Formula Method	Proportion	Dimensional Analysis
$\dfrac{\overset{4}{\cancel{0.500}} \text{ mg}}{\underset{1}{\cancel{0.125}} \text{ mg}} \times 1 \text{ tablet}$ $= 4 \text{ tablets}$	**EXPRESSED AS TWO RATIOS** 1 tablet:0.125 mg : : x:0.5 mg **EXPRESSED AS TWO FRACTIONS** $\dfrac{1 \text{ tablet}}{0.125 \text{ mg}} \times \dfrac{x}{0.5 \text{ mg}}$ **SOLUTION FOR BOTH** **PROPORTION METHODS** $0.5 = 0.125x$ $\dfrac{\overset{4}{\cancel{0.500}} \text{ mg}}{\underset{1}{\cancel{0.125}} \text{ mg}} = x$ $4 \text{ tablets} = x$	$\dfrac{1 \text{ tablet}}{\underset{1}{\cancel{0.125}} \text{ mg}} \;\bigg|\; \dfrac{\overset{4}{\cancel{0.500}} \text{ mg}}{} = 4 \text{ tablets}$

Ben Ruettiger

Solve these practice problems. Answers are given at the end of the chapter. Remember the four methods:

Formula Method	Proportion	Dimensional Analysis
$\dfrac{\text{Desire}}{\text{Have}} \times \text{Supply} = x$	**EXPRESSED AS TWO RATIOS** Supply:Have : : x:Desire **EXPRESSED AS TWO FRACTIONS** $\dfrac{\text{Supply}}{\text{Have}} = \dfrac{x}{\text{Desire}}$	$\dfrac{\text{Supply}}{\text{Have}} \;\bigg|\; \text{Desire} \quad$ (add conversion factors as needed)

1. Order: dexamethasone 1.5 mg po bid
   Supply: tablets labeled 0.75 mg
   $\dfrac{1 \text{ tab}}{0.75mg} \;\bigg|\; 1.5mg = \boxed{2 \text{ tabs}}$

2. Order: digoxin 0.25 mg po every day
   Supply: scored tablets labeled 0.5 mg
   $\dfrac{1 \text{ tab}}{0.5mg} \;\bigg|\; 0.25ms = \boxed{0.5 \text{ tab}}$

3. Order: ampicillin 0.5 g po q6h
   Supply: capsules labeled 250 mg
   $\dfrac{1 \text{ cap}}{0.25g} \;\bigg|\; 0.5g = \boxed{2 \text{ caps}}$

4. Order: prednisone 10 mg po tid
   Supply: tablets labeled 2.5 mg
   $\dfrac{1 \text{ tab}}{2.5 mg} \;\bigg|\; 10mg = \boxed{4 \text{ tabs}}$

5. Order: aspirin 650 mg po stat
   Supply: tablets labeled 325 mg
   $\dfrac{1 \text{ tab}}{325mg} \;\bigg|\; 650mg = \boxed{2 \text{ tabs}}$

6. Order: nifedipine 20 mg po bid
   Supply: capsules labeled 10 mg
   $\dfrac{1 \text{ cap}}{10mg} \;\bigg|\; 20 \text{ mg} = \boxed{2 \text{ caps}}$

7. Order: fluphenazine 10 mg po daily
   Supply: tablets labeled 2.5 mg
   $\dfrac{1 \text{ tab}}{2.5mg} \;\bigg|\; 10mg = \boxed{4 \text{ tabs}}$

SELF-TEST 1   Oral Solids (Continued)

8. Order: penicillin G potassium 200,000 units po q8h
   Supply: scored tablets labeled 400,000 units

   $\dfrac{1\ tab}{400,000u} \times 200,000u = \boxed{0.5\ tab}$

9. Order: digoxin 0.5 mg po every day
   Supply: scored tablets labeled 0.25 mg

   $\dfrac{1\ tab}{0.25mg} \times 0.5mg = \boxed{2\ tabs}$

10. Order: captopril 18.75 mg po tid
    Supply: scored tablets labeled 12.5 mg

    $\dfrac{1\ tab}{12.5mg} \times 18.75ms = \boxed{1.5\ tabs}$

11. Order: quetiapine 300 mg po bid
    Supply: scored tablets labeled 200 mg

    $\dfrac{1\ tab}{200mg} \times 300mg = \boxed{1.5\ tabs}$

12. Order: clonidine 0.3 mg po at bedtime
    Supply: tablets labeled 0.1 mg

    $\dfrac{1\ tab}{0.1mg} \times 0.3mg = \boxed{3\ tabs}$

13. Order: captopril 6.25 mg po bid
    Supply: scored tablets labeled 25 mg

    $\dfrac{1\ tab}{25mg} \times 6.25mg = \boxed{0.25\ tabs}$

14. Order: clonidine 400 mcg po every day
    Supply: tablets labeled 0.2 mg

    $\dfrac{1\ tab}{0.2mg} \times 0.4mg = \boxed{2\ tabs}$

15. Order: warfarin 7.5 mg po every day
    Supply: scored tablets labeled 5 mg

    $\dfrac{1\ tab}{5mg} \times 7.5mg = \boxed{1.5\ tabs}$

16. Order: glyburide 0.625 mg every day
    Supply: scored tablets labeled 1.25 mg

    $\dfrac{1\ tab}{1.25mg} \times 0.625mg = \boxed{0.5\ tab}$

17. Order: naproxen 0.5 g po every day
    Supply: scored tablets labeled 250 mg

    $\dfrac{1\ tab}{0.25g} \times 0.5g = \boxed{2\ tabs}$

18. Order: hydrochlorothiazide 37.5 mg po every day
    Supply: scored tablets labeled 25 mg

    $\dfrac{1\ tab}{25mg} \times 37.5mg = \boxed{1.5\ tabs}$

19. Order: cephalexin 1 g po q6h
    Supply: capsules labeled 500 mg

    $\dfrac{1\ cap}{500mg} \times 1000mg = \boxed{2\ caps}$

20. Order: baclofen 25 mg po tid
    Supply: scored tablets labeled 10 mg

    $\dfrac{1\ tab}{10mg} \times 25mg = \boxed{2.5\ tabs}$

peds

Ben Ruettiger

## PROFICIENCY TEST 1 ▷ Calculations of Liquid Injections

Name: __Ben Ruettiger__

Solve these injection problems. Draw a line on the syringe indicating the amount you would prepare in milliliters. See Appendix A for answers.

1. Order: sodium amytal 0.1 g IM at 7 AM = 100 mg
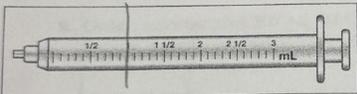   Supply: ampule of liquid labeled 200 mg/3 mL   1.5 mL
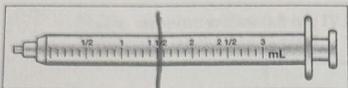
2. Order: morphine sulfate 5 mg IV stat
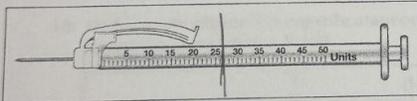   Supply: vial of liquid labeled 15 mg/mL (round to the nearest hundredths)
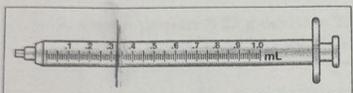
   $$\frac{1\,mL}{15\,mg}\left|\frac{5\,mg}{}\right. = 0.33\,mL$$

3. Order: diphenhydramine 25 mg IM q4h prn
   Supply: ampule of liquid labeled 50 mg/2 mL

   $$\frac{2\,mL}{50\,mg}\left|\frac{25\,mg}{}\right. = 1\,mL$$

4. Order: NPH insulin 15 units and regular insulin 5 units subcutaneous every day at 7 AM
   Supply: vials of NPH insulin 100 units/mL and regular insulin 100 units/mL

   $$NPH \quad \frac{100\,u}{1\,mL}\left|\frac{15\,u}{}\right. = 6.66\,u$$
   $$Reg \quad \frac{100\,u}{1\,mL}\left|\frac{5\,u}{}\right. = 20\,u$$
   $$\boxed{26.6\,u}$$

5. Order: prepare 20 mEq potassium chloride (that will be added to IV fluids for infusion)
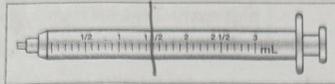   Supply: vial of liquid labeled 40 mEq per 10 mL
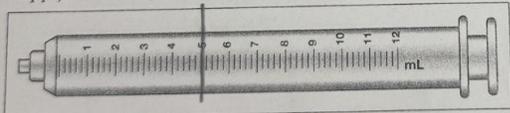
   $$\frac{10\,mL}{40\,mEq}\left|\frac{20\,mEq}{}\right. = 5\,mL$$

(continued)

PROFICIENCY TEST 1 ▶ **Calculations of Liquid Injections (*continued*)**
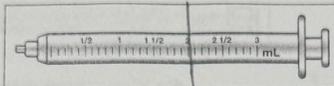
6. Order: scopolamine 0.6 mg subcutaneous stat
   Supply: vial labeled 0.4 mg/mL

   $$\frac{1\,mL}{0.4mg} \bigg| \frac{0.6mg}{} = 1.5\,mL$$

7. Order: atropine sulfate 0.8 mg IV now
   Supply: vial labeled 0.4 mg/mL

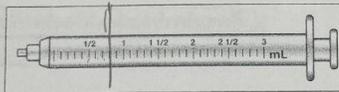 $$\frac{1\,mL}{0.4mg} \bigg| \frac{0.8mg}{} = 2\,mL$$

8. Order: prepare 0.25 g dextrose 25% (that will be added to IV fluids for infusion)
   Supply: vial of liquid labeled 25% dextrose injection 250 mg/mL

   $$\frac{1\,mL}{250mg} \bigg| \frac{250mg}{} = 1\,mL$$
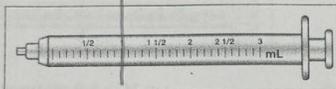
9. Order: ascorbic acid 200 mg IM bid
   Supply: ampule labeled 500 mg/2 mL
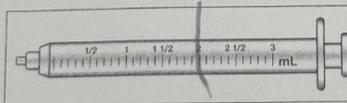
   $$\frac{2\,mL}{500mg} \bigg| \frac{200mg}{} = 0.8\,mL$$

10. Order: epinephrine 7.5 mg subcutaneous stat
    Supply: ampule labeled 1:100

    $$\frac{100mL}{1000mg} \bigg| \frac{7.5mg}{} = 0.75\,mL$$
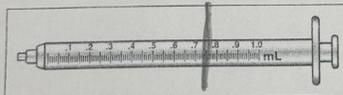
11. Order: diazepam 10 mg IV now
    Supply: vial labeled 5 mg/mL

    $$\frac{1\,mL}{5mg} \bigg| \frac{10mg}{} = 2\,mL$$

PROFICIENCY TEST 1 ▸ Calculations of Liquid Injections (*continued*)

12. Order: chlordiazepoxide 25 mg IM bid
    Supply: vial labeled 100 mg per 2 mL

$$\frac{2\,mL}{100\,mg} \bigg| 25\,mg = 0.5\,mL$$
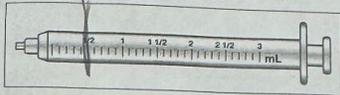
13. Order: hydroxyzine 50 mg IM bid
    Supply: vial labeled 25 mg/mL

$$\frac{1\,mL}{25\,mg} \bigg| 50\,mg = 2\,mL$$
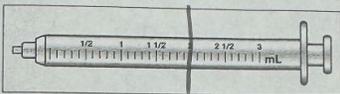
14. Order: lorazepam 0.5 mg IV q4h
    Supply: vial labeled 1 mg/mL

$$\frac{1\,mL}{1\,mg} \bigg| 0.5\,mg = 0.5\,mL$$
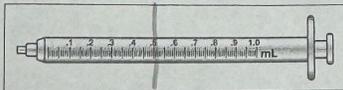
15. Order: phenytoin 0.2 g IM stat
    Supply: vial labeled 200 mg/2 mL

$$\frac{2\,mL}{200\,mg} \bigg| 200\,mg = 2\,mL$$
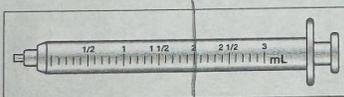
Ben Ruettiger

SELF-TEST 2   Dosage Calculations

In these practice problems, determine whether the doses are safe and calculate the amount needed. Round the lb to kg weight conversions to the nearest hundredth. Answers appear at the end of the chapter. Unless stated, solve for the amount of drug per dose.

handwritten: $\dfrac{20mg}{kg} \Big| \dfrac{9.09kg}{} = 181.82\,mg \div 3 = 60.3$ ✓ Safe

1. **Order:** amoxicillin 60 mg po q8h
   Child: Weight 20 lb   *handwritten:* $\dfrac{20\,lbs}{} \Big| \dfrac{1kg}{2.2lb} = 9.09\,kg$ $\dfrac{40mg}{kg} \Big| \dfrac{9.09kg}{} = 363.64\,mg \div 3 = 121$
   Supply: amoxicillin 125 mg/5 mL   *handwritten:* $\dfrac{5mL}{} \Big| \dfrac{60mg}{125} = 2.4mL$
   Literature: 20 to 40 mg/kg/day in divided doses q8h

2. **Order:** amoxicillin/clavulanate 175 mg po q8h   *handwritten:* $\dfrac{40mg}{kg} \Big| \dfrac{13.18kg}{} = 527.27\,mg \div 3 = 175\,mg$ ✓
   Child: Weight 29 lb   *handwritten:* $\dfrac{29\,lbs}{} \Big| \dfrac{1kg}{2.2lbs} = 13.18\,kg$ SAFe✓   Safe
   Supply: Bottle of 125 mg/5 mL
   Literature: 40 mg/kg/day in divided doses q8h

3. **Order:** ferrous sulfate 200 mg po tid
   Child: 9 years old and weighs 30 kg   *handwritten:* $\dfrac{5mL}{125mg} \Big| \dfrac{200mg}{} = 8mL$
   Supply: bottle of 125 mg/5 mL   *handwritten:* SAFe✓ 200mg/dose
   Literature: children 6 to 12 years old, 600 mg/day, in divided doses tid

4. **Order:** acetaminophen 80 mg po q4h prn for temp 100.9° F and above
   Child: 6 years old and weighs 20.5 kg   *handwritten:* dose too low, safe but
   Supply: chewable tablets 80 mg   *handwritten:* SAFe✓   call provider
   Literature: For child 6 to 8 years, give four chewable tablets. May repeat four or five times daily. Not to exceed five doses in 24 hours.

5. **Order:** diazepam 1 mg IM q3–4h prn
   Infant: 30 days old
   Supply: vial 5 mg/1 mL   *handwritten:* SAFe✓
   Literature: child <6 mo IM 1 to 2.5 mg tid or qid

6. **Order:** Morphine 2 mg subcutaneous q3–4h for pain   *handwritten:* $\dfrac{0.05\,mg}{kg} \Big| \dfrac{14kg}{} = 0.7mg$ SAFe ✓
   Child: 3 years old and weighs 14 kg
   Supply: injection labeled 2 mg/mL   *handwritten:* $\dfrac{0.2mg}{} \Big| \dfrac{14kg}{} = 2.8\,mg$
   Literature: starting dose 0.05 to 0.2 mg/kg; not to exceed 15 mg/dose

7. **Order:** metoclopramide 5 mg po q6h   *handwritten:* $\dfrac{0.1\,mg}{} \Big| \dfrac{30kg}{} = 3mg$
   Child: 3 years old and weighs 30 kg   *handwritten:* SAFe ✓
   Supply: syrup 5 mg/5 mL   *handwritten:* $\dfrac{0.2mg}{} \Big| \dfrac{30kg}{} = 6\,mg$
   Literature: 0.1 to 0.2 mg/kg/dose up to four times a day

8. **Order:** cefotaxime 0.5 g IM q6h   *handwritten:* 500 mg = 2,000mg $\dfrac{100\,mg}{} \Big| \dfrac{21.81kg}{} = 2181\,mg$ Under ✓ but safe
   Child: Weight 48 lb   *handwritten:* $\dfrac{48lbs}{} \Big| \dfrac{1kg}{2.2lb} = 21.81\,kg$
   Supply: injection reconstituted 300 mg per 1 mL   *handwritten:* $\dfrac{200mg}{} \Big| \dfrac{21.81kg}{} = 4362\,mg$ call provider
   Literature: for children <50 kg, 100 to 200 mg/kg/day, divided q6h

9. **Order:** azithromycin po 300 mg × 1 dose   *handwritten:* $\dfrac{10mg}{} \Big| \dfrac{30kg}{} = 300mg$ SAFe✓
   Child: 10 years old and weighs 30 kg
   Supply: oral suspension 100 mg/5 mL in 15-mL bottle
   Literature: children 2 to 15 years, 10 mg/kg (not more than 500 mg/dose) on day 1

10. **Order:** phenytoin po 60 mg bid   *handwritten:* 4mg
    Infant: Weight 12 lb 8 oz
    Supply: phenytoin suspension 30 mg/5 mL
    Literature: 4 to 8 mg/kg/day divided into two doses. Maximum dose is 300 mg/day.

handwritten:

$\dfrac{12\,lb}{} \Big| \dfrac{1kg}{2.2\,lb} = 5.45\,kg = 5.68\,kg$ unsafe ✓ call provider

$\dfrac{8\,oz}{16\,oz} \Big| \dfrac{1lb}{} \Big| \dfrac{1kg}{2.2lb} = 0.227$

$\dfrac{4\,mg}{} \Big| \dfrac{5.68kg}{} = 22.72\,mg / 2 = 11.36\,mg$

$\dfrac{8\,mg}{} \Big| \dfrac{5.68kg}{} = 45.44\,mg / 2 = 22.72\,mg$