

## How to Study Pharmacology

### 1. Learn units of measure (weights & volume)

- names of basic units of weight and volume
- prefixes
- abbreviations
- fractions
- decimals

### 2. Learn how to convert (see next page)

- using fractions
- using decimals/multiples of 10
- from base units to sub units
- from sub units to base units
- memorize common conversions like  $\frac{1}{4} = 25\% = .25 = 25/100$

### 3. Review how to do long division - practice if necessary

- divide the bottom number of a fraction into the top number
- the bottom number (denominator) becomes the divisor
- the top number (numerator) becomes the dividend
- you can't have decimals in the divisor; move them to the right and move the decimal in the dividend the *same* number of places
- the process for long division is divide, multiply, subtract, bring down, repeat as necessary
- for review, visit <http://argyll.epsb.ca/jreed/extras/longdiv/>  
do:  $200/0.4 =$

### 4. Learn the process for dosage calculation

- D = Desired dose ordered by doctor
- A = Available from pharmacy
- U = Unit form drug is available in (ie. Tablet)
- X = amount to be given (always in same units as Q)
- Solve for X:

$$\frac{D}{A} \times U = X$$

- Plug in the numbers given in the problem:

*The drug label reads 0.25 mg per ml. Give 0.4 mg.*

$$\frac{0.4 \text{ mg}}{0.25 \text{ mg}} \times 1 \text{ ml} = 1.6$$

## 5. Learn by doing

- a. Identify where you make mistakes and work to mastery
  - b. Photocopy practice sheets: do daily to mastery and review regularly
  - c. Become familiar with different ways a question can be presented
    - The medication order reads...  
*Lanoxin 0.125 is to be given...*
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# Units of Measure

## Weight: Grams

Name	Abbreviation	Fraction	Decimal

## Volume: Litres

Name	Abbreviation	Fraction	Decimal

## Conversion

1. **Base unit to sub unit (larger to smaller → R)**
  - a. use multiples of ten (times 10, 100, 1000, etc)
  - b. move the decimal to the **right**
  - c. e.g.: 10 gm = ? Mg  
1 mg = 1/1000<sup>th</sup> of a gram  
1 mg = 0.001 of a gram (3 decimal places)  
10 gm = 10,000 ml (decimal in 10 gm moved 3 places to **right**)
  - d. do: 5 L = ? ml
2. **Sub unit to base unit (smaller to larger → L)**
  - a. use fractions of base ten ( 1/10, 1/1000, etc)
  - b. e.g.: 12 mg = ? gm  
1 mg = 1/1000<sup>th</sup> of a gram  
1 mg = 0.001 of a gram (3 decimal places)  
12 mg = 0.012 gm (decimal in 12 gm moved 3 places to **left**)
  - c. do: 250 ml = ? L
3. **Do practice exercises on the next page**
  - a. aim for accuracy first, then speed
  - b. when you are familiar with the process, try doing the work mentally

**Conversion Practice: Photocopy this page before answering questions**

5 L =	ml	50 mg =	gm	<b>1 oz = 30 ml</b>	<b>Make up your own questions based on ones you found difficult.</b>	
.05 L =	ml	500 mg =	gm	2 oz =		ml
.25 L =	ml	5000 mg =	gm	4 oz =		ml
.75 L =	ml	5 mg =	gm	.5 oz =		ml
.675 L =	ml	2 gm =	mg	.25 oz =		ml
250 mg =	gm	500 mcg =	mg	.75 oz =		ml
500 mg =	gm	500 mcg =	gm	1.25 oz =		ml
750 mg =	gm	250 mcg =	mg	2.55 oz =		ml
125 mg =	gm	250 mcg =	gm	900 ml =		oz
2750 mg =	gm	25 mcg =	mg	600 ml =		oz
3250 mg =	gm	25 mcg =	gm	300 ml =		oz
650 mg =	gm	750 ml =	L	1200 ml =		oz
25 ml =	L	0.025 L =	ml	<b>1 cc = 1 ml</b>		
75 ml =	L	0.725 gm =	mg	30 cc =		ml
100 ml =	L	0.5 L =	ml	<b>1 tsp = 5 cc</b>		
125 ml =	L	1225 ml =	L	1 tsp =		ml
225 ml =	L	450 mcg =	mg	2 tsp =		cc
350 ml =	L	450 mcg =	gm	2 tsp =		ml
500 ml =	L	1000 mcg =	mg	3 tsp =		cc
1250 ml =	L	.0675 L =	ml	3 tsp =		ml
175 ml =	L	60 ml =	L	<b>3 tsp = 1 Tbs</b>		
475 ml =	L	600 ml =	L	<b>1 Tbs = 15 cc</b>		
1 mg =	gm	25 mg =	gm	1 Tbs =	ml	
2.5 mg =	gm	50 mcg =	mg	2 Tbs =	cc	
125 mg =	gm	750 mg =	mg	2 Tbs =	ml	

## Dosage Calculations

D = Desired dose ordered by doctor  
A = Available from pharmacy  
U = Unit form drug is available in (ie. Tablet)  
X = amount to be given (always in same units as Q)

Solve for X:

$$\frac{D}{A} \times U = X$$

- Ordered: Penicillin V 500 mg po q6h**  
Supply: V 250 mg/ml  
Give: (Hint: note the **ratio** between dosage ordered **D** and dosage available **A**)
- Ordered: Penicillin V 500 mg po q6h**  
Supply: V 125 mg/ml  
Give:
- Ordered: Heparin 700 units SC stat**  
Supply: 100 units/ml  
Give:
- Ordered: Heparin 500 units SC stat**  
Supply: 100 units SC stat  
Give:
- Ordered: Heparin 300 units SC stat**  
Supply: 150 units/ml  
Give:
- Ordered: Morphine 60 mg**  
Supply: 20 mg/5 cc  
Give:
- Ordered: Drug x 0.3 mg**  
Supply: 60 mcg/1.5 ml  
Give:
- Ordered: Drug y 750 units**  
Supply: 100 units/ml  
Give:

Answers: (1) 2.0 ml (2) 4.0 ml (3) 5 ml (4) 2 ml (5) 4 ml (6) 15 cc (7) 7.5 ml (8) 7.5 ml

## More Practice: Solids to Liquids

- 1. Ordered: Valium 5 mg**  
Supply: 10 mg/2 ml  
Give:
- 2. Ordered: Valium 10 mg**  
Supply: 5 mg/ml  
Give:
- 3. Ordered: Valium 20 mg**  
Supply: 10 mg/2 ml  
Give:
- 4. Ordered: Tylenol 75 mg bid**  
Supply: 25mg/5 ml  
Give:
- 5. Ordered: Tylenol 100 mg/bid**  
Supply: 25mg/5 ml  
Give:
- 6. Ordered: Cloxacillin 0.5 gm bid**  
Supply: 125 mg/ml  
Give:
- 7. Ordered: Cloxacillin 1 gm bid**  
Supply: 50 mg/ml  
Give:
- 8. Ordered: Morphine 20 mg q4h prn**  
Supply: 4 mg/ml  
Give:
- 9. Ordered: Morphine 25 mg q4h prn**  
Supply: 5 mg/ml  
Give:
- 10. Ordered: Morphine 15 mg q4h prn**  
Supply: 3 mg/ml  
Give:
- 11. Ordered: Morphine 30 mg q4h prn**  
Supply: 6 mg/ml  
Give: