

### 3.2.6. Dilution of Enteral Formula

Unit IV: Special Concerns in Nutrition

## Dilution of Enteral Formula

When the concentration of a tube feeding is changed from 100% to a lower percent, water is added to the formula. Sometimes, the nurse must calculate how much fluid to add to the existing formula to change it to the percent ordered.

Use the following steps to change any 100% solution to the percent ordered.

1. Change the percent ordered to a decimal (85% = 0.85).
2. Divide the total amount of formula used by the decimal.
3. Subtract the original total amount from the amount derived in step 2.
4. Add water to the formula in the amount derived in step 3.

Example:

The physician orders an enteral feeding at 25%. The formula for the feeding is available in 240 ml per can. How much water must be added to the 240 ml to change it to a 25% solution?

1. 25% becomes 0.25
2. 240 ml divided by .025 = 960 ml
3. 240 ml subtracted from 960 ml = 720 ml
4. 720 ml is the amount of water that must be added to the formula

Practice the following calculations to determine the amount of water to add to a 100% solution to change it to the percent ordered.

1. Change 360 ml formula to 75%
2. Change 500 ml formula to 30%
3. Change 240 ml formula to 50%
4. Change 100 ml formula to 25%

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Ocean County College - One Day Per Week Nursing Program

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## NASOGASTRIC TUBE FEEDING PROBLEMS

### KEY POINTS:

- Preparing dilute tube feedings requires calculating the number of mL of water to add to the formula to make the ordered strength.
- Information needed to solve the problem includes the amount of formula in the can and the ordered strength.

### Working With Nasogastric Tube Feeding Problems

1. The doctor orders a  $\frac{3}{4}$ -strength formula tube feeding for the patient. The formula comes in cans containing 240 mL. How much water will the nurse add to the can of formula to make the ordered  $\frac{3}{4}$ -strength diluted tube feeding?  

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2. The patient receives a  $\frac{1}{3}$ -strength formula tube feeding. The formula can contains 233 mL. How much water will the nurse add to the can to make the  $\frac{1}{3}$ -strength diluted tube feeding?  

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3. The order is to prepare a  $\frac{2}{3}$ -strength tube feeding of Nepro<sup>®</sup> for a patient with a percutaneous endoscopic gastrostomy (PEG) tube. How much water will the nurse add to the 237 mL can of Nepro to make a  $\frac{2}{3}$ -strength tube feeding?  

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4. The physician orders 200 mL of a 1/4-strength tube feeding q.6h., for a patient with a NG tube. The formula can contains 250 mL. How much water will the nurse add to make the 1/4-strength tube feeding?

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5. A patient who has been receiving full-strength Jevity Plus<sup>®</sup> PEG tube feedings develops diarrhea. The physician orders a diluted tube feeding of 1/2-strength Jevity Plus for the patient. How much water will the nurse add to the 237 mL can of Jevity Plus to make a 1/2-strength tube feeding?

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6. The physician orders a 1/4-strength tube feeding of Osmolite<sup>®</sup> at 40 mL / hr for a patient with a NG tube. The Osmolite can contains 237 mL. How much water will the nurse add to make a 1/4-strength tube feeding?

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7. A patient has an order for 1/2-strength Pulmocare<sup>®</sup> tube feedings, at 50 mL / hr through a PEG tube. The nurse prepares the dilute formula and has a total volume of 475 mL. According to hospital policy, only 4 hours of tube feeding formula can be hung at a time, to minimize bacterial growth. How many mL of the prepared 1/2-strength formula will the nurse use?

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8. The physician orders a 250 mL bolus N/G tube feeding of 3/4-strength tube feeding q.8h. The formula can contains 237 mL. How much water will the nurse add to make the 3/4-strength tube feeding?

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9. The physician orders a diluted tube feeding of 1/3-strength Jevity Plus for the patient. How much water will the nurse add to the 250 mL can of Jevity Plus to make a 1/3-strength tube feeding?

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10. The physician orders a 2/3-strength tube feeding of Suplena<sup>®</sup> at 25 mL / hr, for a patient with a nasogastric tube. The Suplena can contains 240 mL. How much water will the nurse add to make a 2/3-strength tube feeding?

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**Working With Nasogastric Tube Feeding Problems**  
**(pp. 29 – 31)**

1. 80 mL
2. 466 mL
3. 119 mL
4. 750 mL
5. 237 mL
6. 711 mL
7. 200 mL
8. 79 mL
9. 500 mL
10. 120 mL

**Exercise: FOCUS ON SAFETY**  
**Making Clinical Judgments in Working With**  
**Nasogastric Tube Feeding (p. 32)**

b. The amount of water added to the formula.

**CORRECT:** *The ordered formula strength is 2/3. The nurse starts with 200 mL of formula. To make a 2/3-strength formula, the nurse needs to add 100 mL of water, not 80 mL.*

**INCORRECT:**

- a. The documented N/G tube intake should be 400 mL.  
*The documented N/G tube intake is correct.*
- c. The IV intake is incorrect for the ordered rate.  
*The documented IV intake is correct.*
- d. The formula strength should be questioned.  
*The formula strength is ordered by the physician.*


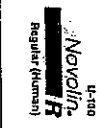
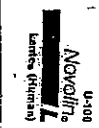
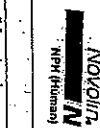
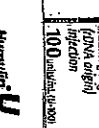
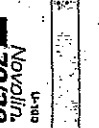
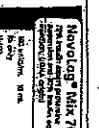
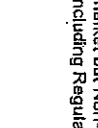
**Module: READING MEDICATION LABELS**

**Working With Reading Medication Labels**  
**(pp. 33 –38)**

1.
  - a. Precose
  - b. acarbose
  - c. 100 mg / tablet
  - d. tablet
  - e. oral

# Insulin Reference Chart (Insulins on formulary at CSMC)

Copyright © 2007, 11/11/2007, a United Drug 2007, 2011, 11/11/2011  
 Prepared By: Donna Maloney, Pharm D, Pharmacy Clinical Coordinator

| Insulin type   | Replica of Box  | Appearance | Onset of Action                   | Peak Effect         | Duration of Action                | Compatibility<br>(Mix IMMEDIATELY prior to administration)   | Comments   |
|--|---|------------|-----------------------------------|---------------------|-----------------------------------|--|--|
| <b>Rapid Acting:</b><br>Novolog®<br>(Insulin aspart)                     |  | Clear      | 10 – 20 minutes                   | 1 – 3 hours         | 3 – 5 hours                       | <ul style="list-style-type: none"> <li>May mix with NPH (draw up Novolog first)</li> </ul>   | Equivalent to Humalog®<br>(Insulin lispro)                                       |
| <b>Short Acting:</b><br>Novolin R®<br>(Regular Human)                    |  | Clear      | 30 – 60 minutes                   | 1 – 5 hours         | 6 – 10 hours                      | <ul style="list-style-type: none"> <li>May mix with NPH (draw up Regular insulin first)</li> <li>Do not mix with lente or ultralente unless patient stabilized on regimen</li> </ul> | Equivalent to Humulin R®   |
| <b>Intermediate Acting:</b><br>Novolin L®<br>(Lente Human)               |  | Cloudy     | 1 – 3 hours                       | 6 – 14 hours        | 16 – 24 hours                     | <ul style="list-style-type: none"> <li>Do not mix with Regular insulin unless patient stabilized on regimen</li> </ul>   | Equivalent to Humulin L®<br><b>DO NOT CONFUSE WITH LANTUS</b> (insulin glargine) |
| Novolin N®<br>(NPH Human)<br>isophane insulin suspension)                |   | Cloudy     | 1 – 2 hours                       | 6 – 14 hours        | 16 – 24 + hours                   | <ul style="list-style-type: none"> <li>May mix with Novolog or Regular insulin (draw up rapid acting insulin first)</li> </ul>   | Equivalent to Humulin N®   |
| <b>Long Acting:</b><br>Lantus®<br>(insulin glargine)                     |    | Clear      | 1.1 hours                         | No significant peak | 24 hours                          | <ul style="list-style-type: none"> <li><b>DO NOT MIX WITH OTHER INSULINS</b></li> </ul>  | Do not confuse with lente insulin  |
| Humulin U®<br>(Ultralente = extended insulin zinc suspension)            |    | Cloudy     | 4 – 6 hours                       | 8 – 20 hours        | 24 – 28 hours                     | <ul style="list-style-type: none"> <li>May mix with regular insulin (draw up Regular insulin first)</li> </ul>   |  |
| <b>Combination Products</b>  |   |            |                                   |                     |                                   |  |  |
| Novolin 70/30®<br>(70% NPH Insulin, 30% Regular Insulin)                 |    | Cloudy     | 30 – 60 minutes                   | 2 – 12 hours        | 10 – 16 hours (up to 18-24 hours) | <ul style="list-style-type: none"> <li><b>DO NOT MIX WITH OTHER INSULINS</b></li> </ul>  | Equivalent to Humulin 70/30<br>Do not confuse with Novolog Mix 70/30             |
| Novolog Mix<br>70/30® (70% insulin aspart protamine, 30% insulin aspart) |    | Cloudy     | Faster than Novolin 70/30 (above) | 1 – 4 hours         | 15 – 18 hours (up to 24 hours)    | <ul style="list-style-type: none"> <li><b>DO NOT MIX WITH OTHER INSULINS</b></li> </ul>  | Do not confuse with Novolin 70/30  |

Other insulins on the market but Non-Formulary at CSMC include: Humalog Mix 75/25 (75% insulin lispro protamine, 25% insulin lispro), Humulin 50/50 (50% NPH, 50% Regular), Velosulin BR (buffered regular), and several purified pork insulins including Regular, Lente, and NPH.

32. Order: Novolin R Regular U-100 insulin subcut ac per sliding scale and blood sugar (BS) level. The patient's blood sugar at 1730 hours is 238.

| Sliding Scale        | Insulin Dosage |
|----------------------|----------------|
| BS: 0-150            | 0 units        |
| BS: 151-250          | 8 units        |
| BS: 251-350          | 13 units       |
| BS: 351-400          | 18 units       |
| BS: greater than 400 | Call MD        |


2. Give: \_\_\_\_\_ units, which equals \_\_\_\_\_ mL. (Mark dose on appropriate syringe.)

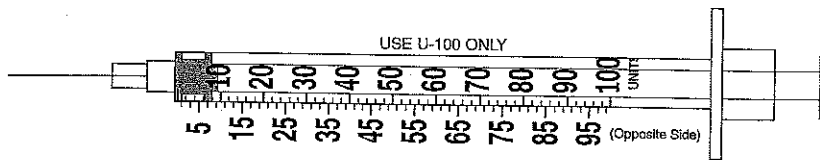
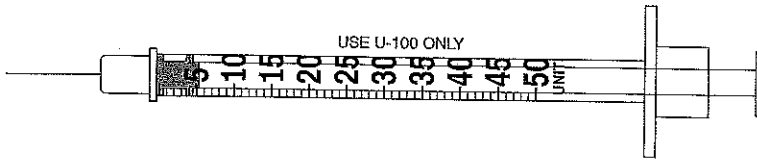
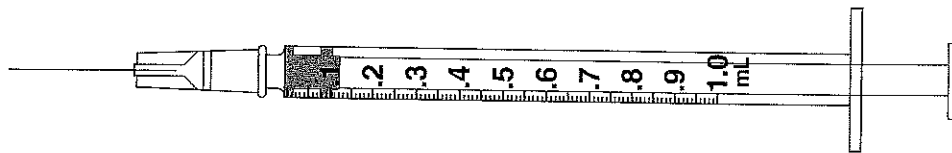
**Novolin-R** NDC 0189-1833-II For information contact: Novo Nordisk Pharmaceuticals Inc. Princeton, NJ 08540

**Novo Nordisk™**  
 Use with U-100 insulin syringes only  
 See insert  
 Keep in a cold place  
 Avoid freezing  
 Change insulin only under medical supervision

0203-31-101-1  
**Regular, Human Insulin Injection (recombinant DNA origin) USP**  
 10 ml 100 units/ml

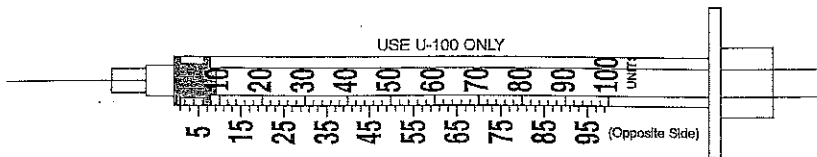
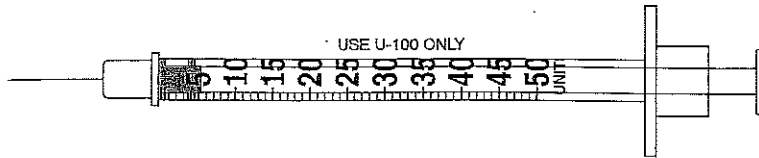
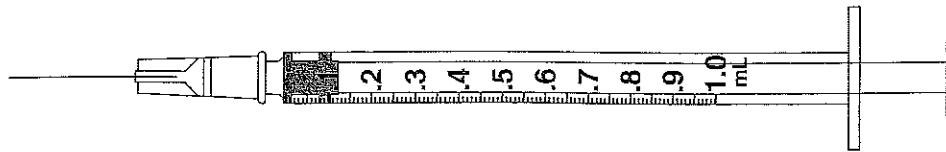
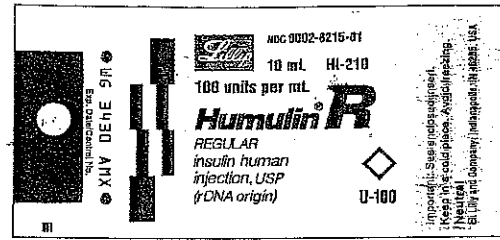
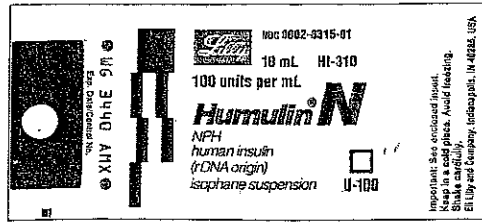
Manufactured by Novo Nordisk A/S DK-2880 Bagsvaerd, Denmark  
 Exp. Date: Control:





33. Order: Humulin R Regular U-100 Insulin 15 units c̄ Humulin N NPH U-100 insulin 45 units subcut at 0730

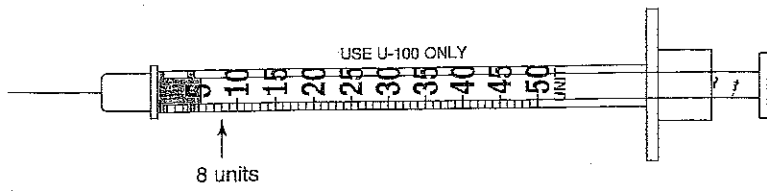
You will give a total of \_\_\_\_\_ units insulin. (Mark dose on appropriate syringe, designating Regular and NPH insulin.)



34. A patient with diabetes is receiving an insulin drip of Humulin R Regular U-100 insulin 300 units in 150 mL NS IV infusing at 10 mL/h. How many units/h of insulin is this patient receiving?  
\_\_\_\_\_ units/h

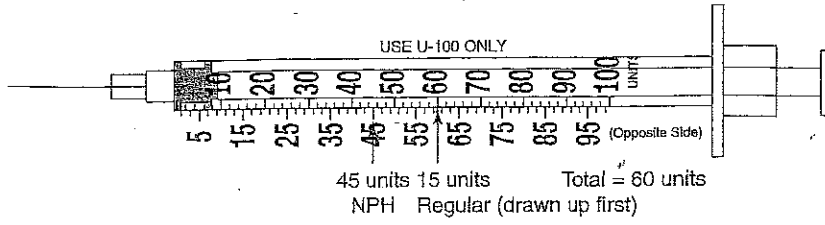


32) 8; 0.08



Answers

33) 60



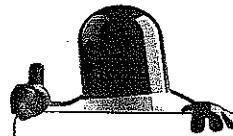
34) 20 units/hr

NAME \_\_\_\_\_

DATE \_\_\_\_\_

ACCEPTABLE SCORE **18**

YOUR SCORE \_\_\_\_\_

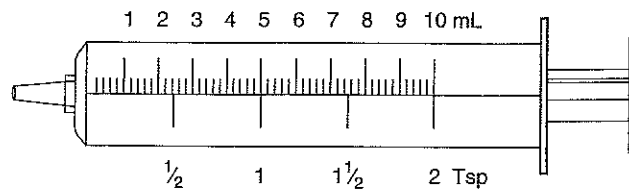


# POSTTEST 1

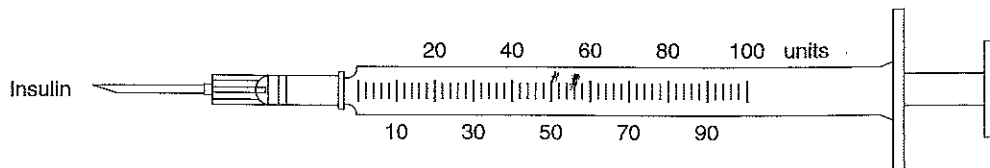
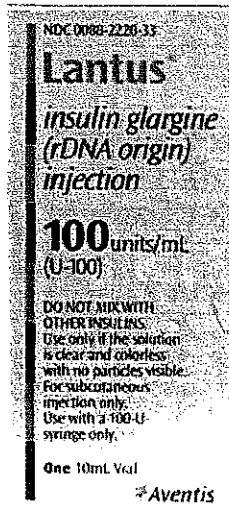


**DIRECTIONS:** The medication order is listed at the beginning of each problem. Calculate the doses. Show your work. Mark the syringe when provided to indicate the correct dose.

- The physician orders penicillin V 500,000 units po four times a day for your patient with a hysterectomy. Penicillin V pediatric suspension 400,000 units/5 mL is supplied. How many milliliters will you administer? \_\_\_\_\_ Draw a vertical line through the syringe to indicate the dose.

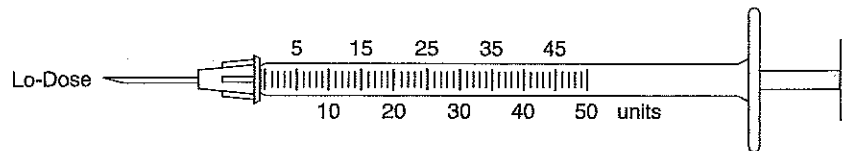
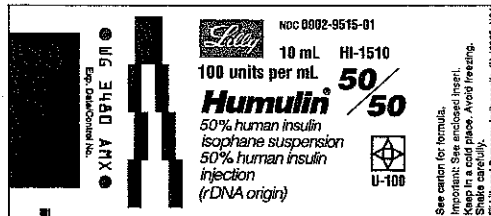


- The physician orders Lantus insulin 40 units subcutaneous daily. Draw a vertical line through the syringe to indicate the dose.



3. In preparation for his upcoming hip replacement surgery, Mr. Stone has Epogen 36,000 units subcutaneous injection once 3 weeks before his surgery. Epogen 40,000 units/mL is available. How many milliliters will the nurse administer? \_\_\_\_\_

4. The physician orders Humulin 50/50 insulin 6 units subcutaneous now. Draw a vertical line through the syringe to indicate the dose.



5. The physician orders penicillin G potassium 3,000,000 units IV q6 h for your patient with an ethmoidectomy. What is the medication concentration if 11.5 mL of diluent is added? \_\_\_\_\_ How many milliliters will you administer? \_\_\_\_\_

NDC 0049-0530-83

*Buffered*  
**Pfizerpen<sup>®</sup>**  
penicillin G potassium  
**For Injection**

TWENTY  
MILLION UNITS **20**

**FOR INTRAVENOUS  
INFUSION ONLY**

CAUTION: Federal law prohibits  
dispensing without prescription.

**ROERIG**   
A division of Pfizer Inc. N.Y., N.Y. 10017

**BULK PHARMACY PACKAGE**  
READ ACCOMPANYING PROFESSIONAL  
INFORMATION

**USUAL DOSAGE**  
6 to 40 million units daily by intravenous infusion only  
in diluent added

|         |                |
|---------|----------------|
| 75 ml   | 250,000 u/ml   |
| 38 ml   | 500,000 u/ml   |
| 11.5 ml | 1,000,000 u/ml |

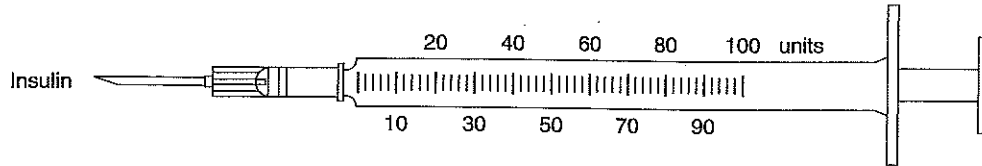
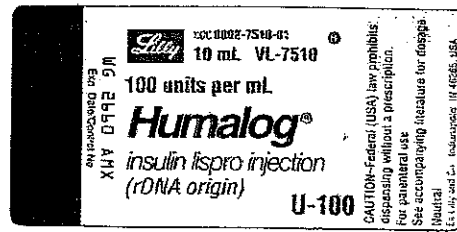
DATE/TIME PREPARED \_\_\_\_\_

BY \_\_\_\_\_

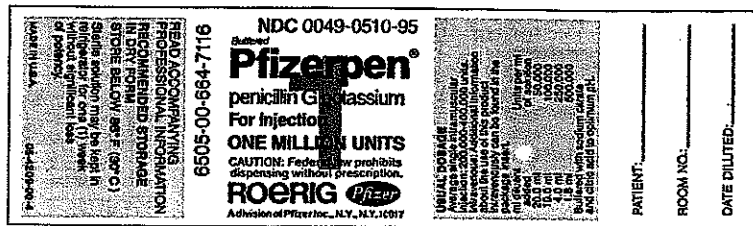
RECOMMENDED STORAGE IN DRY FORM  
STORE BELOW 86° F (30° C)  
Buffered with sodium citrate  
and citric acid to optimum pH.

AFTER RECONSTITUTION, SOLUTION SHOULD BE  
REFRIGERATED. DISCARD UNUSED SOLUTION AFTER 7 DAYS.  
MADE IN U.S.A.

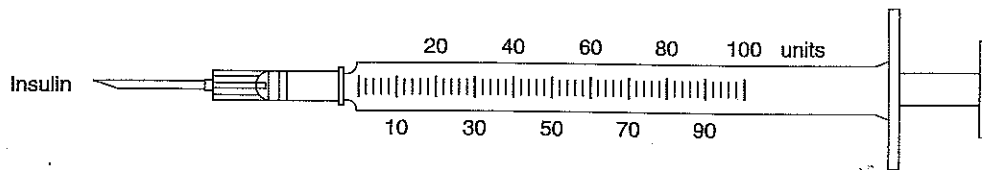
6. Your patient with insulin-dependent diabetes has orders for Humalog insulin 12 units subcutaneous four times a day. You have Humalog insulin U-100 and a U-100 syringe. Draw a vertical line through the syringe to indicate the dose.



7. Mr. Cory has orders for Pfizerpen 600,000 units IM q6 h for a serious pneumococcal infection. Select the most appropriate dilution. How many milliliters of diluent will you add? \_\_\_\_\_ How many milliliters will you administer? \_\_\_\_\_



8. The physician orders Lente insulin 38 units, regular insulin 18 units subcutaneous daily. Lente U-100, regular insulin U-100, and a U-100 syringe are supplied. Draw a vertical line through the syringe to indicate the amount of regular insulin to be given and a second line to indicate the total dose.



9. The physician orders penicillin V 300,000 units po four times a day for your patient with chronic otitis. The drug is supplied in oral solution 200,000 units/5 mL. How many milliliters will you administer? \_\_\_\_\_

10. The physician orders Pfizerpen 1.2 million units IV in a single dose today. What is the medication concentration if 11.5 mL of diluent is added? \_\_\_\_\_ How many milliliters will the nurse administer? \_\_\_\_\_

NDC 0049-0530-83

*Buttered*  
**Pfizerpen**<sup>®</sup>  
penicillin G potassium  
**For Injection**

**TWENTY MILLION UNITS** **20**

**FOR INTRAVENOUS INFUSION ONLY**  
CAUTION: Federal law prohibits dispensing without prescription.

**ROERIG**   
A division of Pfizer Inc. N.Y., N.Y. 10017

RECOMMENDED STORAGE IN DRY FORM  
STORE BELOW 86°F (30°C)  
Buffered with sodium citrate  
and citric acid to optimum pH.  
AFTER RECONSTITUTION, SOLUTION SHOULD BE  
REFRIGERATED. DISCARD UNUSED SOLUTION AFTER 7 DAYS.  
MADE IN U.S.A.

BULK PHARMACY PACKAGE  
READ ACCOMPANYING PROFESSIONAL  
INFORMATION

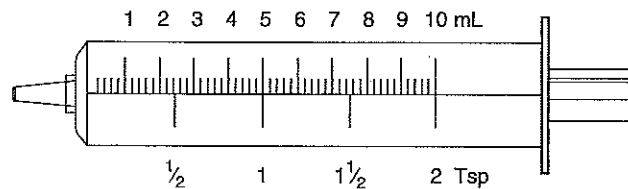
USUAL DOSAGE  
6 to 40 million units daily by intravenous infusion only

Approx. units per ml of solution  
250,000 u/ml  
500,000 u/ml  
1,000,000 u/ml

ml diluent added  
7.5 ml  
8.5 ml  
11.5 ml

DATE/TIME PREPARED \_\_\_\_\_  
BY \_\_\_\_\_

11. Your patient with a sacral decubitus receives penicillin V 200,000 units po four times a day. You have penicillin V oral solution 400,000 units/5 mL. How many milliliters will you administer? \_\_\_\_\_



12. Your postoperative patient receives heparin 5000 units subcutaneous q12 h. Heparin 2500 units/mL is available. How many milliliters will you administer? \_\_\_\_\_
13. Mrs. Tanaka has been admitted with unstable angina. The physician orders Fragmin 8700 international units subcutaneous injection q12 h. How many milliliters will be administered? (Round your final answer to the nearest hundredth.) \_\_\_\_\_

10,000 IU/mL  
9.5 mL multidose vial  
NDC 0013-2436-06



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14. Mrs. Daisy receives nystatin oral suspension 600,000 units po four times a day. How many milliliters will the nurse administer? \_\_\_\_\_

**MYCOSTATIN**  
**ORAL SUSPENSION**  
Nystatin Oral  
Suspension USP

473 mL      NDC 0003-0598-10

Each mL contains  
100,000 USP Nystatin  
Units in a vehicle  
containing 50% sucrose.  
Not more than 1% alcohol  
by volume.

**100,000 units per mL**  
**MYCOSTATIN®**  
**ORAL SUSPENSION**  
Nystatin Oral  
Suspension USP

USUAL DOSAGE FOR  
INFANTS: 2 mL (200,000  
units) four times daily (1 mL  
in each side of mouth).

USUAL DOSAGE FOR  
CHILDREN AND ADULTS:  
See package insert.

**SHAKE WELL  
BEFORE USING**

Store at room  
temperature; avoid  
freezing

Caution: Federal law prohibits  
dispensing without prescription

APOTHECON®  
A Bristol-Myers  
Squibb Company  
Princeton, NJ 08540 USA  
P8739-00

**APOTHECON®**  
A BRISTOL-MYERS SQUIBB COMPANY

15. Ms. Sanders has Epogen 2200 units subcutaneous injection three times a week ordered for anemia caused by chronic renal failure. Epogen 3000 units/mL is available. How many milliliters will the patient receive for each dose? \_\_\_\_\_

16. The physician orders 40 units Lantus U 100 subcutaneous injection daily at bedtime. Draw a vertical line through the syringe to indicate the dose.

NDC 0085-2220-33

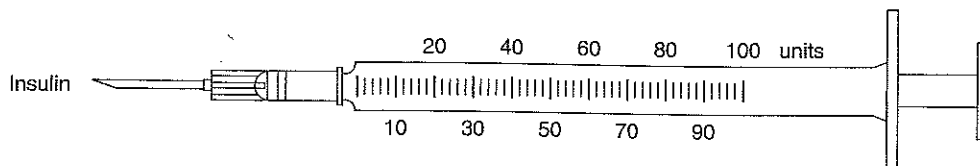
**Lantus**  
*insulin glargine*  
(rDNA origin)  
injection

**100** units/mL  
(U-100)

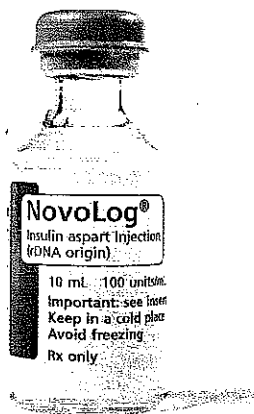
DO NOT MIX WITH  
OTHER INSULINS.  
Use only if the solution  
is clear and colorless  
with no particles visible.  
For subcutaneous  
injection only.  
Use with a 100-U  
syringe only.

One 10mL Vial

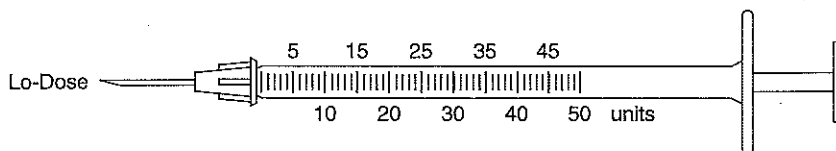
Aventis



17. The physician orders 8 units Novolog U 100 subcutaneous injection daily at bedtime. Draw a vertical line through the syringe to indicate the dose.



Used with permission from Novo Nordisk Inc.



18. The physician orders ampicillin 500 mg IM every 6 hours for a patient with pneumonia. How much diluent will be added to the bottle? \_\_\_\_\_ What is the concentration after reconstitution? \_\_\_\_\_ How many milliliters will the nurse administer? \_\_\_\_\_

NDC 8016-7404-20  
NSN 6505-00-393-351B

EQUIVALENT TO  
**1 gram AMPICILLIN**  
**Ampicillin**  
for Injection, USP  
Formerly known as  
Sterile Ampicillin Sodium, USP  
For IM or IV Use

**Rx only**

For IM use, add 3.5 mL diluent (read accompanying insert). Resulting solution contains 250 mg ampicillin per mL.  
Use solution within 1 hour.  
This vial contains ampicillin sodium equivalent to 1 gram ampicillin.  
Usual Dosage: Adults—250 to 500 mg q. 6 h.  
**READ ACCOMPANYING INSERT** for detailed IM and IV dosage and precautions.

**APOTHECO**  
A Division of  
Pfizer Inc., New York, NY 10017  
Princeton, NJ 08540 USA

74450015  
24-01-144-01

Cont.  
Exp. Date:

19. The physician orders Ancef 500 mg IM every 12 hours for a patient with cellulitis. How much diluent will be added to the bottle? \_\_\_\_\_ What is the concentration after reconstitution? \_\_\_\_\_ How many milliliters will the nurse administer? \_\_\_\_\_

equivalent to  
**1 gram cefazolin**  
NDC 0007-3130-16

**ANCEF®**  
**STERILE CEFAZOLIN**  
**SODIUM (LYOPHILIZED)**

**25 Vials for Intramuscular**  
**or Intravenous Use**

NSN 6505-01-252-9508

Before reconstitution protect from light and store at controlled room temperature (15° to 30°C; 59° to 86°F).  
Usual Adult Dosage: 250 mg to 1 gram every 6 to 8 hours.  
See accompanying prescribing information.  
For I.M. administration add 2.5 mL of Sterile Water for Injection. SHAKE WELL. Withdraw entire contents. Provides an approximate volume of 3.0 mL (330 mg/mL). For I.V. administration see accompanying prescribing information.  
Reconstituted Ancef is stable for 24 hours at room temperature or for 10 days if refrigerated (5°C or 41°F).

SmithKline Beecham Pharmaceuticals  
Philadelphia, PA 19101

694115-N

**K3130-16**

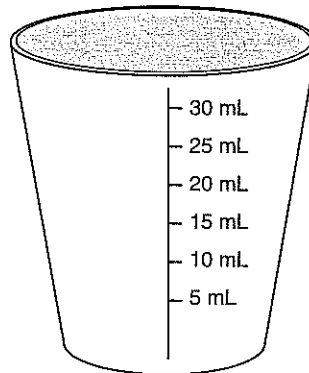
20. Vancocin 1000 mg oral every 6 hours has been ordered for a patient with colitis. How much diluent will be added to the bottle? \_\_\_\_\_ What is the concentration after reconstitution? \_\_\_\_\_ How many milliliters will the nurse administer? \_\_\_\_\_

CAUTION—Federal (USA) law prohibits dispensing without prescription.  
 Usual Dose—See literature.  
 Not For Treatment Of Systemic Infections.  
 Contains Vancomycin Hydrochloride Equivalent to 1 g Vancomycin. Closed System.  
 Prior to Reconstitution: Store at Controlled Room Temperature 59° to 86°F (15° to 30°C).  
 After Reconstitution: The solution should be stored at room temperature. Shake the contents of this vial with distilled or deionized water (20 mL). Mix thoroughly to dissolve.  
 When reconstituted with 20 mL each of water, contains approximately 250 mg of Vancomycin.  
 Eli Lilly and Company  
 Indianapolis, IN 46285, USA  
 ● WW 0742 AMX ●  
 Exp. Date/Control No.

NOC 0002-5105-01 M-5105

**VANCOVIN® HCl**  
 vancomycin hydrochloride for oral solution, USP  
 Equivalent to  
**1g**  
 Vancomycin  
 FOR ORAL USE ONLY

0002-5105-01

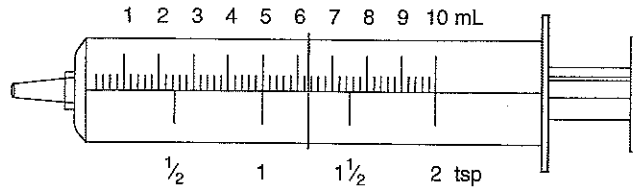



ANSWERS ON PP. 568-570.

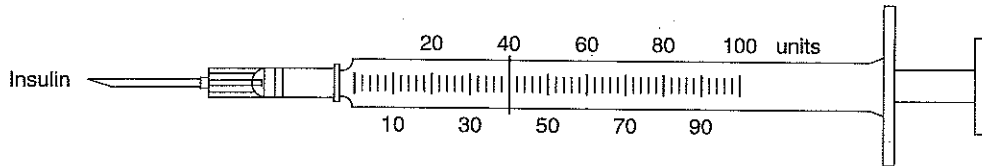


CHAPTER 15 Dosages Measured in Units—Posttest 1, pp. 331–337

| Proportion   | Formula  |
|--|--|
| 1. $400,000 \text{ units} : 5 \text{ mL} :: 500,000 \text{ units} : x \text{ mL}$<br>$400,000x = 2,500,000$<br>$x = \frac{2,500,000}{400,000}$<br>$x = 6.25, 6.3 \text{ mL}$ | $\frac{500,000 \text{ units}}{400,000 \text{ units}} \times 5 \text{ mL} =$<br>$\frac{25}{4} = 6.25, 6.3 \text{ mL}$ |



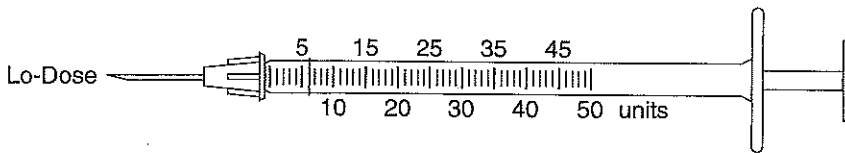
2.



3.  $40,000 \text{ units} : 1 \text{ mL} :: 36,000 \text{ units} : x \text{ mL}$   
 $40,000x = 36,000$   
 $x = \frac{36,000}{40,000}$   
 $x = 0.9 \text{ mL}$

$$\frac{36,000 \text{ units}}{40,000 \text{ units}} \times 1 \text{ mL} = 0.9 \text{ mL}$$

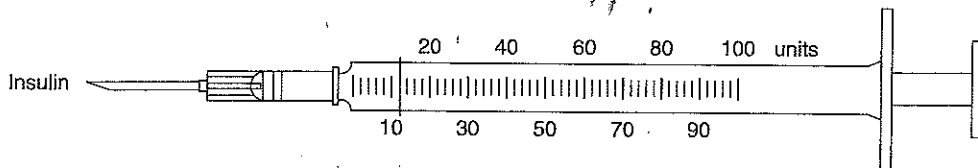
4.



5.  $11.5 \text{ mL}$   
 $1,000,000 \text{ units/mL}$   
 $1,000,000 \text{ units} : 1 \text{ mL} :: 3,000,000 \text{ units} : x \text{ mL}$   
 $1,000,000x = 3,000,000$   
 $x = \frac{3,000,000}{1,000,000}$   
 $x = 3 \text{ mL}$

$$\frac{3,000,000 \text{ units}}{1,000,000 \text{ units}} \times 1 \text{ mL} = 3 \text{ mL}$$

6.



**Proportion**

**Formula**

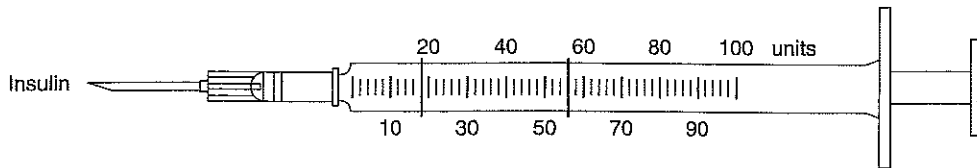
7. Diluent added = 1.5 mL  
 $500,000 \text{ units} : 1 \text{ mL} :: 600,000 \text{ units} : x \text{ mL}$   
 $500,000x = 600,000$   
 $x = \frac{600,000}{500,000}$   
 $x = 1.2 \text{ mL}$

$\frac{600,000 \text{ units}}{500,000 \text{ units}} \times 1 \text{ mL} = 1.2 \text{ mL}$

Diluent 4 mL, 250,000 units/mL  
 $250,000 \text{ units} : 1 \text{ mL} :: 600,000 \text{ units} : x \text{ mL}$   
 $250,000x = 600,000$   
 $x = \frac{600,000}{250,000}$   
 $x = 2.4 \text{ mL}$

$\frac{600,000 \text{ units}}{250,000 \text{ units}} \times 1 \text{ mL} = 2.4 \text{ mL}$

8.



9.  $200,000 \text{ units} : 5 \text{ mL} :: 300,000 \text{ units} : x \text{ mL}$   
 $200,000x = 1,500,000$   
 $x = \frac{1,500,000}{200,000}$   
 $x = 7.5 \text{ mL}$

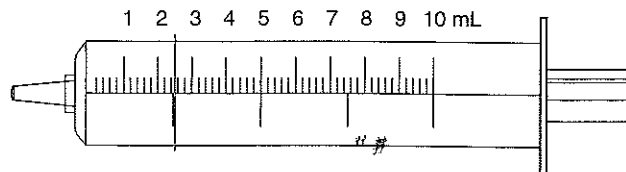
$\frac{300,000 \text{ units}}{200,000 \text{ units}} \times 5 \text{ mL} =$   
 $\frac{15}{2} = 7.5 \text{ mL}$

10. Concentration is 1,000,000 units/mL  
 $1,000,000 \text{ units} : 1 \text{ mL} :: 1,200,000 \text{ units} : x$   
 $1,000,000x = 1,200,000$   
 $x = \frac{1,200,000}{1,000,000}$   
 $x = 1.2 \text{ mL}$

$\frac{1,200,000 \text{ units}}{1,000,000 \text{ units}} \times 1 \text{ mL} = 1.2 \text{ mL}$

11.  $400,000 \text{ units} : 5 \text{ mL} :: 200,000 \text{ units} : x \text{ mL}$   
 $400,000x = 1,000,000$   
 $x = \frac{1,000,000}{400,000}$   
 $x = 2.5 \text{ mL}$

$\frac{200,000 \text{ units}}{400,000 \text{ units}} \times 5 \text{ mL} =$   
 $\frac{1,000,000}{400,000} = 2.5 \text{ mL}$



12.  $2500 \text{ units} : 1 \text{ mL} :: 5000 \text{ units} : x \text{ mL}$   
 $2500x = 5000$   
 $x = \frac{5000}{2500}$   
 $x = 2 \text{ mL}$

$\frac{5000 \text{ units}}{2500 \text{ units}} \times 1 \text{ mL} = 2 \text{ mL}$

**Proportion**

**Formula**

13. 10,000 international units : 1 mL :: 8700 international units : x mL

$$10,000x = 8700$$

$$x = \frac{8700}{10,000}$$

$$x = 0.87 \text{ mL}$$

$$\frac{8700 \text{ international units}}{10,000 \text{ international units}} \times 1 \text{ mL} = 0.87 \text{ mL}$$

14. 100,000 units : 1 mL :: 600,000 units : x mL

$$100,000x = 600,000$$

$$x = \frac{600,000}{100,000}$$

$$x = 6 \text{ mL}$$

$$\frac{600,000 \text{ units}}{100,000 \text{ units}} \times 1 \text{ mL} = 6 \text{ mL}$$

15. 3000 units : 1 mL :: 2200 units : x mL

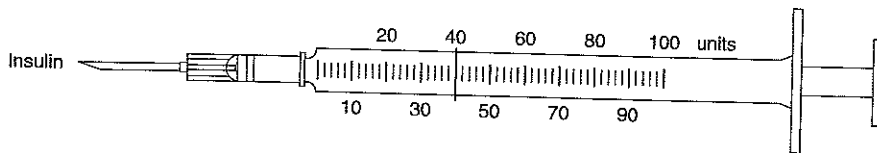
$$3000x = 2200$$

$$x = \frac{2200}{3000}$$

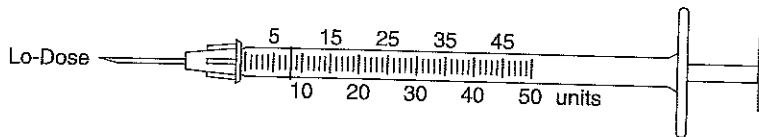
$$x = 0.73, 0.7 \text{ mL}$$

$$\frac{2200 \text{ units}}{3000 \text{ units}} \times 1 \text{ mL} = 0.73, 0.7 \text{ mL}$$

16.



17.



18. Diluent 3.5 mL, 250 mg/mL  
250 mg : 1 mL :: 500 mg : x mL

$$250x = 500$$

$$x = \frac{500}{250}$$

$$x = 2 \text{ mL}$$

$$\frac{500}{250} \times 1 \text{ mL} = 2 \text{ mL}$$

19. Diluent 2.5 mL, 330 mg/mL  
330 mg : 1 mL :: 500 mg : x mL

$$330x = 500$$

$$x = \frac{500}{330}$$

$$x = 1.51, 1.5 \text{ mL}$$

$$\frac{500}{330} \times 1 \text{ mL} = 1.51, 1.5 \text{ mL}$$

20. Diluent 20 mL, 250 mg/5 mL  
250 mg : 5 mL :: 1000 mg : x mL

$$250x = 5000$$

$$x = \frac{5000}{250}$$

$$x = 20 \text{ mL}$$

$$\frac{1000}{250} \times 5 \text{ mL} = 20 \text{ mL}$$

