady state concentration of 7 mg/L using the immediate release formulation. Later the results come back from the lab and the concentration of carbamazepine was 10.5mg/L. In order to achieve the desired serum concentration, what is your suggestion? Salt factor:0.8.