

Equivalents

Metric Equivalents	Household Equivalents	Approximate Equivalents
1 g = 1,000 mg = 1,000,000 mcg	3 t = 1 T	1 g = gr xv
0.001 g = 1 mg = 1,000 mcg	2 T = 1 fl oz	gr i = 60 mg or gr i = 65 mg (in select instances)
0.000001 g = 0.001 mg = 1 mcg	1 cup = 8 fl oz	1 t = 5 mL
1 kg = 1,000 g	1 pt = 2 cups = 16 fl oz	1 T = 3 t = 15 mL = $\frac{1}{2}$ fl oz
1 L = 1,000 mL	1 qt = 2 pt = 4 cups = 32 fl oz	1 fl oz = 30 mL = 6 t
0.001 L = 1 mL	1 lb = 16 oz	1 L = 1 qt = 32 fl oz = 2 pt = 4 cups
1 m = 100 cm = 1,000 mm		1 pt = 480 mL = 16 fl oz = 2 cups
0.01 m = 1 cm = 10 mm		1 cup = 250 mL = 8 fl oz
0.001 m = 0.1 cm = 1 mm		1 kg = 2.2 lb
		1 in = 2.54 cm

Common Calculations

Dosage: Formula Method

- Step 1. Convert
 Step 2. Think
 Step 3. Calculate: $\frac{D}{H} \times Q = X$

Dosage: Ratio-Proportion Method

- Step 1. Convert
 Step 2. Think
 Step 3. Calculate: $\frac{\text{Dosage on hand}}{\text{Amount on hand}} = \frac{\text{Dosage desired}}{X \text{ Amount desired}}$

Dosage: Dimensional Analysis Method

- Step 1. Determine unit of measure for *amount to give* ratio for left side of equation
 Step 2. Think
 Step 3. Match unit of numerator of *supply dosage ratio* with unit of numerator of *amount to give ratio*. Set up all other ratios so units cancel, leaving unit of amount to give. Calculate:
- | | | | |
|----------------------|---------------------|-------------------------|----------------------|
| Amount to Give Ratio | Supply Dosage Ratio | Conversion Factor Ratio | Ordered Dosage Ratio |
|----------------------|---------------------|-------------------------|----------------------|

Temperature Conversions

Celsius: $^{\circ}\text{C} = \frac{^{\circ}\text{F} - 32}{1.8}$ Fahrenheit: $^{\circ}\text{F} = 1.8^{\circ}\text{C} + 32$

IV Flow Rate

$\frac{\text{Total mL}}{\text{Total h}} = \text{mL/h}$
 $\frac{\text{Total mL}}{\text{Total min}} \times 60 \text{ min/h} = \text{mL/h}$
 $\frac{V \text{ (mL)}}{T \text{ (min)}} \times C \text{ (gtt/mL)} = R \text{ (gtt/min)}$

Shortcut:

IV Flow Rate: $\frac{\text{mL/h}}{\text{Drop factor constant}} = R \text{ (gtt/min)}$

Body Surface Area

Metric BSA: $\text{m}^2 = \sqrt{\frac{\text{ht (cm)} \times \text{wt (kg)}}{3,600}}$
 Household BSA: $\text{m}^2 = \sqrt{\frac{\text{ht (in)} \times \text{wt (lb)}}{3,131}}$

Common Medical Abbreviations

Abbreviation	Interpretation	Abbreviation	Interpretation
Route:		Frequency:	
IM	intramuscular	q.h	every hour
IV	intravenous	q.2h	every two hours
IV PB	intravenous piggyback	q.3h	every three hours
subcut	subcutaneous	q.4h	every four hours
SL	sublingual, under the tongue	q.6h	every six hours
ID	intra-dermal	q.8h	every eight hours
GT	gastrostomy tube	q.12h	every twelve hours
NG	nasogastric tube	General:	
NJ	nasojejunal tube	\bar{a}	before
p.o.	by mouth, orally	\bar{p}	after
p.r.	per rectum, rectally	\bar{c}	with
Frequency:		\bar{s}	without
a.c.	before meals	q	every
p.c.	after meals	qs	quantity sufficient
ad. lib.	as desired, freely	aq	water
p.r.n.	when necessary	NPO	nothing by mouth
stat	immediately, at once	gtt	drop
b.i.d.	twice a day	tab	tablet
t.i.d.	three times a day	cap	capsule
q.i.d.	four times a day	et	and
min	minute	noct	night
h	hour		

Drug Calculations Basic Formula

$$\frac{D \text{ (desired)}}{H \text{ (on hand)}} \times V \text{ (vehicle, drug form)}$$

Example:

Order: amoxicillin 100 mg, po, q6h
Available: amoxicillin 250 mg/5 ml

$$\begin{aligned} \frac{D}{H} \times V &= \frac{100 \text{ mg}}{250 \text{ mg}} \times 5 \text{ ml} \\ &= \frac{500}{250} = 2 \text{ ml amoxicillin} \end{aligned}$$

Drug Calculations Ratio and Proportion

$$\begin{array}{ccccccc} H & : & V & :: & D & : & X \\ \text{on hand} & & \text{vehicle} & & \text{desired} & & \text{unknown} \end{array}$$

means
extremes

Example:

Order: amoxicillin 100 mg, po, q6h
Available: amoxicillin 250 mg/5 ml

$$\begin{array}{ccccccc} H & : & V & :: & D & : & X \\ 250 \text{ mg} : 5 \text{ ml} & :: & 100 \text{ mg} : & X \text{ ml} \\ 250 X & = & 500 \\ X & = & 2 \text{ ml amoxicillin} \end{array}$$

Body Weight (Kilograms)

To change pounds to kilograms divide by 2.2.

Example:

Change 44 pounds to kg.

$$\begin{aligned} 44 \div 2.2 &= 20 \text{ kg} \\ \text{dosage/kg/day} &= \text{dosage/day} \\ (\text{dosage} \times \text{kg} &= \text{dose/day}) \end{aligned}$$

IV Flow Rate: Continuous Method II

a. amount of fluid ÷ hours to administer = ml/hr

$$\text{b. } \frac{\text{ml/hr} \times \text{gtt/ml (IV set)}}{60 \text{ min/hr}} = \text{gtt/min}$$

Example:

Order: 1000 ml, D₅/½ NSS over 8 hours
IV set: macrodrip 10 gtt/ml

a. 1000 ml ÷ 8 hours = 125 ml/hr

$$\text{b. } \frac{125 \text{ ml/hr} \times 10 \text{ gtt/ml}}{60 \text{ min/hr}} = 21 \text{ gtt/min}$$

IV Flow Rate: Intermittent Secondary Sets

$$\frac{\text{amount of solution} \times \text{gtt/ml (set)}}{\text{minutes to administer}} = \text{gtt/min}$$

Order: administer 5 ml of drug solution in 50 ml of D₅W over 30 minutes.

IV set: Buretrol (60 gtt/ml)

$$\frac{55 \text{ ml} \times \frac{2}{60} \text{ gtt}}{30 \text{ minutes}} = 110 \text{ gtt/min}$$

IV Flow Rate: Intermittent Volumetric Pump

$$\text{amt of sol} \div \frac{\text{minutes to administer}}{60 \text{ min/hr}} = \text{ml/hr}$$

Order: administer 5 ml of drug solution in 100 ml of D₅W over 45 minutes.

$$\begin{aligned} 105 \text{ ml} \div \frac{45 \text{ min}}{60 \text{ min/hr}} & \text{ (invert divisor and multiply)} \\ &= 105 \times \frac{60}{45} = 140 \text{ ml/hr} \end{aligned}$$

Set volumetric pump at 140 ml/hr to deliver 105 ml over 45 minutes.

Express the following measures using official metric abbreviations and notation rules.

3. six-hundredths of a milligram _____
4. three hundred and ten milliliters _____
5. three-tenths of a kilogram _____
6. four-tenths of a cubic centimeter _____
7. one and five-tenths grams _____
8. one-hundredths of a gram _____
9. four thousand milliliters _____
10. one and two-tenths milligrams _____

List the four commonly used units of weight and the two of volume, from highest to lowest value.

11. _____
- _____

Convert the following metric measures.

- | | |
|------------------------|------------------------|
| 12. 160 mg = _____ g | 27. 300 mg = _____ g |
| 13. 10 kg = _____ g | 28. 2.5 mg = _____ mcg |
| 14. 1500 µg = _____ mg | 29. 1 kL = _____ L |
| 15. 750 mg = _____ g | 30. 3 L = _____ cc |
| 16. 200 mL = _____ L | 31. 10 cc = _____ mL |
| 17. 0.3 g = _____ mg | 32. 0.7 mg = _____ mcg |
| 18. 0.05 g = _____ mg | 33. 4 g = _____ mg |
| 19. 0.15 g = _____ mg | 34. 1000 mL = _____ L |
| 20. 1.2 L = _____ mL | 35. 2.5 mL = _____ cc |
| 21. 15 mL = _____ cc | 36. 1000 mg = _____ g |
| 22. 2 mg = _____ mcg | 37. 0.2 mg = _____ mcg |
| 23. 900 mcg = _____ mg | 38. 2000 g = _____ kg |
| 24. 2.1 L = _____ mL | 39. 1.4 g = _____ mg |
| 25. 475 mL = _____ L | 40. 2.5 L = _____ cc |
| 26. 0.9 cc = _____ mL | |

Answers

- | | | | | |
|--|------------------------------|--------------|--------------|-------------|
| 1. gram-weight;
liter-volume;
meter-length | 7. 1.5 g | 15. 0.75 g | 24. 2100 mL | 33. 4000 mg |
| 2. a, b, c, e, f | 8. 0.01 g | 16. 0.2 L | 25. 0.475 L | 34. 1 L |
| 3. 0.06 mg | 9. 4000 mL | 17. 300 mg | 26. 0.9 mL | 35. 2.5 cc |
| 4. 310 mL | 10. 1.2 mg | 18. 50 mg | 27. 0.3 g | 36. 1 g |
| 5. 0.3 kg | 11. kg, g, mg,
mcg, L, mL | 19. 150 mg | 28. 2500 mcg | 37. 200 mcg |
| 6. 0.4 cc | 12. 0.16 g | 20. 1200 mL | 29. 1000 L | 38. 2 kg |
| | 13. 10,000 g | 21. 15 cc | 30. 3000 cc | 39. 1400 mg |
| | 14. 1.5 mg | 22. 2000 mcg | 31. 10 mL | 40. 2500 cc |
| | | 23. 0.9 mg | 32. 700 mcg | |

Module: SYSTEMS OF MEASUREMENT

METRIC SYSTEM: UNITS OF MEASUREMENT

Kilo Hecto Deka BASIC Deci Centi Milli Micro
UNIT

KEY POINTS:

- Memorize the metric units of measurement, metric abbreviations, and the metric line.

Working With the Metric System

Fill in the blanks with the correct answer.

1. 3.500 L = _____ mL
2. 0.7 L = _____ mL
3. 1000 mg = _____ gram
4. 100 mcg = _____ mg
5. 10 mg = _____ mcg
6. 2 mg = _____ mcg
7. 35.6 mg = _____ gram
8. 7.45 mL = _____ L
9. 0.07 cm = _____ dm
10. 10 km = _____ m
11. 100 cm = _____ mm
12. 1.65 kg = _____ g

13. 1500 mL = _____ L
14. 2.5 g = _____ mg
15. The patient receives vancomycin 750 mg IV b.i.d. How many g does the patient receive per dose? _____
16. The patient has an order for 0.5 g of ampicillin. How many mg will the nurse administer? _____
17. The patient receives levothyroxine 75 mcg p.o. q.AM. How many mg does the patient receive? _____
18. The doctor's order is for digoxin elixir 0.45 mg p.o. now. This dose is equivalent to _____ mcg. _____
19. The weight of a medication is 1.2 kg. This is equivalent to _____ g. _____
20. A wound measures 4 cm in length. This is equivalent to _____ mm. _____
21. The patient has an order for Versed® 7 mg IV for the patient. The pharmacy sends a vial of Versed labeled 5 mg / mL. How many mL will the nurse administer? _____

22. The drug order is for lactulose 1000 mg p.o. b.i.d. for the patient. The pharmacy sends a container labeled lactulose 1 g / 10 mL. How many mL will the nurse administer per dose?
23. The doctor orders Solu-Medrol® 125 mg IV q.12h for the patient. The pharmacy sends Solu-Medrol 0.25 g / mL. How many mL will the nurse administer per dose?
24. The physician writes an order for Benadryl® 50 mg orally q.6h. as needed for the patient. The nurse has a bottle of Benadryl labeled 12.5 mg / 5 mL. How many mL will the nurse administer per dose?
25. The nurse is preparing to administer 750 mg of Vitamin C to the patient at 9:00 AM. In the patient's medication drawer, the nurse finds Vitamin C tablets labeled 0.5 g / tablet. How many tablets will the nurse administer to the patient at 9:00 AM?
26. The patient has an order for lorazepam 0.5 mg IM now. The nurse has lorazepam labeled 2 mg / mL. How many mL will the nurse administer to the patient?

**HOUSEHOLD SYSTEM:
UNITS OF MEASUREMENT**

UNIT	EQUIVALENT MEASUREMENT	ABBREVIATION
1 glass	8 ounces	--
1 cup	8 ounces	--
1 teacup	6 ounces	--
1 tablespoon	3 teaspoons	T, Tbs
1 teaspoon	5 mL	t, tsp
1 drop (drops)	1 minim	gt (gtt)
2.2 pounds	1 kilogram	lb

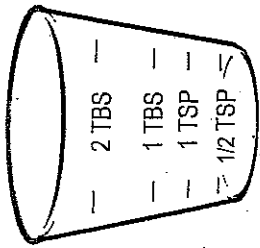
KEY POINTS:

- Memorize the units of measurement, equivalent measurements, and symbols used in the household system.

Working With the Household System
Fill in the blanks with the correct answer.

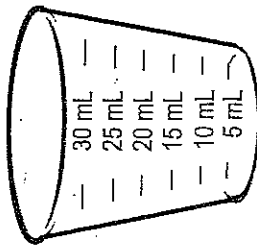
1. Two Tbs = _____ tsp
2. One ounce = _____ T
3. One-half ounce = _____ tsp
4. Two glasses of juice = _____ oz
5. One cup = _____ oz
6. 2 kg = _____ lb

7. Three tsp of an antacid = _____ T.
 Fill in the medicine cup below.



8. The nurse administers 2 tsp of cough syrup to the patient. How many mL will the nurse administer?
- _____

Fill in the medicine cup below.



9. The patient drinks 3 glasses of water. How many ounces did the patient drink?
- _____

10. The nurse gives the patient a cup of broth. How many ounces is this?
- _____

**CONVERSIONS BETWEEN SYSTEMS:
 UNITS OF MEASUREMENT**

UNIT	EQUIVALENT MEASUREMENTS
1 inch	= 2.54 cm
1 oz	= 30 mL = 2 T
1 tsp	= 5 mL
1 T	= 15 mL = 3 tsp
1 glass	= 8 ounces = 240 mL
1 cup	= 8 ounces = 240 mL
1 teacup	= 6 ounces = 180 mL
1 gt	= 1 minim
16 minims	= 1 mL
2.2 lb	= 1 kilogram

KEY POINTS:

- Memorize the equivalent measurements for the metric and household systems of measurement.

Working With Conversions Between Systems
 Fill in the blanks with the correct answer.

- 1/2 oz = _____ mL 10. 32 min = _____ mL
- 1 mcg = _____ mg 11. 20 mL = _____ t
- 2 T = _____ oz 12. 3 T = _____ t
- 0.03 mg = _____ mcg 13. 2 cups = _____ mL
- 1.75 g = _____ mg 14. 1 inch = _____ cm
- 0.5 g = _____ mg 15. 1 cm = _____ mm
- 45 mL = _____ oz 16. 75 kg = _____ lb
- 25 mL = _____ tsp 17. 198 lb = _____ kg
- 85 mg = _____ g 18. 3 dL = _____ L

19. The doctor orders thyroxine 0.2 mg p.o. for the patient. Thyroxine is available in 100 mg tablets. How many tablets will the nurse give?
- _____
20. The patient drinks two 6 oz cups of coffee for breakfast. How many mL did the patient drink?
- _____
21. A patient weighs 84 kg. How many pounds does the patient weigh?
- _____
22. Order: cephalexin 500 mg
Available: cephalexin 0.25 gram per tablet
- How many tablets will the nurse give?
- _____
23. The physician orders Roxanol[®] 30 mg p.o. q.3h. p.r.n. for pain for the patient. Roxanol is available in a bottle labeled 10 mg / 5 mL. How many tsp will the nurse administer?
- _____
24. The patient has an order to administer 600 mcg of a drug subcut to the patient. The pharmacy sends an ampule labeled 2 mg / mL. How many mL will the nurse administer?
- _____
25. The nurse has an order to administer 75 mg of meperidine hydrochloride IM now. In the narcotic drawer, the nurse finds an ampule of meperidine hydrochloride labeled 100 mg / mL. How many mL will the nurse administer?
- _____

1. 30
2. 14
3. 49
4. 1 1/2
5. 150
6. 95
7. 75
8. 2010

Module: METHODS OF CALCULATION

Working With Methods of Calculation (pp. 10 - 15)

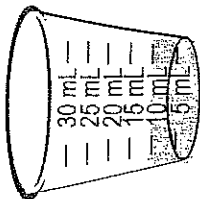
1. 2 tablets
2. 1 1/2 tablets
3. 2 pills
4. 0.5 tablet
5. 3 caplets
6. 3.5 mL
7. 6 mL
8. 0.5 mL
9. 3 mL
10. 16 mL
11. 10 days
12. 10 days
13. 2.25 mL
14. 3.5 mL
15. 30 mL
16. 0.6 mL
17. 15 days
18. 20 mL
- 19a. 0.4 mL
- b. 5 doses
- 20a. 0.8 mL
- b. 5 doses
- c. 0.65 mL
- d. 6 doses

Module: SYSTEMS OF MEASUREMENT

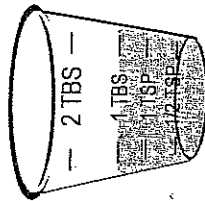
Working With the Metric System (pp. 16 - 18)

1. 3500 mL
2. 700 mL
3. 1 g
4. 0.1 mg
5. 10,000 mcg
6. 2000 mcg
7. 0.0356 g
8. 0.00745 L
9. 0.007 dm
10. 10,000 M
1. 1000 mm
2. 1650 g
3. 1.5 L
14. 2500 mg
15. 0.75 g
16. 500 mg
17. 0.075 mg
18. 450 mcg
19. 1200 g
20. 40 mm
21. 1.4 mL
22. 10 mL
23. 0.5 mL
24. 20 mL
25. 1.5 tablets
26. 0.25 mL

1. 6 tsp
2. 2 T
3. 3 tsp
4. 16 oz
5. 8 oz
6. 4.4 lb
7. 1 T
8. 10 mL



9. 24 oz
10. 8 oz



Working With Conversions Between Systems (pp. 21 - 22)

1. 15 mL
2. 0.001 mg
3. 1 oz
4. 30 mcg
5. 1750 mg
6. 500 mg
7. 1.5 oz
8. 5 tsp
9. 0.085 g
10. 2 mL
11. 4 t
12. 9 t
13. 480 mL
14. 2.54 cm
15. 10 mm
16. 165 lb
17. 90 kg
18. 0.3 L
19. 2 tablets
20. 360 mL
21. 184.8 lb
22. 2 tablets
23. 3 tsp
24. 0.3 mL
25. 0.75 mL

NURSING 175
MEDICATION CALCULATION QUIZ

NAME: _____

DATE: _____

PART I: CONVERSIONS (2 points each)

1. 0.065 g = _____ mg
2. 500 mL = _____ L
3. 3 kg = _____ lbs
4. 5 cc = _____ mL
5. 300 mcg = _____ mg
6. 10 mL = _____ tsp
7. 0.01 mg = _____ mcg
8. 2 oz = _____ mL
9. 1 g = _____ mg
10. 3t = _____ T
11. 44 lb = _____ kg

PART II: Calculate the following drug doses showing all work. Round off as directed. State answers in correct form - mg, ml, hour, etc. (6 points each)

1. The order reads KCl 10 mEq in 1000ml of IV solution. You have on hand a vial of KCl with 40 mEq/20 mL. How many mL's should you withdraw from the vial to add to the IV solution?

Answer: _____

2. The order reads Digoxin 0.125 mg po daily. The medication is available in tablets of 0.25 mg strength. How many tablets will you administer?

Answer: _____

3. The order is to administer 0.05 g Rocephin IM. The vial reads 20mg/ml. How many ml's is equivalent to 0.05g?

Answer: _____

4. The order reads Ampicillin 0.5 g po q 4h. The medication is available in Ampicillin oral suspension 250 mg/5 mL. How many mL's will you give?

Answer: _____

5. A patient is to receive 100ml of Augmentin IVPB over 45 minutes. The drop factor is 20gtt/ml. How many gtt/min will you set the IV. (Round to whole number).

Answer: _____

6. The order is for Dilaudid 90 mcg IVP every 3 hrs. Vial is labeled Dilaudid 0.05 mg/ml. How many mLs will you administer?

Answer: _____

7. The order reads Ampicillin 750 mg IM bid. Directions on the vial read: Dilute with 4.5ml sterile water to yield 1g/5mL. How many mLs will you give?

Answer: _____

8. The patient is to receive Cleocin suspension 225mg po stat. Available Cleocin 375/5ml. How many mL will you administer?

Answer: _____

9. The order is for 150 mL D5W with 250mg Rocephin to be given over 30 minutes. The drop factor is 15gtt/ml. How many gtt/min will you set the IV?

Answer: _____

10. The order is for Pen VK 400,000 units po QID. Available is Pen VK 200,000 units/5ml. How many mL will you administer in 24 hours?

Answer: _____

11. The order is for Synthroid 25mcg po daily. The label reads Synthroid 0.05mg. How many tabs will you give?

Answer _____

12. You will give 2L of D5W over 15 hours. What is the rate of the IV pump?(Round to the whole number).

Answer _____

13. The order is for Phenergan/codeine 6.25mg/5ml. The patient may take 1-2 tsp every 4 hours prn. If the patient reports taking 8 tsp. over the last 24hours, how many mg of the medicine was taken?

Answer _____

NURSING 175
MEDICATION CALCULATION QUIZ

PART I

1. 65 mg
2. 0.5 L
3. 6.6 lbs
4. 5 ml
5. 0.3 ml
6. 2 tsp.
7. 10 mcg
8. 60 ml
9. 1000mg
10. 1 T
11. 20 kg

PART II

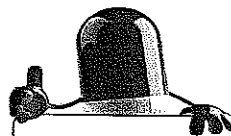
1. 5 ml
2. $\frac{1}{2}$ tab
3. 2.5 ml
4. 10 ml
5. 44 gtts/min
6. 1.8 ml
7. 3.8 ml
8. 3 ml
9. 75 gtts/min
10. 40 ml/24hr
11. $\frac{1}{2}$ tab
12. 133 ml/hr
13. 50 mg

NAME _____

DATE _____

ACCEPTABLE SCORE 24

YOUR SCORE _____



POSTTEST 1



DIRECTIONS: The medication order is listed at the beginning of each problem. Calculate the oral doses. Show your work. Shade each medicine cup or oral syringe when provided to indicate the correct dose.

1. The physician orders aspirin 975 mg po four times a day for a patient who had a mitral valve repair. How many tablets will the nurse administer per dose? _____

N 0047-0606-32

Aspirin Tablets, USP

**Analgesic (Pain Reliever)/
Antipyretic (Fever Reducer)**

6505-00-163-8750

Directions—Adults: Oral dosage is 1 tablet every three hours; or 1 to 2 tablets every four hours; or 2 to 3 tablets every six hours, while symptoms persist, not to exceed 12 tablets in any 24-hour period, or as directed by a doctor. Drink a full glass of water with each dose. **Children under 12 years of age:** Consult a doctor.

Indications—For the temporary relief of minor aches and pains and to reduce fever.

Quality Sealed for your protection*

*Do not use if the innerseal over the opening of the bottle printed "SEALED for YOUR PROTECTION" is broken or missing.

**1000 Tablets
325 mg (5 grains) each**

**WC WARNER
CHILCOTT**

Active Ingredient—Each tablet contains Aspirin, USP 325 mg. Also contains corn starch and microcrystalline cellulose.

Warnings—Children and teenagers should not use this medicine for chicken pox or flu symptoms before a doctor is consulted about these symptoms, a rare but serious illness reported to be associated with aspirin.

Keep this and all drugs out of the reach of children. In case of accidental overdose, seek professional assistance or contact a poison control center immediately. As with any drug, if you are pregnant or nursing a baby, seek the advice of a health care professional before using this medicine. **Do not use this medicine for more than 10 days unless specifically directed to do so by a doctor because it may cause problems in the unborn child or complications during delivery.** Do not take this product for pain for more than 10 days or for fever for more than 3 days unless directed by a doctor. If pain or fever persists or gets worse, if new symptoms occur, or if redness or swelling is present, consult a doctor because these could be signs of a serious condition.

Do not take this product if you are allergic to aspirin or if you have asthma, or if you have stomach problems (such as heartburn, upset stomach, or stomach pain) that persist or recur, or if you have ulcers or bleeding in the stomach. If you experience dizziness, ringing in the ears or a loss of hearing, occur, consult a doctor before taking any more of this product.

Drug Interaction Precaution: Do not take this product if you are taking a prescription drug for anticoagulation (thinning the blood), diabetes, gout, or arthritis unless directed by a doctor.

Store below 30°C (86°F). Protect from moisture.

Exp date and lot

WARNER CHILCOTT LABS
Div of Warner-Lambert Co.
Morris Plains, NJ 07950 USA
0506-6322

SPECIMEN

0047-0606-32 1

2. Mr. Clay receives tetracycline 0.5 g po four times a day for a gastrointestinal infection. How many capsules will the nurse administer per dose? _____

Zenith

NDC 0172-2407-60

TETRACYCLINE HCl

CAPSULES, USP

500 mg

100 Capsules (Black/Yellow)

CAUTION: Federal law prohibits dispensing without prescription.

Each Capsule Contains:
Tetracycline HCl, USP 500 mg

USUAL DOSAGE: See Package Insert

PHARMACIST:
Dispense in a tight, light-resistant container as defined in the USP. Use child-resistant closure.

Store at controlled room temperature 15°-30°C (59°-86°F).

Manufactured by:
ZENITH LABORATORIES, INC., NORTHVALE, NJ 07847

0282L

LOT: 0172-2407-60 4

EXP.

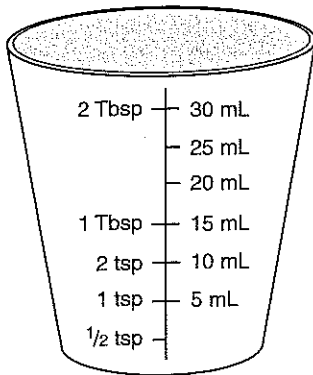
3. The physician orders ampicillin 1 g po q6 h for treatment of shigellosis. How many capsules will the nurse administer per dose? _____

<p>Manufactured for WARNER CHILCOTT LABORATORIES Div of Warner-Lambert Co. © 1994 Morris Plains, NJ 07950 USA By: Clonmel Chemicals Co. Ltd. Clonmel, Republic of Ireland</p> <p>0402G201 8505-00-770-8343</p> <p>Lot _____</p> <p>Expiration date _____</p>	<p>TEAR ALONG HERE</p> <p>VOID</p>	<p>N 0047-0402-24</p> <p>Ampicillin Capsules, USP</p> <p>250mg</p> <p>100 Capsules</p> <p>Caution - Federal law prohibits dispensing without prescription.</p> <p>W/C WARNER CHILCOTT</p>	<p>Each capsule contains ampicillin trihydrate equivalent to 250 mg ampicillin.</p> <p>Usual Adult Dosage - 250 or 500 mg every 6 hours. See package insert.</p> <p>PHARMACY STOCK PACKAGE Dispense in a tight, light- resistant container as defined in the USP. Store below 30°C (86°F). Protect from moisture.</p> <p>0402J011</p>
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4. The physician prescribes Allegra 60 mg two times a day for your patient's complaints of allergic rhinitis. You have 0.03-gms tablets available. How many tablets will you administer per dose? _____

5. The physician orders levothyroxine 100 mcg po daily. You have 0.05-mg tablets available. How many tablets will you administer per dose? _____

6. Mr. Shen, admitted with a psychoneurotic disorder, receives Atarax 25 mg po daily in the morning. You have Atarax 10 mg/5 mL. How many milliliters will you administer per dose? _____



7. Your cardiac patient has Cardizem 60 mg four times a day ordered. How many tablets will you administer per dose? _____

NDC 0088-1792-47 6505-01-259-2914

120 mg **Hoechst Marion Roussel**

CARDIZEM[®]
(diltiazem HCl)

120 mg

100 Tablets

Each tablet contains diltiazem hydrochloride, 120 mg (equivalent to 110.3 mg as diltiazem). Dose and Administration: See package insert for prescribing information. CAUTION: Keep out of reach of children. Pharmacist: Dispense in light-resistant container as defined in USP. Important: This package is not child resistant. Store at controlled room temperature 20°-25° F (68°-77° F).

© 1995, Hoechst Marion Roussel, Inc.
Hoechst Marion Roussel, Inc.
Kansas City, MO 64137 USA

3 0088-1792-47

50007212

8. The physician prescribes codeine 30 mg po q3 h prn for pain relief for your patient with a total hip replacement. How many tablets will you administer per dose? _____

NDC 0002-2557-02
100 No. 250

POISON **℞**

SOLUBLE TABLETS
CODEINE PHOSPHATE 30
SOLUBLE TABLETS
30 mg

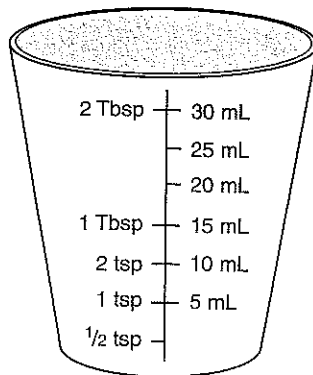
Warning—May be habit forming.

For Prescription Compound—See Us! Usual Adult Dose—80 mg every 4 hours. Contains Lactose and Sucrose, q.s. Dispense in a light, light-resistant container.

CAUTION—Federal (USA) law prohibits dispensing without prescription. Keep tightly closed. WV 1415 AMX
E.I. LILLY AND COMPANY
INDIANAPOLIS, IN 46205 USA

0002-2557-02

9. Your patient receives Vistaril 50 mg po three times a day for preoperative anxiety. Vistaril oral suspension 25 mg/5 mL is available. How many milliliters will you administer per dose? _____



10. The physician orders Prozac liquid 30 mg po twice a day. How many milliliters will you administer per dose? _____

NDC 0777-5120-58
120 mL M-5120

PROZAC®
LIQUID
FLUOXETINE
HYDROCHLORIDE
ORAL SOLUTION

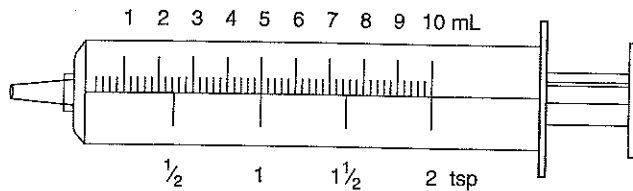
Equivalent to
20 mg per 5 mL
Base

See accompanying literature for dosage.
Dispense in a tight, light-resistant container.
Each 5 mL contains Fluoxetine Hydrochloride
equivalent to 20 mg Fluoxetine base
Contains alcohol 0.23%

Store at Controlled Room Temperature 59° to 86°F
(15° to 30°C)
Keep Tightly Closed
Rx only

Eli Lilly and Company
Indianapolis, IN 46285 USA
Expiration Date/Control No.

0777 5120 58



11. Your patient receives Crystodigin 0.1 mg po daily for an atrial arrhythmia. Crystodigin tablets 0.2 mg are available. How many tablets will you administer per dose? _____
12. The physician prescribes KCl 20 mEq po twice a day for hypokalemia. KCl liquid is supplied 30 mEq/22.5 mL. How many milliliters will the nurse administer per dose? _____
13. The physician orders Lipitor 40 mg po daily. How many tablets will you give per dose? _____

Store at controlled room temperature, 20°-25°C (68°-77°F) [See USP].

PROFESSIONAL SAMPLE

NDC 0071-0156-30

Rx only

30 Tablets

Lipitor® (20)
(atorvastatin calcium)
tablets

20 mg

DOSAGE AND USE
See package insert for full prescribing information.

Each tablet contains 20 mg atorvastatin.

54-5878-31-0

Distributed by
Pfizer Parke-Davis
Division of Pfizer Inc., NY, NY 10017

Manufactured by:
Pfizer Ireland
Pharmaceuticals
Dublin, Ireland
MADE IN PUERTO RICO

14. Your patient with a lumbar laminectomy has Benadryl 100 mg po at bedtime prn ordered for insomnia. How many capsules will you administer per dose? _____

Usual Dosage—Adults,
1 capsule three or four times
daily, or as directed by the phy-
sician. See package insert.
Dispense in a tight container as
defined in the USP.
The pink capsule with white
band is a trademark registered in
the United States Patent Office.

N 0071-0373-24
KAPSEALS®
Benadryl®
(Diphenhydramine HCl
Capsules, USP)
50 mg
Caution—Federal law prohibits
dispensing without prescription.
100 CAPSULES

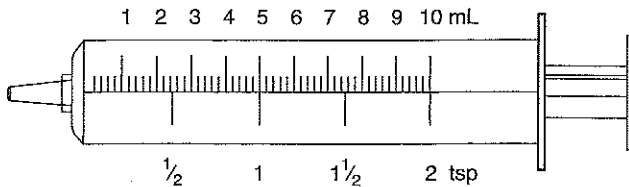
Keep this and all drugs out of the reach
of children.
Store at controlled room temperature
(15° to 30° C [59° to 86° F]). Protect
from moisture.
© 1982, Warner-Lambert Co.

PARKE-DAVIS
Div of Warner-Lambert Co.
Morris Plains, NJ 07960 USA

0373G094

0071-0373-24 2

15. Your patient has Lasix 38 mg po q12 h ordered for hypercalcemia. You have Lasix 10 mg/mL. How many milliliters will you administer per dose? _____



16. Mrs. Cook receives Keflex 100 mg po q6 h for a sinus infection. How many milliliters will the nurse administer per dose? _____

NDC 0777-2321-97
60 mL (When Mixed) M-201

KEFLEX®
CEPHALEXIN FOR
ORAL SUSPENSION, USP
125 mg per 5 mL

CAUTION—Federal (U.S.A.) law prohibits dispensing
without prescription.
Usual children's dose—25 to 50 mg per kg a day in
four equal doses. For more information, consult
package insert.
Morphine sulfate equivalent to 1.5 g Cephalexin in a dry
powder form.
Directions for Mixing—Add 25 mL of water in two
steps to each addition of powder. Shake well.
Each 5 mL (approx. one teaspoonful) will then con-
tain 125 mg Cephalexin Monohydrate equivalent to 125 mg
of Keflex.
Mfg. by
DISTA PRODUCTS COMPANY
a Division of Eli Lilly and Company, Inc.
Carefree, IN 46013
Eli Lilly and Co., Indianapolis, IN, U.S.A.
Expiration Date

80 mL KEFLEX® CEPHALEXIN FOR ORAL
SUSPENSION, USP 125 mg per 5 mL. Over-
dosing may occur if more than 14 days worth of
suspension is prepared. For 14 days worth of sus-
pension, prepare 140 mL. Shake, tightly closed. Discard
unused portion after 14 days.
SHAKE WELL BEFORE USING
Control No.

17. The physician orders Mevacor 30 mg po daily to be given with evening meal. You have 10-mg tablets available. How many tablets will you administer per dose? _____

18. Mr. Jones receives Inderal 80 mg po two times a day for a dysrhythmia. You have Inderal 40-mg scored tablets. How many tablets will you administer per dose? _____

19. The physician prescribes Apresoline 20 mg po three times a day for your patient's hypertension. You have 10-mg tablets available. How many tablets will you administer per dose? _____

20. Your patient with epilepsy receives phenobarbital 90 mg po three times a day. How many tablets will you administer in each dose? _____ How many tablets will you administer in 1 day? _____

NDC 0002-1037-04
1000 TABLETS No. 1574

Lilly **IV**

**PHENOBARBITAL
TABLETS, USP**
60 mg

WARNING—May be habit forming.

CAUTION—Federal (U.S.A.)
law prohibits dispensing
without prescription.

Usual Adult Sedative Dose—15 to 30 mg
2 to 4 times a day.
Usual Adult Hypnotic Dose—100 to
200 mg

Keep Tightly Closed
Store at Controlled Room Temperature
59° to 86°F (15° to 30°C)
Dispense in a light container

El Lilly & Co., Indianapolis, IN 46205-1154
Expiration Date/Control No.

21. Mrs. Luther has alprazolam 0.5 mg po three times a day prescribed for her panic disorder. You have 0.25-mg tablets available. How many tablets will you administer per dose? _____

22. Mr. Barry has Ambien 10 mg po at bedtime ordered for insomnia. How many tablets will the nurse administer per dose? _____

A07757-3

100 Tablets
NDC 0025-5401-31

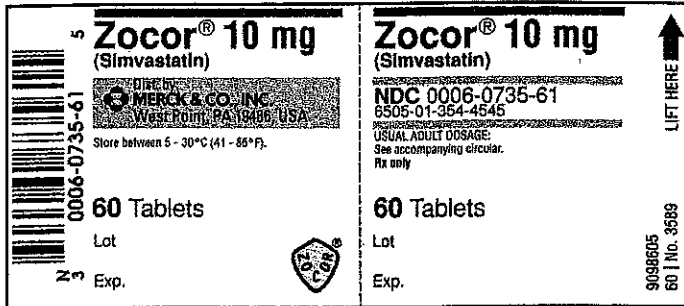
Ambien **IV**
(zolpidem tartrate)

5 mg

SEARLE

3 0025-5401-31 8

23. Mrs. Torres has metoprolol 150 mg po twice daily ordered for hypertension. You have metoprolol 100-mg scored tablets available. How many tablets will you administer per dose? _____
24. The physician orders Zocor 30 mg po daily in the evening. How many tablets will you administer per dose? _____



25. Mr. Bond has Allegra 60 mg po twice a day ordered. Allegra 30-mg tablets are available. How many tablets will you administer per dose? _____

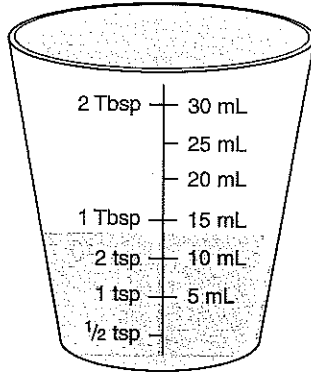
ANSWERS ON PP. 533-537.

Proportion	Formula
1. 325 : 1 tab :: 975 : x tab $325 : 1 :: 975 : x$ $325x = 975$ $x = \frac{975}{325}$ $x = 3$ tablets	$\frac{975 \text{ mg}}{325 \text{ mg}} \times 1 \text{ tab} =$ $\frac{975}{325} = 3$ tablets
2. 1000 mg : 1 g :: x mg : 0.5 g $1000 : 1 :: x : 0.5$ $x = 500$ mg 500 mg : 1 cap :: 500 mg : x cap $500 : 1 :: 500 : x$ $500x = 500$ $x = \frac{500}{500}$ $x = 1$ capsule	$\frac{500 \text{ mg}}{500 \text{ mg}} \times 1 \text{ cap} =$ $\frac{500}{500} = 1$ capsule
3. 250 mg : 1 cap :: 1000 mg : x cap $250 : 1 :: 1000 : x$ $250x = 1000$ $x = \frac{1000}{250}$ $x = 4$ capsules	$\frac{1000 \text{ mg}}{250 \text{ mg}} \times 1 \text{ cap} =$ $\frac{1000}{250} = 4$ capsules
4. 30 mg : 1 tab :: 60 mg : x tab $30 : 1 :: 60 : x$ $30x = 60$ $x = \frac{60}{30}$ $x = 2$ tablets	$\frac{60 \text{ mg}}{30 \text{ mg}} \times 1 \text{ tab} =$ $\frac{60}{30} = 2$ tablets

Proportion

5. $100 \text{ mcg} = 0.1 \text{ mg}$
 $0.05 \text{ mg} : 1 \text{ tab} :: 0.1 : x \text{ tab}$
 $0.05 : 1 :: 0.1 : x$
 $0.05x = 0.1$
 $x = \frac{0.1}{0.05}$
 $x = 2 \text{ tablets}$

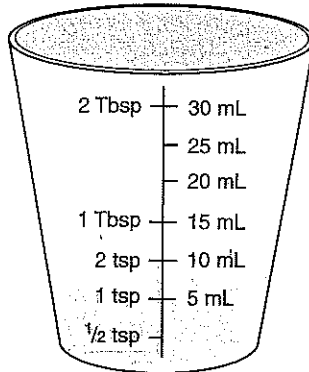
6. $10 \text{ mg} : 5 \text{ mL} :: 25 \text{ mg} : x \text{ mL}$
 $10 : 5 :: 25 : x$
 $10x = 125$
 $x = \frac{125}{10}$
 $x = 12.5 \text{ mL}$



7. $120 \text{ mg} : 1 \text{ tab} :: 60 \text{ mg} : x \text{ tab}$
 $120 : 1 :: 60 : x$
 $120x = 60$
 $x = \frac{60}{120}$
 $x = \frac{1}{2} \text{ tablet}$

8. $30 \text{ mg} : 1 \text{ tab} :: 30 \text{ mg} : x \text{ tab}$
 $30 : 1 :: 30 : x$
 $30x = 30$
 $x = \frac{30}{30}$
 $x = 1 \text{ tablet}$

9. $25 \text{ mg} : 5 \text{ mL} :: 50 \text{ mg} : x \text{ mL}$
 $25 : 5 :: 50 : x$
 $25x = 250$
 $x = \frac{250}{25}$
 $x = 10 \text{ mL}$



Formula

$$\frac{0.1 \text{ mg}}{0.05 \text{ mg}} \times 1 \text{ tab} =$$

$$\frac{0.1}{0.05} = 2 \text{ tablets}$$

$$\frac{25 \text{ mg}}{10 \text{ mg}} \times 5 \text{ mL} =$$

$$\frac{25}{10} \times \frac{5}{1} = \frac{25}{2}$$

$$\frac{25}{2} = 12.5 \text{ mL}$$

$$\frac{60 \text{ mg}}{120 \text{ mg}} \times 1 \text{ tab} =$$

$$\frac{60}{120} = \frac{1}{2} \text{ tablet}$$

$$\frac{30 \text{ mg}}{30 \text{ mg}} \times 1 \text{ tab} =$$

$$\frac{30}{30} = 1 \text{ tablet}$$

$$\frac{50 \text{ mg}}{25 \text{ mg}} \times 5 \text{ mL} =$$

$$\frac{50}{25} \times \frac{5}{1} =$$

$$\frac{10}{1} = 10 \text{ mL}$$

Proportion

Formula

10. 20 mg : 5 mL :: 30 mg : x mL
 20 : 5 :: 30 : x
 $20x = 150$
 $x = \frac{150}{20}$
 $x = 7.5 \text{ mL}$

$\frac{30 \text{ mg}}{20 \text{ mg}} \times 5 \text{ mL} =$
 $\frac{30}{20} \times \frac{5}{1} =$
 $\frac{30}{4} = 7.5 \text{ mL}$



11. 0.2 mg : 1 tab :: 0.1 mg : x tab
 0.2 : 1 :: 0.1 : x
 $0.2x = 0.1$
 $x = \frac{0.1}{0.2}$
 $x = \frac{1}{2} \text{ tablet}$

$\frac{0.1 \text{ mg}}{0.2 \text{ mg}} \times 1 \text{ tab} =$
 $\frac{0.1}{0.2} = \frac{1}{2} \text{ tablet}$

12. 30 mEq : 22.5 mL :: 20 mEq : x mL
 30 : 22.5 :: 20 : x
 $30x = 450$
 $x = \frac{450}{30}$
 $x = 15 \text{ mL}$

$\frac{20 \text{ mEq}}{30 \text{ mEq}} \times 22.5 \text{ mL} =$
 $\frac{20}{30} \times \frac{22.5}{1} = \frac{450}{30}$
 $\frac{15}{1} = 15 \text{ mL}$

13. 20 mg : 1 tab :: 40 mg : x tab
 20 : 1 :: 40 : x
 $20x = 40$
 $x = \frac{40}{20}$
 $x = 2 \text{ tablets}$

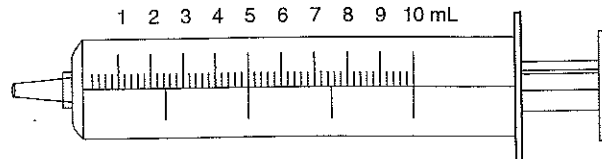
$\frac{40 \text{ mg}}{20 \text{ mg}} \times 1 \text{ tab} =$
 $\frac{40}{20} = 2 \text{ tablets}$

14. 50 mg : 1 cap :: 100 mg : x cap
 50 : 1 :: 100 : x
 $50x = 100$
 $x = \frac{100}{50}$
 $x = 2 \text{ capsules}$

$\frac{100 \text{ mg}}{50 \text{ mg}} \times 1 \text{ cap} =$
 $\frac{100}{50} = 2 \text{ capsules}$

15. 10 mg : 1 mL :: 38 mg : x mL
 10 : 1 :: 38 : x
 $10x = 38$
 $x = \frac{38}{10}$
 $x = 3.8 \text{ mL}$

$\frac{38 \text{ mg}}{10 \text{ mg}} \times 1 \text{ mL} =$
 $\frac{38}{10} = 3.8 \text{ mL}$



Proportion

Formula

16. 125 mg : 5 mL :: 100 mg : x mL
 125 : 5 :: 100 : x
 $125x = 500$
 $x = \frac{500}{125}$
 $x = 4 \text{ mL}$

$\frac{100 \text{ mg}}{125 \text{ mg}} \times 5 \text{ mL} =$
 $\frac{100}{125} \times \frac{5}{1} = \frac{100}{25}$
 $\frac{100}{25} = 4 \text{ mL}$

17. 10 mg : 1 tab :: 30 mg : x tab
 10 : 1 :: 30 : x
 $10x = 30$
 $x = \frac{30}{10}$
 $x = 3 \text{ tablets}$

$\frac{30 \text{ mg}}{10 \text{ mg}} \times 1 \text{ tab} =$
 $\frac{30}{10} = 3 \text{ tablets}$

18. 40 mg : 1 tab :: 80 mg : x tab
 40 : 1 :: 80 : x
 $40x = 80$
 $x = \frac{80}{40}$
 $x = 2 \text{ tablets}$

$\frac{80 \text{ mg}}{40 \text{ mg}} \times 1 \text{ tab} =$
 $\frac{80}{40} = 2 \text{ tablets}$

19. 10 mg : 1 tab :: 20 mg : x tab
 10 : 1 :: 20 : x
 $10x = 20$
 $x = \frac{20}{10}$
 $x = 2 \text{ tablets}$

$\frac{20 \text{ mg}}{10 \text{ mg}} \times 1 \text{ tab} =$
 $\frac{20}{10} = 2 \text{ tablets}$

20. 60 mg : 1 tab :: 90 mg : x tab
 60 : 1 :: 90 : x
 $60x = 90$
 $x = \frac{90}{60}$
 $x = 1\frac{1}{2} \text{ tablets per dose}$

$\frac{90 \text{ mg}}{60 \text{ mg}} \times 1 \text{ tab} =$
 $\frac{90}{60} = 1\frac{1}{2} \text{ tablets per dose}$

$1\frac{1}{2} \text{ tab} : 1 \text{ dose} :: x \text{ tab} : 3 \text{ doses}$
 $\frac{3}{2} : 1 :: x : 3$
 $x = \frac{3}{2} \times \frac{3}{1}$
 $x = \frac{9}{2}$
 $x = 4\frac{1}{2} \text{ tablets/day}$

21. 0.25 mg : 1 tab :: 0.5 mg : x tab
 0.25 : 1 :: 0.5 : x
 $0.25x = 0.5$
 $x = \frac{0.5}{0.25}$
 $x = 2 \text{ tablets}$

$\frac{0.5 \text{ mg}}{0.25 \text{ mg}} \times 1 \text{ tab} =$
 $\frac{0.5}{0.25} = 2 \text{ tablets}$

Proportion**Formula**

22. 5 mg : 1 tab :: 10 mg : x tab

$$5 : 1 :: 10 : x$$

$$5x = 10$$

$$x = \frac{10}{5}$$

$$x = 2 \text{ tablets}$$

$$\frac{10 \text{ mg}}{5 \text{ mg}} \times 1 \text{ tab} =$$

$$\frac{10}{5} = 2 \text{ tablets}$$

23. 100 mg : 1 tab :: 150 mg : x tab

$$100 : 1 :: 150 : x$$

$$100x = 150$$

$$x = \frac{150}{100}$$

$$x = 1\frac{1}{2} \text{ tablets}$$

$$\frac{150 \text{ mg}}{100 \text{ mg}} \times 1 \text{ tab} =$$

$$\frac{150}{100} = 1\frac{1}{2} \text{ tablets}$$

24. 10 mg : 1 tab :: 30 mg : x tab

$$10 : 1 :: 30 : x$$

$$10x = 30$$

$$x = \frac{30}{10}$$

$$x = 3 \text{ tablets}$$

$$\frac{30 \text{ mg}}{10 \text{ mg}} \times 1 \text{ tab} =$$

$$\frac{30}{10} = 3 \text{ tablets}$$

25. 30 mg : 1 tab :: 60 mg : x tab

$$30 : 1 :: 60 : x$$

$$30x = 60$$

$$x = \frac{60}{30}$$

$$x = 2 \text{ tablets}$$

$$\frac{60 \text{ mg}}{30 \text{ mg}} \times 1 \text{ tab} =$$

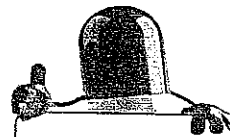
$$\frac{60}{30} = 2 \text{ tablets}$$

NAME _____

DATE _____

ACCEPTABLE SCORE 19

YOUR SCORE _____



POSTTEST 1



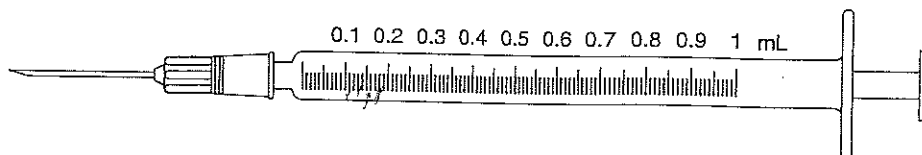
DIRECTIONS: The medication order is listed at the beginning of each problem. Calculate the parenteral doses. Show your work. Shade the syringe when provided to indicate the correct dose.

1. The physician orders Vistaril 25 mg IM three times a day q6 h prn to enhance the effects of pain medication for your patient with a thyroidectomy. How many milliliters will you administer? _____

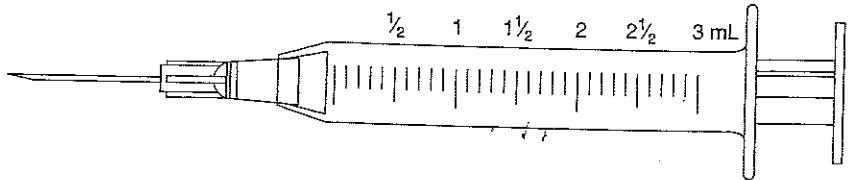
<p>FOR INTRAMUSCULAR USE ONLY. USUAL ADULT DOSE: Intramuscularly, 25-100 mg stat; repeat every 4 to 6 hours, as needed. See accompanying prescribing information.</p> <p>Each mL contains 50 mg of hydroxyzine hydrochloride, 0.3% benzyl alcohol and sodium hydroxide to adjust to isotonic pH.</p> <p>To avoid discoloration, protect from prolonged exposure to light.</p> <p>Rx only</p>	<p>10 mL NDC 0019-5450-74</p> <p>Vistaril® (hydroxyzine hydrochloride)</p> <p>Intramuscular Solution</p> <p>50 mg/mL</p> <p>Roerig Division of Pfizer Inc., NY, NY 10012</p>	<p>Store below 86°F (30°C). PROTECT FROM FREEZING.</p> <p>PATIENT: _____</p> <p>ROOM NO.: _____</p> <p>05-1111-32-4 MADE IN USA</p> <p>9249</p>
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2. Your patient with a septoplasty complains of nausea and has promethazine 25 mg IM four times a day ordered. How many milliliters will you administer? _____

<p>25 DOSETTE® AMPULS Each CD NDC 0841-1496-35</p> <p>PROMETHAZINE HCl INJECTION, USP</p> <p>50 mg/mL</p> <p>FOR DEEP INTRAMUSCULAR USE ONLY</p> <p>Each mL contains promethazine hydrochloride 50 mg, edetate disodium 0.1 mg, calcium chloride 0.04 mg, sodium metabisulfite 0.25 mg and phenol 5 mg in Water for Injection, pH 4.0-5.5; buffered with acetic acid-sodium acetate. Sealed under nitrogen. USUAL DOSAGE: See package insert. PROTECT FROM LIGHT. Keep covered in carton until time of use. Store at 15°-30°C (59°-86°F). DO NOT USE IF SOLUTION HAS DEVELOPED COLOR OR CONTAINS A PRECIPITATE. To open ampuls, ignore color line; break at constriction. Caution: Federal law prohibits dispensing without prescription. Product Code: 1496-35 B-51496d</p>
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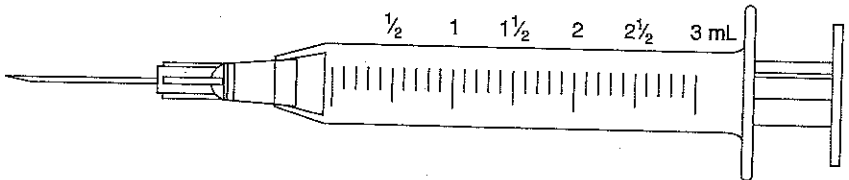
3. Your patient who has undergone tympanomastoidectomy complains of pain and has codeine 30 mg IM q2 h prn ordered. Codeine is supplied in a 1-mL ampule containing 15 mg. How many milliliters will you administer? _____



4. The physician orders Keflin 500 mg IM q6 h for your patient with a *Klebsiella* infection. Keflin 1 g/10 mL is available. How many milliliters will you administer? _____



5. Your patient, who has undergone medullary carcinoma excision, has hydrocortisone 50 mg IM twice a day ordered. You have hydrocortisone 100 mg/2 mL available. How many milliliters will you administer? _____



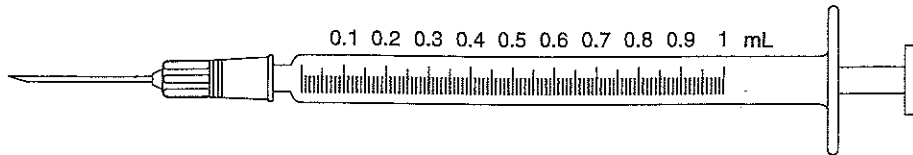
6. The physician orders Dilaudid 0.5 mg IM q4 h prn. How many milliliters will the nurse administer? _____



7. Mr. Harrison has Toradol 15 mg IM ordered q6 h for pain after a hip replacement. A prefilled syringe with Toradol 30 mg/mL is available. How many milliliters will the nurse administer? _____

8. The physician orders scopolamine 0.2 mg IM at 0600 before surgery. How many milliliters will the nurse administer? _____

LyphaMed®
SCOPOLAMINE HYDROBROMIDE INJECTION, USP
0.4 mg/mL
 FOR IM, IV OR SC USE
 See Package Insert.
 N 0489-0268-25
 1 mL No. 258-01
 LyphaMed, Inc.
 Rosemont, IL 60018 L-66 1

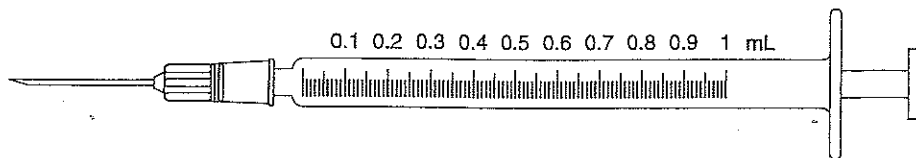


9. The physician orders Thorazine 100 mg IM stat. Thorazine is supplied in a 10-mL vial containing 25 mg/mL. How many milliliters will the nurse administer? _____

NSN 6595-01-156-1091
 Dilute before IV use. Store below 80°F
 Do not freeze. Protect from light.
 Each mL contains, in aqueous solution,
 chlorpromazine hydrochloride, 25 mg;
 ascorbic acid, 2 mg; sodium bisulfite, 1 mg;
 sodium sulfite, 1 mg; sodium chloride, 1 mg.
 Contains benzyl alcohol, 7%, as preservative.
 See accompanying prescribing information.
 For deep IM injection.
 Caution: Federal law prohibits dispensing
 without prescription.
 Manufactured by SmithKline Beecham
 Pharmaceuticals, Philadelphia, PA 19101
 Marketed by SCIOS NOVA INC.
25 mg/mL
 NDC 0007-5062-01
THORAZINE®
CHLORPROMAZINE HCl
INJECTION
 10 mL Multi-Dose Vial
SKB SmithKline Beecham

10. Your severely agitated patient has diazepam 2 mg IM q6 h prn ordered. How many milliliters will you administer? _____

10 mL Multiple Dose Vial
 NDC 0641-2289-41
 6505-01-240-8894
DIAZEPAM CIV
INJECTION, USP
5 mg/mL
 FOR INTRAMUSCULAR or
 INTRAVENOUS USE
 Each mL contains diazepam 5 mg,
 benzyl alcohol 1 mg, sodium chloride
 1 mg, and sodium benzoate 1 mg. pH
 6.5. Contains benzyl alcohol 10% as
 preservative. See accompanying
 USP&L DOSAGE, see package
 insert for complete prescribing in-
 formation.
 NOTE: Solution may appear
 colorless to light yellow. Use
 between 15°-30°C (59°-86°F).
 Caution: Federal law prohibits
 dispensing without prescription.
 2289-41 0046 A-2289c
 LOT EXP.



11. Atropine 0.7 mg IM stat is ordered for your patient before surgery. You have atropine 0.5 mg/mL. How many milliliters will you administer? _____

12. Your patient with a medication reaction complains of pruritus and has Benadryl 25 mg IM prn ordered. You have Benadryl 50 mg/mL available. How many milliliters will you administer? _____

N 0071-4402-10
Benadryl®
 (Diphenhydramine Hydrochloride Injection, USP)
50 mg per mL
HIGH POTENCY
10 mL

PARKE-DAVIS

13. The physician orders Depo-Medrol 50 mg IM twice a day. How many milliliters will the nurse administer? _____


Depo-Medrol®
 (Methylprednisolone Acetate Suspension, USP)
80 mg per mL

For IM, intrathecal, or intravitreal use. See package insert for complete prescribing information. See also package insert for information on use in children. The Upjohn Company, Kalamazoo, MI 49001, USA.

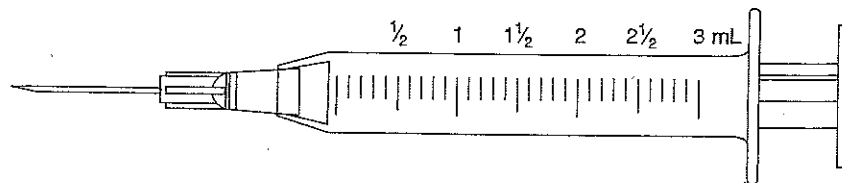
14. The physician orders ampicillin 500 mg IM q4 h for a patient who has undergone lumbar laminectomy. How many milliliters will the nurse administer? _____

NDC 0015-7403-20
 NSN 6505-00-946-4700
 EQUIVALENT TO
500 mg AMPICILLIN
STERILE AMPICILLIN
SODIUM, USP
 For IM or IV Use
 CAUTION: Federal law prohibits dispensing without prescription.

For IM use, add 1.8 mL diluent (read accompanying circular). Resulting solution contains 250 mg ampicillin per mL. This solution within 1 hour. This vial contains ampicillin sodium equivalent to 500 mg ampicillin. Final Dose: Adults—250 to 500 mg IM q4h. **READ ACCOMPANYING CIRCULAR** for detailed indications, IM or IV use, contraindications, precautions, and other information. A Bristol-Myers Squibb Company, Princeton, NJ 08540 USA. 740320DR-2



Cont. _____
 Exp. Date: _____



15. The physician orders Ancef 300 mg IV q8 h. You have Ancef 1 g/50 mL vial available. How many milliliters will you administer? _____

16. The physician orders morphine 6 mg IM q3 h prn. How many milliliters will the nurse administer? _____

LOT
EXP.

LIGHT SENSITIVE: Keep covered in carton until time of use. To open—Cut seal along dotted line.

SAMPLE COPY

25 DOSETTE® Vials
Each contains 1 mL

MORPHINE CII
SULFATE INJECTION, USP

10 mg/mL

FOR SC, IM OR SLOW IV USE
NOT FOR EPIDURAL OR INTRATHECAL USE
PROTECT FROM LIGHT — Store at 15°-30°C (59°-86°F). Avoid freezing.
USUAL DOSAGE: See package insert.

WARNING: May be habit forming.

NDC 0641-0180-25

Each mL contains morphine sulfate 10 mg, monobasic sodium phosphate monohydrate 10 mg, dibasic sodium phosphate, anhydrous 2.8 mg, sodium formaldehyde sulfoxylate 3 mg and phenol 2.5 mg in Water for Injection, pH 2.5-6.5; sulfuric acid added, if needed, for pH adjustment. Sealed under nitrogen. NOTE: Do not use if color is darker than pale yellow, if it is discolored in any other way or if it contains a precipitate. Caution: Federal law prohibits dispensing without prescription. Code: 0180-25 B-501608

ES

17. The physician orders dexamethasone 6 mg IM stat. You have dexamethasone 10 mg/mL. How many milliliters will you administer? _____

18. Your patient with congestive heart failure has furosemide 20 mg IV daily ordered. How many milliliters will you administer? _____

FUROSEMIDE
INJECTION, USP

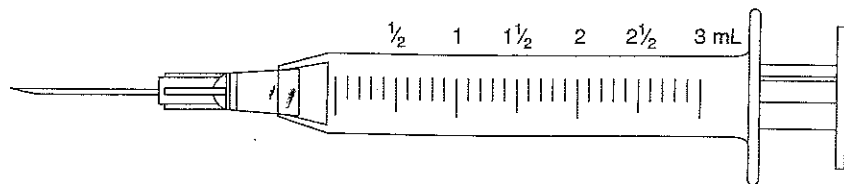
10 mg/mL

For IM or IV Use

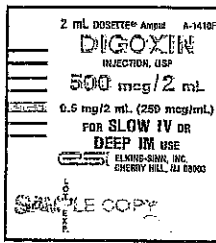
4 mL Single Dose Vial

PRECAUTIONS: Furosemide is a potent diuretic. It may cause dehydration. Patients should be observed for signs of dehydration. Patients should be advised to avoid alcohol and other diuretics. Patients should be advised to avoid potassium supplements and potassium-rich foods unless directed by a physician. Patients should be advised to avoid salt tablets. Patients should be advised to avoid other drugs that may interact with furosemide. Patients should be advised to avoid driving or operating machinery until they know how furosemide affects them. Patients should be advised to avoid exposure to sunlight. Patients should be advised to avoid exposure to heat. Patients should be advised to avoid exposure to cold. Patients should be advised to avoid exposure to humidity. Patients should be advised to avoid exposure to dry air. Patients should be advised to avoid exposure to dust. Patients should be advised to avoid exposure to pollen. Patients should be advised to avoid exposure to mold. Patients should be advised to avoid exposure to bacteria. Patients should be advised to avoid exposure to viruses. Patients should be advised to avoid exposure to fungi. Patients should be advised to avoid exposure to parasites. Patients should be advised to avoid exposure to insects. Patients should be advised to avoid exposure to animals. Patients should be advised to avoid exposure to plants. Patients should be advised to avoid exposure to minerals. Patients should be advised to avoid exposure to vitamins. Patients should be advised to avoid exposure to hormones. Patients should be advised to avoid exposure to enzymes. Patients should be advised to avoid exposure to antibodies. Patients should be advised to avoid exposure to antigens. Patients should be advised to avoid exposure to toxins. Patients should be advised to avoid exposure to allergens. Patients should be advised to avoid exposure to irritants. Patients should be advised to avoid exposure to carcinogens. Patients should be advised to avoid exposure to mutagens. Patients should be advised to avoid exposure to teratogens. Patients should be advised to avoid exposure to reproductive toxins. Patients should be advised to avoid exposure to developmental toxins. Patients should be advised to avoid exposure to neurotoxins. Patients should be advised to avoid exposure to nephrotoxins. Patients should be advised to avoid exposure to hepatotoxins. Patients should be advised to avoid exposure to cardiotoxins. Patients should be advised to avoid exposure to cytotoxins. Patients should be advised to avoid exposure to immunosuppressants. Patients should be advised to avoid exposure to immunomodulators. Patients should be advised to avoid exposure to immunostimulants. Patients should be advised to avoid exposure to immunosuppressants. Patients should be advised to avoid exposure to immunomodulators. Patients should be advised to avoid exposure to immunostimulants. Patients should be advised to avoid exposure to immunosuppressants. Patients should be advised to avoid exposure to immunomodulators. Patients should be advised to avoid exposure to immunostimulants.

LOT 401736
EXP.



19. The physician orders digoxin 0.3 mg IM now. How many milliliters will the nurse administer? _____

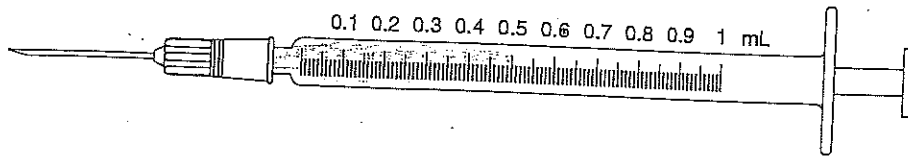


20. Mrs. Joyce has verapamil 5 mg IV bolus ordered to be given over 2 minutes now for dysrhythmia. Verapamil 2.5 mg/mL is supplied. How many milliliters will Mrs. Joyce receive? _____

ANSWERS ON PP. 556-559.

CHAPTER 14 Parenteral Dosages—Posttest 1, pp. 299–304

Proportion	Formula
1. $50 \text{ mg} : 1 \text{ mL} :: 25 \text{ mg} : x \text{ mL}$ $50x = 25$ $x = \frac{25}{50}$ $x = 0.5 \text{ mL}$	$\frac{25 \text{ mg}}{50 \text{ mg}} \times 1 \text{ mL} = 0.5 \text{ mL}$
2. $50 \text{ mg} : 1 \text{ mL} :: 25 \text{ mg} : x \text{ mL}$ $50x = 25$ $x = \frac{25}{50}$ $x = 0.5 \text{ mL}$	$\frac{25 \text{ mg}}{50 \text{ mg}} \times 1 \text{ mL} = 0.5 \text{ mL}$



Proportion

Formula

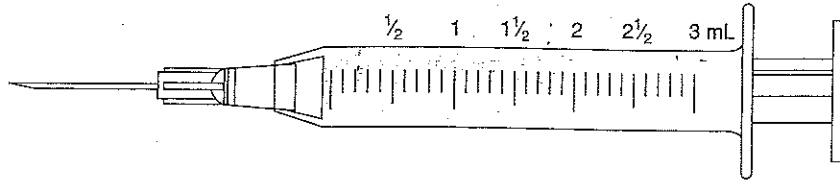
$$3. \quad 15 \text{ mg} : 1 \text{ mL} :: 30 \text{ mg} : x \text{ mL}$$

$$15x = 30$$

$$x = \frac{30}{15}$$

$$x = 2 \text{ mL}$$

$$\frac{30 \text{ mg}}{15 \text{ mg}} \times 1 \text{ mL} = 2 \text{ mL}$$



$$4. \quad 1000 \text{ mg} : 10 \text{ mL} :: 500 \text{ mg} : x \text{ mL}$$

$$1000x = 5000$$

$$x = \frac{5000}{1000}$$

$$x = 5 \text{ mL}$$

$$\frac{500 \text{ mg}}{1000 \text{ mg}} \times 10 \text{ mL} = \frac{10}{2} = 5 \text{ mL}$$

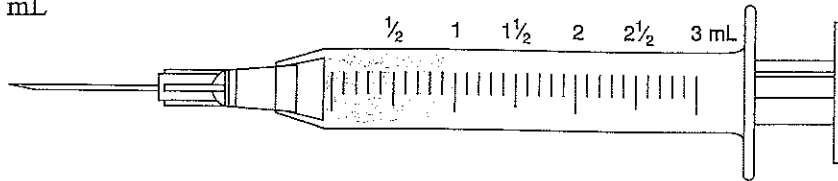
$$5. \quad 100 \text{ mg} : 2 \text{ mL} :: 50 \text{ mg} : x \text{ mL}$$

$$100x = 100$$

$$x = \frac{100}{100}$$

$$x = 1 \text{ mL}$$

$$\frac{50 \text{ mg}}{100 \text{ mg}} \times 2 \text{ mL} = \frac{100}{100} = 1 \text{ mL}$$



$$6. \quad 2 \text{ mg} : 1 \text{ mL} :: 0.5 \text{ mg} : x \text{ mL}$$

$$2x = 0.5$$

$$x = \frac{0.5}{2}$$

$$x = 0.25 \text{ mL}$$

$$\frac{0.5 \text{ mg}}{2 \text{ mg}} \times 1 \text{ mL} = 0.25 \text{ mL}$$

$$7. \quad 30 \text{ mg} : 1 \text{ mL} :: 15 \text{ mg} : x \text{ mL}$$

$$30x = 15$$

$$x = \frac{15}{30}$$

$$x = 0.5 \text{ mL}$$

$$\frac{15 \text{ mg}}{30 \text{ mg}} \times 1 \text{ mL} = 0.5 \text{ mL}$$

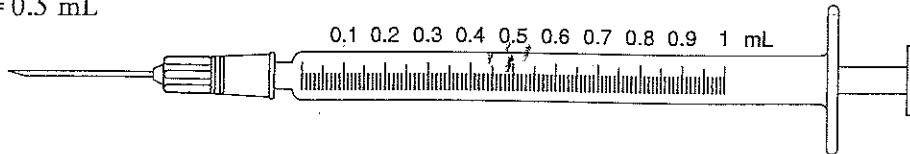
$$8. \quad 0.4 \text{ mg} : 1 \text{ mL} :: 0.2 \text{ mg} : x \text{ mL}$$

$$0.4x = 0.2$$

$$x = \frac{0.2}{0.4}$$

$$x = 0.5 \text{ mL}$$

$$\frac{0.2 \text{ mg}}{0.4 \text{ mg}} \times 1 \text{ mL} = 0.5 \text{ mL}$$



$$9. \quad 25 \text{ mg} : 1 \text{ mL} :: 100 \text{ mg} : x \text{ mL}$$

$$25x = 100$$

$$x = \frac{100}{25}$$

$$x = 4 \text{ mL}$$

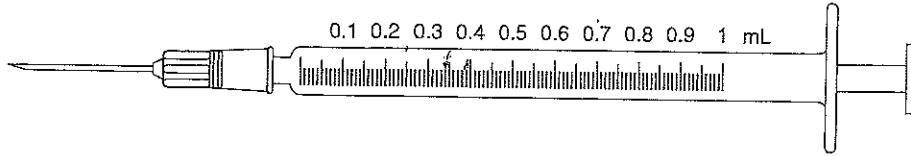
$$\frac{100 \text{ mg}}{25 \text{ mg}} \times 1 \text{ mL} = 4 \text{ mL}$$

Proportion

Formula

10. 5 mg : 1 mL :: 2 mg : x mL
 $5x = 2$
 $x = \frac{2}{5}$
 $x = 0.4 \text{ mL}$

$\frac{2 \text{ mg}}{5 \text{ mg}} \times 1 \text{ mL} = 0.4 \text{ mL}$



11. 0.5 mg : 1 mL :: 0.7 mg : x mL
 $0.5x = 0.7$
 $x = \frac{0.7}{0.5}$
 $x = 1.4 \text{ mL}$

$\frac{0.7 \text{ mg}}{0.5 \text{ mg}} \times 1 \text{ mL} = 1.4 \text{ mL}$

12. 50 mg : 1 mL :: 25 mg : x mL
 $50x = 25$
 $x = \frac{25}{50}$
 $x = 0.5 \text{ mL}$

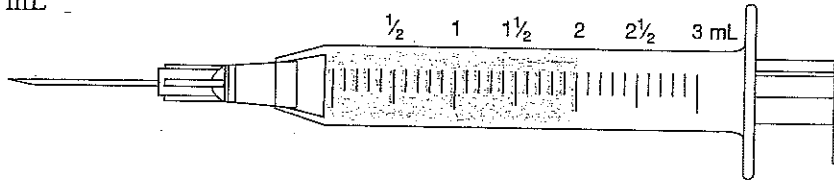
$\frac{25 \text{ mg}}{50 \text{ mg}} \times 1 \text{ mL} = 0.5 \text{ mL}$

13. 80 mg : 1 mL : 50 mg : x mL
 $80x = 50$
 $x = \frac{50}{80}$
 $x = 0.625 \text{ mL or } 0.63 \text{ mL}$

$\frac{50 \text{ mg}}{80 \text{ mg}} \times 1 \text{ mL} = 0.625 \text{ mL or } 0.63 \text{ mL}$

14. 250 mg : 1 mL :: 500 mg : x mL
 $250x = 500$
 $x = \frac{500}{250}$
 $x = 2 \text{ mL}$

$\frac{500 \text{ mg}}{250 \text{ mg}} \times 1 \text{ mL} = \frac{500}{250} = 2 \text{ mL}$



15. 1000 mg : 50 mL :: 300 mg : x mL
 $1000x = 15,000$
 $x = \frac{15,000}{1000}$
 $x = 15 \text{ mL}$

$\frac{300 \text{ mg}}{1000 \text{ mg}} \times \frac{50 \text{ mL}}{1} = \frac{300}{20} = 15 \text{ mL}$

16. 10 mg : 1 mL :: 6 mg : x mL
 $10x = 6$
 $x = \frac{6}{10}$
 $x = 0.6 \text{ mL}$

$\frac{6 \text{ mg}}{10 \text{ mg}} \times 1 \text{ mL} = 0.6 \text{ mL}$

17. 10 mg : 1 mL :: 6 mg : x mL
 $10x = 6$
 $x = \frac{6}{10}$
 $x = 0.6 \text{ mL}$

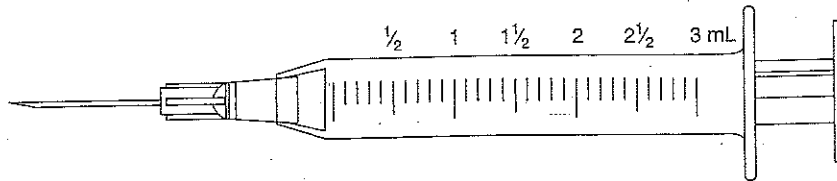
$\frac{6 \text{ mg}}{10 \text{ mg}} \times 1 \text{ mL} = 0.6 \text{ mL}$

Proportion

18. $40 \text{ mg} : 4 \text{ mL} :: 20 \text{ mg} : x \text{ mL}$
 $40x = 80$
 $x = \frac{80}{40}$
 $x = 2 \text{ mL}$

Formula

$\frac{20 \text{ mg}}{40 \text{ mg}} \times 4 \text{ mL} =$
 $\frac{20}{40} \times \frac{4}{1} = \frac{20}{10}$
 $\frac{20}{10} = 2 \text{ mL}$



19. $0.5 \text{ mg} : 2 \text{ mL} :: 0.3 \text{ mg} : x \text{ mL}$
 $0.5x = 0.6$
 $x = \frac{0.6}{0.5}$
 $x = 1.2 \text{ mL}$

$\frac{0.3 \text{ mg}}{0.5 \text{ mg}} \times 2 \text{ mL} = \frac{0.6}{0.5} = 1.2 \text{ mL}$

20. $2.5 \text{ mg} : 1 \text{ mL} :: 5 \text{ mg} : x \text{ mL}$
 $2.5x = 5$
 $x = \frac{5}{2.5}$
 $x = 2 \text{ mL}$

$\frac{5 \text{ mg}}{2.5 \text{ mg}} \times 1 \text{ mL} = 2 \text{ mL}$

CHAPTER 14 Parenteral Dosages—Posttest 2, pp. 305–310

Proportion

1. $4 \text{ mg} : 1 \text{ mL} :: 2 \text{ mg} : x \text{ mL}$
 $4x = 2$
 $x = \frac{2}{4}$
 $x = 0.5 \text{ mL}$

Formula

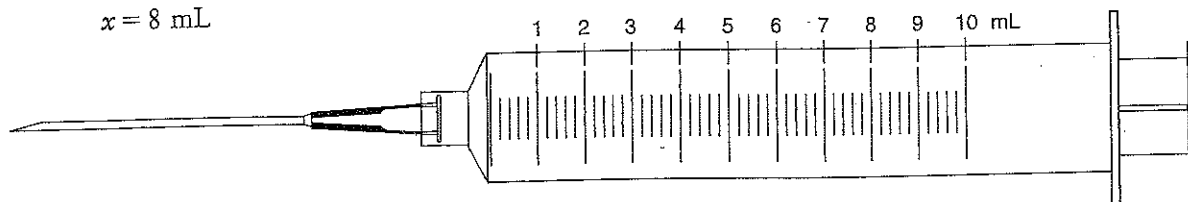
$\frac{2 \text{ mg}}{4 \text{ mg}} \times 1 \text{ mL} = 0.5 \text{ mL}$

2. $4 \text{ mg} : 1 \text{ mL} :: 2 \text{ mg} : x \text{ mL}$
 $4x = 2$
 $x = \frac{2}{4}$
 $x = 0.5 \text{ mL}$

$\frac{2 \text{ mg}}{4 \text{ mg}} \times 1 \text{ mL} = 0.5 \text{ mL}$

3. $500 \text{ mg} : 10 \text{ mL} :: 400 \text{ mg} : x \text{ mL}$
 $500x = 4000$
 $x = \frac{4000}{500}$
 $x = 8 \text{ mL}$

$\frac{400 \text{ mg}}{500 \text{ mg}} \times 10 \text{ mL} = \frac{40}{5} = 8 \text{ mL}$



TABLET CALCULATIONS

You are to give 30 mg. of Inderal. The available dosage strength is a scored 60mg. tablet. What amount will you give?

2. Azulfidine 1.5 g has been ordered every twelve hours. The available tablets are 500 mg each. What amount will you give?

3. Premarin 1.25 mg is ordered daily for your patient. The only available tablet strength is 625 mcg. What amount will you give?

4. You are to give 90 mg. of Inderal. The available dosage strength is a scored 60mg. tablet. What amount will you give?

5. Potassium penicillin 1,200,000 u has been ordered for your patient. The available tablets are 400,000 u each. What amount will you give?

6. Azulfidine two grams has been ordered every twelve hours. The available tablets are 500 mg each. What amount will you give?

7. Potassium penicillin 800,000 u has been ordered for your patient. The available tablets are 400,000 u each. How many will you give?

8. Azulfidine 1.0 g has been ordered every twelve hours. The available tablets are 500 mg each. How many tablets will you give?

9. Dymelor 0.75 g is ordered. Scored tablets are labeled 500 mg. each. How many tablets will you give?

10. 100 mg per tablet is available; how much will you administer if the dosage ordered is 0.1 gram?

11. Sodium Seconal capsules are labeled 100 mg. How many will be administer if the order is for gr 1 1/2?

12. Clinoril 0.1 g is ordered; available tablets contain 200 mg. How many tablets will you administer?

13. Imipramine HCL is available in 50 mg tablets. How many tablets will you administer if the order of for .05 g?

14. Ergotrate maleate 200 mcg is ordered. Dosage strength is 0.2 mg. How many tablets will you administer?

15. Ritalin 30 mg is ordered; available tablets are labeled 20 mg. How many tablets will you administer?

16. Clinoril 125 mg is ordered; available tablets are 0.5 g. How many tablets will you give?

17. Elavil 75 mg is ordered; available tablets contain 25 mg. How many tablets will you give?

18. Brethine 10 mg is ordered; available tablets contain 2.5 mg. How many tablets will you give?

19. Motrin 0.6g is ordered; available tablets contain 600 mg. How many tablets will you give?

20. Digoxin 0.5 mg is ordered; available tablets contain 250 mcg. per tablet. How many tablets will you give?

TABLET CALCULATION ANSWERS

1. ½ TAB
2. 3 TAB
3. 2 TAB
4. 1.5 TAB
5. 3 TAB
6. 4 TAB
7. 2 TAB
8. 2 TAB
9. 1.5 TAB
10. 1 TAB
11. 1 TAB
12. 0.5 TAB
13. 1 TAB
14. 1 TAB
15. 1.5 TAB
16. ¼ TAB
17. 3 TAB
18. 4 TAB
19. 1 TAB
20. 2 TAB

DOSE CALCULATIONS

1. Thorazine 30 mg IM is ordered for your patient. The available concentration is 25mg/ml. What amount will you give?

2. Dilaudid 3 mg IM is ordered for your patient. The only available dosage strength is 4 mg/mL. What amount will you give?

3. Thorazine 37.5 mg has been ordered for your patient. The only available dosage is 25 mg/mL. What amount will you give?

4. Solu-Cortef is available in a 100mg/2ml IM solution. Your patient is to receive 50mg IM. What amount will you give?

5. Morphine sulfate gr 1/8 is ordered for injection for your patient. The available solution is gr 1/12 per ml. What amount will you give?

6. Three milligrams of Haldol IM are ordered for your patient. On your unit, Haldol is available in 2 ml ampules that contain 5 mg/ml. What amount will you give?

7. Thorazine 45 mg IM is ordered for your patient. The available concentration on your unit is 25mg/ml. What amount will you give?

8. Dilaudid 3 mg IM is ordered for your patient. The only available dosage strength is 2 mg/mL. What amount will you give?

9. Solu-Cortef is available in a 50mg/2ml IM solution. Your patient is to receive 25 mg IM. What amount will you give?

10. 20 mg of Phenergan is ordered; available solution contains 25mg/ml. How much will you administer?

11. 30 mg of Tofranil is ordered; available solution contains 25mg/2ml. How much will you administer?

12. 15 mg of Torecan is ordered; available solution contains 10mg/2ml. How much will you give?

13. 500 mg of Ampicillin solution is ordered; available solution contains 125 mg/5mL. How much will you give?

14. 375 mg of Tetracycline syrup is ordered; available solution contains 125 mg/teaspoon. How much will you give?

15. Lasix 20mg is ordered IV stat; available solution contains 10mg/mL. How many ml will you give?

16. Penicillin G Potassium 1,000,000 units is ordered; available solution contains 500,000 u per cc. How many ml will you give?

17. 0.25g Tetracycline is ordered; available solution contains 50mg per ml. How much will you administer?

18. Protamine Sulfate 25 mg is ordered IV; the vial is labeled 5mg/2ml. How many ml's will you give?

19. 50 mg of Demerol is ordered; available solution contains 100mg/ml. How much will you give?

20. Robinul 0.1mg is ordered pre-op; available solution is 0.4mg/2ml. How much will you give?

Answers

- | | |
|------------|------------|
| 1. 1.2 mL | 11. 2.4 mL |
| 2. .75 ml | 12. 3 mL |
| 3. 1.5 mL | 13. 20 mL |
| 4. 1 mL | 14. 3 tsp |
| 5. 1.5 mL | 15. 2 ml |
| 6. 0.6 mL | 16. 2 mL |
| 7. 1.8 mL | 17. 5 mL |
| 8. 1.5 mL | 18. 10 mL |
| 9. 1.0 mL | 19. 0.5 mL |
| 10. 0.8 ml | 20. 0.5 mL |

IV RATES

1. The physician orders an IV infusion of D5W 1000 ml to infuse over the next eight hours. The IV tubing that you are using delivers 15gtt/mL. What is the correct rate of flow?

2. A patient, admitted with a head injury, has an order for D5NS at 25 ml/hour. The IV tubing has a calibration of 10gtt/ml. What is the correct rate of flow for this patient?

3. Your patient has an order to infuse 100 ml of D51/2NS with 10MEq of KCl over the next thirty minutes. The set calibration is 10gtt/ml. What is the correct rate of flow for this patient?

4. The order reads: "Over the next 4 hours, infuse 500 ml of 5% Dextrose in Normal Saline. Add 20 MEq of KCl to solution." You know that the IV tubing set is calibrated to deliver 10gtt/ml. What is the rate of flow?

5. The 10am medications scheduled for your patient include Keflex 1.5 G in 50 ml of a 5% Dextrose solution. According to the pharmacy, this preparation should be administered in thirty minutes. The IV tubing on your unit delivers 15 gtts per milliliter. What is the correct rate of flow in drops per minute?

6. 1000cc solution of D5NS with 20,000 units of Heparin is infusing at 20ml per hour. The IV set delivers 60 gtts per mL. How many units of Heparin is the patient receiving each hour?

7. Your patient has an order to receive 800 units of Heparin per hour by continuous intravenous infusion. If the pharmacy mixes the IV bag to contain a total of 5,000 units of Heparin in 500 ml of D5W, how many mL's per minute should the patient receive?
Hour

8. The physician orders an IV infusion of D5W 1000 ml to infuse over the next eight hours. The IV tubing that you are using delivers 10 gtt/ml. What is the correct rate of flow (drops per minute)?

9. A patient, admitted with a head injury, has an order to start 1000cc of D5NS at 30ml/hour. The IV tubing has a calibration of 60 gtt/ml. What is the correct rate of flow for this patient?

10. Your patient has an order to infuse 100 ml of D5 $\frac{1}{2}$ NS with 40 MEq of KCl over the next 60 minutes. The set calibration is 15 gtt/ml. What is the correct rate of flow for this patient?

11. The 10am medications scheduled for your patient include Keflex 2.0 g in 100 ml of a 5% Dextrose solution. According to the pharmacy, this preparation should be administered in thirty minutes. The IV tubing on your unit delivers 10 gtts per milliliter. What is the correct rate of flow in drops per minute?

12. A 500 cc solution of D5NS with 20,000 units of Heparin is infusing at 20ml per hour. The IV set delivers 60 gtts per ml. How many units of Heparin is the patient receiving each hour?

13. The physician orders 1.5 liters of Lactated Ringers solution to be administered intravenously to your patient over the next 12 hours. Calculate the rate of flow if the IV tubing delivers 20gtt/ml.

14. The physician orders 1.5 liters of Lactated Ringers solution to be administered intravenously to your patient over the next 12 hours. Calculate the rate of flow if the IV tubing delivers 15 gtts per cubic centimeter.

15. The physician orders 1.5 liters of Lactated Ringers solution to be administered intravenously to your patient over the next 12 hours. Calculate the rate of flow if the IV tubing delivers 60 gtts/ml.

16. The order reads: "Over the next 4 hours, infuse 500 ml of 5% Dextrose in Normal Saline. Add 20 MEq of KCl to solution." You know that the IV tubing set is calibrated to deliver 10gtt/ml. In drops per minute, what is the rate of flow?

17. On Wednesday afternoon, your patient returns from surgery with an IV fluid order for 1000cc every 8 hours. On Thursday morning at 8am, you assess that 600 ml of a 1L bag has been absorbed. The physician orders the remainder of that bag to infuse over the next 6 hours. You know that the IV tubing used by your unit delivers 10 gtt/ml. What will the correct rate of flow be?

18. The physician reduces an IV to 30ml/hour. The IVAC indicates that 270 ml are remaining in the present IV bag. You notice that it is exactly 10:30 am. At what time will the infusion be completed?

19. The medications scheduled for your patient include Keflex 1.5 grams in 50 ml of a 5% Dextrose solution. According to the pharmacy, this preparation should be administered in 30 minutes. The IV tubing on your unit delivers 15 gtts per milliliter. What is the correct rate of flow in drops per minute?

20. In checking your patient's 10 am medications, you notice that you have orders to infuse 50mg. of Chloramphenicol in 100 ml of 5% Dextrose in Water over 30 minutes. The IV tubing delivers 15 gtt/ml. What is the correct rate of flow?

ANSWERS TO IV DRIP RATES

1. 31 gtts/min
2. 4 gtts/min
3. 33 gtts/min
4. 21 gtts/min
5. 25 gtts/min
6. 400 UNITS/HR
7. 80 CC/HR
8. 21 gtts/min
9. 30 gtts/min
10. 25 gtts/min
11. 33 gtts/min

12. 800 UNITS/HR
13. 42 gtts/min
14. 31 gtts/min
15. 125 gtts/min
16. 21 gtts/min
17. 11 gtts/min
18. 1930 OR 7:30PM
19. 25 gtts/min
20. 50 gtts/min

Or, you can use ratio-proportion.

$$\frac{50 \text{ mL}}{30 \text{ min}} \propto \frac{X \text{ mL}}{60 \text{ min}}$$

$$30X = 3000$$

$$\frac{30X}{30} = \frac{3000}{30}$$

$$X = 100 \text{ mL}/60 \text{ min or } 100 \text{ mL/h}$$

QUICK REVIEW

- $\frac{\text{Total mL ordered}}{\text{Total h ordered}} = \text{mL/h}$
- If the infusion time is less than one hour, then
 - $\frac{\text{Total mL ordered}}{\text{Total min ordered}} \times 60 \text{ min/h} = \text{mL/h}$
- Round mL/h to a whole number.

REVIEW SET 35

Calculate the flow rate at which you will program the electronic infusion regulator for the following IV orders.

1. 1 L D₅W IV to infuse in 10 h by infusion pump
Flow rate: _____ mL/h
2. 1800 mL Normal Saline IV to infuse in 15 h by controller
Flow rate: _____ mL/h
3. 2000 mL D₅W IV in 24 h by controller
Flow rate: _____ mL/h
4. 100 mL NS IV PB in 30 min by infusion pump
Flow rate: _____ mL/h
5. 30 mL antibiotic in D₅W IV in 15 min by infusion pump
Flow rate: _____ mL/h
6. 2.5 L NS IV in 20 h by controller
Flow rate: _____ mL/h
7. 500 mL D₅LR IV in 4 h by controller
Flow rate: _____ mL/h
8. 600 mL 0.45% NaCl IV in 3 h by infusion pump
Flow rate: _____ mL/h
9. 150 mL antibiotic in D₅W IV in 2 h by infusion pump
Flow rate: _____ mL/h
10. 3 L NS IV in 24 h by controller
Flow rate: _____ mL/h
11. 1.5 L LR Injection IV in 24 h by infusion pump
Flow rate: _____ mL/h
12. 240 mL D₁₀W IV in 10 h by controller
Flow rate: _____ mL/h
13. 750 mL D₅W IV in 5 h by infusion pump
Flow rate: _____ mL/h
14. 1.5 L D₅NS IV in 12 h by controller
Flow rate: _____ mL/h
15. 380 mL D₅ 0.45% NaCl in 9 h by infusion pump
Flow rate: _____ mL/h

REVIEW SET 37

1. State the rule for the formula method to calculate IV flow rate in gtt/min when mL/h are known.

Calculate the flow rate or watch count in gtt/min.

2. Order: 3000 mL D_5W IV @ 125 mL/h
Drop factor: 10 gtt/mL
_____ gtt/min
3. Order: 250 mL LR IV @ 50 mL/h
Drop factor: 60 gtt/mL
_____ gtt/min
4. Order: 100 mL NS bolus IV to infuse in 60 min
Drop factor: 20 gtt/mL
_____ gtt/min
5. Order: $D_5 \frac{1}{2}$ NS IV with 20 mEq KCl per liter to run at 25 mL/h
Drop factor: 60 gtt/mL
_____ gtt/min
6. Order: Two 500 mL units of whole blood IV to be infused in 4 h
Infusion set is calibrated to 20 drops per milliliter.
_____ gtt/min
7. Hyperalimentation solution is ordered for 1240 mL to infuse in 12 h using an infusion set with tubing calibrated to 15 gtt/mL
_____ gtt/min
8. Order: D_5 NS IV @ 150 mL/h
Drop factor: 20 gtt/mL
_____ gtt/min
9. Order: 150 mL NS bolus IV to infuse in 45 min
Drop factor: 15 gtt/mL
_____ gtt/min
10. Order: 80 mL D_5W antibiotic solution IV to infuse in 60 min
Drop factor: 60 gtt/mL
_____ gtt/min
11. Order: 480 mL packed red blood cells IV to infuse in 4 h
Drop factor: 10 gtt/mL
_____ gtt/min
12. Order: D_5W IV @ 120 mL/h
Drop factor: 15 gtt/mL
_____ gtt/min
13. Order: D_5 0.33% NaCl IV @ 50 mL/h
Drop factor: 20 gtt/mL
_____ gtt/min
14. Order: 2500 mL LR IV @ 165 mL/h
Drop factor: 20 gtt/mL
_____ gtt/min
15. Order: 3500 mL D_5LR IV to run at 160 mL/h
Drop factor: 15 gtt/mL
_____ gtt/min

After completing these problems, see page 514 to check your answers.

Shortcut Method

By converting the volume and time in the formula method to mL/h (or mL/60 min), you can use a shortcut to calculate flow rate. This shortcut is derived from the drop factor (C), which cancels out each time and reduces the 60 minutes (T). You are left with the *drop factor constant*. Look at these examples.

- 7) $D_{10 \frac{1}{4}} \text{ NS} = 10 \text{ g dextrose per } 100 \text{ mL and } 0.225 \text{ g NaCl per } 100 \text{ mL}$

Dextrose:

$$\frac{10 \text{ g}}{100 \text{ mL}} \times \frac{X \text{ g}}{500 \text{ mL}}$$

$$100X = 5000$$

$$\frac{100X}{100} = \frac{5000}{100}$$

$$X = 50 \text{ g}$$

NaCl:

$$\frac{0.225 \text{ g}}{100 \text{ mL}} \times \frac{X \text{ g}}{500 \text{ mL}}$$

$$100X = 112.5$$

$$\frac{100X}{100} = \frac{112.5}{100}$$

$$X = 1.125 \text{ g}$$

Review Set 35 from page 340

- 1) 100 2) 120 3) 83 4) 200 5) 120 6) 125 7) 125 8) 200 9) 75 10) 125 11) 63 12) 24 13) 150 14) 125 15) 42

Solutions—Review Set 35

- 1) 1 L = 1000 mL

$$\frac{\text{Total mL}}{\text{Total h}} = \frac{1000 \text{ mL}}{10 \text{ h}} = 100 \text{ mL/h}$$

- 3) $\frac{\text{Total mL}}{\text{Total h}} = \frac{2000 \text{ mL}}{24 \text{ h}} = 83.3 \text{ mL/h} = 83 \text{ mL/h}$

- 4) $\frac{100 \text{ mL}}{\frac{30 \text{ min}}{1}} \times \frac{2 \frac{60 \text{ min}}{1}}{\text{h}} = 200 \text{ mL/h}$

- 5) $\frac{30 \text{ mL}}{\frac{15 \text{ min}}{1}} \times \frac{4 \frac{60 \text{ min}}{1}}{\text{h}} = 120 \text{ mL/h}$

- 6) $2.5 \text{ L} = 2.5 \times 1000 = 2500 \text{ mL}$

$$\frac{\text{Total mL}}{\text{Total h}} = \frac{2500 \text{ mL}}{20 \text{ h}} = 125 \text{ mL/h}$$

Review Set 36 from pages 342–343

- 1) 15 2) 10 3) 60 4) 60 5) 10

Review Set 37 from page 346

- 1) $\frac{V}{T} \times C = R$ 2) 21 3) 50 4) 33 5) 25 6) 83 7) 26 8) 50 9) 50 10) 80 11) 20 12) 30 13) 17 14) 55 15) 40

Solutions—Review Set 37

$$1) \frac{V}{T} \times C = R \text{ or } \frac{\text{Volume}}{\text{Time in min}} \times \text{Drop Factor} = \text{Rate}$$

Volume in mL divided by time in minutes, multiplied by the drop factor calibration in drops per milliliter, equals the flow rate in drops per minute.

- 2) $\frac{V}{T} \times C = \frac{125 \text{ mL}}{60 \text{ min}} \times 10 \text{ gtt/mL} = \frac{125 \text{ gtt}}{6 \text{ min}} = 20.8 \text{ gtt/min} \approx 21 \text{ gtt/min}$

- 3) $\frac{V}{T} \times C = \frac{50 \text{ mL}}{60 \text{ min}} \times 60 \text{ gtt/mL} = 50 \text{ gtt/min}$

Recall that when drop factor is 60 mL/h, then mL/h = gtt/min.

- 4) $\frac{V}{T} \times C = \frac{100 \text{ mL}}{60 \text{ min}} \times 20 \text{ gtt/mL} = \frac{100 \text{ gtt}}{3 \text{ min}} = 33.3 \text{ gtt/min} \approx 33 \text{ gtt/min}$

- 6) Two 500 mL units of blood = 1000 mL total volume
mL/h = $\frac{1000 \text{ mL}}{4 \text{ h}} = 250 \text{ mL/h}$

$$\frac{V}{T} \times C = \frac{250 \text{ mL}}{60 \text{ min}} \times 20 \text{ gtt/mL} = \frac{250 \text{ gtt}}{3 \text{ min}} = 83.3 \text{ gtt/min} \approx 83 \text{ gtt/min}$$

- 7) $\frac{\text{Total mL}}{\text{Total h}} = \frac{1240 \text{ mL}}{12 \text{ h}} = 103.3 \text{ mL/h} = 103 \text{ mL/h}$

$$\frac{V}{T} \times C = \frac{103 \text{ mL}}{60 \text{ min}} \times 15 \text{ gtt/mL} = \frac{103 \text{ gtt}}{4 \text{ min}} = 25.7 \text{ gtt/min} \approx 26 \text{ gtt/min}$$

- 9) $\frac{150 \text{ mL}}{60 \text{ min}} \times 15 \text{ gtt/mL} = \frac{150 \text{ gtt}}{3 \text{ min}} = 50 \text{ gtt/min}$

Module: RECONSTITUTION OF POWDERED MEDICATIONS

SINGLE-STRENGTH RECONSTITUTION

KEY POINTS:

- In single-strength reconstitution, the manufacturer identifies one amount of diluent to add to the powdered medication.
- The dosage strength of the mixed medication is used to calculate the amount to give to the patient.
- Information needed to work with single-strength reconstitution problems includes the type and amount of diluent, the dosage strength of the mixed medication, the length of time the solution will remain stable, and storage information.
- Once the medication is reconstituted, the nurse writes the date and time of reconstitution and the nurse's initials on the medication label.

Working with Single-Strength Reconstitution

Solve the following single-strength reconstitution problems.

1. The physician orders cefazolin sodium 0.25 g IM q.8h. The pharmacy sends a 1 g vial of sterile cefazolin powder with the following mixing instructions: "For IM use, add 2.5 mL sterile water for injection and shake. Provides a volume of 3.0 mL (330 mg/mL)."
 - a. How much diluent will be added to the cefazolin sodium powder?

b. What type of diluent will be added?

c. What is the dosage strength of the mixed medication?

d. How many mL of the medication will the nurse give to the patient?

2. The order is for procaine penicillin G 300,000 units IM b.i.d. A 1-g vial of procaine penicillin G powder is in the medication drawer. The medication has the following mixing instructions: "IM use: Dissolve 4.6 mL bacteriostatic water for injection to make 200,000 units/mL."

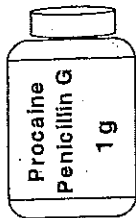
a. How much diluent will be added to the procaine penicillin G powder?

b. What type of diluent will be added?

c. What is the dosage strength of the mixed medication?

d. How many mL of the medication will the nurse give to the patient?

3. What data should be entered on the vial below when labeling the vial after reconstitution?



4. The physician orders 200 mg of an antibiotic IM q.12h. The pharmacy sends a vial of antibiotic powder for reconstitution with the following mixing directions: "For IM injection, IV direct (bolus) injection, or IV infusion, add 2 mL sterile water for injection. Shake well. Provides an approximate concentration of 125 mg/mL."

a. How much diluent will be added to the antibiotic powder?

b. What type of diluent will be added?

c. What is the dosage strength of the mixed medication?

d. How many mL of the medication will the nurse give to the patient?

5. The order is for ticarcillin disodium 0.5 g IM q.6h. The directions state to add 2 mL of NS. The reconstituted solution contains 1 g/2.6 mL.

a. What is the dosage strength of the reconstituted medication?

b. How much will be given to the patient?

6. The order is for oxacillin 450 mg IM q.6h.

NDC 0015-7981-20
 EQUIVALENT TO
1 gram OXACILLIN
OXACILLIN SODIUM
FOR INJECTION, USP
 Buffered—For IM or IV Use
 CAUTION: Federal law prohibits
 dispensing without prescription.

This vial contains oxacillin sodium
 and sodium hydroxide, sodium
 oxacillin and 20 mg sodium sodium
 phosphate. Add 7 mL Sterile Water
 for Injection, USP • Each 1.5 mL
 contains oxacillin 250 mg
 Dose: Adults: 250 mg to 500 mg
 intravenously every 4 to 6 hours.
 See package for intravenous use.
 Contains 1.5 mL of solution. After
 reconstitution, the solution may be
 stored at room temperature or
 refrigeration.
APOTHECON Scrubbin Company
 Princeton, NJ 08540 USA
 788122 DRLZ



Cont:
 Exp. Date:

a. How much diluent will be added to the oxacillin powder?

b. What type of diluent will be added?

c. What is the resulting dosage strength of the mixed medication?

d. How many mL of the oxacillin will the nurse give to the patient?

7. The physician orders Augmentin 500 mg p.o. q.12h. The pharmacy sends the following drug:

AUGMENTIN®
250mg/5mL

250mg/5mL

AUGMENTIN®
AMOXICILLIN/
CLAVULANATE
POTASSIUM
FOR ORAL SUSPENSION

When reconstituted,
each 5 mL contains:
AMOXICILLIN, 250 MG,
as the trihydrate
CLAVULANIC ACID, 62.5 MG,
as clavulanate potassium

100mL
(when reconstituted)

SB SmithKline Beecham

Use only if lower part is intact.
Mix with water to reconstitute.
Add 1.25 g clavulanate and 250 mg amoxicillin.
Store dry powder at room temperature.
Caution: Federal law prohibits dispensing without prescription.
SmithKline Beecham Pharmaceuticals
Philadelphia, PA 19101

3 0029-6090-23 6

9405811-C

Keep tightly closed.
Shake well before using.
Must be refrigerated.
Discard after 10 days.

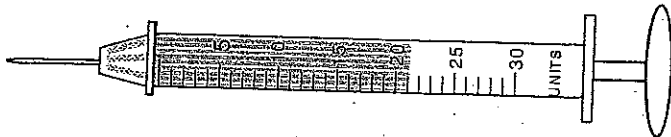
- a. How much diluent will be added to the Augmentin powder?

- b. What is the dosage strength of the mixed medication?

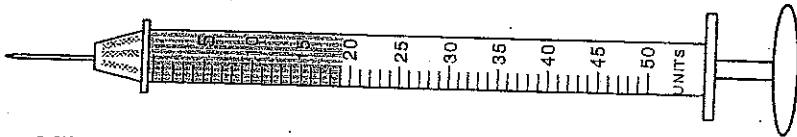
- c. How many mL of the Augmentin oral suspension will the nurse give to the patient?

- d. What data should be entered on the label above after reconstitution?

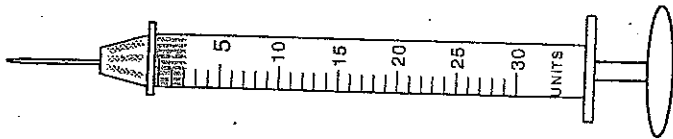
14. 21 U
Fill in the syringe.



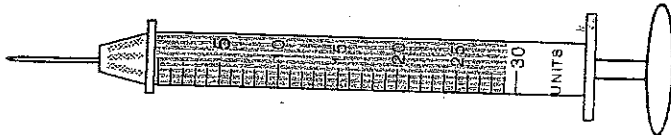
15. 19 U
Fill in the syringe.



16. 2 U
Fill in the syringe.



17. 29 U
Fill in the syringe.



Module: RECONSTITUTION OF POWDERED MEDICATIONS

Working with Single-Strength Reconstitution

- 1.a. 2.5 mL
- b. Sterile water for injection
- c. 330 mg/mL

- 1.d. 0.76 mL
- 2.a. 4.6 mL
 - b. Bacteriostatic water
 - c. 200,000 units/mL
 - d. 1.5 mL
3. Date and time of rec
- 4.a. 2 mL
 - b. Sterile water for injc
 - c. 125 mg/mL
 - d. 1.6 mL
- 5.a. 1 g/2.6 mL
 - b. 1.3 mL
- 6.a. 5.7 mL
 - b. Sterile water for injc
 - c. 250 mg/1.5 mL
 - d. 2.7 mL
- 7.a. 87 mL
 - b. 250 mg/5 mL
 - c. 10 mL
8. Date and time of rec

Working with Multiple-St

1. The smallest volume
- 2.a. 100 mg/mL
 - b. 7.5 mL
 - c. Date and time of rec
circle selected volume
corresponding dosag
- 3.a. 100,000 units/mL
 - b. 500,000 units/mL
 - c. 9.6 mL of diluent - g
4.6 mL of diluent - g
1.6 mL of diluent - g

Exercise: FOCUS ON SAFETY

Making Clinical Judgments in Working With IV Push Medication

- Read each situation, and then make a clinical judgment.
- Provide a rationale for your decision or action.

Date	Physician's Order
2/12	Atropine 0.8 mg IMP Stat

SITUATION:
Atropine is available in 1 mg/mL. To implement this order safely, the nurse is most correct to:

- a. give the ordered dose slowly into the vein.
- b. administer 0.8 mL over 2 minutes.
- c. add the atropine dose to the primary IV fluid.
- d. Dilute with 10 mL normal saline.

IMPLEMENTATION

- Atropine (at-ro-peen)
- Direct IV: Give IV undiluted or dilute in 10 mL sterile water.
- Rate: Administer at a rate of 0.6 mg over 1 min. Do not add to solution. Inject through Y-tubing or 3-way stopcock.

Rationale / Discussion:

INFUSION AND COMPLETION TIME

- KEY POINTS:**
- Use mL / hr and total amount of IV fluid to calculate the infusion time (hours and minutes).
 - Use the starting time and the infusion time to calculate the completion time of the IV fluid.
 - With infusion time, convert parts of an hour to minutes.

Working With Infusion Time
Use the information provided to identify the infusion time for the following problems.

1. The doctor orders 1 L of D5/0.45% NS to infuse at 125 mL / hr. What is the infusion time of the IV?

2. At 0700, 500 mL of D5W is started to infuse at 60 mL / hr. What is the infusion time of the IV?

3. At 1000, 1000 mL of Lactated Ringer's is started on the patient. The IV is infusing at 75 mL / hr. The drop factor is 10 gtt / min. What is the infusion time of the IV?

4. The nurse restarts an IV with 800 mL D5/LR to infuse at 125 mL / hr. What is the infusion time of the IV?

5. The patient has an IVPB of famotidine 20 mg in 100 mL NS. The nurse sets the IV pump at 200 mL / hr. What is the infusion time of the IVPB?

6. The nurse starts an IV of 100 mL D5W with 10 mEq KCl to infuse at 30 mL / hr. What is the infusion time of the IV?

Working With Completion Time

1. The nurse starts 1 L of D5/0.45% NS to infuse at 125 mL / hr at 0800. What is the completion time of this IV?

2. At 1400, 250 mL of D5W is started to infuse at 60 mL / hr. What is the completion time of the IV?

3. At 2000, 1000 mL of 0.45% NS is started to infuse at 100 mL / hr. What is the completion time of the IV?

4. The nurse restarts an IV bag containing 600 mL of IV fluid at 1930 to infuse at 75 mL / hr. What is the completion time of the IV?

5. The nurse restarts an IV bag containing 500 mL of D5/0.45% NS at 1430, to infuse at 80 mL / hr. What is the completion time of this IV?

6. The nurse restarts 750 mL of LR at 0900, to infuse at 150 mL / hr. What is the completion time of the IV?

Working With Infusion and Completion Time

1. The doctor orders 1 L NS to infuse over 10 hours. The nurse starts the IV at 0900. At 1000 the patient pulls out the IV. The nurse restarts the IV at 1100 at the same rate. Starting with the amount of IV fluid left at 1100, calculate the new infusion time and the completion time of the IV.

Infusion time _____
Completion time _____

2. The doctor orders 500 mL D10W to infuse at 75 mL / hr. The nurse starts the IV at 1330. At 1530, the IV rate is increased to 100 mL / hr, per doctor's orders. Starting with the amount of IV fluid remaining at 1530, calculate the new infusion time and completion time of the IV.

Infusion time _____
Completion time _____

3. The doctor orders 1 L NS to infuse over 8 hours. The nurse starts the IV at 1600. At 2000, the IV rate is decreased to 100 mL / hr. Starting with the amount of IV fluid remaining at 2000, calculate the new infusion time and completion time of the IV.

Infusion time _____

Completion time _____

4. The doctor order 500 mL of NS to infuse at 100 mL / hr. The nurse starts the IV at 0530. At 0700, the IV rate is decreased to 75 mL / hr. Starting with the amount of IV fluid remaining at 0700, calculate the new infusion time and completion time of the IV.

Infusion time _____

Completion time _____

5. At 1600, 1 L D5W is started to infuse over 8 hours. At 1900, the IV infiltrates. The nurse restarts the IV at 2100 at the same IV rate. Starting with the amount of IV fluid remaining at 2100, calculate the new infusion time and completion time of the IV.

Infusion time _____

Completion time _____

Exercise: FOCUS ON SAFETY
 Making Clinical Judgments in Working With Infusion at Completion Time

- Read each situation, and then make a clinical judgment.
- Provide a rationale for your decision or action.

SITUATION:
 The nurse started 1 liter of D5/0.9% NS at 0700, to infuse at 125 mL/hr via gravity. The drop factor of the IV tubing is 15 gtt/mL. At 1200, the IV intake is 300 mL. In assessing flow rate, the nurse counts 21 gtt/min. Which action(s) the nurse are appropriate (select all that apply)?

a. Increase the flow rate to 31 gtt / min.	c. Report a completion of 1736.
b. Increase the flow rate to 41 gtt / min for 4 hours.	d. Plan to give 1000 mL the day shift.
e. Administer the IV fluid through an infusion pump.	

Rationale / Discussion:

4. 167 mL/hr
5. 100 mL/hr
6. 167 mL/hr
7. 50 mL/hr
8. 138 mL/hr
9. 100 mL/hr
10. 133 mL/hr

Working With Flow Rate (p. 80 – 81)

1. 125 gtt/min
2. 21 gtt/min
3. 21 gtt/min
4. 8 gtt/min
5. 11 gtt/min
6. 33 gtt/min
7. 31 gtt/min
8. 167 gtt/min
9. 26 gtt/min
10. 25 gtt/min

Exercise: FOCUS ON SAFETY
Making Clinical Judgments in Working With Milliliters per Hour and Flow Rate (p. 82)

- a. continue to monitor the IV intake at 13 gtt/min.
- CORRECT:** The IV is set at the appropriate rate to deliver 50 mL/hr.

INCORRECT:

- b. question the oral intake for the day shift. There is no indication for questioning the oral intake in this situation.
- c. increase the flow rate to 31 gtt/min. The IV rate is accurate and should not be increased without an MMD order.
- d. change the IV tubing to a minibidrop. The IV tubing does not need to be changed. The flow rate can be accurately set and monitored with the current tubing.

1. 4 – 5 minutes
2. 6 – 10 minutes
3. 1 – 2 minutes
4. 2 – 3 minutes
5. 2 minutes
6. 1 minute
7. 2 minutes or longer (3 minutes or 8 – 15 minutes)

Exercise: FOCUS ON SAFETY
Making Clinical Judgments in Working With Milliliters per Hour and Flow Rate (p. 86)

- b. administer 0.8 mL over 2 minutes.

CORRECT: The recommended rate of administration is 0.6 mg over 1 minute. The order is for 0.8 mg, which will require an additional minute for administration.

INCORRECT:

- a. give the ordered dose slowly into the vein. For safe administration, the nurse needs to follow the recommended rate and routes of administration.
- c. add the atropine dose to the primary IV fluid. The order is for IVP. The atropine should not be added to the primary IV fluid.
- d. Dilute with 10 mL normal saline. The recommended solution for dilution is sterile water.

Working With Infusion Time (pp. 87 – 88)

1. 8 hours
2. 8 hours 20 minutes
3. 13 hours 20 minutes
4. 6 hours 24 minutes
5. 30 minutes
6. 3 hours 20 minutes

Working With IV Push Medications (pp. 81 - 85)

1. 4 - 5 minutes
2. 6 - 10 minutes
3. 1 - 2 minutes
4. 2 - 3 minutes
5. 2 minutes
6. 1 minute
7. 2 minutes or longer (3 minutes or 8 - 15 minutes)

Exercise: FOCUS ON SAFETY
Making Clinical Judgments in Working With
Milliliters per Hour and Flow Rate (p. 86)

- b. administer 0.8 mL over 2 minutes.

CORRECT:

The recommended rate of administration is 0.6 mg over 1 minute. The order is for 0.8 mg, which will require an additional minute for administration.

INCORRECT:

- a. give the ordered dose slowly into the vein. *For safe administration, the nurse needs to follow the recommended rate and routes of administration.*
- c. add the atropine dose to the primary IV fluid. *The order is for IVP. The atropine should not be added to the primary IV fluid.*
- d. Dilute with 10 mL normal saline. *The recommended solution for dilution is sterile water.*

Working With Infusion Time (pp. 87 - 88)

1. 8 hours
2. 8 hours 20 minutes
3. 13 hours 20 minutes
4. 6 hours 24 minutes
5. 30 minutes
6. 3 hours 20 minutes

Working With Completion Time (pp. 88 – 89)

1. 4:00 PM or 1600
2. 6:10 PM or 1810
3. 6:00 AM or 0600
4. 3:30 AM or 0330
5. 8:45 PM or 2045
6. 2:00 PM or 1400

Working With Infusion and Completion Time (pp. 89 – 90)

1. Infusion Time = 9 hours
Completion Time = 8:00 PM or 2000
2. Infusion Time = 3 hours 30 minutes
Completion Time = 7:00 PM or 1900
3. Infusion Time = 5 hours
Completion Time = 1:00 AM or 0100
4. Infusion Time = 4 hours 40 minutes
Completion Time = 11:40 AM or 1140
5. Infusion Time = 5 hours
Completion Time = 2:00 AM or 0200

Exercise: FOCUS ON SAFETY

Making Clinical Judgments in Working With Infusion and Completion Time (p. 91)

- a. Increase the flow rate to 31 gtt / min.
CORRECT: The nurse should increase the correct flow rate to administer 125 mL / hr.
- c. Report a completion time of 1736.
CORRECT: At 1200, there are 700 mL of fluid left in the primary IV. Following the physician's orders to administer 125 mL / hr, it will take 5 hr and 36 minutes for 700 mL to infuse into the patient.

INCORRECT:

- b. Increase the flow rate to 41 gtt / min for 4 hours.
The flow rate should not be adjusted to "catch up."
- d. Plan to give 1000 mL for the day shift.
The nurse must document the actual amount of IV fluid given for the shift. Because the IV is behind, the patient will not receive 1000 mL for the shift.
- e. Administer the IV fluid through an infusion pump.
The IV has been ordered to infuse via gravity. The nurse should assess the IV site to ensure proper placement.