

2. Estimate the products:

- $42 \times 39 =$
- $596 \times 204 =$
- $8431 \times 9760 =$
- $0.0726 \times 6951 =$
- $6.1 \times 67.39 =$

3. Estimate the quotients:

- $171 \div 19 =$
- $184 \div 2300 =$
- $98,000 \div 49 =$
- $1.0745 \div 500 =$
- $458.4 \div 8 =$

### CALCQUIZ

- Digoxin oral solution contains 0.05 mg (milligram) of digoxin in each milliliter (mL) of elixir. If there are 1000 mcg (micrograms) in each milligram, how many micrograms of digoxin would be delivered in each dose of 0.6 mL?
- A probiotic colon health product contains, in each capsule, 3 billion viable cells of *Lactobacillus acidophilus* and *Bifidobacterium longum*. Express the number of viable cells in a container of 30 capsules.
- Simethicone oral suspension contains 20 mg of drug in each 0.3-mL dose. How many milligrams of simethicone would be contained in a 30-mL container of the suspension?
- The drug pramlintide (SYMLIN) is an antihyperglycemic agent for use in patients with diabetes treated with insulin. The drug is supplied in a pen-injector containing a solution with a concentration of 1000 mcg of pramlintide per milliliter. How many milliliters of the solution should be used to supply an initial dose of 15 mcg of pramlintide?
- A physician prescribed mometasone furoate monohydrate (NASONEX) nasal spray for a patient, with directions to administer two sprays into each nostril once daily. If each spray contains 50 mcg of drug and the container can deliver a total of 120 sprays, how many micrograms of drug would the patient receive daily, and how many days of use will the prescription last the patient?

### ANSWERS TO "CASE IN POINT" AND PRACTICE PROBLEMS

#### Case in Point 1.1

1 teaspoonful = 5 mL

Adult dose = 2 teaspoonfuls = 10 mL

a. Child's dose =  $\frac{1}{4} \times 10 \text{ mL}$  (2 teaspoonfuls) = 2.5 mL

b.  $\frac{10 \text{ mg}}{5 \text{ mL}} \times 2.5 \text{ mL} = 5 \text{ mg dextromethorphan HBr}$

(Continued)

and

$$\frac{100 \text{ mg}}{5 \text{ mL}} \times 2.5 \text{ mL} = 50 \text{ mg guaifenesin}$$

Proof of calculations: child's dose is  $\frac{1}{4}$  of adult dose:

$$\text{Child's calculated dose of cough syrup/adult dose} = 2.5 \text{ mL}/10 \text{ mL} = \frac{1}{4} \checkmark$$

$$\text{Child's calculated dose of dextromethorphan HBr/adult dose} = 5 \text{ mg}/20 \text{ mg} = \frac{1}{4} \checkmark$$

$$\text{Child's calculated dose of guaifenesin/adult dose} = 50 \text{ mg}/200 \text{ mg} = \frac{1}{4} \checkmark$$

### Ratio, Proportion, and Dimensional Analysis

1. 0.4 mL insulin injection
2. 3.75 mL
3. 2.75 g diazepam
4. 192 mg
5. 420 mg codeine phosphate  
4200 mg acetaminophen
6. 240 mg dextromethorphan hydrobromide
7. 0.13 mg
8. 300 mcg filgrastim
9. 32 mg lopinavir and 8 mg ritonavir
10. 0.7 mL aripiprazole injection
11. 18,920 mg acyclovir
12. 0.15 mg fluoride ion
13. 150 units vitamin A
14. 20,000 mg
15. 44 mg elemental iron
16. 26 cm<sup>2</sup>
17. 0.1 mg dexamethasone phosphate
18. a. 300 sprays  
b. 450 mg
19. 16,000,000 units
20. 2.4 mcg ciprofloxacin

### Percent

1. 54 patients
2. 30.69% DEPAKOTE subjects  
9.88% placebo subjects
3. 0.69 or 68.58%
4. 0.012 or 1.24% of patients
5. 2 patients

**Estimation**

1. a. 20,500 (19,881)  
b. 14,500 (14,320)  
c. \$240.00 (\$253.19)
2. a.  $40 \times 40 = 1600$  (1638)  
b.  $600 \times 200 = 120,000$  (121,584)  
c.  $8000 \times 10,000 = 80,000,000$  (82,286,560)  
d.  $(7 \times 70) = 490$  (504.6426)  
e.  $6 \times 70 = 420$  (411.079)
3. a.  $170 \div 20 = 8.5$  (9)  
b.  $180 \div 2000 = 0.09$  (0.08)  
c.  $9800 \div 5 = 1960$  (2000)  
d.  $0.01 \div 5 = 0.002$  (0.002149)  
e.  $460 \div 8 = 57.5$  (57.3)

**References**

1. Institute for Safe Medication Practices. List of error-prone abbreviations. Available at: <https://ismp.org/recommendations/error-prone-abbreviations-list>. Accessed September 22, 2019.
2. Dimensional Analysis-Tripod.com. Available at: <http://susanp3.tripod.com/snurse/id28.htm>. Accessed September 22, 2019.
3. Craig GP. *Clinical Calculations Made Easy*. 4th Ed. Baltimore, MD: Lippincott Williams & Wilkins; 2008.

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