**A patient who is taking 300 mg of an extended release oral theophylline product Q 12 hours is admitted to the hospital and made NPO. What IV aminophyline dose should be administered to this patient? (Note: IV aminophylline is administered by continuous infusion).**

**A 59 year old, ABW=IBW=75kg man who is intubated and admitted to the Intensive Care Unit**

**with an exacerbation of his COPD. He currently smokes 2 packs of cigarettes daily and has**

**normal liver and cardiac function. The theophylline half-life in this patient is 5 hours.**

**Calculate the Vd and a loading dose.**

**a. Calculate the volume of distribution**

**75 kg \* 0.5 L/kg = 37.5 L**

**b. Calculate a loading dose to achieve a concentration of 10 mcg/ml.**

**LD = 1 mg/1000 mcg \* 10 mcg/mL \* 37500 = 375 mg loading dose**

c. Calculate a maintenance dose to achieve a Css of 10 mcg/ml

1. Calculate Ke

Ke = 0.14 /hr

2. Calculate CL

Cl = Ke \* Vd = 0.14 \* 37.5L = 5.2 L/hr

3. Calculate MD of theophylline liquid S=1 F=1

1 mg/1000mcg \* 10 mcg/ mL \* 1000 mL / 1 L \* 5.2 \* 6 hrs = 312 mg q6h

The above patient has been receiving 300mg every 12 hours of oral theophylline sustained release tablet. His current steady-state theophylline concentration is 4 mcg/ml. Calculate a dose to provide a steady-state concentration of 12 mcg/ml.

a. Calculate clearance based on current steady-state concentration.

Cl = 600 mg/(4 mcg/ml) / (1000 ml/L) / (1/1000 mcg)/24hr = 6.25 L/hr

b. Estimate volume of distribution

c. Calculate a loading dose to obtain a Css of 12 mcg/ml

LD = 12 mcg/Ml \* 37.5 L = 450 mg

d. Use clearance to calculate new maintenance dose (pharmacokinetic method)

MD = 12 mcg/ml \* 6.25 L/hr \* 12hr = 900mg q12h