Answers to Practice Problem Set #9

1. Erythropoietin is a hormone that stimulates red blood cell production. The normal dose is 150 units/kg, divided into three doses, every week (i.e., 50 units/kg TIW). Your pharmacy carries 3 strengths of erythropoietin:

4000 units/ml 10,000 units/ml 20,000 units/ml

Please circle which product you will use to prepare the dose for a 180-pound male patient and calculate the amount of medication he will need to inject for each dose.

_____ ml (round to the nearest 0.1 ml)

1 ml of the 4000 u/ml
0.4ml of the 10,000 u/ml
0.2ml of the 20,000 u/ml

2. The vial of erythropoietin should be stored between 2° and 8° centigrade. At what temperature will you set your refrigerator, which only registers in Fahrenheit?

_____ °F (**2°C to 8°C/5)(9) + 32° = 35.6°F to 46.4°F**

anything from 36 - 46°F is OK; realize that you need to choose *one* number within the range, however – you cannot set a refrigerator to a range

3. A 36-pound child has just been diagnosed with an ear infection. The physician has prescribed trimethoprim/sulfamethoxazole and wants you to calculate the dose. The normal dose for children with ear infections is 8 mg/kg of the trimethoprim component, given in two divided doses, daily for 10 days. Trimethoprim/sulfamethoxazole oral suspension is available in a preparation that contains 40mg of trimethoprim and 200mg of sulfamethoxazole per 5ml. Please indicate what you will type on the prescription label. Round the dose to the nearest 0.2ml.

Give _____ ml by mouth _____ time(s) a day for 10 days.

(8 mg/kg/day)(36 lb) (1 kg/2.2 lb)(5ml/40mg)(1 day/2 doses) = 8.2 ml/dose

Give 8.2ml by mouth 2 times a day for 10 days.

4. A 43 year-old, 160-pound, 5'10" male patient with a serum creatinine of 3.8 is to receive stavudine, an anti-viral agent. Facts and Comparisons contains the following dosing chart:

ABW = 73 kg; IBW = 73kg
(140 – 43)(73)/(72)(3.8) = 26 ml/min

CrCl (ml/min)	wt ≥ 60 kg	wt < 60 kg
> 50	40mg po q12h	30mg po q12h
26-50	**20mg po q12h**	15mg po q12h
10-25	20mg po q24h	15mg po q24h

What will your recommended stavudine dosing regimen be?

I recommend **20** mg every **12** hours.

5. A 190-pound patient is to receive a 0.25mg/kg IV loading dose of abciximab. The drug is available as an injection of 2mg/ml. Please calculate how many ml (round to the nearest 0.2ml) will need to be injected into this patient.

10.8 ml **(190 lb)(1 kg/2.2 lb)(0.25mg/kg)(1ml/2mg) = 10.8ml**

6. The same patient will now need to receive an infusion of 10 mcg/min for 12 hours. Please calculate the infusion rate in ml/hr if 4.5ml of the drug is placed in a 250ml bag of normal saline (0.9% NaCl).

__**16.7**__ ml/hr

(10 mcg/min)(60min/hr)(250 ml/4.5 ml)(1 ml/2 mg)(1 mg/1000 mcg) = 16.7 ml/hr

7. A pharmacy intern had just finished mixing a morphine drip for a patient when he received word that the morphine drip was discontinued by the physician. The pharmacy intern had originally placed 6.7 ml of morphine 15mg/ml solution into a 500ml bag of dextrose to make a 100mg drip. Rather than waste the solution, the intern decided to make the morphine drip into morphine PCA syringes, which contain 50ml of a 1mg/ml morphine solution. Please calculate how much morphine the intern will need to add to the current morphine drip in order to make a 1mg/ml solution, and then calculate how many syringes the intern will be able to make from the resulting solution.

The intern will add _____**29**_____ ml of 15mg/ml morphine to the bag to make a 1mg/ml solution.

From this mixture he will be able to make ___**10**_____ 50ml, 1 mg/ml syringes.

100mg/507ml = 0.2 mg/ml

15 mg/ml **0.8 parts**
1 mg/ml
0.2 mg/ml **14 parts**
total: 14.8 parts

0.8 parts **=** **x ml**
14.8 parts **507ml + x ml**

14.8x = 406.4ml + 0.8x
14x = 406.4ml
x = 29 ml

double check:
(29 ml)(15mg/ml) = 435 mg, added to 100mg = 535 mg
535mg in 507ml + 29ml = 0.998 mg/ml

507ml + 29ml = 536ml = ten 50ml syringes

8. The patient in question #7 had his morphine IV drip discontinued because his physician had decided to give him his morphine as an oral tablet. The patient had been receiving 4 mg/hr of the morphine in order to control his pain. 1 mg of IV morphine is equivalent to approximately 6mg of oral morphine, and clinicians often start the patient at 1/2 – 3/4 the calculated dose, just to be safe (they then increase the dose if pain not satisfactorily controlled). Oral morphine sustained release tablets are available in 15mg, 30mg, 60mg, and 100mg tablets. The tablet dosing frequency is either every 8 hours or every 12 hours (either is equally acceptable). Please design a daily regimen for this patient, using as few tablets/dose as possible.

This patient should take __**2**__ tablet(s) of the __**100**__ mg strength every ____**12**__ hours.

(4 mg IV/hr)(24 hrs/day)(6mg oral/1mg IV) = 576 mg oral/day

1/2 – 3/4 this dose is 288 – 432 mg oral/day to start; I am choosing 400mg/day since it is within the standard dosing range.

9. A 26-pound child is to receive amoxicillin for an ear infection. The suggested dosing range for amoxicillin for an ear infection is 30-50 mg/kg/day, given in 3 divided doses. Amoxicillin comes in a 125mg/5ml and a 250mg/5ml oral suspension. Please design a dosing regimen for this child and write down the directions you would type on the label. Round to the nearest 1/2 teaspoonful.

You will dispense (circle one): 125mg/5ml 250mg/5ml

Give _____ teaspoonfuls every 8 hours for 10 days.

(11.8 kg) (30-50mg/kg/day)(1day/3 doses)(5ml/125mg) = 4.72ml - 7.9ml (2.36ml - 3.95ml of 250/5)

Therefore 1 or 1.5 tsp of 125mg/5ml OK, 0.5 tsp of the 250mg/5ml OK.

10. A 45 year-old, 250-pound, 5'4" female is to receive tobramycin. Standard recommendations are for 2mg/kg as a loading dose, and then 1.5 mg/kg every 8 hours. Assuming that her kidney function is normal, please calculate the loading and maintenance doses. Remember that if a person is overweight, their adjusted body weight is equal to their ideal body weight plus 40% of the difference between the ideal and actual body weight. IBW = 45kg + 2.3kg for every inch over 5 feet, for females. Tobramycin doses are always rounded to the nearest 10mg.

160 mg loading dose

120 mg IV every 8 hours

IBW = 54 kg ABW = 114 kg adjusted IBW = 78 kg

(2mg/kg)(78 kg) = 156 mg

(1.5mg/kg)(78 kg) = 117mg