

LURLEEN B. WALLACE COLLEGE OF NURSING AND HEALTH SCIENCES

NU 426 Community Health Across the Lifespan

Calculations Tutorial

Directions for Calculations Quizzes: Calculate each problem as directed. You may use a calculator. Document enough to show the steps of your reasoning. Give the units of measurement in your answer (lots, bottles, tablets, etc.).

**Calculating how much to dispense**

1. A patient being seen at a migrant farmworkers' outreach clinic is ordered EryPed Drops 300 mg PO Q 8 H x 14 days. The patient has access to a refrigerator. You have available EryPed Drops 200 mg / 5 ml. A. How many ml of Amoxil Drops will you give to equal one 300 mg dose? B. How many ml will need to be dispensed for the entire 14-day course of treatment?

Answer:

Calculate the amount needed per dose:

$$300 \text{ mg / dose} \times 5 \text{ ml} / 200 \text{ mg} = \underline{7.5 \text{ ml / dose}}$$

Calculate the amount needed for the whole course of treatment:

$$7.5 \text{ ml / dose} \times 3 \text{ doses / day} \times 14 \text{ days} = \underline{315 \text{ ml / course}}$$

2. An ambulatory patient is suffering from poison ivy dermatitis on his forearms. He is ordered topical hydrocortisone cream applied to the affected area Q 6 H. If he applies 30 ml per dose around the clock, what will be a 7-day supply in **ounces**?

Answer:

Calculate the total amount needed to fill the patient's prescription:

$$30 \text{ ml / dose} \times 4 \text{ doses / day} \times 7 \text{ days} = 840 \text{ cc}$$

Convert the patient's total amount in ml to cc:

$$840 \text{ cc} / 30 \text{ cc/oz} = \underline{28 \text{ ounces}}$$

3. You are a diabetic educator with a sight-impaired client who is 72 years old. This year she is very excited to be going to visit her daughter for two weeks in Florida. She asks you to draw up all her syringes beforehand so she can take them with her. She takes 80 units NPH in the morning and 40 units NPH in the evening. NPH insulin is available in a 5 cc vial containing 100 units / cc. How many vials and syringes will you need in order to prepare a 14-day supply?

Answer:

Calculate the total amount needed to fill the patients prescription for the time specified:  
 $80 \text{ units} + 40 \text{ units} = 120 \text{ units / day}$   
 $120 \text{ units / day} \times 14 \text{ days} = 1680 \text{ units / 14 days}$

Convert the amount in units to the amount dispensed in vials.  
A vial contains:  $5 \text{ cc} \times 100 \text{ units/cc} = 500 \text{ units}$   
 $1680 \text{ units needed} / 500 \text{ units per vial} = 3.36 \text{ vials} = \underline{4 \text{ vials}}$

Figure out the number of doses (syringes) needed for the time period.  
 $14 \text{ days} \times 2 \text{ syringes / day} = \underline{28 \text{ syringes}}$

Note: Round up to whole syringes and vials, since you will dispense the whole thing.

### Calculating supplies needed for populations

4. You are a nurse for a school Nutrition Awareness Program. You received a grant to conduct 50 nutrition awareness health fairs at middle schools during the year. As a reward to the children, you have always provided fruit snacks in the afternoon. From experience you expect to give away an average of 180 pieces of fruit at each fair. The most popular assortment has been the following proportions: **2** bananas, **2** apples, **1** orange, and **1** bunch of grapes. For each health fair, how many pieces of each fruit should the nurse buy with the grant money?

Answer:

Note that items are perishable, so you will not be stocking up.

Calculate the proportion of fruits needed:  
 $180 \text{ pieces of fruit} / (2+2+1+1 \text{ parts}) = 180/6 = 30 \text{ pieces per part of the "recipe"}$

$2 \text{ parts} \times 30 \text{ pieces/part} = \underline{60 \text{ bananas}}$   
 $2 \times 30 = \underline{60 \text{ apples}}$   
 $1 \times 30 = \underline{30 \text{ oranges}}$   
 $1 \times 30 = \underline{30 \text{ bunches of grapes}}$

5. You are the public health department's immunization nurse for an urban county. The total county population is 300,000. You expect that your nursing team will immunize 1/8 of the population with 0.5 cc doses of flu vaccine during October and November. The vaccine is available in vials containing 5 cc each. You must order the vials in cases of 100. How many cases should you order?

Answer:

Calculate the number of doses needed.  
 $300 \text{ 000 population} \times 1/8 = 37 \text{ 500 doses needed}$

Calculate the amount to order to meet the needed number of doses:

$$\text{A Vial} = 5 \text{ cc} / 0.5 \text{ cc/dose} = 10 \text{ doses / vial}$$

$$\text{A Case} = 100 \text{ vials} \times 10 \text{ doses/vial} = 1000 \text{ doses}$$

$$37 \text{ 500 doses needed} / 1000 \text{ doses/case} = 37.5 = \underline{38 \text{ cases needed}}$$

Note: round up the number of cases, since you will order whole cases (like drops).

6. You are a mission nurse for an overseas building project. You are purchasing diarrhea prevention medication for your volunteers. From past experience, you predict that approximately two-thirds of your volunteers will agree to take the medication. Your crew will include 10 teams of 8 volunteers. Additional staff include the nurse, eight experienced cooks, and a veterinarian. All the staff will agree to take the medication. The medication dosage is Cipro 500 mg Q 12 H x 7 days. If Cipro is available in bottles containing 100 tablets (of the 500-mg dose), how many bottles would be reasonable to purchase to cover volunteers and staff?

Answer:

Figure out the size of the population being served:

$$10 \text{ teams} \times 8 \text{ volunteers} = 80 \text{ volunteers} \times 2/3 = 53.33 = 54 \text{ volunteers taking meds}$$

$$54 \text{ volunteers} + 10 \text{ staff} = 64 \text{ total taking meds}$$

Figure out the amount of medication needed to supply the population:

$$64 \text{ persons} \times 2 \text{ tabs / day} \times 7 \text{ days} = 896 \text{ tabs needed}$$

Convert to the number of bottles to order:

$$896 \text{ tabs} / 100 \text{ tabs/bottle} = 8.96 \text{ bottles} = \underline{9 \text{ bottles}}$$

7. You are a school nurse in an urban school district whose board has accepted the reality that teenagers are having sex. You are requesting funding to provide condoms to the students in an effort to reduce unintended pregnancy and STDs. To determine the number of condoms needed, you will use the following assumptions:

- The student body is made up of 600 students.
- Within the student body, 25 % are abstinent, 50 % obtain condoms elsewhere or won't use them, and 25 % will be served by your supply (this is your target population).
- The students in your target population will be having sex, on average, twice a week, and will use condoms every time.
- The students in your target population have partners who are not in the target population.
- Your clients will stock up for vacations, so you will be supplying them throughout the calendar year.
- Condoms are available in lots of 500.

How many lots of condoms should you order?

Answer:

Figure out the size of the target population being served:

$$600 \text{ students} \times 0.25 \text{ target \%} = 150 \text{ students}$$

Figure out the amount of supplies your clients will need for the year:

$$150 \text{ students} \times 2 \text{ condoms / week} \times 52 \text{ wks / year} = 15\,600 \text{ condoms}$$

Convert to the number of lots to order:

$$15\,600 \text{ condoms} / 500 \text{ condoms/lot} = 31.2 \text{ lots} = \underline{32 \text{ lots}} \text{ (round up)}$$

### Working with budgets and cost calculations

1. You are a nurse for a wellness promotion service that is very popular among women in your community. Over the past few years, you have had several patients who were diagnosed with breast cancer. Unfortunately, their cancers could have been detected earlier if they had been doing breast self-exams regularly. This year, you intend to begin promoting breast self-exams by providing calendar stickers, a shower card, and teaching materials. You will need a 3-year community grant to pay for the supplies. You anticipate reaching 800 women during each of the three years. Supplies for each woman will cost \$ 5.00. How much grant money should you request to cover the supplies for all three years?

Answer:

Calculate the total cost:

$$800 \text{ women / year} \times 3 \text{ years} \times \$ 5. / \text{ woman} = \underline{\$ 12\,000.00 \text{ for all 3 years}}$$

9. As a cost-saving measure, your clinic has begun dispensing medications from a large stock bottle rather than ordering expensive individualized packaging through the pharmacy. For example, the patient will be given a labeled zip-lock bag that contains the medication and instructions for taking it. Given the current epidemic of hypertension, you expect to treat 5000 patients during the year. Each patient will need 12 bags of tablets reflecting the monthly order: Hydrochlorothiazide 50 mg PO daily x 30 days. (Assume a month's supply is 30 days' worth.) Hydrochlorothiazide 50 mg tablets are available to you in a 100-tablet stock bottle. How many stock bottles will you need to obtain funding for annually?

Answer:

Figure out the total amount needed by the population for the year:

$$5000 \text{ patients} \times 30 \text{ tabs / month} \times 12 \text{ months} = 1\,800\,000 \text{ tabs total}$$

Convert the number of tablets needed to the number of bottles to order:

$$1\,800\,000 \text{ tabs} / 100 \text{ tabs/bottle} = \underline{18\,000 \text{ bottles}}$$

10. Building on the previous problem, if the clinic's cost per stock bottle is \$ 24.00, A) what is the average cost per patient per year for treatment of hypertension? B) If the previous cost per patient was \$ 250.00 per year, what is the **total** amount the clinic will save in a year?

Answer:

Calculate the total cost per year for the whole program:

$18\ 000\ \text{bottles} / \text{year} \times \$ 24. / \text{bottle} = \$ 432\ 000\ \text{total cost per year}$

Calculate the current cost per year per patient:

$\$ 432\ 000 / 5000\ \text{pts} = \underline{\$ 86.40\ \text{annual cost per patient}}$

Calculate the savings per year per patient:

Previous cost – current cost = savings

$\$ 250. - \$86.40 = \$ 163.60\ \text{savings per pt.}$

Calculate the savings per year for the whole program (5000 patients):

Savings per patient x number of patients = total clinic savings

$\$ 163.60 \times 5000 = \underline{\$ 818\ 000\ \text{total savings per year}}$