

PHA 5127
Case Study 1
Fall 2002

Question 1.

A 10 yr old, 25 kg patient suffering from Status Asthmatics was given an iv bolus of aminophylline (800 mg). When theophylline plasma concentrations were measured at 0.5 and 5 hours after injection, drug levels were found to be 35 and 14.4 mg/L, respectively.

(Assume a therapeutic range of 10-20 mg/L for theophylline, 1 mg aminophylline is equivalent to 0.8 mg theophylline and elimination occurs by a first-order process.)

- (1) Calculate k_e and half-life of theophylline in this patient.
- (2) Calculate V_d of theophylline in this patient.
- (3) How long will it take before the patient is subtherapeutic?

Question 2.

A 41 yr old, 60 kg male patient with gram-negative pneumonia, was being treated with gentamicin and ampicillin. Gentamicin had been given as an iv bolus (2 mg/kg). The concentration-time profile of gentamicin after first dose in this patient was shown as following:

(Assume first-order elimination for gentamicin.)

Time (h)	Concentration (mg/L)
0	
1	5.5
2	4.2
3	3.3
4	2.5
6	1.5
8	0.9
10	0.5

- (1) Calculate the AUC_{0-10} of cefaclor using trapezoidal rule.
- (2) Calculate the $AUC_{0-\infty}$.