

Days' Supply Calculations

Unit: Prescription Processing

Problem Area: Filling Prescriptions

Lesson: Days' Supply Calculations

- **Student Learning Objectives.** Instruction in this lesson should result in students achieving the following objectives:

- 1 Calculate days' supply of tablets or capsules.**
- 2 Calculate days' supply for fixed quantity medications.**

- **Resources.** The following resources may be useful in teaching this lesson:

Aiken, Cheryl and Robert J. Anderson. *Certification Exam Review for Pharmacy Technicians*, 4th ed. Paradigm, 2016.

Ballington, Don A., and Robert J. Anderson. *Pharmacy Practice for Technicians*, 5th ed. Paradigm, 2015.

"Calculating Days Supply," *Pharmacy-Tech-Resources.com*. Accessed April 13, 2019.
<https://www.pharmacy-tech-resources.com/days-supply.html>.

Fulcher, Robert M., and Eugenia M. Fulcher. *Math Calculations for Pharmacy Technicians*, 2nd ed. Elsevier, 2013.

Olsen, June L., Anthony P. Giangrasso, and Dolores Shrimpton, *Medical Dosage Calculations*, 11th ed. Pearson, 2015.



■ Equipment, Tools, Supplies, and Facilities

- ✓ Overhead or PowerPoint projector
- ✓ Visual(s) from accompanying master(s)
- ✓ Copies of sample test, lab sheet(s), and/or other items designed for duplication
- ✓ Materials listed on duplicated items
- ✓ Computers with printers and Internet access
- ✓ Classroom resource and reference materials

■ Key Terms. The following terms are presented in this lesson (shown in bold italics):

- ▶ bid
- ▶ days' supply
- ▶ inhaler
- ▶ insulin
- ▶ nebulizer
- ▶ ophthalmic
- ▶ otic
- ▶ po
- ▶ prn
- ▶ qid
- ▶ QS (quantity sufficient)
- ▶ reconstituted
- ▶ reimbursement
- ▶ Rule of Hand
- ▶ subcut
- ▶ suspension
- ▶ tid

■ Interest Approach. Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is included here.

The ability to manipulate conversions and make calculations is a requirement of pharmacy technicians. However, in many cases when math is mentioned to new pharmacy technicians, it can trigger instant stress by reminding students of previous experiences with mathematics. Pharmaceutical calculations are performed every day in the pharmacy. The repetitiveness of these calculations will reinforce the technician's knowledge and confidence. Can you think of a situation where you needed a mathematical calculation and were stressed out by it? What helped you to work towards a solution and to relieve your stress?

CONTENT SUMMARY AND TEACHING STRATEGIES

Objective 1: Calculate days' supply for tablets or capsules.

Anticipated Problem: How do you calculate days' supply for tablets or capsules?

- I. Calculating days' supply for tablets or capsules
 - A. When entering a prescription into the pharmacy computer system a technician must often perform certain calculations to determine proper dosages, amount to dispense, or days' supply. One of the most common calculations that the pharmacy technician will perform is finding the **days' supply**, the number of days of medication that the physician prescribes. This is the number of days a medication should last if it is used correctly. A 30 day supply is defined as a supply lasting the customer for a period consisting of 30 consecutive days. Understanding this calculation is essential for insurance purposes as errors could result in incorrect **reimbursement**, to pay back, refund, or repay, or rejection of the insurance claim. A technician must perform these calculations carefully and swiftly to provide excellent and safe customer service.
 - B. While many drugs are dosed once daily, some medications must be taken more often. For instance, some prescriptions may instruct for the medication to be taken **bid**, two, to **qid**, four, times a day. This will impact the amount of medication necessary for a 30 or 90 day supply. It is important for pharmacy technicians to pay close attention to the dosing instructions on each individual prescription. For oral solids, including tablets and capsules, the days' supply can be calculated the following way:
 1. A prescription is written for ampicillin 500mg 1 cap qid #28. What is the days' supply of this medication? Another way to look at this would be how long will this medication last if the patient takes each dose properly? To find the days' supply first determine how many units will be taken in 1 day.
$$\begin{aligned}\text{Dose} &= 1 \text{ capsule} \\ \text{Frequency} &= \text{qid (4 times a day)} \\ 1 \text{ capsule} \times 4 \text{ times daily} &= 4 \text{ capsules daily}\end{aligned}$$
 2. Next, to determine the amount of days this medication will last, divide the total quantity dispensed by the daily quantity taken.
$$\begin{aligned}\text{Daily amount} &= 4 \text{ capsules} \\ \text{Amount of medication to dispense} &= 28 \text{ capsules} \\ 28 \text{ capsules} \div 4 \text{ capsules} &= 7 \text{ days' supply}\end{aligned}$$
 - C. This calculation often needs to be performed for liquid dosage forms. Because the dose is most often written for teaspoons (tsp) or milliliters (mL), the amount per

dose must be considered to determine the days' supply. The conversions for household volumes are:

1 teaspoonful (tsp) = 5mL

1 tablespoonful (tbsp) = 15mL

1. A prescription is written for promethazine 6.25mg/5mL solution. Take 1 tsp **po**, by mouth, every 4 to 6 hours, **prn**, when necessary, for nausea and vomiting. Dispense #240 mL. First determine how many units will be taken in one day.

$24 \text{ hours} \div 4 \text{ hours} = 6 \text{ tsp per day}$

2. Next, determine how many mL are needed each day.

$6 \text{ tsp} \times 5\text{mL/tsp} = 30\text{mL per day}$

3. Finally, calculate the amount of days this medication will last.

$240\text{mL} \div 30\text{mL} = 8 \text{ days}$

- D. It is also important to calculate how much medication a patient will need to complete a course of therapy. Liquid formulations, such as a **suspension**, a liquid in which small particles of a solid are dispersed but not dissolved, often require dispensing **reconstituted**, restored to its original state by the addition of water, bottles with more medication than the actual quantity written on the prescription.

1. The instructions call for the suspension to be given 1 tsp **tid**, three times per day, x 10 days and the prescriber writes **QS**, quantity sufficient, or the amount which is enough, on the prescription. The pharmacy must determine the total volume to dispense for the entire course of therapy. Determine how many units will be taken in one day.

Dosage = 1 tsp = 5mL

Frequency = tid = 3 times per day

$5\text{mL} \times 3 \text{ times daily} = 15\text{mL per day}$

$15\text{mL} \times 10 \text{ total days} = 150\text{mL}$

150mL is needed for 10 days of therapy

2. The same can be done to calculate days' supply. If a prescription calls for a medication to be taken 2 tbsp bid, dispense 300mL, how long will this order last the patient.

Dosage = 2tbsp $\times$ 15mL/tbsp = 30mL

Frequency = bid = 2 times per day

$30\text{mL} \times 2 \text{ times daily} = 60\text{mL per day}$

$300\text{mL} \div 60\text{mL} = 5 \text{ days' supply}$

Teaching Strategy: Many techniques can be used to help students master this objective. Use VM-A to review common abbreviations used by prescribers when writing prescriptions.

Objective 2: Calculate days' supply for fixed quantity medications.

Anticipated Problem: How do you calculate days' supply for fixed quantity medications?

II. Calculating days' supply for fixed quantity medications

- A. Calculating days' supply of fixed quantity medications such as inhalers, insulin, creams or ointments, and eye or ear drops that come in container sizes with specific amounts can be difficult. An incorrect days' supply calculation can lead to the patient receiving too much or too little medication for the specified time. Miscalculations can also lead to rejected insurance claims or cause the pharmacy to be audited and not reimbursed for the cost of the medication.
- B. The basic idea for calculating days' supply of fixed quantity medication is the same as that for tablets and capsules. You will need to figure out how much of the medication the patient will use each day and then figure out how many days the container of medication will last. The quantity to dispense is usually not written on the prescription so the pharmacy will need to choose the most appropriate container size and calculate the days' supply from that quantity. The difficulty is to convert both the prescribed dose and the amount of drug in the whole container into the same unit of measure (drops, mL, puffs, and units).
- C. An **inhaler** is a device that gets medicine directly into a person's lungs. The pharmacy will need to determine how many "puffs" there are in one inhaler. This information can usually be found on the box or outer wrapping of the inhaler or the package insert. A patient brings in a prescription for an albuterol inhaler 2 puffs qid. The inhaler has 200 puffs. Calculate the days' supply.
- $$2 \text{ puffs} \times 4 \text{ times per day} = 8 \text{ puffs per day}$$
- $$200 \text{ puffs} \div 8 \text{ puffs per day} = 25 \text{ days' supply}$$
1. A **nebulizer** is an electrically powered machine that turns a liquid medication into a mist so that it can be breathed directly into the lungs through a face mask or mouthpiece. For nebulized medications you need to know how many vials are contained in one box. Some patients may need to use more than one vial for a dose. However, partial vials are usually discarded after each use and so each vial can't be counted more than once toward the days' supply. A patient has a prescription for levalbuterol 0.63mg nebulized tid. Calculate the days' supply if one box of levalbuterol 0.63mg/vial has 24 vials.
- $$1 \text{ vial} \times 3 \text{ times per day} = 3 \text{ vials per day}$$
- $$24 \text{ vials} \div 3 \text{ vials per day} = 8 \text{ days' supply}$$
- D. **Insulin** is a hormone produced by the pancreas that allows the body to use glucose for energy. Some people cannot make insulin or are resistant to the insulin their bodies make. These individuals must receive injected insulin to replace or supplement their body's insulin. For insulin you need to know how many units are in one vial. The standard concentration for most insulin is 100units per every 1mL. Insulin vials are usually 10mL (1000 units). A patient brings in a

prescription for Lantus Insulin 50 units **subcut**, subcutaneous or under the skin, once daily. Calculate the days' supply.

Dosage = 50 units

Frequency = once daily

Total units of insulin per vial = $100\text{units/mL} \times 10\text{mL} = 1000\text{units}$

$1000\text{units} \div 50 \text{ units per day} = 20 \text{ days' supply}$

- E. Pharmacies may encounter issues when dispensing **ophthalmic**, relating to the eye, and **otic**, relating to the ear, products. To solve days' supply for these medications, it is essential to know how many drops are in 1mL. This number varies based on the medication and physical properties of the solution or suspension. Usually the conversion factor is 20 drops per 1mL. However, this is only an estimation and some insurance claims use 15 drops per 1mL or 12 drops per 1mL. Technicians should check with the pharmacist to find out which conversion factor to use. The patient has a prescription for Cortisporin Otic four drops in the left ear tid for 10 days. Cortisporin comes in 10mL bottles. Calculate the days' supply.

Dosage = 4 drops

Frequency = $4\text{drops} \times 3 \text{ times per day} = 12 \text{ drops per day}$

$10\text{mL bottle} \times 20\text{drops/mL} = 200 \text{ drops per bottle}$

$200 \text{ drops} \div 12\text{drops/day} = 16 \text{ days' supply}$

- F. For topical creams and ointments you will need to find out the general size of the area being treated. How long a product will last depends on the size of the area to be treated. Information about the size of the area is almost never written on prescriptions. You can use the "Rule of Hand," to calculate days' supply. The **Rule of Hand** states that one gram will cover the area of about four flat hands, wrist to fingertips with fingers together. A patient has a prescription for Fluticasone 0.05% cream, apply bid to left forearm for 14 days. You look at the patient and see that the surface of your hand is roughly half of the patient's forearm. So according to the rule of hand you will need about 0.5grams (two flat hands) to cover his forearm one time. This means he will need about one gram per day or a minimum of 14 grams to fill the prescription. Fluticasone 0.05% cream comes in 15g, 30g, and 60g tubes.

$15\text{g/tube} \div 1\text{g} = 15 \text{ days' supply}$

$30\text{g/tube} \div 1\text{g} = 30 \text{ days' supply}$

$60\text{g/tube} \div 1\text{g} = 60 \text{ days' supply}$

The 15g tube would contain enough cream to last the patient 14 days.

- G. In the hospital setting, dispensing fixed quantity medications is a little easier than in the community pharmacy setting. Often, just one container size of a medication is stocked and when a patient's supply is depleted, a nurse will just reorder a new supply. For example, if a vial of insulin is dispensed to a patient, the vial will be used until it is gone, or the beyond use date is reached, and then a new vial will be ordered for the patient.

- H. Pharmacy technicians play a very important role in the prescription filling process. Not only do they ensure that the patient gets the correct medication, but they also ensure that the patient gets the correct dose. In order to do this pharmacy technicians must be able to confidently and accurately calculate doses for prescription orders. Some tips to help minimize the chances of making a calculation error are:
1. While attempting to perform simple calculations in your head, it is important to remember that a simple error can lead to severe medical consequences or even death. Therefore, even the simplest pharmacy calculation should be completed on paper. There are a number of activities that take place simultaneously in the pharmacy. The chances of becoming distracted or interrupted while performing a calculation are very high. If you are interrupted, you have a record of where in the calculation you were before you had to stop.
 2. When performing calculations in the pharmacy it is imperative to include all mathematical units. Using the incorrect unit could lead to an incorrect calculation or dosage and could potentially harm a patient.
 3. After performing the calculation, make sure that your answer makes sense to you. This is especially true if the dosing supply or quantity dispensed seems unusually higher or lower than what is typically dispensed. Technicians should check, check, and double check all pharmacy calculations so that patient safety is maintained.

Teaching Strategy: Many techniques can be used to help students master this objective. Use VM-B for a quick review on how to calculate a days' supply of medication. Assign LS-A.

Review/Summary. Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. If a textbook is being used, questions at the ends of chapters may also be included in the Review/Summary.

Application. Use the included visual master(s) and lab sheet(s) to apply the information presented in the lesson.

Evaluation. Evaluation should focus on student achievement of the objectives for the lesson. Various techniques can be used, such as student performance on the application activities. A sample written test is provided.

Answers to Sample Test:

Part One: Matching

1. e
2. c

3. f
4. b
5. a
6. d

Part Two: Completion

1. suspension
2. inhaler
3. Rule of Hand
4. ophthalmic
5. subcut
6. insulin

Part Three: True/False

1. T
2. T
3. F
4. F
5. T
6. T

Days' Supply Calculations

► Part One: Matching

Instructions: Match the term with the correct definition.

- | | |
|-----------------|------------------|
| a. days' supply | d. prn |
| b. bid | e. otic |
| c. qid | f. reconstituted |

- _____ 1. Relating to the ear
- _____ 2. Four times a day
- _____ 3. Restored to its original state by the addition of water
- _____ 4. Two times a day
- _____ 5. The number of days of medication that the physician prescribes
- _____ 6. When necessary

► Part Two: Completion

Instructions: Provide the word or words to complete the following statements.

- 1. Liquid formulations, such as a _____ are liquids in which small particles of a solid are dispersed but not dissolved.
- 2. An _____ is a device that gets medicine directly into a person's lungs.
- 3. The _____ states that one gram will cover the area of about four flat hands, wrist to fingertips with fingers together.
- 4. Products relating to the eye are called _____ products.



5. _____ refers to under the skin.
6. _____ is a hormone produced by the pancreas that allows the body to use glucose for energy.

► **Part Three: True/False**

Instructions: Write T for true or F for false.

- _____ 1. An incorrect days' supply calculation can lead to the patient receiving too much or too little medication for the specified time.
- _____ 2. For nebulized medications some patients may need to use more than one vial for a dose.
- _____ 3. The standard concentration for most insulin is 10units per every 1mL.
- _____ 4. How long a topical product will last does not depend on the size of the area to be treated.
- _____ 5. When performing calculations in the pharmacy it is imperative to include all mathematical units.
- _____ 6. Even the simplest pharmacy calculation should be completed on paper.

COMMON PHARMACEUTICAL ABBREVIATIONS USED WHEN WRITING PRESCRIPTIONS

Abbreviation	Meaning
bid	2 times per day
mL	Milliliter
po	By mouth
prn	When needed
qid	4 times per day
QS	Quantity sufficient
tbsp	Tablespoon
tid	3 times per day
tsp	Teaspoon



CALCULATING DAYS' SUPPLY OF FIXED QUANTITY MEDICATIONS

Type of Medication	Determine the Total Amount Per Container	Divide Total Amount Per Container by Amount Used Each Day to Get Day's Supply	Tips
Inhaler	Total number of puffs per inhaler	Total number of puffs per day	Do not enter a days' supply past the beyond use date
Nebulizer	Total number of vials per box	Total number of vials per day	One vial cannot be counted twice because partials must be discarded
Insulin	Total number of units per vial	Total number of units per day	Do not assign a days' supply past the beyond use date once vial is opened
Eye/Ear drops	Total number of drops per bottle	Total number of drops per day	Convert drops to mL using a conversion of 20drops/mL
Creams/Ointments	Total grams per container	Total number of grams per day	Estimate the number of grams using the Rule of Hand



Days' Supply Calculations

Purpose

The purpose of this activity is to solve pharmaceutical dosage calculations.

Objective(s)

1. Calculate days' supply of medication for tablets or capsules.
2. Calculate days' supply of medication for liquid medications.
3. Calculate days' supply of fixed quantity medications.
4. Define common abbreviations used on prescriptions.

Materials

- ◆ class notes
- ◆ pencil
- ◆ calculator
- ◆ practice problems

Procedure

1. Review your class notes on calculating days' supply of medication.
2. Read each of the practice problems.
3. Calculate the days' supply for each problem.
4. Show all calculations for each problem.
5. Participate in a class discussion about the importance of calculating the correct dosage.
6. Turn your problems into your instructor.



Practice Problems:

1. A prescription is written for Phenobarbital 100mg capsules #28 1 cap po qid. What is the days' supply?
2. A prescription is written for Valium 5mg tablets #60 1 tab po bid. What is the days' supply?
3. A prescription is written for Augmentin 600mg/5mL 3/4 tsp tid for 10 days. Augmentin comes in 75mL, 100mL, and 150mL bottles. What volume should be dispensed to the patient? What size bottle should be used?
4. A prescription is written for cephalexin 250mg/5mL 1tsp po every 6 hours for 10 days. How much volume should be dispensed to the patient?
5. A prescription is written for Humulin 100 insulin 10mL 35 units subcut every day. What is the days' supply?
6. A prescription is written for #2 vials of Novolin insulin 10mL 40 units subcut in the morning and 25 units subcut in the evening. What is the days' supply?
7. A prescription is written for ProAir 8.5g inhaler 2 puffs tid. What is the days' supply if the inhaler contains 200 puffs?
8. A prescription is written for Tobradex Ophthalmic Suspension 5mL 1–2 drops in both eyes tid. What is the days' supply?
9. A prescription is written for Nizoral cream 15g apply to the affected area once daily. The amount supplied does not exceed 500mg to 1g so unless otherwise noted, use 1g for the dose for the affected area. What is the days' supply?
10. A prescription was written for Bactroban ointment 30g apply to the affected area tid. Unless otherwise noted use 1g for the dose for the affected area. What is the days' supply?

Days' Supply Calculations

1. 7 days
2. 30 days
3. 112.5 mL, 150 mL bottle
4. 200mL
5. 28 days
6. 30 days
7. 33 days
8. 8 days
9. 15 days
10. 10 days