## Answers to Practice Problem Set #6

1. A cancer patient has achieved pain control with morphine 5mg IM every 4 hours routinely while in the hospital. The physician wants to send him home with an oral morphine product and asks for a dose that is equivalent to his IM regimen. You know that 10mg of IM morphine is roughly equivalent to 30mg of oral morphine. The oral morphine products available are MS Contin 15mg, 30mg, 60mg, and 100mg. These are sustained-release products and so can be dosed every 8-12 hours. Please calculate an equivalent oral dosage regimen for this patient.

MS Contin _____mg po q_____h

**$\frac{5\text{mg IM}}{\text{dose}} \times \frac{6\text{ doses}}{\text{day}} \times \frac{30\text{mg po}}{10\text{mg IM}} = \frac{90\text{ mg}}{\text{day}}$**

**30mg po q8h ; 45mg po q12h is somewhat OK**

2. Famcyclovir is a new drug available that can be given to patients with herpes zoster (shingles) to help decrease duration of symptoms. Facts and comparisons gives you the following information:

| Famcyclovir dosage in renal impairment | |
|---|---|
| CrCl (ml/min) | dosage regimen |
| ≥60 | 500mg po q8h |
| 40-59 | 500mg po q12h |
| 20-39 | 500mg po q24h |
| <20 | avoid use |

Please calculate the creatinine clearance of a 140-pound, 5'7", 68-year-old female with shingles who has a serum creatinine of 1.4mg/dl, and recommend a dosage regimen.

_____ml/min

__**500**__mg po q__**24**__h

**$\frac{(140 - 68)(61 \text{ or } 64)}{(85)(1.4)} = 37 - 39 \text{ ml/min}$**

3. Pediacare Infants' Decongestant contains 7.5mg of pseudoephedrine in each 0.8ml. If the dosage recommendations for a child are 2mg/kg, how much of this product, in ml, will you recommend be given to a 26 pound child?

__**2.5**__ml

**$26 \text{ lb} \times \frac{1 \text{ kg}}{2.2 \text{ lb}} \times \frac{2 \text{ mg}}{\text{kg}} \times \frac{0.8\text{ml}}{7.5\text{mg}} = 2.5\text{ml}$**

4. The average concentration of hydrogen ions in human blood is 0.00004 mEq/L. Calculate the pH of the blood.

**0.00004 mEq/L = 0.00000004 Eq/L**

**pH = -log[$H^+$] = -log(0.00000004 Eq/L) = 7.4**

5. Dopamine is often given to enhance renal perfusion in patients at risk for developing renal failure. A physician has written an order to begin dopamine at 2.5mcg/kg/minute for a 175-pound patient. A standard dopamine drip is 400mg in 500ml D5W. Please calculate an infusion rate in ml/hr for this patient.

__**14.9**__ml/hr

**$\frac{2.5 \text{ µg}}{\text{kg/hr}} \times 175 \text{ lb} \times \frac{1 \text{ kg}}{2.2 \text{ lb}} \times 60 \frac{\text{min}}{\text{hr}} \times \frac{500\text{ml}}{400\text{mg}} \times \frac{1\text{mg}}{1000\text{µg}} = 14.9 \text{ ml/hr}$**

6. Trimethoprim/sulfamethoxazole (trade name: Bactrim or Septra) is often given to children with otitis media (middle ear infection) at a dose of 4mg/kg of the trimethoprim componant every 12 hours. The product is available as a suspension containing 40mg/5ml of the trimethoprim componant (and 200mg/5ml of the sulfamethoxazole componant). Please calculate how many teaspoonfuls a mother will administer per dose to her 32-lb child. Round to the nearest half-teaspoonful.

__**1.5**__ teaspoonfuls every 12 hours

**4 mg/kg/dose x 32 lb x 1 kg/2.2 lb x 5ml/40mg x 1 tsp/5 ml = 1.45 tsp**

7. Most medications will follow a phenomenon known as "linear kinetics". This means that if a dose is raised or lowered by a certain percentage, the serum drug concentration will be correspondingly raised or lowered by the same percentage. A patient who is receiving gentamicin 80mg has a peak serum drug concentration of 4µg/ml. You would like to increase this patient's peak serum concentration to 6-8µg/ml. What would be an appropriate dose for the patient to receive in order to increase the serum concentration to a peak level within this target range?

__**140**__mg

**4 µg/ml / 80mg = 6–8 µg/ml / x mg x = 120 – 160; anything in this range is fine**

8. A patient is to receive 350mg/day of a chemotherapy drug, 5-FU, by continous infusion. The pump can infuse as little as 0.5ml/hr, and the cassette which holds the drug can be filled with up to 100ml of fluid. The stock solution of 5-FU comes in a strength of 50mg/ml.
a. How much drug and diluent will you need to mix in order to provide this patient with at least a 7-day supply of medication?

__**49**__ml of 5-FU 50mg/ml **(more OK if multiplied by 7.1+ days)**

__**51**__ml of NS the diluent

__**24.5**__mg/ml final concentration

- **(350mg/day)(7 days) = 2450mg**
- **(2450mg 5FU)(1ml/50mg 5FU) = 49ml 5FU stock soln**
- **100ml – 49ml 5FU = 51ml NS**
- **2450mg/100ml = 24.5 mg/ml**

9. What will the infusion rate of the medication in question 8 be?

__**0.6**__ml/hr

**350 mg/day x 1 day/24hr x 1ml/24.5mg = 0.595 ml/hr ≈ 0.6 ml/hr**

10. A child registers a rectal temperature of 39.2°C. What would this temperature be in °F?

__**102.6**__°F

**(39.2°C/ 5)(9) + 32 = 102.56°F**