Chapter 6: Practice Problem Answers

DOSING REGIMENS AND DOSAGE CALCULATIONS

Please note: If dosing in kg, use 2 decimal places for calculations. When dosing in mg, round to the nearest whole number.

1. If a patient weighs 76 kg and the usual preoperative dose of midazolam is 0.08 mg/kg, what would the dose for this patient be?

$$76\ \text{kg} \times \frac{0.08\ \text{mg}}{\text{kg}} = 76\ \cancel{\text{kg}} \times \frac{0.08\ \text{mg}}{\cancel{\text{kg}}} = 76 \times 0.08\ \text{mg} = 6.08\ \text{mg} \approx 6\ \text{mg}$$

2. If a chloral hydrate is dosed at 25 mg/kg/day as a sedative for children, what is the dose for a 30 lb child?

$$30\ \text{lb} \div \frac{2.2\ \text{lb}}{\text{kg}} = 30\ \text{lb} \times \frac{\text{kg}}{2.2\ \text{lb}} = 30\ \cancel{\text{lb}} \times \frac{\text{kg}}{2.2\ \cancel{\text{lb}}} = \frac{30\ \text{kg}}{2.2} = 13.64\ \text{kg}$$

$$\frac{25\ \text{mg}}{\text{kg}} \times 13.64\ \text{kg} = \frac{25\ \text{mg}}{\cancel{\text{kg}}} \times 13.64\ \cancel{\text{kg}} = 25\ \text{mg} \times 13.64 = 341\ \text{mg/day}$$

3. If a dose of a medication is 75 mg/kg/day in four divided doses, what is the dose for a 210 lb patient?

$$210\ \text{lb} \div \frac{2.2\ \text{lb}}{\text{kg}} = 210\ \text{lb} \times \frac{\text{kg}}{2.2\ \text{lb}} = 210\ \cancel{\text{lb}} \times \frac{\text{kg}}{2.2\ \cancel{\text{lb}}} = \frac{210\ \text{kg}}{2.2} = 95.45\ \text{kg}$$

$$95.45\ \text{kg} \times \frac{75\ \text{mg}}{\text{kg}} \times \frac{1}{\text{day}} \div \frac{4\ \text{doses}}{\text{day}} = 95.45\ \text{kg} \times \frac{75\ \text{mg}}{\text{kg}} \times \frac{1}{\text{day}} \times \frac{\text{day}}{4\ \text{doses}}$$

$$95.45\ \cancel{\text{kg}} \times \frac{75\ \text{mg}}{\cancel{\text{kg}}} \times \frac{1}{\cancel{\text{day}}} \times \frac{\cancel{\text{day}}}{4\ \text{doses}} = \frac{7{,}158.75\ \text{mg}}{4\ \text{doses}} = 1{,}789.69 \approx 1{,}790\ \text{mg/dose}$$

4. The doctor orders glucagon 25 mcg/kg for an infant who is severely hypoglycemic. If the infant weighs 16 pounds, what would the dose of glucagon be?

$$16\text{ lb} \div \frac{2.2\text{ lb}}{\text{kg}} = 16\text{ lb} \times \frac{\text{kg}}{2.2\text{ lb}} = 16\ \cancel{\text{lb}} \times \frac{\text{kg}}{2.2\ \cancel{\text{lb}}} = \frac{16\text{ kg}}{2.2} = 7.27\text{ kg}$$

$$7.27\text{ kg} \times \frac{25\text{ mcg}}{\text{kg}} = 7.27\ \cancel{\text{kg}} \times \frac{25\text{ mcg}}{\cancel{\text{kg}}} = 7.27 \times 25\text{ mcg} = 181.75 \approx 182\text{ mcg/dose}$$

5. If the dose of a medication is 35 mg/kg/day in two divided doses, what is the dose for a 115 lb patient?

$$115\text{ lb} \div \frac{2.2\text{ lb}}{\text{kg}} = 115\ \cancel{\text{lb}} \times \frac{\text{kg}}{2.2\ \cancel{\text{lb}}} = \frac{115\text{ kg}}{2.2} = 52.27\text{ kg}$$

$$52.27\text{ kg} \times \frac{35\text{ mg}}{\text{kg}} \times \frac{1}{\text{day}} \times \frac{\text{day}}{2\text{ doses}} = 52.27\ \cancel{\text{kg}} \times \frac{35\text{ mg}}{\cancel{\text{kg}}} \times \frac{1}{\cancel{\text{day}}} \times \frac{\cancel{\text{day}}}{2\text{ doses}}$$

$$\frac{1{,}829.45}{2\text{ doses}} = 914.73 \approx 915\text{ mg/dose}$$

6. If the dose of a medication is 18 mg/kg/day in three divided doses, what is the dose for a 254 lb patient?

$$254\text{ lb} \times \frac{\text{kg}}{2.2\text{ lb}} = 254\ \cancel{\text{lb}} \times \frac{\text{kg}}{2.2\ \cancel{\text{lb}}} = \frac{254\text{ kg}}{2.2} = 115.45\text{ kg}$$

$$115.45\text{ kg} \times \frac{18\text{ mg}}{\text{kg}} \times \frac{1}{\text{day}} \times \frac{\text{day}}{3\text{ doses}} = 115.45\ \cancel{\text{kg}} \times \frac{18\text{ mg}}{\cancel{\text{kg}}} \times \frac{1}{\cancel{\text{day}}} \times \frac{\cancel{\text{day}}}{3\text{ doses}}$$

$$\frac{2{,}078.1\text{ mg}}{3\text{ doses}} = 692.7 \approx 693\text{ mg/dose}$$

7. How many grams of medication is to be dispensed in the following dosing regimen: Ibuprofen 800 mg – take one tablet t.i.d. for 4 days

$$\frac{800\text{ mg}}{\text{tab}} \times \frac{3\text{ tab}}{\text{day}} \times 4\text{ days} = \frac{800\text{ mg}}{\cancel{\text{tab}}} \times \frac{3\ \cancel{\text{tab}}}{\cancel{\text{day}}} \times 4\ \cancel{\text{days}} = 800\text{ mg} \times 3 \times 4 = 9{,}600\text{ mg}$$

$$9{,}600\text{ mg} \div \frac{1{,}000\text{ mg}}{1\text{ g}} = 9{,}600\text{ mg} \times \frac{1\text{ g}}{1{,}000\text{ mg}} = 9{,}600\ \cancel{\text{mg}} \times \frac{1\text{ g}}{1{,}000\ \cancel{\text{mg}}}$$

$$\frac{9{,}600\text{ g}}{1{,}000} = 9.6\text{ grams}$$

OR:

$$800\text{ mg} = 0.8\text{ g}$$

$$\frac{0.8\text{ g}}{\text{tab}} \times \frac{3\text{ tabs}}{\text{day}} \times 4\text{ days} = \frac{0.8\text{ g}}{\cancel{\text{tab}}} \times \frac{3\ \cancel{\text{tabs}}}{\cancel{\text{day}}} \times 4\ \cancel{\text{days}} = 0.8\text{ g} \times 3 \times 4 = 9.6\text{ grams}$$

8. If the physician prescribes acetaminophen with codeine #3 po 1 to 2 tablets every 4-6 hours PRN for 3 days, how many total tablets is prescribed to be dispensed?

Maximum – 2 acetaminophen with codeine #3 tabs every 4 hours

$$\frac{24\text{ hrs}}{\text{day}} \div \frac{4\text{ hrs}}{\text{dose}} = \frac{24\text{ hrs}}{\text{day}} \times \frac{\text{dose}}{4\text{ hrs}} = \frac{24\ \cancel{\text{hrs}}}{\text{day}} \times \frac{\text{dose}}{4\ \cancel{\text{hrs}}} = \frac{24\text{ doses}}{4\text{ days}} = 6\text{ doses/day}$$

$$\frac{2\text{ tabs}}{\text{dose}} \times \frac{6\text{ doses}}{\text{day}} \times 3\text{ days} = \frac{2\text{ tabs}}{\cancel{\text{dose}}} \times \frac{6\ \cancel{\text{doses}}}{\cancel{\text{day}}} \times 3\ \cancel{\text{days}} = 2\text{ tabs} \times 6 \times 3 = 36\text{ tabs}$$

Use the following scenario to solve problems 9 through 12.

A physician prescribes phenytoin 6 mg/kg/day divided into three daily doses for a 330-pound female patient to control convulsions. The physician is investigating using 150 mg phenytoin capsules compounded by the pharmacy, instead of the commercially-available options, in order to reduce the number of capsules the patient must take each day.

9. How much phenytoin should be administered for each dose?

$$330 \text{ lb} \times \frac{1 \text{ kg}}{2.2 \text{ lb}} = 330 \cancel{\text{lb}} \times \frac{1 \text{ kg}}{2.2 \cancel{\text{lb}}} = \frac{330 \text{ kg}}{2.2} = 150 \text{ kg}$$

$$150 \text{ kg} \times \frac{6 \text{ mg}}{\text{kg}} \times \frac{1}{\text{day}} = 150 \cancel{\text{kg}} \times \frac{6 \text{ mg}}{\cancel{\text{kg}}} \times \frac{1}{\text{day}} = \frac{150 \times 6 \text{ mg} \times 1}{\text{day}} = 900 \text{ mg/day}$$

$$\frac{900 \text{ mg}}{\text{day}} \times \frac{\text{day}}{3 \text{ doses}} = \frac{900 \text{ mg}}{\cancel{\text{day}}} \times \frac{\cancel{\text{day}}}{3 \text{ doses}} = 300 \text{ mg/dose}$$

10. If the doctor prescribed the phenytoin for a total of five days, how many milligrams of medication should be dispensed?

$$300 \text{ mg} \times \frac{3 \text{ doses}}{\text{day}} \times 5 \text{ days} = 300 \text{ mg} \times \frac{3 \text{ doses}}{\cancel{\text{day}}} \times 5 \cancel{\text{days}} = 4{,}500 \text{ mg}$$

11. The pharmacy is unable to compound 150 mg capsules and must order the commercially-available 50 mg chewable tablets. How many tablets would be dispensed for 10 days of therapy?

$$\frac{300 \text{ mg}}{\text{dose}} \div \frac{50 \text{ mg}}{\text{tab}} = \frac{300 \text{ mg}}{\text{dose}} \times \frac{\text{tab}}{50 \text{ mg}} = \frac{150 \cancel{\text{mg}}}{\text{dose}} \times \frac{\text{tab}}{50 \cancel{\text{mg}}} = \frac{300 \text{ tabs}}{50 \text{ doses}} = 6 \text{ tabs/dose}$$

$$\frac{6 \text{ tabs}}{\text{dose}} \times \frac{3 \text{ doses}}{\text{day}} \times 10 \text{ days} = \frac{6 \text{ tabs}}{\cancel{\text{dose}}} \times \frac{3 \cancel{\text{doses}}}{\cancel{\text{day}}} \times 10 \cancel{\text{days}} = 180 \text{ chewable tablets}$$

12. The patient continues to experience convulsions, so the doctor increases the daily dose to 8 mg/kg/day. The pharmacy is now able to compound the phenytoin solution150 mg/5mL solution (please note: book lists "capsule" in error). How many milliliters will the patient take each day?

Weight is 150 kg.

$$150\ \text{kg} \times \frac{8\ \text{mg}}{\text{kg}} \times \frac{1}{\text{day}} = 150\ \cancel{\text{kg}} \times \frac{8\ \text{mg}}{\cancel{\text{kg}}} \times \frac{1}{\text{day}} = 1{,}200\ \text{mg/day}$$

$$1{,}200\ \text{mg/day} \div 150\ \text{mg/5 ml} = 1{,}200 \times \frac{5\text{mL}}{150\text{mg}} = \frac{1{,}200\ \cancel{\text{mg}} \times 5\ \text{mL}}{150\ \cancel{\text{mg}}}$$

$$= \frac{6{,}000\ \text{mL}}{150} = 40\ \text{mL/day}$$

Use the following scenario to solve problems 13 and 14.

A geriatric patient who has difficulty swallowing large tablets presents a prescription for Erythromycin 400 mg/5 mL with directions to take 500 mg every 12 hours for 10 days.

13. Determine the amount of suspension needed to make one 500 mg dose.

$$\frac{400\ \text{mg}}{5\ \text{mL}} = \frac{500\ \text{mg}}{\text{Z}} \times 400\ \text{mg} \times \text{Z} = 5\text{mL} \times 500\ \text{mg}$$

$$\frac{\cancel{400\ \text{mg}}\ \text{Z}}{\cancel{400\ \text{mg}}} = \frac{5\ \text{mL} \times 500\ \cancel{\text{mg}}}{400\ \text{mg}}$$

$$\text{Z} = \frac{500 \times 5\text{mL}}{400} = \frac{2{,}500\ \text{mL}}{400} = 6.25\ \text{mL/dose}$$

OR:

$$\frac{400\ \text{mg}}{5\ \text{mL}} = \frac{\text{Z mg}}{1\ \text{mL}}$$

$$Z = \frac{400\ \text{mg}}{5\ \text{mL}} = 80\ \text{mg/mL}$$

$$Z\ \text{mL} = 500\ \text{mg} \div 80\frac{\text{mg}}{\text{mL}} = 500\ \cancel{\text{mg}} \times \frac{1\ \text{mL}}{80\ \cancel{\text{mg}}} = \frac{500\ \text{mL}}{80} = 6.25\ \text{mL}$$

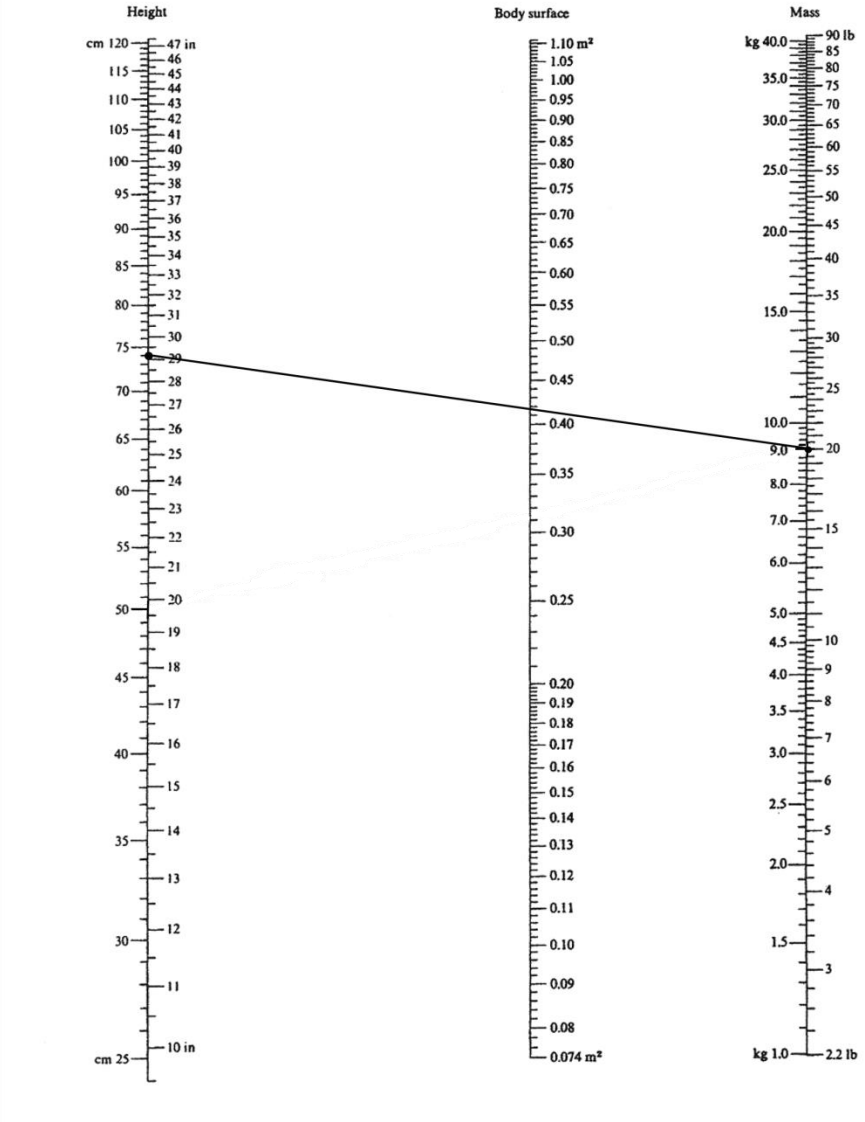
14. Determine the volume of medication to be dispensed for the full course of therapy.

$$\frac{6.25\ \text{mL}}{\text{dose}} \times \frac{2\ \text{doses}}{\text{day}} \times 10\ \text{days} = \frac{6.25\ \text{mL}}{\cancel{\text{dose}}} \times \frac{2\ \cancel{\text{doses}}}{\cancel{\text{day}}} \times 10\ \cancel{\text{days}} = 125\ \text{mL}$$

Use the following scenario to solve problems 15 and 16.

A 14-month-old child weighs 9 kg and is 76 cm tall.

15. What is the child's BSA? See the Nomogram for Children (Figure 1).



$\text{BSA} = .42\ \text{m}^2$

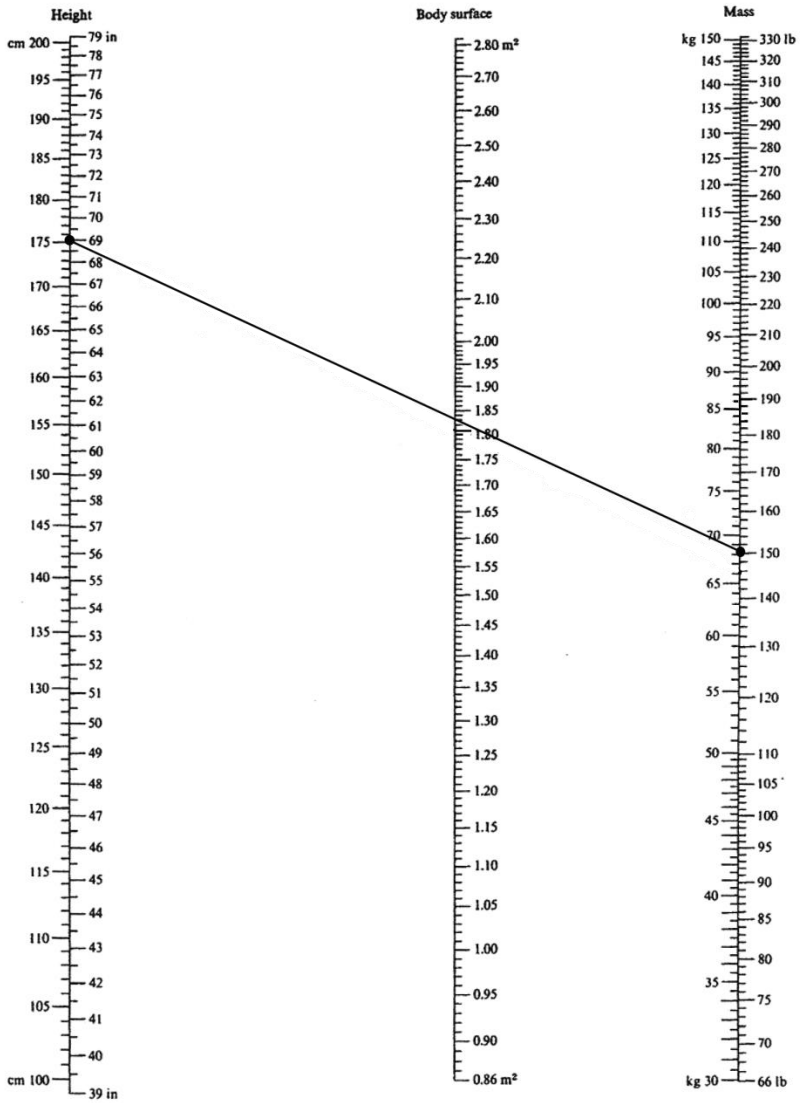
16. What would the medication dose for this child be if the medication is normally dosed at 13 mg/m^2?

$$\frac{13\ \text{mg}}{\text{m}^2} \times .42\ \text{m}^2 = \frac{13\ \text{mg}}{\cancel{\text{m}^2}} \times .42\ \cancel{\text{m}^2} = 5.46\ \text{mg}$$

Use the following scenario to solve problems 17 and 18.

A 36-year-old female patient weighs 148 pounds and is 5 feet 9 inches tall.

17. What is the patient's BSA? See the Nomogram for Adults (Figure 2).



$\text{BSA} = 1.8\ \text{m}^2$

18. If the patient were to take medication normally dosed at 30 mg/m^2 what would her dose be?

$$\frac{30\ \text{mg}}{\text{m}^2} \times 1.8\ \text{m}^2 = \frac{30\ \text{mg}}{\cancel{\text{m}^2}} \times 1.8\ \cancel{\text{m}^2} = 54\ \text{mg}$$

Use the following scenario to solve problems 19 and 20.

Theophylline 100 mg tablets are prescribed for the treatment of asthma and have a recommended dose of 3 mg/kg of body weight every eight hours. The patient weighs 220 pounds, and the doctor would like the patient to take the medication for 14 days before returning to the office for further evaluation.

19. What dose (in mg) is required for this patient?

$$220 \text{ lbs} \times \frac{1 \text{ kg}}{2.2 \text{ lb}} = 220 \cancel{\text{lbs}} \times \frac{1\text{kg}}{2.2 \cancel{\text{lb}}} = \frac{220 \text{ kg}}{2.2} = 100 \text{ kg}$$

Dose (mg) = Dose (mg/kg) x patient's weight (kg)

$$\text{Dose (mg)} = \frac{3 \text{ mg}}{\text{kg}} \times 100 \text{ kg} =$$

$$\frac{3 \text{ mg}}{\cancel{\text{kg}}} \times 100 \cancel{\text{kg}} = 300 \text{ mg}$$

20. How many 100 mg tablets should be dispensed for this patient to complete the 14-day regimen?

$$\frac{1 \text{ tab}}{100 \text{ mg}} \times \frac{300 \text{ mg}}{\text{dose}} = \frac{1 \text{ tab}}{100 \cancel{\text{mg}}} \times \frac{300 \cancel{\text{mg}}}{\text{dose}} = \frac{300 \text{ tabs}}{100 \text{ dose}} = 3 \text{ tabs/dose}$$

$$\text{Total number of tablets} = \frac{3 \text{ tabs}}{\text{dose}} \times \frac{3 \text{ doses}}{\text{day}} \times 14 \text{ days} = \frac{3 \text{ tabs}}{\cancel{\text{dose}}} \times \frac{3 \cancel{\text{doses}}}{\cancel{\text{day}}} \times 14 \cancel{\text{days}}$$

3 tabs x 3 x 14 = 126 tabs

Patient: N.O. Cena
DOB: 5/5/1955

24-hour Total Parenteral (IV) Nutrition (TPN)

Ingredient / Nutrient	Amount to Add
Dextrose 5%	850 mL
Amino Acids with Electrolytes 8.5%	500 mL
Lipids 10%	500 mL
Calcium Gluconate 10%	1 g
Potassium Chloride 2 mEq/mL	60 mEq
MVI	10 mL
Trace Elements	1 mL
Insulin Regular 100 units/mL	200 units

Dr. J.T. Smith
Date Written: 2/18/2019

21. How many milliliters of potassium chloride will be added to this TPN bag?

$$60 \text{ mEq} \times \frac{1 \text{ mL}}{2 \text{ mEq}} = \frac{60 \cancel{\text{ mEq}} \times 1 \text{ mL}}{2 \cancel{\text{ mEq}}} = \frac{60 \text{ mL}}{2} = 30 \text{ mL}$$

22. How many mL of insulin will be added to this TPN bag?

$$200 \text{ units} \times \frac{1 \text{ mL}}{100 \text{ units}} = \frac{20 \cancel{\text{ units}} \times 1 \text{ mL}}{100 \cancel{\text{ units}}} = \frac{200 \text{ mL}}{100} = 2 \text{ mL}$$

Patient: Mr. Albert Lerjick
D.O.B.: 2/10/1950

Prednisone 10 mg tablets
Sig: 6 tabs daily x3d, 5 tabs daily x3d, 4 tabs daily x2d, ṪṪṪ daily x3d, ṪṪ daily x2d, Ṫ daily x4d, 1/2-Tab daily x3d
Disp: Q.S. Ref: 2

Dr. James Harrison
NPI: 8620090078

23. How many 10 mg tablets must be dispensed to fill this prescription?

    (6 x 3) + (5 x 3) + (4 x 2) + (3 x 3) + (2 x 2) + (1 x 4) + (0.5 x 3) = 59.5 rounded to 60 tablets

24. This patient will not be able to split these tablets in half due to significant arthritis of the hands, so your pharmacist asks you to dispense 5 mg tablets for the whole prescription instead. How many tablets must be given?

    (12 x 3) + (10 x 3) + (8 x 2) + (6 x 3) + (4 x 2) + (2 x 4) + (1 x 3) = 119 tablets

    OR 59.5 x 2 = 119 tablets

25. How many days will a fill of this prescription last?

    3 + 3 + 2 + 3 + 2 + 4 + 3 = 20 days