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 Ibuprophen 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;} \quad 300 \times 6 = 1800
Answer: Dosage is not within range

IV Calculations

• [amount of fluid to be infused] \times [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 \text{or} 21 \text{gtts/min}

Answer: 21 gtts/min
Medication Calculation Examination Study Guide

- **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:** \(31 \text{ gtts/min}\)

- 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 = 54.54 \text{ mg/hr or } 54.5 \text{ mg/hr}
  \]

  **Answer:** \(54.5 \text{ mg/hr}\)

**The “7 Rights” of Medication Administration**

<table>
<thead>
<tr>
<th>Right Patient</th>
<th>Right Drug</th>
<th>Right Dose</th>
<th>Right Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Time</td>
<td>Right Documentation</td>
<td>Right to Refuse</td>
<td></td>
</tr>
</tbody>
</table>

**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