

Learning Skills, Room 120

How to Study Pharmacology

Learn units of measure (weights & volume)

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

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 $\frac{1}{4} = 25\% = .25 = 25/100$

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, <https://www.calculatorsoup.com/calculators/math/longdivisiondecimals.php>

Practice: $200/0.4 =$

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 A)

Solve for X:

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

A

How to Study Pharmacology

Plug in the numbers given in the problem:

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

0.4 mg

—— x 1 ml = 1.6

0.25 mg

Learn by doing

- Identify where you make mistakes and work to mastery
- Photocopy practice sheets: do daily to mastery and review regularly
- Become familiar with different ways a question can be presented:

The medication order reads...

Lanoxin 0.125 is to be given...

Units of Measure

Weight: Grams

Volume: Litres

Conversion

Base unit to sub unit (larger to smaller → .R)

use multiples of ten (times 10, 100, 1000, etc)

move the decimal to the **right**

eg: 10 gm = ? mg

1 mg = 1/1000th 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**)

Practice: 5 L = ? ml

Sub unit to base unit (smaller to larger → .L)

use fractions of base ten (1/10, 1/100, etc)

eg: 12 mg = ? gm

1 mg = 1/1000th 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**)

Practice: 250 ml = ? L

Do following practice exercises

- aim for accuracy first, then speed
- 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	1 oz =	30 ml	Make up your own questions here based on ones you found difficult.
.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	1 cc =	1 ml	
75 ml =	L	0.725 gm =	mg	30 cc =	ml	
100 ml =	L	0.5 L =	ml	1 tsp =	5 cc	
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	3 tsp =	1 Tbs	
475 ml =	L	600 ml =	L	1 Tbs =	15 cc	
1 mg =	gm	25 mg =	gm	1 Tbs =	ml	
2.5 mg =	gm	750 mcg =	mg	2 Tbs =	cc	
125 mg =	gm	750 mg =	mg	2 Tbs =	ml	

How to Study Pharmacology

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:

D

– x **U** = **X**

A

1. 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**)

2. Ordered: Penicillin V 500 mg po q6h
Supply: V 125 mg/ml
Give:

3. Ordered: Heparin 700 units SC stat
Supply: 100 units/ml
Give:

4. Ordered: Heparin 500 units SC stat
Supply: 100 units SC stat
Give:

5. Ordered: Heparin 300 units SC stat
Supply: 150 units/ml
Give:

6. Ordered: Morphine 60 mg
Supply: 20 mg/5 cc
Give:

7. Ordered: Drug x 0.3 mg
Supply: 60 mcg/1.5 ml
Give:

8. 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

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- | | | | |
|-----|----------|-------------|---------------|
| 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: | | |