

### PHC721 - CLINICAL PROBLEM SET # 3

Patient
Male, 74 years old
Chief Complaint
<i>Background Information: 'Total Health', an Integrated Dental-Medical Team-Based Practice at the Oregon Coast is cut off from the outside world by an earthquake and a tsunami. The only team member available to provide healthcare services at the time is a Dentist. The patient was brought to her office by a stranger. "I have chest pain and feel dizzy and weak. It is cold in here."</i>
Background and/or Patient History
Coronary Artery Disease Peptic Ulcer Disease
Medications: Cimetidine (Tagamet®) Nitroglycerin Propranolol
Current Findings
EKG: Myocardial Infarction (S-T segment elevation in leads II and III, T-wave inversion) and Severe Acute Cardiac Arrhythmia (highly irregular R-R intervals). Temp: 97.8 F; BP: 85/50 mmHg; HR: ~100 bpm (irregular); Obesity (BMI ~35)  To correct the life-threatening arrhythmia, the patient received a continuous intravenous infusion of Lidocaine, the anti-arrhythmic medication readily available in any dental office. The pharmacokinetic parameters of Lidocaine that the Dentist was able to quickly look up ( <a href="http://www.pdr.net">http://www.pdr.net</a> ) are: Vd 77 L; Clearance 640 mL/min; Half-Life: 1.4 h; whereas the target steady-state plasma concentration of Lidocaine is 3 mg/L.  The patient also received Tylenol #3 (300 mg Acetaminophen with 30 mg Codeine), the strongest analgesic available in this dental office at that time.

1. Based on the pharmacokinetic parameters that the Dentist was able to look up online:

- A. What was the most likely rate of the Lidocaine infusion to achieve the systemic therapeutic effect?
- B. How long did it take to reach 96.875% of the steady-state plasma concentration?

2. What potential modifiers of the dosage of **A)** Lidocaine and **B)** Tylenol #3 should be considered in this patient's case?

II. Another patient is a 36-year-old female who was brought in by a friend. The friend states that the patient self-administered Morphine 6 hours earlier.

The patient has pinpoint pupils and the blood drawn at the time of the patient's arrival shows:

- Morphine level of 0.20 mg/L;
- P<sub>O2</sub> 54 mmHg and P<sub>CO2</sub> 84 mmHg.

**How much Morphine did the patient inject?** In your calculations, please consider the following pharmacokinetic parameters of Morphine in this patient: Vd 200 L; t<sub>1/2</sub> 3 hrs.