



Medication Calculation Examination Study Guide

D = Desired Dose

Q = Quantity of Solution

H = Strength on Hand

X = Unknown quantity of Drug

- Sample: Physician orders 500 mg of ibuprofen (desired **Dose**) for a patient and you have 250 mg (Quantity on **Hand**) tablets (**Quantity of solution**) on hand.

Solution: $D \div H \times Q = X$ $500\text{mg} \div 250 \text{ mg} \times 1 \text{ tablet} = 2 \text{ tablets}$

Answer: 2 tablets.

- Sample: Physician orders 1500 mg of liquid ibuprofen for a patient. Quantity of Ibuprofen is 500 mg in 1 cc, how much will you administer?

Solution: $1500 \text{ mg} \div 500 \text{ mg} \times 1 \text{ cc} = 3 \text{ cc}$

Answer: 3 cc

Dosage and Conversions

Sample: MD orders 300 mg of Ibuprofen to be taken by a 6 kg infant every 4 hours. Label shows 75 – 150 mg/kg per day. Is the physician's order within normal range?

Solution: $6 \times 75 = 450 \text{ mg}$ (minimum dosage per day); $150 \times 6 = 900$ (maximum dosage per day)

$24 \div 4 = 6 \text{ dosages}$; $300 \times 6 = 1800$

Answer: Dosage is not within range

IV Calculations

- [amount of fluid to be infused] x [drop factor] \div minutes to infuse = gtts/min
- *Sample:* Dr. A. orders your patient to receive 125 ml of D5W an hour for the next 8 hours. The nursing unit uses tubing with a drop factor of 10. What is the drip rate per minute?
- *Solution:* Convert 1 hour to 60 minutes: $1250 \times 10 \text{ gtts} \div 60 \text{ minutes} = 20.83$ or 21 gtts/min
Answer: 21 gtts/min



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- *Sample:* Dr. B. orders a liter of D5W to run this 8-hour shift. The drop factor is 15. What is the drip rate per minute?

Solution: 1 liter = 1000 cc of solution, next convert 8 hours to minutes (8 X 60 minutes) = 480 minutes

$$1000 \text{ cc} \times 15 \text{ gtts} \div 480 \text{ minutes} = 31.25 \text{ or } 31 \text{ gtts/min}$$

Answer: 31 gtts/min

- Your patient weighs 200 lb and the order is to infuse 250 mg dobutamine in 500 ml NS at 10 mcg/kg/min. How many milligrams of dobutamine will infuse per hour?

$$200 \div 2.2 = 90.90 \text{ kg}; 60 \text{ minutes} = 1 \text{ hour:}$$

$$10 \text{ mcg} \times 90.90 \text{ kg} \times 60 \text{ min} = 5454.54 \text{ mcg/hour} \div 1000 = 5.45454 \text{ mg/hr or } 5.5 \text{ mg/hr}$$

Answer: 5.5mg/hr

The “7 Rights” of Medication Administration

Right Patient	Right Drug	Right Dose	Right Route
Right Time	Right Documentation	Right to Refuse	

Conversion Table

- 1 kilogram (kg) = 1000 grams (g)
- 1 gram (g) = 1000 milligrams (mg)
 - Convert Grams to Milligrams by Multiplying grams by 1,000
 - Convert Milligrams to grams by dividing milligrams by 1,000
- 1 milligram (mg) = 1000 micrograms (mcg)
- Grains (gr.) 15 = 1 Gram (g) or 1000 milligrams (mg)
 - To convert g. to gr multiply by 15
 - To convert gr to g divide by 15.
- 1 Grain (gr.) = 60 Milligrams (mg)
 - To convert gr. to mg multiply gr. by 60
 - To convert mg to gr. divide mg. by 60
- 1ml = 1 cc
- 1 ounce = 30 ml
- 1 tablespoon (T or tbsp) = 15 ml
- 1 teaspoon (t or tsp) = 5 ml
- 2.2 lb = 1 kg
- To convert pounds to kg divide pounds by 2.2
- To convert kg to pounds multiply by 2.2

Medication Calculations

	Equals	Also Equals
1 kilograms (kg)	1000 grams (g)	2.2 pounds (lb)
1 gram (g)	1000 milligrams (mg)	1,000,000 micrograms (mcg)
0.001 grams (g)	1 milligram (mg)	1000 micrograms (mcg)
1 microgram (mcg)	0.001 milligrams (mg)	
4 cups (C)	1 liter (L)	1000 milliliters (ml)
2 cups (C)	16 ounces (oz)	1 pound (lb)
1 cup (C)	8 ounces (oz)	240 milliliters (ml)
1 ounce (oz)	30 milliliters (ml)	450 drops (gtts)
1 ml = 1 cc	15 drops (gtts)	
1 tablespoon (tbsp)	15 milliliters (ml)	
1 teaspoon (tsp)	5 milliliters (ml)	
1 grain (gr)	60 milligram (mg)	

To change g to mg multiply by 1000

To change mg to g divide by 1000