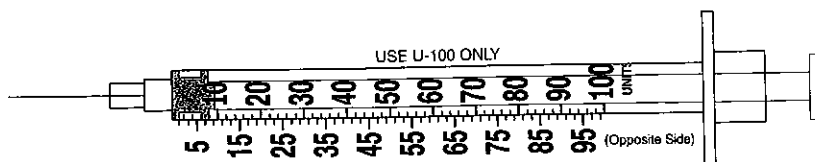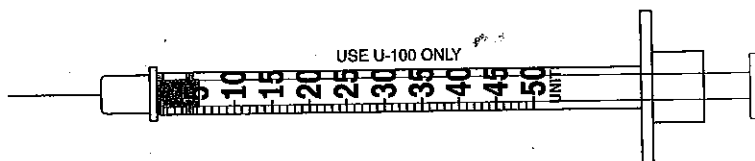29. Order: Humulin R regular U-500 insulin 180 units subcut stat (for discharge teaching patient about home self-administration only)
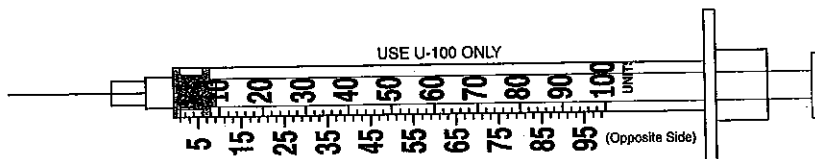
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Draw arrows and label the dosage for each of the combination insulin orders to be measured in the same syringe. Label and measure the insulins in the correct order, indicating which insulin will be drawn up first.

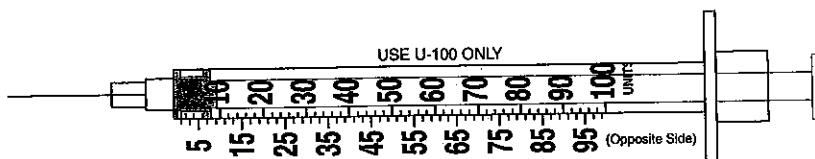30. Order: Novolin R regular U-100 insulin 21 units with Novolin N NPH U-100 insulin 15 units subcut stat

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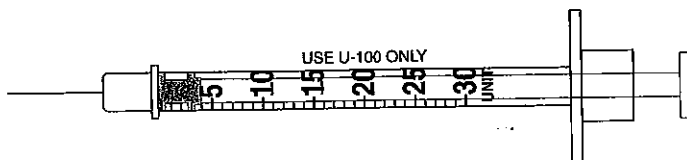31. Order: Humulin R regular U-100 insulin 16 units with Humulin N NPH U-100 insulin 42 units subcut stat

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32. Order: Humulin R regular U-100 insulin 32 units with Humulin N NPH U-100 insulin 40 units subcut ā dinner
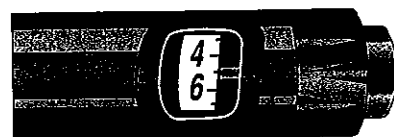
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33. Order: Humulin R regular U-100 insulin 8 units with Humulin N NPH U-100 insulin 12 units subcut stat

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Questions 34 and 35: Identify the dose of insulin displayed in the dose window of the insulin pen.

34. _____ units of insulin

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35. _____ units of insulin

Use the following medication order and insulin sliding scale to answer questions 36 through 40.

Order: Humulin R regular U-100 insulin subcut a.c. per sliding scale.

INSULIN SLIDING SCALE

Insulin Dose	Glucose Reading (mg/dL)*
No coverage	Glucose less than 160
2 units	160 to 220
4 units	221 to 280
6 units	281 to 340
8 units	341 to 400

*Glucose greater than 400: Hold insulin; call MD stat.

36. When will you check the patient's blood glucose level to determine the amount of insulin to give?

_____

37. At what range of blood glucose levels will you administer insulin? _____

38. The patient's blood glucose level before breakfast is 250 mg/dL. What should you do? _____

_____

39. The patient's blood glucose level before lunch is 150 mg/dL. How much insulin should you give now?

_____

40. The patient's blood glucose level before dinner is 410 mg/dL. What should you do now?

_____

After completing these problems, see pages 619–621 to check your answers.

SUMMARY

You are now prepared to solve many of the dosage calculations you will encounter in your health care career. Oral and parenteral drug orders, written in the forms presented thus far, account for a large percentage of prescriptions. You are aware that high-alert drugs account for a high percentage of drug errors and that extreme caution is required. You have learned to think through the process from order, to supply, to amount administered, and to apply the Three-Step Approach and the dosage calculation formula method:

$$\frac{D\ (desired)}{H\ (have)} \times Q\ (quantity) = X\ (amount)$$

Work the practice problems for Chapter 11. After completing the practice problems, you should feel comfortable and confident working dosage calculations. If not, seek additional instruction. Concentrate on accuracy. Remember: One error in dosage calculation can be a serious risk to your patient.
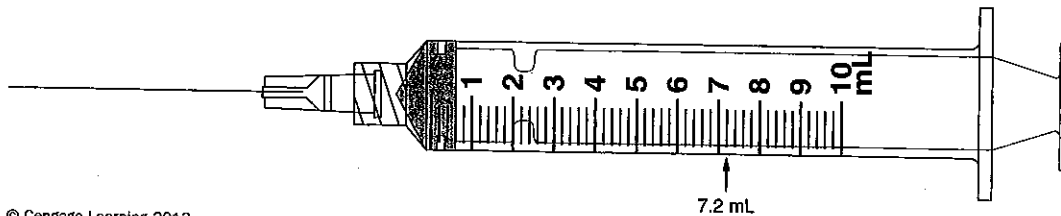
19) Order: fosphenytoin 280 mg IV daily until tolerating PO fluids

Supply: 50 mg/mL

Convert: Order and supply in same unit. No conversion needed.

Think: 280 mg is more than 5 times 50 mg. Needed amount will be more than 5 times 1 mL, or more than 5 mL.

Calculate: $\frac{D}{H} \times Q = \frac{\overset{28}{280 \text{ mg}}}{\underset{5}{50 \text{ mg}}} \times 1 \text{ mL} = \frac{28}{5} \text{ mL}$

= 5.6 mL (verifies estimate)

20) Order: diltiazem 18 mg IV bolus stat

Supply: 5 mg/mL in 10 mL vial

Convert: Order and supply in same unit. No conversion needed.

Think: 18 mg is more than 3 times 5 mg, and closer to but less than 4 times 5 mg. Needed amount will be more than 3 times 1 mL (or more than 3 mL), but less than 4 times 1 mL (or less than 4 mL).

Calculate: $\frac{D}{H} \times Q = \frac{18 \text{ mg}}{5 \text{ mg}} \times 1 \text{ mL} = \frac{18}{5} \text{ mL}$

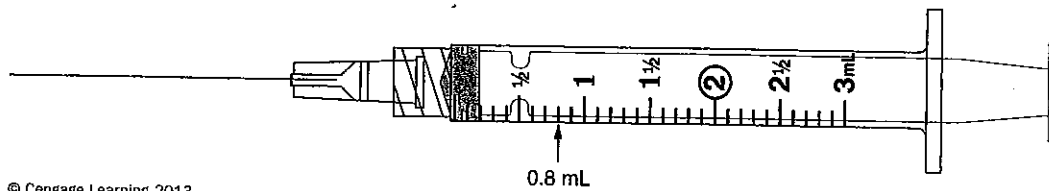= 3.6 mL (verifies estimate)

Review Set 25 from pages 303–310

1) A 2) C 3) D 4) B, D 5) Humulin R, regular, short-acting, 100 units/mL, U-100 insulin syringe 6) Novolin N, NPH, intermediate-acting, 100 units/mL, U-100 insulin syringe 7) NovoLog, aspart, rapid-acting, 100 units/mL, U-100 insulin syringe 8) Humalog, lispro, rapid-acting, 100 units/mL, U-100 insulin syringe 9) Humulin R, regular, short-acting, 500 units/mL, 1 mL syringe 10) Lantus, glargine, long-acting, 100 units/mL, U-100 insulin syringe 11) standard, dual-scale 100 unit/mL U-100 syringe; Lo-Dose, 50 unit/0.5 mL U-100 syringe; Lo-Dose, 30 unit/0.3 mL U-100 syringe 12) Lo-Dose, 50-unit U-100 syringe 13) 0.6 14) 0.25 15) False 16) 20 17) 30,000 18) 6,400 19) No; order is for 67 units and syringe amount is 68 units 20) No; order is for Humulin R regular U-100 insulin and drug supplied is Humulin R regular U-500 insulin 21) No; order is for 23 units of Novolog 70/30 U-100 insulin and drug supplied is 23 units of Novolog U-100 insulin 22) Yes
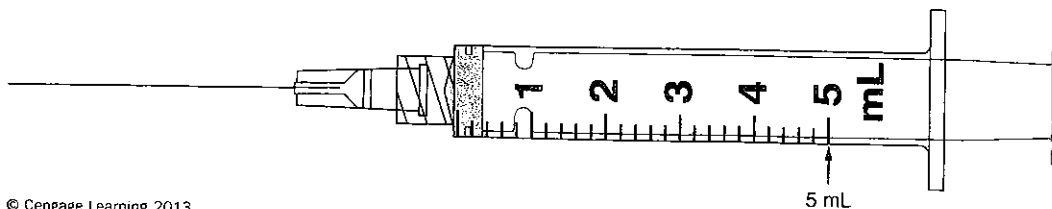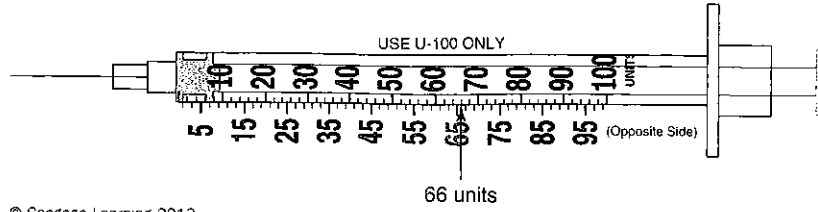
23)

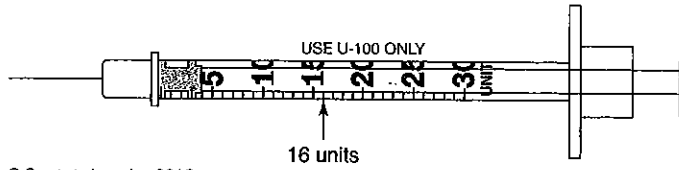© Cengage Learning 2013

7.2 mL

24)

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0.8 mL

25)

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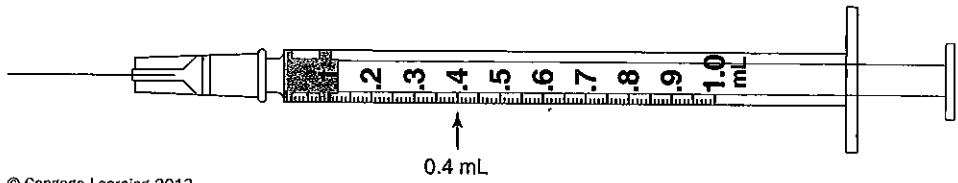
5 mL

26)

USE U-100 ONLY

66 units

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27)

USE U-100 ONLY

16 units

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28)

0.4 mL

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29)

USE U-100 ONLY

36 units

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30)

USE U-100 ONLY

15 units   21 units   Total = 36 units
NPH   regular
                (drawn up first)

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31)

USE U-100 ONLY

42 units   16 units   Total = 58 units
NPH   regular
           (drawn up first)

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32)

USE U-100 ONLY

40 units   32 units   Total = 72 units
NPH   regular
                (drawn up first)

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13)

USE U-100 ONLY

12 units   8 units
NPH   regular
(drawn up first)

Total = 20 units
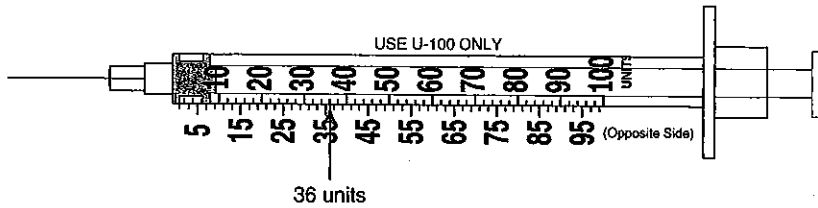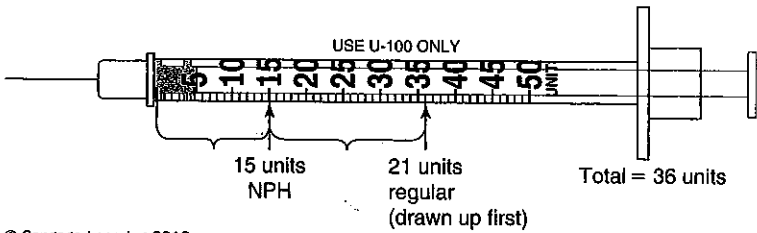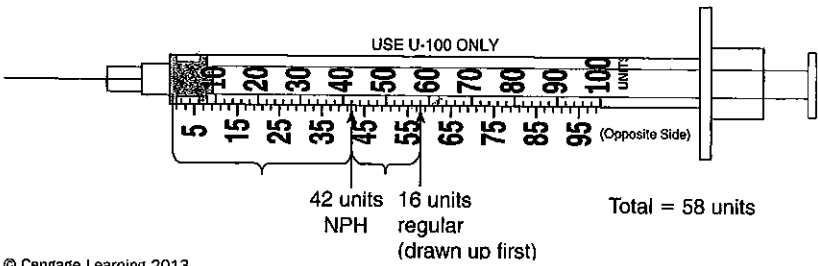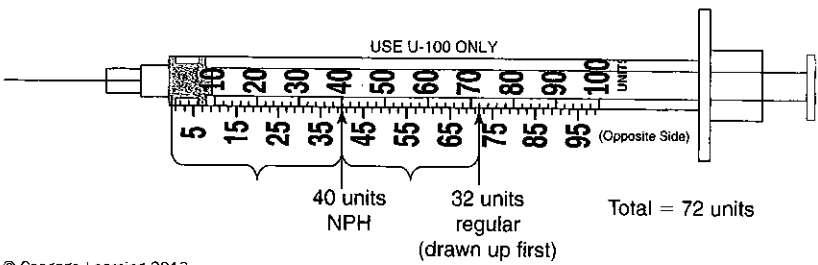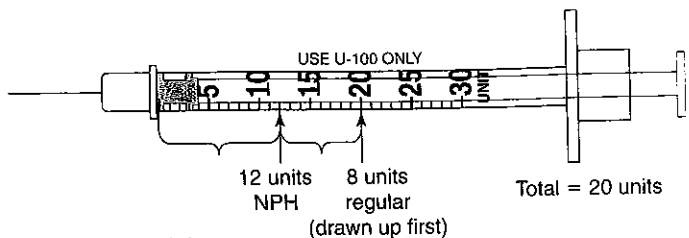
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34) 5

35) 39

36) Before meals (before insulin administration).

37) Blood glucose levels of 160–400.

38) Administer 4 units of Humulin R regular U-100 insulin.

39) None; do not administer insulin.

40) Contact the physician immediately for further instructions.

Solutions—Review Set 25

13) Recall that U-100 = 100 units per mL

$$\frac{D}{H} \times Q = \frac{\overset{6}{\cancel{60 \text{ units}}}}{\underset{10}{\cancel{100 \text{ units}}}} \times 1 \text{ mL} = \frac{6}{10} \text{ mL} = 0.6 \text{ mL}$$

14) Recall that U-500 = 500 units/mL

$$\frac{D}{H} \times Q = \frac{\overset{1}{\cancel{125 \text{ units}}}}{\underset{4}{\cancel{500 \text{ units}}}} \times 1 \text{ mL} = \frac{1}{4} \text{ mL} = 0.25 \text{ mL}$$

Measure 0.25 mL of U-500 insulin in a 1 mL syringe to administer 125 units.

16) $\frac{D}{H} \times Q = \frac{D \text{ units}}{10 \text{ units}} \times 1 \text{ mL} = 2 \text{ mL}$

Apply ratio-proportion:

$\frac{D}{10} \diagup\!\!\!\!\diagdown \frac{2}{1}$

D = 20 units

17) $\frac{D}{H} \times Q = \frac{D \text{ units}}{10,000 \text{ units}} \times 1 \text{ mL} = 3 \text{ mL}$

$\frac{D}{10,000} \diagup\!\!\!\!\diagdown \frac{3}{1}$

D = 30,000 units

28) Recall that U-500 = 500 units/mL

$$\frac{D}{H} \times Q = \frac{\overset{2}{\cancel{200 \text{ units}}}}{\underset{5}{\cancel{500 \text{ units}}}} \times 1 \text{ mL} = \frac{2}{5} \text{ mL} = 0.4 \text{ mL}$$

Measure 0.4 mL of U-500 insulin in a 1 mL syringe to administer 200 units.

29) U-500 insulin is five times more concentrated than U-100 insulin. To use U-100 syringe for the more concentrated U-500 insulin, you should divide the units ordered by 5.

$\frac{180 \text{ units}}{5}$ = 36 units (of U-500 insulin measured in a U-100 insulin syringe).

You can also use ratio-proportion:

$\frac{180 \text{ units}}{500 \text{ units}} \diagup\!\!\!\!\diagdown \frac{X \text{ units}}{100 \text{ units}}$

500X = 18,000

$\frac{500X}{500} = \frac{18,000}{500}$

X = 36 units (of U-500 insulin measured in a U-100 insulin syringe)

Teach your patient to draw up 36 units of U-500 insulin in a U-100 syringe to provide 180 units of U-500 insulin.

Practice Problems—Chapter 11 from pages 312–320

1) 0.4; 1 mL 2) 1.5; 3 mL 3) 2.4; 3 mL 4) 0.6; 1 mL or 3 mL 5) 2; 3 mL 6) 10; 10 mL 7) 0.8; 1 mL or 3 mL

8) 1; 3 mL 9) 1; 3 mL 10) 5.6; 10 mL 11) 1.5; 3 mL 12) 0.6; 1 mL or 3 mL 13) 0.6; 1 mL or 3 mL 14) 1.9; 3 mL

15) 0.6; 1 mL or 3 mL 16) 0.75; 1 mL 17) 0.67; 1 mL 18) 1; 3 mL 19) 0.3; 1 mL 20) 1.6; 3 mL 21) 0.75; 1 mL; The route is IM; the needle may need to be changed to an appropriate gauge and length. 22) 0.5; 1 mL or 3 mL

23) 0.7; 1 mL or 3 mL 24) 0.8; 1 mL or 3 mL 25) 1.3; 3 mL 26) 1.6; 3 mL 27) 6; 10 mL 28) 0.8; 1 mL or 3 mL

29) 1.5; 3 mL 30) 1.6; 3 mL 31) 0.7; 1 mL or 3 mL 32) 0.5; 1 mL or 3 mL 33) 10; 10 mL 34) 16; 30-unit Lo-Dose U-100 insulin 35) 25; 50-unit Lo-Dose U-100 insulin 36) 5.8; 10 mL