

Math Packet

De Anza College Nursing Program

Updated: 04/02/08

PRACTICE MATH QUESTIONS

Table of Contents

<u>Quarter</u>	<u>Page Number</u>
Q1 Questions.....	3
Q1 Answers.....	9
Q2 Questions.....	13
Q2 Answers.....	20
Q3 Pedi Questions.....	21
Q3 Pedi Answers.....	26
Q3 OB Questions.....	31
Q3 OB Answers.....	32
Q4 Heparin Questions.....	33
Q4 Heparin Answers.....	39
Q4 Questions.....	40
Q4 Answers.....	45
Q5 Med-Surg Questions.....	50
Q5 Med-Surg Answers.....	52
Q5 Psych Questions.....	54
Q5 Psych Answers.....	55

PRACTICE MATH QUESTIONS QUARTER 1

Convert the following to Roman numerals:

1. 8
2. 16
3. 54
4. 97
5. 123

Do the following problems:

6. $77 \times 56 =$
7. $24.8 \times 32.9 =$
8. $15 \times 18 =$
9. $36.87 \times 28.98 =$
10. $105 \times 27 =$
11. $63 \div 22 =$
12. $94.5 \div 24 =$
13. $68.6 \div 12.35 =$
14. $138.25 \div 39.2 =$
15. $258.96 \div 122.84 =$

Reduce the following fractions to their lowest terms:

16. $16/24 =$

17. $70/490 =$

18. $36/216 =$

19. $68/136 =$

20. $32/15 =$

Multiply the following fractions:

21. $3 \frac{3}{4} \times 10 \frac{2}{3} =$

22. $9/2 \times 3/2 =$

23. $6 \frac{1}{4} \times 7 \frac{1}{9} \times 9/5 =$

Change the following number to fractions (in lowest terms):

24. $78.87 =$

25. $1.245 =$

26. $86.4 =$

Solve the following proportions:

27. $120/4.2 = 16/X$

28. $750:250 = X:5$

29. $81/3 = X/15$

30. $0.125:0.5 = X:10$

Determine the value of X in the following proportions. Write the answer to the nearest 100th (2 decimal places) and include appropriate unit of measure. Check your answers to make sure they are logical.

$$31. \frac{5 \text{ ml}}{12.5 \text{ mg}} = \frac{X}{24 \text{ mg}}$$

$$32. \frac{2.5 \text{ ml}}{40 \text{ mg}} = \frac{X}{30 \text{ mg}}$$

$$33. \frac{0.8 \text{ ml}}{0.6 \text{ mg}} = \frac{X}{0.3 \text{ mg}}$$

$$34. \frac{2 \text{ ml}}{36 \text{ mg}} = \frac{X}{24 \text{ mg}}$$

$$35. \frac{2 \text{ tabs}}{200 \text{ mg}} = \frac{X}{150 \text{ mg}}$$

$$36. \frac{1 \text{ cap}}{1.5 \text{ mg}} = \frac{X}{4.5 \text{ mg}}$$

$$37. \frac{5 \text{ ml}}{75 \text{ mg}} = \frac{X}{187.5 \text{ mg}}$$

$$38. \frac{1.2 \text{ ml}}{300 \text{ mg}} = \frac{X}{120 \text{ mg}}$$

$$39. \frac{1 \text{ tab}}{0.5 \text{ mcg}} = \frac{X}{0.25 \text{ mcg}}$$

$$40. \frac{0.9 \text{ ml}}{78 \text{ mg}} = \frac{X}{52 \text{ mg}}$$

Solve the following medication problems.

Remember to set up a ratio or use the formula $D/H \times Q = \text{Amount to be given}$.

D= **D**esired **D**ose (what the doctor ordered)

H= What you **H**ave on **H**and

Q= **Q**uantity.

For example: Doctor ordered **750 mg** of medication "A". = **D**esired **D**ose

Pharmacy sends **250 mg** tablets of medication "A". = **H**ave on **H**and

$750 \text{ mg} / 250 \text{ mg} \times 1 \text{ tablet} = 3 \text{ tablets}$

Show your work.

41. Order: Ampicillin 130 mg
On hand: Ampicillin 250 mg/ml
What volume will you give?
42. Order: Gentamicin 6 mg
On hand: Gentamicin 20 mg/ml
What volume will you give?
43. Order: ASA gr X
On hand: ASA 325 mg/tablet
How many tablets will you give?
44. Order: Phenobarbital gr 1/2
On hand: Phenobarbital 40 mg/ml
What volume will you give?
45. Order: Penicillin 200,000 units
On hand: Penicillin 500,000 units/ml
What volume will you give?
46. Order: Morphine 8 mg
On hand: Morphine 10 mg/ml
What volume will you give?
47. Order: Heparin 5,000 units
On hand: Heparin 20,000 units/ml
What volume will you give?
48. Order: Demerol 0.025 Gm
On hand: Demerol 100 mg/ml
What volume will you give?

Solve the following medication problems.
Remember the appropriate unit of measure in your answer.

49. Ampicillin 0.6 Gm po has been ordered for Mr. Mills.
How many tablets will you administer if each tablet is 200 mgs?

50. Experimental medication "A" comes in tablets of 100 mcg/ tablet.
Mrs. Snow's order is "A" 0.75 mg po. How many tablets will you give?

51. Ordered: Gantrisin 1 gm of oral solution for bladder infection.
How much will you give if the bottle reads 250 mg per 5 ml?

52. You have analgesic 75 mg per ml on hand.
The order reads Analgesic 50 mg IM q4h.
How many mls will you give?

53. The doctor orders KCl 40 mEq po.
On hand you have KCl tablets of 20 mEq each.
How many will you give?

54. The vial of Penicillin G contains 10 ml.
The label reads 100,000 units/ml.
The doctor orders Mr. Nice to receive 50,000 units.
How many ml will you give?

55. Ordered: 24 mg/kg of Rifadin. Mr. Clark weighs 220 pounds.
Each capsule contains Rifadin 600 mg.
How many capsules will you give?

56. Mr. Lee is to receive 5,500 units of Heparin subcutaneous bid.
The vial reads 10,000 units per ml.
How much will you give?

57. Mr. Takada is to receive 0.75 mg of Medication D po daily.
The tabs in his med cassette are labeled 0.25 mg.
How many tablets will you give?

58. Mr. Harvey is to receive Lopressor 0.15 Gm daily.
Each tablet contains 100 mg.

How many tablets will you give Mr. Harvey?

59. Doctor Halligan orders Metricillin 750 mg daily po ac breakfast.
The bottle indicates that each tablet is equivalent to 1.5 Gm of Metricillin.

How many tablets will you give to the client?

60. Betty Ross asks your advice about taking her medication.
The instructions on the bottle read take 0.369 mcg tid.
The bottle states the each tablet contains 0.123 mcg.

How many tablets will you tell Ms. Ross to take each dose? Each day?

61. Mrs. C has a G-Tube for feedings. Her order is Resource 80 ml/hr for 20 hours.
Start each feeding at 1400 (2 pm).

How many ml's total does she receive each day?

At what time should the feeding be complete?

At the beginning of your shift 0700 (7 am) you note that 1360 ml have been given. How many more hours does the feeding need to run to complete the order? Is it on time?

62. Mr. R has a G-Tube for feedings. His orders are for Resource 75 ml/h for 20 hours. Start each feeding at 1400 (2 pm).

How many ml's total does he receive each day?

At what time should the feeding be complete?

At the beginning of your shift 0700 (7 am) you note that 1125 ml have been given. How many more hours does the feeding need to run to complete the order? Is it on time?

PRACTICE MATH ANSWERS QUARTER 1

Convert the following to Roman numerals:

1. $8 = \mathbf{VIII}$
2. $16 = \mathbf{XVI}$
3. $54 = \mathbf{LIV}$
4. $97 = \mathbf{XCVII}$
5. $123 = \mathbf{CXXIII}$

Do the following problems:

6. $77 \times 56 = \mathbf{4312}$
7. $24.8 \times 32.9 = \mathbf{815.92}$
8. $15 \times 18 = \mathbf{270}$
9. $36.87 \times 28.98 = \mathbf{1068.4926}$, rounded $\mathbf{1068.49}$
10. $105 \times 27 = \mathbf{2835}$
11. $63 \div 22 = \mathbf{2.863}$, rounded $\mathbf{2.86}$
12. $94.5 \div 24 = \mathbf{3.937}$, rounded $\mathbf{3.94}$
13. $68.6 \div 12.35 = \mathbf{5.554}$, rounded $\mathbf{5.55}$
14. $138.25 \div 39.2 = \mathbf{3.526}$, rounded $\mathbf{3.53}$
15. $258.96 \div 122.84 = \mathbf{2.108}$, rounded $\mathbf{2.11}$

Reduce the following fractions to their lowest terms:

16. $16/24 = \mathbf{2/3}$ ($\mathbf{8}$ is common)
17. $70/490 = \mathbf{1/7}$ ($\mathbf{70}$ is common)
18. $36/216 = \mathbf{1/6}$ ($\mathbf{36}$ is common)
19. $68/136 = \mathbf{1/2}$ ($\mathbf{68}$ is common)
20. $32/15 = \mathbf{32/15}$ or $\mathbf{2 \frac{2}{15}}$ (no common factor)

Multiply the following fractions:

21. $3 \frac{3}{4} \times 10 \frac{2}{3} = 15 \frac{1}{4} \times 32 \frac{2}{3} = \mathbf{40}$
22. $9/2 \times 3/2 = \mathbf{27/4}$ or $\mathbf{6 \frac{3}{4}}$
23. $6 \frac{1}{4} \times 7 \frac{1}{9} \times 9/5 = 25 \frac{1}{4} \times 64/9 \times 9/5 = \mathbf{80}$

Change the following number to fractions (in lowest terms):

24. $78.87 = \mathbf{78 \frac{87}{100}}$
25. $1.245 = 1 \frac{245}{1000} = \mathbf{1 \frac{49}{200}}$
26. $86.4 = 86 \frac{4}{10} = \mathbf{86 \frac{2}{5}}$

Solve the following proportions:

27. $120/4.2 = 16/X$, $120X = 16 \times 4.2$ $\mathbf{X = 0.56}$
28. $750:250 = X:5$ $750/250 = X/5$ $750 \times 5 = 250X$ $\mathbf{X = 15}$
29. $81/3 = X/15$ $81 \times 15 = 3X$ $\mathbf{X = 405}$
30. $0.125:0.5 = X:10$ $0.125/0.5 = X/10$ $0.125 \times 10 = 0.5X$ $\mathbf{X = 2.5}$

Determine the value of X in the following proportions. Write the answer to the nearest 100th (2 decimal places) and include appropriate unit of measure. Check your answers to make sure they are logical.

- 31. X = **9.6 ml**
- 32. X = **1.88 ml**
- 33. X = **0.4 ml**
- 34. X = **1.33 ml**
- 35. X = **1.5 tabs**
- 36. X = **3 caps**
- 37. X = **12.5 ml**
- 38. X = **0.48 ml**
- 39. X = **0.5 tabs**
- 40. X = **0.6 ml**

Solve the following medication problems.

Remember to set up a ratio or use the formula $D/H \times Q = \text{Amount to give}$. Show your work.

$$41. \frac{130 \text{ mg}}{250 \text{ mg}} \times 1 \text{ ml} = \frac{130 \text{ mg}}{250 \text{ mg}} = \frac{X}{1 \text{ ml}}$$

Answer= 0.52 ml

$$42. \frac{6 \text{ mg}}{20 \text{ mg}} \times 1 \text{ ml} = \frac{6 \text{ mg}}{20 \text{ mg}} = \frac{X}{1 \text{ ml}}$$

Answer= 0.3 ml

$$43. 10 \text{ gr} = 650 \text{ mg}$$

$$\frac{650 \text{ mg}}{325 \text{ mg}} \times 1 \text{ tab} = \frac{650 \text{ mg}}{325 \text{ mg}} = \frac{X}{1 \text{ tab}}$$

Answer= 2 tabs

$$44. \text{gr } \frac{1}{2} = 30 \text{ mg}$$

$$\frac{30 \text{ mg}}{40 \text{ mg}} \times 1 \text{ ml} = \frac{30 \text{ mg}}{40 \text{ mg}} = \frac{X}{1 \text{ ml}}$$

Answer= 0.75 ml

$$45. \frac{200,000 \text{ units}}{500,000 \text{ units}} \times 1 \text{ ml} = \frac{200,000 \text{ units}}{500,000 \text{ units}} = \frac{X}{1 \text{ ml}}$$

Answer= 0.4 ml

$$46. \frac{8 \text{ mg}}{10 \text{ mg}} \times 1 \text{ ml} = \frac{8 \text{ mg}}{10 \text{ mg}} = \frac{X}{1 \text{ ml}}$$

Answer= 0.8 ml

47. $\frac{5000 \text{ units}}{20,000 \text{ units}} \times 1 \text{ ml} = \frac{5000 \text{ units}}{20,000 \text{ units}} = \frac{X}{1 \text{ ml}}$
Answer= 0.25 ml

48. $0.025 \text{ Gm} = 25 \text{ mg}$
 $\frac{25 \text{ mg}}{100 \text{ mg}} \times 1 \text{ ml} = \frac{25 \text{ mg}}{100 \text{ mg}} = \frac{X}{1 \text{ ml}}$
Answer= 0.25 ml

Solve the following medication problems. Remember the appropriate unit of measure in your answer.

49. $\frac{600 \text{ mg}}{200 \text{ mg}} \times 1 \text{ tab} = \frac{600 \text{ mg}}{200 \text{ mg}} = \frac{X}{1 \text{ tab}}$
Answer= 3 tabs

50. $0.75 \text{ mg} = 750 \text{ mcg}$
 $\frac{750 \text{ mcg}}{100 \text{ mcg}} \times 1 \text{ tab} = \frac{750 \text{ mcg}}{100 \text{ mcg}} = \frac{X}{1 \text{ tab}}$
Answer= 7.5 tabs

51. $1 \text{ Gm} = 1000 \text{ mg}$
 $\frac{1000 \text{ mg}}{250 \text{ mg}} \times 5 \text{ ml} = \frac{1000 \text{ mg}}{250 \text{ mg}} = \frac{X}{5 \text{ ml}}$
Answer= 20 ml

52. $\frac{50 \text{ mg}}{75 \text{ mg}} \times 1 \text{ ml} = \frac{50 \text{ mg}}{75 \text{ mg}} = \frac{X}{1 \text{ ml}}$
Answer= 0.67 ml

53. $\frac{40 \text{ mEq}}{20 \text{ mEq}} \times 1 \text{ tab} = \frac{40 \text{ mEq}}{20 \text{ mEq}} = \frac{X}{1 \text{ tab}}$
Answer= 2 tabs

54. $\frac{50,000 \text{ units}}{100,000 \text{ units}} \times 1 \text{ ml} = \frac{50,000 \text{ units}}{100,000 \text{ units}} = \frac{X}{1 \text{ ml}}$
Answer= 0.5 ml

55. $220 \text{ lbs} = 100 \text{ kg}$
 $24 \text{ mg} \times 100 \text{ kg} = 2400 \text{ mg}$
 $\frac{2400 \text{ mg}}{600 \text{ mg}} \times 1 \text{ cap} = \frac{2400 \text{ mg}}{600 \text{ mg}} = \frac{X}{1 \text{ cap}}$
Answer= 4 capsules

56. $\frac{5500 \text{ units}}{10,000 \text{ units}} \times 1 \text{ ml} =$ $\frac{5500 \text{ units}}{10,000 \text{ units}} = \frac{X}{1 \text{ ml}}$
Answer= 0.55 ml

57. $\frac{0.75 \text{ mg}}{0.25 \text{ mg}} \times 1 \text{ tab} =$ $\frac{0.75 \text{ mg}}{0.25 \text{ mg}} = \frac{X}{1 \text{ tab}}$
Answer= 3 tabs

58. $0.15 \text{ Gm} = 150 \text{ mg}$
 $\frac{150 \text{ mg}}{100 \text{ mg}} \times 1 \text{ tab} =$ $\frac{150 \text{ mg}}{100 \text{ mg}} = \frac{X}{1 \text{ tab}}$
Answer= 1.5 tabs

59. $1.5 \text{ Gm} = 1500 \text{ mg}$
 $\frac{750 \text{ mg}}{1500 \text{ mg}} \times 1 \text{ tab} =$ $\frac{750 \text{ mg}}{1500 \text{ mg}} = \frac{X}{1 \text{ tab}}$
Answer= 1/2 tab or 0.5 tab

60. $\frac{0.369 \text{ mcg}}{0.123 \text{ mcg}} \times 1 \text{ tab} =$ $\frac{0.369 \text{ mcg}}{0.123 \text{ mcg}} = \frac{X}{1 \text{ tab}}$
Answer= 3 tabs each dose,
Total per day = 3 doses per day x 3 tabs /dose = 9 tablets

61. Mrs. C has a G-Tube for feedings. Her order is Resource 80 ml/hr for 20 hours. Start each feeding at 1400 (2 pm).
 How many ml's total does she receive each day? **80 ml x 20 hr = 1600 ml**
 At what time should the feeding be complete? **1000 (10 am)**
 At the beginning of your shift 0700 (7 am) you note that 1360 ml have been given.
 How many more hours does the feeding need to run to complete the order? Is it on time?
1600 ml – 1360 ml = 240 ml left divided by 80 = 3 hours (1000/10 am).
Yes, it is on time.

62. Mr. R has a G-Tube for feedings. His orders are for Resource 75 ml/h for 20 hours. Start each feeding at 1400 (2 pm)
 How many ml total does he receive each day? **75 ml x 20 hrs = 1500 ml**
 At what time should the feeding be complete? **1000 (10 am)**
 At the beginning of your shift 0700 (7 am) you note that 1125 ml have been given.
 How many more hours does the feeding need to run to complete the order? Is it on time?
1500 ml – 1125 ml = 375 ml left, 375 ml/ 75 ml = 5 hours (1200/12 noon).
No, it is not on time.

PRACTICE MATH QUESTIONS QUARTER 2

1. The doctor ordered Penicillin G 300,000 units IM.
The multidose vial reads: Penicillin G 200,000 units per 1.2 ml.
How much will you give?

 - a. 0.8 ml
 - b. 1.5 ml
 - c. 1.8 ml
 - d. 2.2 ml

2. The doctor orders Codeine Sulfate 30 mg IM q 3 hrs prn for pain.
The ampule reads: Codeine Sulfate 25 mg per ml.
How much will you give?

 - a. 0.6 ml
 - b. 0.8 ml
 - c. 1.2 ml
 - d. 1.4 ml

3. The doctor orders Streptomycin 300 mg IM daily.
The ampule reads: Streptomycin 500 mg per 1 ml.
How much will you give?

 - a. 1.8 ml
 - b. 1.6 ml
 - c. 0.8 ml
 - d. 0.6 ml

4. You are to give Chlorpromazine 0.075 Gm IM q 3 hrs prn for nausea.
You have on hand: Chlorpromazine 25 mg per ml.
How much will you administer?

 - a. 0.3 ml
 - b. 0.5 ml
 - c. 1.5 ml
 - d. 3 ml

5. Your order reads: Vistaril 25 mg IM prn for anxiety.
Your vial reads: Vistaril 100 mg/ 2 ml.
How many ml will you give?

 - a. 0.5 ml
 - b. 0.8 ml
 - c. 1.0ml
 - d. 1.5 ml

6. Your order reads: Vistaril 75 mg IM q3h prn for nausea.
Your vial reads: Vistaril 100 mg/2 ml.

How many ml will you give?

- a. 0.75 ml
- b. 1.25 ml
- c. 1.5 ml
- d. 1.75 ml

7. Your bottle reads: Tylenol elixir 150 mg/5 ml PO.
Your order reads: Tylenol elixir 90 mg po q3h prn.

How many ml will you give?

- a. 2 ml
- b. 3 ml
- c. 5 ml
- d. 6 ml

8. Your order reads: Dramamine 35mg IM.
Your vial reads 50 mg/ml.

How many ml will you give?

- a. 0.6 ml
- b. 0.7 ml
- c. 0.8 ml
- d. 1.2 ml

9. Your order reads: Digoxin 0.20 mg IV daily.
Your ampule reads Digoxin 0.05 mg/ml.

How many ml will you give?

- a. 2 ml
- b. 4 ml
- c. 6 ml
- d. 8 ml

10. You have Robinul 0.2 mg/ml.
Your order reads: Robinul 0.15 mg IM.

How many ml will you give?

- a. 0.5 ml
- b. 0.75 ml
- c. 1.25 ml
- d. 1.5 ml

11. Your Heparin vial reads: 20,000 units/ml.
Your order reads: Heparin 5,000 units subcutaneous bid.
How many ml will you give?
a. 0.25 ml
b. 0.5 ml
c. 0.75ml
d. 1.25 ml

12. Your order reads Vitamin K 40 mg q6h IV.
The vial reads: Vitamin K 25 mg/2.5 ml.
How many ml will you give?
a. 3 ml
b. 3.5 ml
c. 4 ml
d. 4.5 ml

13. You are going to give Tetanus Antitoxin 2,500 units IM.
Your vial reads: Tetanus Antitoxin 1,500 units/ml.
How many ml will you give?
a. 1.6 ml
b. 1.66 ml
c. 1.67 ml
d. 1.7 ml

14. You have an order to reconstitute a powdered drug.
The vial contains 200,000 units of the drug.
You wish to give 25,000 units in 1 ml.
How much diluent will you add?
a. 2.5 ml
b. 5 ml
c. 6 ml
d. 8 ml

15. You have a vial that contains 8 Gm of Amykaycin.
If you reconstitute the medication with 10 ml of normal saline,
how many ml will you need to administer 4 Gm of the drug?
a. 2 ml
b. 3 ml
c. 4 ml
d. 5 ml

16. You have a vial that contains 5 Gm of Methicillin.

If you reconstitute the medication with 10 ml of normal saline, how many ml will you need to administer 2 Gm of the drug?

- a. 2 ml
- b. 3 ml
- c. 4 ml
- d. 5 ml

17. Your ampule reads: Amitriptyline 10 mg/ml.

The ampule reads 10 ml.

How many ml should be administered per dose if 20 mg is prescribed qid?

- a. 1.5 ml
- b. 2 ml
- c. 2.5 ml
- d. 3 ml

18. You have a vial of Penicillin that contains 200,000 units.

How many mls of the solution will you add to obtain 25,000 units/ml?

- a. 5 ml
- b. 6.5 ml
- c. 8 ml
- d. 10 ml

19. Desianoside injection is supplied in 2 ml ampules.

Each 2 ml contains 0.4 mg.

How many mg are contained in 8 ml?

- a. 1.6 mg
- b. 302 mg
- c. 16 mg
- d. 32 mg

20. Your order reads: Neomycin 15 mg/kg/dose IM to an adult weighing 120 pounds.

Your vial reads: Neomycin 250 mg/ml.

How many ml should be given per dose?

- a. 3.1 ml
- b. 3.3 ml
- c. 3.5 ml
- d. 3.7 ml

21. Your order reads: Myambutol 35 mg/kg/day.

Your patient weighs: 68.5 kg.

You have Myambutol 400 mg/tablet.

How many tablets will you give?

- a. 4.5 tablets
- b. 5 tablets
- c. 5.5 tablets
- d. 6 tablets

22. Your order reads: INH injection 5 mg/kg/day IM.

Your patient weighs: 67 kg.

Your vial reads: INH 100 mg/ml.

How many ml should be administered per dose?

- a. 2.2 ml
- b. 3 ml
- c. 3.4 ml
- d. 3.8 ml

23. Your order reads: NaCl 200 ml/h.

Your tubing drop factor is: 15 gtt/ml.

How many drops per minute will you administer?

- a. 35 gtts/minute
- b. 50 gtts/minute
- c. 75 gtts/minute
- d. 80 gtts/minute

24. Peter has an order to receive D₅W/0.45 NaCl 1500 ml in 24 hours.

How many ml will he receive per hour?

- a. 63 ml/h
- b. 65 ml/h
- c. 70 ml/h
- d. 75 ml/h

25. Mary comes back to your unit after her appendectomy.

Her postoperative orders read: Normal Saline (NS) at 80 ml/h.

Your tubing factor is: 20 gtts/ml.

How many drops per minute will you administer?

- a. 24 gtts/minute
- b. 27 gtts/minute
- c. 28 gtts/minute
- d. 30 gtts/minute

26. John has an order to receive lactated ringers solution (LR) 2500 ml in 24 hours.
The drop factor is: 15 gtts/ml.

How many gtts/minute will he receive?

- a. 22 gtts/minute
- b. 26 gtts/minute
- c. 32 gtts/minute
- d. 36 gtts/minute

27. Your order reads: D₅W at 80 ml/h.

Your tubing drop factor is: 60 gtts/ml.

How many gtts/minute will you administer?

- a. 50 gtts/minute
- b. 60 gtts/minute
- c. 70 gtts/minute
- d. 80 gtts/minute

28. You have a 1000 ml bag of NaCl to be administered at 85 ml/h.

How many hours do you expect the bottle to last?

- a. 10 hours
- b. 11 hours
- c. 12 hours
- d. 13 hours

29. Your order reads: LR 2500 ml/24 hrs.

How many ml/hr will you give?

- a. 95 ml/h
- b. 100 ml/h
- c. 104 ml/h
- d. 110 ml/h

30. The order is to give 1000 ml of D₅W/0.45% NaCl over 6 hours.

Using a drop factor of 10gtts/ml, find the rate in gtts/minute and ml/hr.

31. The physician has ordered 1000 ml of D₅W to alternate with 1000 ml 0.45% sodium chloride over the next 24 hours at a rate of 150 ml/h.

Using 15 gtts/ml, determine the rate in gtts/minute.

32. The order is for Ringer's lactate 500 ml q8h.

Using 60 gtts/minute, determine the gtts/minute and ml/hr.

33. The order is to infuse 1000 ml of D₅W over 24 hours.

Using 60 gtts/ml, determine the rate in gtts/minute and ml/h.

34. The physician has ordered two units of whole blood (500 ml each) over the next 5 hours.

Using 10gtts/ml, determine the rate in gtts/minute.

35. The physician has ordered 250 ml of Dextran 40 to be given over the next 90 minute. The drop factor is 12 gtts/ml. Find the rate in gtts/minute.
36. The order is to infuse two units of washed, packed red cells (250 ml each) over the next 3 hours. Using a drop factor of 10 gtts/ml, find the rate in gtts/minute.
37. The patient is to receive 3 liters of D₅W/0.45% NaCl over the next 24 hours. The drop factor is 10 gtts/ml. Determine the rate of the IV in gtts/minute.
38. The patient is to receive 3 units of whole blood (1 unit is approximately 500 ml) over the next 6 hours. The drop factor of the tubing is 10 gtts/ml. Determine the rate of the infusion in gtts/minute.
39. The order is to give 250 ml of Dextran 40 over 60 minutes. The drop factor of the tubing is 10 gtts/ml. Determine the rate of the infusion in gtts/minute.

CASE STUDY

R. K., a 23 year-old female, has been admitted with a diagnosis of dehydration. She has a history of ulcerative colitis and experienced severe diarrhea for several days prior to admission. Her original IV order upon admission was: 1000 ml D₅W/0.45% NaCl with 20 mEq KCL to run at a 6 hour rate. The IV infusion set being used delivers 15 gtts/ml.

1. With the original IV order, how many ml of IV fluid was the patient receiving in 24 hours?
2. What rate (gtts/minute) was needed to administer 1000 ml of IV fluid over a 6 hour period?
3. With the new IV order, how many ml of IV fluid will the patient now receive in 24 hours?
4. What rate (ml/h) is now needed to administer 1000 ml of IV fluid over an 8 hour period?
5. What rate (gtts/minute) is now needed to administer 1000 ml of IV fluid over an 8 hour period?

PRACTICE MATH ANSWERS QUARTER 2

- | | | |
|-------|---------------------------|--------------------------------|
| 1. C | 17. B | 31. 38 gtts/minute |
| 2. C | 18. C | 32. 63 gtts/minute |
| 3. D | 19. A | 33. 42 gtts/minute and 42 ml/h |
| 4. D | 20. B | 34. 33 gtts/minute |
| 5. A | 21. D | 35. 33 gtts/minute |
| 6. C | 22. C | 36. 28 gtts/minute |
| 7. B | 23. B | 37. 21 gtts/minute |
| 8. B | 24. A | 38. 42 gtts/minute |
| 9. B | 25. B | 39. 42 gtts/minute |
| 10. B | 26. B | |
| 11. A | 27. D | |
| 12. C | 28. C | |
| 13. C | 29. C | |
| 14. D | 30. 28 gtts/min, 167 ml/h | |
| 15. D | | |
| 16. C | | |

Case study

1. 4000 ml
2. 42 gtts/minute
3. 3000 ml
4. 125 ml/h
5. 31 gtts/minute

PRACTICE MATH QUESTIONS QUARTER 3 PEDIATRICS

1. Wt: 7.7 lbs

Order: Medication "D" 90 mg IV q8h

Reference: 25 –55 mg/kg/dose q8h

What is the dosage range per dose?

What is the dosage range per day?

Has an appropriate dosage been ordered?

Vial: 55 mg/1 ml

How much will you give?

2. Wt: 5.5 kg

Order: Medication "K" 175 mg IV tid

Reference: 30 –50 mg/kg/dose tid

What is the dosage range per dose?

What is the dosage range per day?

Has an appropriate dosage been ordered?

Stock supply: 80 mg/2 ml

How much will you give per dose?

3. Wt: 19.8 lbs

Order: Medication "Y" 165 mg IV qid

Reference: 50 – 75 mg/kg/day in divided doses

What is the dosage range per dose?

What is the dosage range per day?

Has an appropriate dosage been ordered?

Vial: 30 mg/1 ml

How much will you give per dose?

4. Wt: 24 lbs

Order: Medication "R" 115 mg IV tid

Reference: 20 –40 mg/kg/day in divided doses

What is the dosage range per dose?

What is the dosage range per day?

Has an appropriate dosage been ordered?

Vial: 50 mg/2 ml

How much will you give per dose?

5. Wt: 13.5 kg

Order: Medication "P" 58 mg IV bid

Reference: 3 - 6 mg/kg/dose q12h

What is the dosage range per dose?

What is the dosage range per day?

Has an appropriate dosage been ordered?

Vial: 45 mg/1 ml

How much will you give per dose?

6. Wt: 22 lbs

Order: Medication "R" 265 mg IV q6h

Reference: 100 – 200 mg/kg/day in 4 divided doses

What is the dosage range per dose?

What is the dosage range per day?

Has an appropriate dosage been ordered?

Vial: 50 mg/1 ml

How much will you give?

7. Wt: 15 kg
Order: Tylenol 275 mg q4h prn for T >101 (R)
Patient Temp: 103.2 (R)
Reference: 10 – 20 mg/kg/dose every 4 hours as needed

What is the dosage range per dose?
What is the dosage range per day?
Has an appropriate dosage been ordered?

Vial: 160 mg/5 ml
How much will you give?

8. Wt: 33 lbs
Order: Medication “Q” 120 mg po tid
Reference: 20 – 40 mg/kg/day in divided doses

What is the dosage range per dose?
What is the dosage range per day?
Has an appropriate dosage been ordered?

Vial: 100 mg/2 ml
How much will you give?

9. Order: Gentamicin 56 mg bid IV
Label reads: 80 mg/2 ml.
How much will you give?

10. The pediatric dosage range for Ampicillin is 100 – 200 mg/kg/d tid – qid.
The child weighs 21 pounds.
What would be the appropriate dosage range per day for this child?

11. Order reads: Cefazolin 170 mg IV tid.
Label reads: 225 mg/1 ml.
How much will you give?

12. Order reads: Solumedrol 15 mg IV bid.
Label reads: 40 mg/2 ml
How much will you give?

13. Order reads: Claforan 170 mg IV tid.
Label reads: 95 mg/1 ml
How much will you give?

14. Order reads: Gentamicin 42 mg bid IV.
Label reads: 80 mg/2 ml.
How much will you give?

15. The pediatric dosage range for Gentamicin is 2.5 mg/kg/dose bid – tid.
The child weighs 13 pounds.
What would be the appropriate dosage range per day for this child?

16. Order reads: Solumedrol 35 mg IV bid.
Label reads: 40 mg/2 ml
How much will you give?

17. Order reads: Claforan 270 mg IV tid.
Label reads: 95 mg/1 ml
How much will you give?

18. Dosage range for Ampicillin is 100 – 200 mg/kg/day.
The client weighs: 14 kg.
What range of Ampicillin may he receive in one day?

19. Order reads: Claforan 225 mg IV tid
Label reads: 95 mg/1 ml
How much will you give?

20. Order reads: Gentamicin 68 mg bid IV
Label reads: 80 mg/2 ml
How much will you give?

21. The pediatric dosage range for Gentamicin is: 2.5 mg/kg/dose bid – tid.
The child weighs 8 pounds.
What would be the appropriate dosage range per day for this child?

22. Order reads: Solumedrol 10 mg IV bid.
Label reads: 40 mg/2 ml.
How much will you give?

23. Order reads: Claforan 250 mg IV tid
Label reads: 95 mg/1 ml
How much will you give?

24. Order reads: Ampicillin 140 mg bid IV
Label reads: 250 mg/1 ml
How much will you give?

25. The pediatric dosage range for Gentamicin is: 2.5 mg/kg/dose bid – tid.
The child weighs 11 pounds.
What would be the appropriate dosage range per day for this child?

26. Order reads: Solumedrol 32 mg bid IV
Label reads: 40 mg/2 ml
How much will you give?

27. Order reads: Claforan 420 mg IV tid
Label reads: 95 mg/1 ml
How much will you give?

PRACTICE MATH ANSWERS QUARTER 3 PEDIATRICS

1. Wt: 7.7 lbs **$7.7 \text{ lbs} / 2.2 \text{ lbs per kg} = 3.5 \text{ kg}$**
Order: Medication "D" 90 mg IV q8h = **270 mg/day**
Reference: 25 –55 mg/kg/dose q8h

What is the dosage range per dose? **$(25 \times 3.5) - (55 \times 3.5) = 87.5 - 192.5 \text{ mg}$**
What is the dosage range per day? **$(3 \times 87.5) - (3 \times 192.5) = 262.5 - 577.5 \text{ mg}$**
Has an appropriate dosage been ordered? **Yes**

Vial: 55 mg/1 ml
How much will you give? **$\frac{90 \text{ mg} \times 1 \text{ ml}}{55 \text{ mg}} = 1.64 \text{ ml/dose}$**

2. Wt: 5.5 kg
Order: Medication "K" 175 mg IV tid = **525 mg/day**
Reference: 30 –50 mg/kg/dose tid

What is the dosage range per dose? **$(30 \times 5.5) - (50 \times 5.5) = 165 - 275 \text{ mg}$**
What is the dosage range per day? **$(165 \times 3) - (275 \times 3) = 495 - 825 \text{ mg}$**
Has an appropriate dosage been ordered? **Yes**

Stock supply: 80 mg/2 ml
How much will you give per dose? **$\frac{175 \text{ mg} \times 2 \text{ ml}}{80 \text{ mg}} = 4.38 \text{ ml/dose}$**

3. Wt: 19.8 lbs **$19.8 / 2.2 = 9 \text{ kg}$**
Order: Medication "Y" 165 mg IV qid = **660 mg/day**
Reference: 50 – 75 mg/kg/day in divided doses

What is the dosage range per dose? **$(450/4) - (675/4) = 112.5 - 169 \text{ mg}$**
What is the dosage range per day? **$(50 \times 9) - (75 \times 9) = 450 - 675 \text{ mg}$**
Has an appropriate dosage been ordered? **Yes**

Vial: 30 mg/1 ml
How much will you give per dose? **$\frac{165 \text{ mg} \times 1 \text{ ml}}{30 \text{ mg}} = 5.5 \text{ ml/dose}$**

4. Wt: 24 lbs $24/2.2 = 10.9$ kg
Order: Medication "R" 115 mg IV tid = **345 mg/day**
Reference: 20 –40 mg/kg/day in divided doses

What is the dosage range per dose? $(218/3) - (436/3) = 72.7 - 145$ mg
What is the dosage range per day? $(20 \times 10.9) - (40 \times 10.9) = 218 - 436$ mg
Has an appropriate dosage been ordered? **Yes**

Vial: 50 mg/2 ml
How much will you give per dose? $\frac{115 \text{ mg} \times 2 \text{ ml}}{50 \text{ mg}} = 4.6$ ml/dose

5. Wt: 13.5 kg
Order: Medication "P" 58 mg IV bid = **116 mg/day**
Reference: 3 - 6 mg/kg/dose q12h

What is the dosage range per dose? $(3 \times 13.5) - (6 \times 13.5) = 40.5 - 81$ mg
What is the dosage range per day? $(40.5 \times 2) - (81 \times 2) = 81 - 162$ mg
Has an appropriate dosage been ordered? **Yes**

Vial: 45 mg/1 ml
How much will you give per dose? $\frac{58 \text{ mg} \times 1 \text{ ml}}{45 \text{ mg}} = 1.29$ ml/dose

6. Wt: 22 lbs $22/2.2 = 10$ kg
Order: Medication "R" 265 mg IV q6h = **1060 mg/day**
Reference: 100 – 200 mg/kg/day in 4 divided doses

What is the dosage range per dose? $(1000/4) - (2000/4) = 250 - 500$ mg
What is the dosage range per day? $(10 \times 100) - (10 \times 200) = 1000 - 2000$ mg
Has an appropriate dosage been ordered? **Yes**

Vial: 50 mg/1 ml
How much will you give? $\frac{265 \text{ mg} \times 1 \text{ ml}}{50 \text{ mg}} = 5.3$ ml/dose

7. Wt: 15 kg

Order: Tylenol 275 mg q4h prn for T >101 (R) = **1650 mg/day**

Patient Temp: 103.2 (R)

Reference: 10 – 20 mg/kg/dose every 4 hours as needed

What is the dosage range per dose? **(10 x 15) – (20 x 15) = 150 – 300 mg**

What is the dosage range per day? **(6 x 150) – (6 x 300) = 900 - 1800 mg**

Has an appropriate dosage been ordered? **Yes**

Vial: 160 mg/5 ml

How much will you give?
$$\frac{275 \text{ mg} \times 5 \text{ ml}}{160 \text{ mg}} = 8.59 \text{ ml}$$

8. Wt: 33 lbs **33/ 2.2 = 15 kg**

Order: Medication “Q” 120 mg po tid = **360 mg/day**

Reference: 20 –40 mg/kg/day in divided doses

What is the dosage range per dose? **(300/3) - (600/3) = 100 – 200 mg**

What is the dosage range per day? **(15 x 20) – (15 x 40) = 300 – 600 mg**

Has an appropriate dosage been ordered? **Yes**

Vial: 100 mg/2 ml

How much will you give?
$$\frac{120 \text{ mg} \times 2 \text{ ml}}{100 \text{ mg}} = 2.4 \text{ ml}$$

9. Order reads: Gentamicin 56 mg bid IV

Label reads: 80 mg/2 ml

How much will you give?
$$\frac{2 \text{ ml}}{80 \text{ mg}} = \frac{x}{56 \text{ mg}} \quad x = 1.4 \text{ ml}$$

10. The pediatric dosage range for Ampicillin is 100 –200 mg/kg/day tid – qid.

The child weighs 21 pounds. **21/ 2.2 = 9.5 kg**

What would be the appropriate dosage range per day for this child?

(9.55 x 100) – (9.55 x 200) = 955 – 1910 mg/day

11. Order reads: Cefazolin 170 mg IV tid.

Label reads: 225 mg/1 ml.

How much will you give?
$$\frac{1 \text{ ml}}{225 \text{ mg}} = \frac{x}{170 \text{ mg}} \quad x = 0.76$$

12. Order reads Solumedrol 15 mg IV bid.

Label reads: 40 mg/2 ml

How much will you give? $\frac{2 \text{ ml}}{40 \text{ mg}} = \frac{x}{15 \text{ mg}}$ $x = 0.75$

13. Order reads: Claforan 170 mg IV tid.

Label reads: 95 mg/1 ml

How much will you give? $\frac{1 \text{ ml}}{95 \text{ mg}} = \frac{x}{170 \text{ mg}}$ $x = 1.79 \text{ ml}$

14. Order reads Gentamicin 42 mg bid IV.

Label reads: 80 mg/2 ml.

How much will you give? $\frac{2 \text{ ml}}{80 \text{ mg}} = \frac{x}{42 \text{ mg}}$ $x = 1.05 \text{ ml}$

15. The pediatric dosage range for Gentamicin is 2.5 mg/kg/dose bid – tid.

The child weighs 13 pounds. $13 / 2.2 = 5.91 \text{ kg}$

What would be the appropriate dosage range per day for this child?

$5.91 \times 2.5 \text{ mg} \times 2 = 29.55$ $5.91 \times 2.5 \times 3 = 44.33$
29.6 – 44.3 mg/day

16. Order reads: Solumedrol 35 mg IV bid.

Label reads: 40 mg/2 ml

How much will you give? $\frac{2 \text{ ml}}{40 \text{ mg}} = \frac{x}{35 \text{ mg}}$ $x = 1.75 \text{ ml}$

17. Order reads Claforan 270 mg IV tid.

Label reads: 95 mg/1 ml

How much will you give? $\frac{1 \text{ ml}}{95 \text{ mg}} = \frac{x}{270 \text{ mg}}$ $x = 2.84 \text{ ml}$

18. Dosage range for Ampicillin is 100 – 200 mg/kg/day.

The client is 14 kg. What range of Ampicillin may he receive in one day? **1400 - 2800 mg/day**

19. Order reads: Claforan 225 mg IV tid.

Label reads: 95 mg/1 ml

How much will you give? **2.37 ml**

20. Order reads: Gentamicin 68 mg bid IV
Label reads: 80 mg/2 ml
How much will you give? **1.7 ml**

21. The pediatric dosage range for Gentamicin is 2.5 mg/kg/dose bid – tid.
The child weighs 8 pounds.
What would be the appropriate dosage range per day for this child?
18.2 – 27.3 mg/day

22. Order reads: Solumedrol 10 mg IV bid
Label reads: 40 mg/2 ml
How much will you give? **0.5 ml**

23. Order reads: Claforan 250 mg IV tid
Label reads: 95 mg/1 ml
How much will you give? **2.63 ml**

24. Order reads: Ampicillin 140 mg bid IV
Label reads: 250 mg/1 ml
How much will you give? **0.56 ml**

25. The pediatric dosage range for Gentamicin is 2.5 mg/kg/dose bid – tid.
The child weighs 11 pounds.
What would be the appropriate dosage range per day for this child? **25 – 37.5 mg/day**

26. Order reads: Solumedrol 32 mg bid IV
Label reads: 40 mg/2 ml
How much will you give? **1.6 ml**

27. Order reads: Claforan 420 mg IV tid
Label reads: 95 mg/1 ml
How much will you give? **4.42 ml**

PRACTICE MATH QUESTIONS QUARTER 3 OB

1. Baby Boy Gomez weighed 3.27 kg at birth.
Convert this number to grams and pounds.

2. Baby Girl Jones measures 52 cm. in length, 32.5 cm around her head,
34 cm around her chest and 31.5 cm around her abdomen.
Convert these numbers to inches.

3. A premature infant weighs 950 grams at birth.
Convert this figure to pounds and to kilograms.

4. Baby Boy Wong weighed 3560 grams at birth.
Convert his weight to pounds and to kilograms.

5. Baby Girl Smith is 20.5 inches long at birth.
How many centimeters is this measurement?

6. Barbara Smith's placenta measured 16 cm in diameter and weighed 850 grams.
How many inches did the placenta measure?
How many pounds did the placenta weigh?

PRACTICE MATH ANSWERS QUARTER 3 OB

- 1. 3270 grams; 7.19 pounds**
- 2. 52 cm = 20.8 inches; 32.5 cm = 13 inches; 34 cm = 13.6 inches; 31.5 cm = 12.6 inches**
- 3. 0.95 kg; 2.09 pounds**
- 4. 3.56 kg; 7.83 pounds**
- 5. 51.25 cm**
- 6. 6.4 in; 1.87 pounds**

PRACTICE MATH QUESTIONS

QUARTER 4

HEPARIN DRIP CALCULATIONS

Heparin drips can seem complex for several reasons. One is the fact that there are two different units of measurement in the MD order. (ml, USP units). Another is the range of parameters for use in titrating the rate according to the PTT (partial thromboplastin time) lab value (RN responsibility). Another reason is that we need to know not only the ml per hour, but the number of units per hour the patient is receiving. Finally, there are several different questions that can be asked about a Heparin drip.

Hopefully, these tips and practice questions will help you with these calculations. The Heparin infusion chapter in your current medication calculation text is another resource that may be useful to you as well... check it out!

Meet your Heparin Drip

Visualize an IV bag...

This bag has Heparin added to it. This is known as a solution. It has a certain number of units of Heparin in every ml of IV fluids (units per ml). The amount of Heparin added to the bag (as well as the volume of the bag) is dependent upon the MD order. The IV solution is generally 5% Dextrose (D₅W).

A Heparin drip is ALWAYS administered with a pump. (Hint: most IV pumps today are manufactured with built in technology that works with only one type of tubing set. With these pumps, you will program the pump to deliver ml/hr, which means the drop factor of the tubing set is NOT significant! This means you DON'T have to calculate the flow rate – Yippee!!!!!!) However your math book shows examples in which you do need to take the tubing set into account.

Because the number of units of Heparin added to the IV bag is *usually* a large number (often 25,000 or more), it usually translates to a relatively *small* rate (as ADULT IV rates go). The rate is expressed in ml/hr. So, generally, when you think “Heparin Drip,” think RATE in “Small Numbers.”

There are a couple of ways to calculate Heparin drip questions. You will use one of two methods of ratio and proportion. Use the one that is most comfortable for you. Later, we will work through some examples and there are a number of practice questions and answers. Consult your current medication calculation book as needed.

Meet Your Heparin Calculation Questions:

You will need to be able to answer one of three questions. **Perhaps the most important thing to know is: what, exactly, IS the question asking?**

The three questions are:

1. How many units/hr is the patient receiving?
2. By how much will you change (increase/decrease) your pump setting?
3. What is your pump setting (how many ml/hr is this)?

Meet Your Heparin Drip Order:

Here are two examples of an MD order for a Heparin Drip. These orders are actually ordering the same thing:

- #1. D₅W, 500ml, with Heparin 25,000 units, IV, at 20ml/hr.
- #2. D₅W, 500 ml, with Heparin 25,000 units, at 1000 units per hour, IV.

You will always be given either the rate (ml/hr) or the units per hour (units/hr) in the MD order.

There are parameters for titration, which accompany the IV order. According to the PTT result, the RN will titrate, or adjust, the rate (ml/hr = pump setting). Here is an example of titration parameters an MD might order:

Titrate Heparin drip per parameters:

- Heparin rate parameter: PTT 86 – 100 sec = decrease Heparin drip by 200 units per hour.
- Heparin rate parameter: PTT 55 – 85 sec = no change
- Heparin rate parameter: PTT >100 sec = hold infusion for 60 min., decrease Heparin rate by 300 units/hr, call MD if any evidence of bleeding.
- Heparin rate parameter: PTT 45 – 54 sec = increase Heparin drip by 100 units/hr
- Heparin rate parameter: PTT 44 sec or less = increase Heparin drip by 200 units/hr.
- Any clinical bleeding = stop drip and inform MD STAT.

You will need to monitor the PTT, determine its place in the range ordered, and decide if action is needed. If you determine you must change the rate, you now need to determine how many ml/hr is equal to the number of units by which you must change your infusion. Remember that ml/hr means “pump setting.”

If the rate changes as a result of the PTT, there will be some mechanism for the RN to change or alter the original IV order. Many agencies also use a flowsheet to track labs and rate and/or unit changes.

Meet Your Calculations:

We will use the following MD orders to demonstrate (*For purpose of all calculations, assume the drip factor of the tubing set is factored into the pump technology.*) For help solving the problems, see the next page and/or refer to your current calculation book as needed.

MD Orders:

#1. D₅W, 500 ml, with Heparin 25,000 units, IV, at 20 ml/hr.

#2. D₅W, 500 ml, with Heparin 25,000 units, at 1000 units per hour, IV.

Example #1: units per hour

Let's use MD order #1 (above). Both methods you can use are shown. Calculate units per hour (aka "How many units/hr is the patient receiving?")

$$25,000 \text{ units: } 500 \text{ ml} = X \text{ units: } 20 \text{ ml/hr} \quad \text{OR} \quad \frac{25000 \text{ units}}{500 \text{ ml}} = \frac{X \text{ units}}{20 \text{ ml/hr}}$$

$$\begin{aligned} 500 X &= 500,000 \\ X &= 1000 \end{aligned}$$

Answer: X = 1000 units/hr. The patient is receiving 1000 units per hour

Example #2: ml per hour

Now let's use MD order #2 (above). Both methods you can use are shown. Calculate ml/hr (aka "How many ml/hr is this?" and What is the pump setting?")

$$25,000 \text{ units: } 500 \text{ ml} = 1000 \text{ units: } X \text{ ml/hr} \quad \text{OR} \quad \frac{25000 \text{ units}}{500 \text{ ml}} = \frac{1000 \text{ units}}{X \text{ ml/hr}}$$

$$25,000 X = 500 \times 1000$$

Answer: X = 20 ml/hr. The pump setting is 20 ml/hr

Example # 3: units per ml

This is another way to think about Heparin drips, and it just happens to be my favorite! Remember earlier, when I said, “when you think of Heparin drips, think of small numbers” in terms of IV rate (ml/hr)?? It helps ME a lot to calculate the number of units per ml. Then I can use simple multiplication to calculate units per hour AND rate changes easily throughout my shift.

Let’s use MD order #1 (below). Calculate units per ml.

#1. D₅W, 500 ml, with Heparin 25,000 units, IV at 20 ml/hr.

$$\begin{array}{l} 25,000 \text{ units: } 500 \text{ ml} = X \text{ units: } 1 \text{ ml} \quad \mathbf{OR} \quad \frac{25,000 \text{ units}}{500 \text{ ml}} = \frac{X \text{ units}}{1 \text{ ml}} \\ 500 X = 25,000 \quad \mathbf{OR} \quad 250/5 = 50 \end{array}$$

Answer: X = 50 units/ml. The solution delivers 50 units of Heparin per ml.

NOW: If the rate is at 20 ml/hr, to determine units per hour I just multiply

$$\begin{array}{r} 50 \\ \times 20 \\ \hline 1000 \end{array}$$

to get the units per hour (in this case, 1000). AND, if I need to titrate, I divide 50 into the number of units which I must change to get the number of ml by which I need to change my pump.

For example: If I need to increase my heparin drip by 100 ml/hr, I divide 50 into 100 to get 2. I then know I will increase the pump setting by 2 ml (note: If I increased my rate of 20 ml by 2 ml, the new pump setting will be 22 ml/hr).

Additional help with solving:

These are the same examples demonstrated in the previous section. Refer to my calculations to help guide you through solving the problems.

MD orders:

- #1. D₅W, 500 ml, with Heparin 25,000 units, IV, at 20 ml/hr.
- #2. D₅W, 500 ml, with Heparin 25,000 units, at 1000 units per hour, IV.

Example #1: units per hour.

Let's use MD order #1 (above). Both methods you can use are shown. Calculate units per hour (aka "How many units/hr is the patient receiving?").

$$\begin{array}{l} 25,000 \text{ units: } 500 \text{ ml} = X \text{ units: } 20 \text{ ml/hr} \\ 500 X = 500,000 \\ X = 1000 \end{array} \quad \text{or} \quad \begin{array}{l} \frac{25000 \text{ units}}{500 \text{ ml}} = \frac{X \text{ units}}{20 \text{ ml/hr}} \\ \text{(cross multiply)} \end{array}$$

Answer: X = 1000 units/hr. The patient is receiving 1000 units per hour.

Example #2: ml per hour

Now let's use MD order #2 (above). Both methods you can use are shown. Calculate ml/hr (aka "How many ml/hr is this?" and "What is the pump setting?").

$$\begin{array}{l} 25,000 \text{ units: } 500 \text{ ml} = 1000 \text{ units: } X \text{ ml/hr} \\ 25,000 X = 500 \times 1000 \\ X = 20 \end{array} \quad \text{or} \quad \begin{array}{l} \frac{25,000 \text{ units}}{500 \text{ ml}} = \frac{1000 \text{ units}}{X \text{ ml/hr}} \\ \text{(cross multiply)} \end{array}$$

Answer: X = 20 ml/hr. The pump setting is 20 ml/hr

Practice:

Here are some problems to practice with. Note the different ways to ask the same question. Answers are on the next page (no peeking 'til you've tried to solve!!)

MD Order: D₅W, 500 ml, with Heparin 25,000 units, IV at 20 ml/hr.

Titrate Heparin drip per parameters:

- Heparin rate parameter: PTT 86 – 100 sec: decrease Heparin drip by 200 units per hour.
- Heparin rate parameter: PTT 55 – 85 sec: no change
- Heparin rate parameter: PTT >100 sec: hold infusion for 60 min., decrease Heparin rate by 300 units/hr, call MD if any evidence of bleeding.
- Heparin rate parameter: PTT 45 – 54 sec: increase Heparin drip by 100 units/hr
- Heparin rate parameter: PTT 44 sec or less: increase Heparin drip by 200 units/hr.
- Any clinical bleeding: stop drip and inform MD STAT.

All questions assume you are starting with the original order.

1. At the rate in the original order (above), how many units are being infused?
2. How many ml/hr is this?
3. If the PTT is 50, how many units/hr of Heparin should be infused?
4. By how much will you change your pump?
5. How many ml/hr is this?
6. If the PTT is 44, how many units/hr of Heparin should be infused?
7. What is the pump setting?
8. If the PTT is 90, how many units/hr of Heparin is the patient receiving?
9. What is the difference in the pump setting?
10. How many ml/hr is this?
11. If the PTT is 65, how many units/hr of Heparin should be infused?
12. What is the rate?
13. If PTT is 120, how many units of Heparin should be infused?
14. How many ml/hr is this?

PRACTICE MATH ANSWERS QUARTER 4- Heparin Drip Calculations

All questions assume you are starting with the original order.

1. At the rate in the original order (above), how many units are being infused?
1000 units/hr
2. How many ml/hr is this? **20 ml/hr (note: ml/hr = rate)**
3. If the PTT is 50, how many units/hr of Heparin should be infused? **1100 units/hr**
4. By how much will you change your pump? **Add 2 ml**
5. How many ml/hr is this? **22 ml/hr**
6. If the PTT is 44, how many units/hr of Heparin should be infused? **1200 units/hr**
7. What is the pump setting? **24 ml/hr**
8. If the PTT is 90, how many units/hr of Heparin is the patient receiving? **800 units/hr**
9. What is the difference in the pump setting? **Subtract 4 ml/hr**
10. How many ml/hr is this? **16 ml/hr**
11. If the PTT is 65, how many units/hr of Heparin should be infused? **1000 units/hr**
12. What is the rate? **20 ml/hr (i.e. no change)**
13. If PTT is 120, how many units of Heparin should be infused? **Hold for 1 hour, then 700 units/hr**
14. How many ml/hr is this? **Hold for 1 hour, then 14 ml/hr**

PRACTICE MATH QUESTIONS QUARTER 4

Hints for IV drip calculations:

$$\frac{\text{Drops per ml (tubing)}}{1 \text{ ml}} = \frac{60x \text{ (minutes)}}{\text{ml (per hour)}}$$

Using question # 18:

$$\text{Step \#1} \quad \frac{15}{1} = \frac{60x}{125} \quad \text{cross multiply}$$

$$\text{Step \#2} \quad 60x = 1875 \quad \text{Get X by itself}$$

$$\text{Step\#3} \quad \frac{60x}{60} = \frac{1875}{60} \quad \text{Divide}$$

$$\text{Step \#4} \quad x = 31.25 \quad \text{Round off}$$

$$\text{Step \#5} \quad \text{set IV to 31 gtt/min}$$

1. You are preparing to administer your Cefazolin 1 Gm IV in 50 ml of D₅W over 20 minutes. What will be the flow rate (in ml per hr) to administer this drug on time?
2. How many drops per minute will this be if the drop factor of the IV tubing is 10?
3. How many drops per minute will this be if the drop factor of the IV tubing is 15?
4. Ordered: Morphine Sulfate 12 mg IM q 4 hrs. prn pain.
On hand: Morphine Sulfate 10 mg/1 ml.
How many ml will you administer?
5. Ordered: Toradol (Ketorolac) 15 mg IV q 6 hrs.
On hand: Toradol 60 mg/2ml.
How many ml will you administer?
6. Ordered: Morphine Sulfate 8 mg IM Q4h prn pain
On hand: Morphine Sulfate 10 mg/ml.
How many ml will you administer?

7. Ordered: Lanoxin (Digoxin) 0.25 mg IV daily
On hand: Lanoxin (Digoxin) 0.5 mg/1ml.
How many ml will you administer?

8. Ordered: KCl 40 mEq powder, PO daily.
On hand: KCl 20 mEq powder packets.
How many packets will you administer?

9. Ordered: Demerol 20 mg IM Q 4-6 hrs prn pain.
On hand: Demerol 50mg/1ml.
How many ml will you administer?

10. Ordered: D₅W, 1000 ml bag, continuous IV at 125 ml/hr.
The current bag was hung at 12 noon.
At what time will the next bag be due?

11. If the IV in the previous problem was infused using adult (macro drip) tubing with a drop factor of 15 gtts/ml, how many drops per minute will you deliver?

12. Ordered: D₅W/0.45 NaCl 1000 ml, continuous IV at 100 ml/hr.
The present bag was hung at 11 pm (2300).
At what time will the next bag be due?

13. If the IV in the previous problem was infused using pedi (micro drip) tubing with a drop factor of 60 gtts/ml, how many drops per minute will you deliver?

14. Ordered: Phenergan 12.5 mg IM Q 4hours prn nausea
On hand: Phenergan 25 mg/1 ml.
How many ml will you administer?

15. Ordered: KCl 20 mEq powder:
If K⁺ is 3.8 – 4.5= 1 packet
If K⁺ is 3.2 – 3.7= 2 packets
If K⁺ is 2.5 –3.1= 3 packets

On hand: KCl 40 mEq powder packets.
Lab result: K⁺ = 3.5
How many packets will you administer?

16. Ordered: Packed red blood cells, 1 unit, infuse over 3 hours. (1 unit = 250 ml).
How many ml/hr will you deliver?

17. Blood tubing has a drop factor of 10 gtts/ml.
For the previous problem, how many drops per minute will you deliver?

18. Ordered: Primaxin 300 mg IVPB q8 hours,
On hand: Primaxin 500 mg vial.
After adding 9 ml of diluent to the mix, the med you end up with is a total of 10 ml of mixed Primaxin.
How many ml will you add to the IVPB?

19. Ordered: Prednisone 15 mg PO BID.
On hand: Prednisone 10 mg tabs.
How many pills will you administer?

20. The order reads KCl elixir 15 mEq po.
The bottle of potassium elixir states the strength is 10 mEq in 15 ml.
How many ml will you administer?

21. The order read 0.5 mg Digoxin IV push now.
The dose available is 500 mcg per 2 ml.
How many ml will you give?

22. Heparin is available as 15,000 units in 500 ml D₅W.
The order reads to administer the Heparin at a rate of 500 units/hour.
The IV tubing you are using has a drop factor of 60 (micro drip).
How many ml per hour will you set the IV pump to deliver 500 units/hr?

23. _____ ml = one ounce

24. One gram = _____ milligrams

25. Grain X = _____ milligrams

26. 1 milligram = _____ micrograms

27. 1 liter = _____ ml

28. The doctor's order reads Digoxin 0.5 mg po daily.
The tablets you have are labeled 0.25 mg.
How many tablets do you give?

29. You have Demerol 50 mg per ml on hand.
The doctor's order reads Demerol 35 mg IM q4h.
How many ml of Demerol will you give?

30. The doctor ordered KCl 60 mEq added to 1000 ml D₅W.
Using a 20 ml multiple dose bottle containing 40 mEq of KCl, how many ml of KCl do you add?
What is the ml dilution?

31. Erythromycin 250 mg capsules on hand.
How many capsules will you give for 1 Gm?

32. The doctor orders Verapamil 0.5 mg IV.
You have 2.5 mg per ml on hand.
How much do you give?

33. Gentamycin 80 mg in 100 ml D₅W must be given over one hour.
How many drops per minute do you adjust the flow rate if the drop factor of the IV set is 10?
If the drop factor of the IV set is 15?

34. What is the flow rate if Gentamycin 100 ml must be given over one half hour?
How many drops per minute if the drop factor of the IV set is 10?
If the drop factor of the IV set is 15?

35. Ampicillin 500 mg in 50 ml D₅W must be given over one half hour.
How many drops per minute do you adjust the flow if the drop factor of the IV set is 10?
If the drop factor of the IV set is 15?

36. The doctor's order reads Heparin 5000 units subcutaneous bid.
You have 10,000 units per ml on hand.
How much will you give?

37. You have Demerol 75 mg per ml on hand.
The doctor's order reads 60 mg q3h.
How many ml will you give?

38. A post operative patient is to receive Morphine Sulfate 6 mg subcutaneous.
How many ml will you give if the Morphine Sulfate you use is:
8 mg per ml?
10 mg per ml?
12 mg per ml?
15 mg per ml?

39. Solumedrol 80 mg is ordered.
Solumedrol 125 mg per ml is on hand.
How much Solumedrol will you give?

PRACTICE MATH ANSWERS QUARTER 4

1. You are preparing to administer your Cefazolin 1 Gm IV in 50 ml of D₅W over 20 minutes. What will be the flow rate (in ml per hr) to administer this drug on time?

150 ml/h

2. How many drops per minute will this be if the drop factor of the IV tubing is 10?

$$\frac{10 \text{ gtt} \times 150 \text{ ml} \times 1 \text{ hour}}{1 \text{ ml} \quad 1 \text{ hour} \quad 60 \text{ min}}$$
$$1500/60 = 25 \text{ gtt/min}$$

3. How many drops per minute will this be if the drop factor of the IV tubing is 15?

$$\frac{15 \text{ gtt} \times 150 \text{ ml} \times 1 \text{ h}}{1 \text{ ml} \quad 1 \text{ h} \quad 60 \text{ min}}$$
$$\frac{150}{4} = 37.5 \text{ or } 38 \text{ gtt/min}$$

4. Ordered: Morphine Sulfate (MS) 12 mg IM q4hrs prn pain.

On hand: MS 10 mg/1 ml.

How many ml will you administer? **1.2ml**

5. Ordered : Toradol (Ketorolac) 15 mg IM q6hrs.

On hand: Toradol 60 mg/2ml.

How many ml will you administer? **0.5 ml**

6. Ordered: Morphine Sulfate 8 mg IM q4h prn pain

On hand: Morphine Sulfate 10 mg/ml.

How many ml will you administer? **0.8 ml**

7. Ordered: Lanoxin (digoxin) 0.25 mg IV daily.

On hand: Lanoxin (digoxin) 0.5 mg/1ml.

How many ml will you administer? **0.5 ml**

8. Ordered: KCl 40 mEq powder, PO daily.

On hand: KCl 20 mEq powder packets.

How many packets will you administer? **2 packets**

9. Ordered: Demerol 20 mg IM q4hrs prn pain.

On hand: Demerol 50mg/1ml.

How many ml will you administer? **0.4 ml**

10. Ordered: D₅W, 1000 ml, continuous IV at 125 ml/hr.

The present bag was hung at 1200 (12 noon).

At what time will the next bag be due? **2000 (8 pm)**

11. If the IV in the previous problem was infused using adult (macro drip) tubing with a drop factor of 15 gtts/ml, how many drops per minute will you deliver? **31 gtt/min (31.25)**

12. Ordered: D₅W/0.45 NaCl 1000ml, continuous IV at 100 ml/hr.

The present bag was hung at 2300 (11 pm).

At what time will the next bag be due? **0900 (9 am)**

13. If the IV in the previous problem was infused using pedi (micro drip) tubing with a drop factor of 60 gtts/ml, how many drops per minute will you deliver? **100 gtts/min**

14. Ordered: Phenergan 12.5 mg IV q4 hours prn nausea

On hand: Phenergan 25 mg/1 ml.

How many ml will you administer? **0.5 ml**

15. Ordered: KCl 20 mEq powder PO prn:

If K⁺ is 3.8 – 4.5= 1 packet

If K⁺ is 3.2 – 3.7= 2 packets

If K⁺ is 2.5 – 3.1= 3 packets

On hand: KCl 40 mEq powder packets.

Lab result: K⁺ = 3.5.

How many packets will you administer?

1 packet (note: on hand dose different than ordered)

16. Ordered: Packed red blood cells, 1 unit, infuse over 3 hours. (1unit = 250 ml).

How many ml/hr will you deliver? **83 ml/hr (83.33)**

17. Blood tubing has a drop factor of 10 gtts/ml. For the previous problem, how many drops per minute will you deliver? **14 gtts/min (13.8)**

18. Ordered: Primaxin 300 mg IVPB q8 hours,

On hand: Primaxin 500 mg vial.

After adding 9 ml diluent to mix, the med you end up with is a total of 10 ml of mixed Primaxin.

How many ml will you add to the IVPB? **6 ml**

19. Ordered: Prednisone 15 mg PO BID.

On hand: Prednisone 10 mg tabs. How many pills will you administer? **1.5 pills**

20. The order reads KCl elixir 15 mEq po.

The bottle of potassium elixir states the strength is 10 mEq in 15 ml.

How many ml will you administer? **10 mEq = 15 mEq**

$$\frac{15 \text{ ml}}{10 \text{ X}} = \frac{15 \text{ mEq}}{x}$$

$$10 \text{ X} = 225$$

$$x = 22.5 \text{ ml}$$

21. The order reads 0.5 mg Digoxin IV push now.
The dose available is 500 mcg per 2 ml.
How many ml will you give? **2 ml**

22. Heparin is available as 15,000 units in 500 ml D₅W.
The order reads to administer the Heparin at a rate of 500 units/hour.
The IV tubing you are using had a drop factor of 60 (micro drip).
How many ml per hour will you set the IV pump to deliver?

$$\text{Step 1: } 15,000 \text{ units} / 500 \text{ ml} = 30 \text{ units/ml}$$
$$\text{Step 2: } \frac{1 \text{ ml}}{30 \text{ units}} : \frac{500 \text{ units}}{500 \text{ ml}} = 500 \text{ ml} = 16.67 \text{ ml/h} = 17 \text{ ml/hr}$$

23. **30** ml = one ounce

24. One gram = **1000** milligrams

25. Grain X = **650** milligrams

26. 1 milligram = **1000** micrograms

27. 1 liter = **1000** ml

28. The doctor's order reads Digoxin 0.5 mg po daily.
The tablets you have are labeled 0.25 mg.
How many tablets do you give? **2 tablets**

29. You have Demerol 50 mg per ml on hand.
The doctor's order reads Demerol 35 mg IM q4h.
How many ml of Demerol will you give?

$$\frac{50 \text{ mg}}{1 \text{ ml}} = \frac{35 \text{ mg}}{X}$$
$$50 X = 35$$
$$X = 35/50 = 0.7 \text{ ml}$$

30. The doctor ordered KCl 60 mEq added to 1000 ml D₅W.
Using a 20 ml multiple dose bottle containing 40 mEq of KCl,
how many ml of KCl do you add? **KCl 1000 + 30 = 1030;**
What is the ml dilution? **30 ml of 60 mEq/1030 ml = 0.06 mEq per ml**

31. Erythromycin 250 mg capsules on hand.
How many capsules will you give for 1 Gm? **4 capsule**

32. The doctor orders Verapamil 0.5 mg IV.
 You have 2.5 mg per ml on hand.
 How much do you give?

$$\frac{2.5 \text{ mg}}{1 \text{ ml}} = \frac{0.5 \text{ mg}}{X}$$

$$2.5 X = 0.5$$

$$X = 0.5/2.5$$

$$0.2 \text{ ml}$$

33. Gentamycin 80 mg in 100 ml D₅W must be given over one hour.
 How many drops per minute do you adjust the flow rate if the drop factor of the IV set is 10? If the drop factor of the IV set is 15?

$$\frac{10 \text{ gtt}}{1 \text{ ml}} \times \frac{100 \text{ ml}}{1 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}} = \frac{1000 \text{ gtt}}{60 \text{ min}} = 16.67 \text{ gtt/min} = 17 \text{ gtt/min}$$

$$\frac{15 \text{ gtt}}{1 \text{ ml}} \times \frac{100 \text{ ml}}{1 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}} = \frac{1500 \text{ gtt}}{60 \text{ min}} = 25 \text{ gtt/min}$$

34. What is the flow rate if Gentamycin 100 ml must be given over one half hour?
 How many drops per minute if the drop factor of the IV set is 10?
 If the drop factor of the IV set is 15?

$$\frac{10 \text{ gtt}}{1 \text{ ml}} \times \frac{200 \text{ ml}}{1 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}} = \frac{2000 \text{ gtt}}{60 \text{ min}} = 33.33 \text{ gtt/min} = 33 \text{ gtt/min}$$

$$\frac{15 \text{ gtt}}{1 \text{ ml}} \times \frac{200 \text{ ml}}{1 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}} = \frac{3000 \text{ gtt}}{60 \text{ min}} = 50 \text{ gtt/min}$$

35. Ampicillin 500 mg in 50 ml D₅W must be given over one half hour.
 How many drops per minute do you adjust the flow if the drop factor of the IV set is 10?
 If the drop factor of the IV set is 15?

$$\frac{10 \text{ gtt}}{1 \text{ ml}} \times \frac{100 \text{ ml}}{1 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}} = \frac{1000 \text{ gtt}}{60 \text{ min}} = 16.67 \text{ gtt/min} = 17 \text{ gtt/min}$$

$$\frac{15 \text{ gtt}}{1 \text{ ml}} \times \frac{100 \text{ ml}}{1 \text{ h}} \times \frac{1 \text{ h}}{60 \text{ min}} = \frac{1500 \text{ gtt}}{60 \text{ min}} = 25 \text{ gtt/min}$$

36. The order reads Heparin 5000 units subcutaneous bid.
 You have 10,000 units per ml on hand.
 How much will you give? **0.5 ml**

37. You have Demerol 75 mg per ml on hand.
The doctor's order reads 60 mg q3h.
How many ml will you give?

$$\frac{75 \text{ mg}}{1 \text{ ml}} = \frac{60 \text{ mg}}{X}$$

$$75 X = 60$$
$$X = 60/75 = 0.8 \text{ ml}$$

38. A post operative patient is to receive Morphine Sulfate 6 mg subcutaneous.
How many ml will you give if the Morphine Sulfate you use is:

8 mg per ml? $\frac{8 \text{ mg}}{1 \text{ ml}} = \frac{6 \text{ mg}}{X}$

$$8x = 6 \quad X = 6/8 = 0.75 \text{ ml}$$

10 mg per ml? $\frac{10 \text{ mg}}{1 \text{ ml}} = \frac{6 \text{ mg}}{X}$

$$10x = 6 \quad X = 6/10 = 0.6 \text{ ml}$$

12 mg per ml? $\frac{12 \text{ mg}}{1 \text{ ml}} = \frac{6 \text{ mg}}{X}$

$$12x = 6 \quad X = 6/12 = 0.5 \text{ ml}$$

15 mg per ml? $\frac{15 \text{ mg}}{1 \text{ ml}} = \frac{6 \text{ mg}}{X}$

$$15x = 6 \quad X = 6/15 = 0.4 \text{ ml}$$

39. Solumedrol 80 mg is ordered.
Solumedrol 125 mg per ml is available.
How much Solumedrol will you give?

$$\frac{125 \text{ mg}}{1 \text{ ml}} = \frac{80 \text{ mg}}{X}$$

$$125 X = 80$$
$$X = 80/125 = 0.64 \text{ ml}$$

PRACTICE MATH QUESTIONS QUARTER 5 MED-SURG

1. The doctor ordered nitroglycerin (NTG) drip for chest pain. The order was to start at 10mcg/min and titrate up to 80mcg/min. You have 50 mg NTG in 250 ml of NS.

What would you set the pump at for 10 mcg/min?

2. The previous shift nurse reports the client continued to have chest pain and now the drip is at 18 ml/hr.

How much NTG per minute is the client receiving?

3. During your initial assessment of your client you note that the Lidocaine drip (2 gm in 500 ml D₅W) is infusing at 45 ml/hr.

How much Lidocaine (mg/min) is your client receiving?

4,5,6 The doctor ordered a Dopamine drip at 4 mcg/kg/min. You have 400 mg in 250 ml D₅W.

How fast would you infuse the drip if your client weighs

4. 154 pounds?

5. 75 kg?

6. 60 kg?

Case study

A client is admitted with CVA. He has a nasogastric (NG) tube for enteral feedings and a peripheral IV of D₅W.

He has the following orders:

Ensure 240 ml q4h followed by 50 ml water.

IV D₅W at 50 ml/hr

Colace 100 mg oral suspension bid per NG tube at 0900 and 2100 (9 am and 9 pm)

Ampicillin 500 mg IVPB q6h in 50ml D₅W

Tylenol suspension 650 mg q4h prn temperature > 100 F via NG tube

Lasix 40 mg (oral suspension) bid via ng tube at 0900 and 2100 (9 a & 9 pm)

K-lor 40 mEq dissolved in 40 ml water daily via NG tube.

Calculate the following:

7. IV rate if the drip factor is 10 gtts/ml
8. How much Colace if the label reads 150 mg/15 ml
9. How much Tylenol if the label reads 125 mg/5 ml
10. How much Lasix if the label reads 40 mg /5 ml
11. What is the 24 hour total intake (IV plus enteral) if the client received Tylenol 2 times and the protocol is to flush the NG tube with 10 ml water before, between and after each medication via NG tube.?

PRACTICE MATH ANSWERS QUARTER 5 MED-SURG

1. The doctor ordered Nitroglycerin (NTG) drip for chest pain. The order was to start at 10mcg/min and titrate up to 80mcg/min. You have 50 mg NTG in 250 ml of NS. What would you set the pump at for 10 mcg/min?

$$\frac{250 \text{ ml}}{50 \text{ mg}} \times \frac{10 \text{ mcg}}{1 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{1 \text{ mg}}{1000 \text{ mcg}} = \frac{150,000}{50,000} = \mathbf{3 \text{ ml/hr}}$$

2. The previous shift nurse reports the client continued to have chest pain and now the drip is at 18 ml/hr. How much NTG per minute is the client receiving?

$$\frac{10 \text{ mcg/min}}{3 \text{ ml/hr}} = \frac{X}{18 \text{ ml/hr}} \quad \mathbf{60 \text{ mcg/min}}$$

Or:
$$\frac{18 \text{ ml}}{1 \text{ hr}} \times \frac{1 \text{ hr}}{60 \text{ min}} \times \frac{50 \text{ mg}}{250 \text{ ml}} \times \frac{1000 \text{ mcg}}{1 \text{ mg}} = \mathbf{60 \text{ mcg/min}}$$

3. During your initial assessment of your client you note that the Lidocaine drip (2 gm in 500 ml D₅W) is infusing at 45 ml/hr. How much Lidocaine (mg/min) is your client receiving?

$$\frac{2000 \text{ mg}}{500 \text{ ml}} \times \frac{45 \text{ ml}}{\text{hr}} \times \frac{1 \text{ hr}}{60 \text{ min}} = \mathbf{3 \text{ mg/min}}$$

- 4,5,6 The doctor ordered a Dopamine drip at 4 mcg/kg/min. You have 400 mg in 250 ml D₅W. $\mathbf{400/250 = 1.6 \text{ mg/ml}}$

4. How fast would you infuse the drip if your client weighs 154 pounds? $\mathbf{154 \text{ lbs} = 70 \text{ kg}}$.

$$\frac{70 \text{ kg} \times 4 \text{ mcg/kg/min} \times 60 \text{ min}}{\text{hr}} \times \frac{1 \text{ ml}}{1.6 \text{ mg}} = \mathbf{10.5 \text{ ml/hr} \quad 11 \text{ ml/hr}}$$

5. 75 kg?

$$\mathbf{11.25 \text{ ml/hr} = 11 \text{ ml/hr}}$$

6. 60 kg? $\mathbf{9 \text{ ml/hr}}$

Case Study Answers

A client is admitted with CVA. He has a nasogastric (NG) tube for enteral feedings and a peripheral IV of D₅W. He has the following orders:

Ensure 240 ml q4h followed by 50 ml water.

IV D₅W at 50 ml/hr

Colace 100 mg oral suspension bid per NG tube 0900 and 2100 (9 am and 9 pm)

Ampicillin 500 mg in 50 ml D₅W, IVPB q6h

Tylenol suspension 650 mg q4h prn temperature > 100 F via NG tube

Lasix 40 mg (oral suspension) bid via NG tube 0900 and 2100 (9 am & 9 pm)

K-lor 40 mEq dissolved in 40 ml water daily at 0900 (9 am) via NG tube.

Calculate the following:

1. IV rate if the drip factor is 10 gtts/ml= **8 gtts/min**
2. How much Colace if the label reads 150 mg/15 ml= **10 ml**
3. How much Tylenol if the label reads 125 mg/5 ml= **26 ml**
4. How much Lasix if the label reads 40 mg /5 ml= **5 ml**
5. What is the 24 hour total intake (IV plus enteral) if the client received Tylenol 2 times and the protocol is to flush the NG tube with 10 ml water before, between and after each medication via NG tube?

Feeding	240 x 6	= 1440 ml
Water	50 x 6	= 300 ml
IV	50 x 24	= 1200 ml
IVPB	50 x 4	= 200 ml
0900 (10 + C + 10 +L + 10 + K + 10)		= 40 ml
Tylenol 2 (20)		= 40 ml
2100 (10 +C +10 + L + 10)		= <u>30 ml</u>
		3250 ml

PRACTICE MATH QUESTIONS QUARTER 5 PSYCH

1. For anxiety, a patient is prescribed Ativan (lorazepam) 2 mg PO every day at bedtime.
The medication comes in 1 mg tablet form.
How many tablets would you give?

2. The doctor has ordered 40 mg of Prozac (fluoxetine) to be given bid to a patient suffering from depression.
The oral solution comes in a bottle that reads 20 mg /5 ml.
How many ml's would you give?

3. The order is for Seroquel (quetiapine) 12.5 mg PO every four hours prn.
The medication label indicates that each scored tablet is 25 mg.
How many tablets would you give?

4. A patient is to receive Ativan (lorazepam) 0.5 mg by IM injection for severe agitation.
The medication comes prepared in a syringe with 2 mg of lorazepam in 2 ml's.
How many ml's would you give?

5. Thorazine (chlorpromazine) comes in a 10 ml multidose vial with 25 mg of Thorazine per ml.
You are to draw up and administer 60 mg of Thorazine.
How many ml's will you give?

6. You have an order for lithium concentrate 450 mg PO.
The concentrate comes as 300 mg per 5 ml.
How many ml's would you give?

7. The patient is to receive 5 mg of Prolixin (fluphenazine) this AM.
The Prolixin orange-flavored elixer is 2.5 mg per 5 ml.
How many ml's of Prolixn will you give?

8. The patient has a prn order for Benadryl (diphenhydramine) 25 mg IM for extrapyramidal side effects of antipsychotic medication.
The medication comes in 10 mg per ml or 50 mg per ml vials.
Which concentration will you choose and how many ml's will you give?

PRACTICE MATH ANSWERS QUARTER 5 PSYCH

1. For anxiety, a patient is prescribed Ativan (lorazepam) 2 mg PO every day at bedtime.
The medication comes in 1 mg tablet form.
How many tablets would you give? **2 tablets**

2. The doctor has ordered 40 mg of Prozac (fluoxetine) to be given BID to a patient suffering from depression.
The oral solution comes in a bottle that reads 20 mg/5 ml.
How many ml's would you give? **10 ml**

3. The order is for Seroquel (quetiapine) 12.5 mg PO every four hours prn.
The medication label indicates that each scored tablet is 25 mg.
How many tablets would you give? **½ tablet**

4. A patient is to receive Ativan (lorazepam) 0.5 mg by IM injection for severe agitation.
The medication comes prepared in a syringe with 2 mg of lorazepam in 2 ml's.
How many ml's would you give? **0.5 ml**

5. Thorazine (chlorpromazine) comes in a 10 ml multidose vial with 25 mg of Thorazine per ml.
You are to draw up and administer 60 mg of Thorazine.
How many ml's will you give? **2.4 ml**

6. You have an order for lithium concentrate 450 mg PO.
The concentrate comes as 300 mg per 5 ml.
How many ml's would you give? **7.5 ml**

7. The patient is to receive 5 mg of Prolixin (fluphenazine) this AM.
The Prolixin orange-flavored elixer is 2.5 mg per 5 ml.
How many ml's of Prolixn will you give? **10 ml**

8. The patient has a prn order for Benadryl (diphenhydramine) 25 mg IM for extrapyramidal side effects of antipsychotic medication.
The medication comes in 10 mg per ml or 50 mg per ml vials.
Which concentration will you choose and how many ml's will you give?
50 mg per ml vial, give 0.5 ml