Dosage calculation practice: 30 nursing problems with answers

Thirty problems, sorted from easy to hard. Show your setup, keep every step unrounded and round only the final answer. Unless a problem says otherwise, round volumes over 1 mL to the nearest tenth, volumes under 1 mL to the nearest hundredth, and drip rates to whole drops. Use 1 kg = 2.2 lb.

The values are for practice only. In practice, always follow the order, the label and your facility's protocol.

Conversions

1. Convert 0.25 g to mg.
2. Convert 750 mcg to mg.
3. A child weighs 55 lb. What is the weight in kg?
4. A parent asks how many teaspoons are in a 15 mL dose. What do you tell them?
5. How many mg are in each mL of a 1:1,000 solution?

Oral and injection doses

6. Order: 500 mg PO. Available: 250 mg tablets. How many tablets?
7. Order: 0.125 mg PO. Available: 0.25 mg scored tablets. How many tablets?
8. Order: 375 mg PO. Available: 125 mg per 5 mL. How many mL?
9. Order: 0.4 g PO. Available: 250 mg per 5 mL. How many mL?
10. Order: 75 mg IM. Available: 50 mg/mL. How many mL?
11. Order: 4 mg IV. Available: 10 mg/mL. How many mL?
12. Order: 1 g a day in 4 equal doses. Available: 250 mg tablets. How many tablets per dose?

IV pump and infusion time

13. Infuse 1,000 mL over 8 hours by pump. What is the rate in mL/h?
14. Infuse 500 mL over 3 hours by pump. What is the rate in mL/h, to the nearest tenth?
15. Infuse 100 mL of IV antibiotic over 30 minutes by pump. What is the rate in mL/h?
16. 1,000 mL is running at 125 mL/h. How many hours will it take?
17. 500 mL started at 9:00 a.m. at 80 mL/h. What time will it finish?

Gravity drip

18. Infuse 1,000 mL over 8 hours. Drop factor 15 gtt/mL. What is the rate in gtt/min?
19. Infuse 250 mL over 2 hours. Drop factor 20 gtt/mL. What is the rate in gtt/min?
20. Infuse 50 mL over 30 minutes with microdrip tubing (60 gtt/mL). What is the rate in gtt/min?
21. Infuse 100 mL over 20 minutes. Drop factor 10 gtt/mL. What is the rate in gtt/min?

Pediatric doses

22. A child weighs 22 lb. Order: 15 mg/kg/dose. Available: 160 mg per 5 mL. How many mg per dose, and how many mL?
23. A child weighs 18 kg. Order: 40 mg/kg/day divided every 12 hours. Available: 400 mg per 5 mL. How many mL per dose?
24. A child weighs 30 lb. The safe range is 25 to 50 mg/kg/day divided every 8 hours. Order: 150 mg every 8 hours. Is the order within the safe range?
25. A child weighs 12 kg. The maximum is 10 mg/kg/dose. Order: 150 mg per dose. Is the order safe, and what do you do?
26. A child's verified BSA is 0.6 m^2. Order: 100 mg/m^2/dose. Available: 20 mg/mL. How many mg and how many mL?

Heparin and high-alert infusions

27. Order: heparin 5,000 units subcut. Available: 10,000 units/mL. How many mL?
28. Order: heparin 1,200 units/h. Bag: 25,000 units in 500 mL. What is the pump rate in mL/h?
29. A client weighs 176 lb. Protocol: bolus 80 units/kg, then 18 units/kg/h. Bolus vial: 5,000 units/mL. Bag: 25,000 units in 250 mL. Find the bolus volume and the pump rate.
30. The same client's protocol now says: rebolus 40 units/kg and increase the infusion by 2 units/kg/h. Find the rebolus volume (5,000 units/mL vial) and the new pump rate (25,000 units in 250 mL).

Answer key

1. 0.25 × 1,000 = 250 mg
2. 750 ÷ 1,000 = 0.75 mg
3. 55 ÷ 2.2 = 25 kg
4. 15 ÷ 5 = 3 tsp (1 tbsp). Teach the dose in mL with an oral syringe.
5. 1 g in 1,000 mL = 1,000 mg in 1,000 mL = 1 mg/mL
6. 500 ÷ 250 = 2 tablets
7. 0.125 ÷ 0.25 = 0.5 tablet (scored, and only if splitting is allowed)
8. 375 × 5 ÷ 125 = 15 mL
9. 0.4 g = 400 mg. 400 × 5 ÷ 250 = 8 mL
10. 75 ÷ 50 = 1.5 mL
11. 4 ÷ 10 = 0.4 mL
12. 1 g = 1,000 mg. 1,000 ÷ 4 = 250 mg per dose = 1 tablet
13. 1,000 ÷ 8 = 125 mL/h
14. 500 ÷ 3 = 166.66... = 166.7 mL/h
15. 30 min = 0.5 h. 100 ÷ 0.5 = 200 mL/h
16. 1,000 ÷ 125 = 8 hours
17. 500 ÷ 80 = 6.25 h = 6 h 15 min. Finishes at 3:15 p.m.
18. 8 h = 480 min. 1,000 × 15 ÷ 480 = 31.25 = 31 gtt/min

19. 2 h = 120 min. 250 × 20 ÷ 120 = 41.67 = 42 gtt/min
20. 50 × 60 ÷ 30 = 100 gtt/min
21. 100 × 10 ÷ 20 = 50 gtt/min
22. 22 ÷ 2.2 = 10 kg. 10 × 15 = 150 mg per dose. 150 × 5 ÷ 160 = 4.6875 = 4.7 mL
23. 18 × 40 = 720 mg/day. Every 12 hours is 2 doses: 720 ÷ 2 = 360 mg. 360 × 5 ÷ 400 = 4.5 mL
24. 30 ÷ 2.2 = 13.636... kg. Range: 13.636 × 25 = 340.9 mg/day to 13.636 × 50 = 681.8 mg/day. Order: 150 × 3 = 450 mg/day. Within range.
25. Maximum: 12 × 10 = 120 mg per dose. 150 mg is above it. Hold the dose and clarify with the prescriber or pharmacist.
26. 0.6 × 100 = 60 mg. 60 ÷ 20 = 3 mL
27. 5,000 ÷ 10,000 = 0.5 mL
28. 25,000 ÷ 500 = 50 units/mL. 1,200 ÷ 50 = 24 mL/h
29. 176 ÷ 2.2 = 80 kg. Bolus: 80 × 80 = 6,400 units. 6,400 ÷ 5,000 = 1.28 mL. Infusion: 80 × 18 = 1,440 units/h. Bag: 25,000 ÷ 250 = 100 units/mL. 1,440 ÷ 100 = 14.4 mL/h
30. Rebolus: 80 × 40 = 3,200 units. 3,200 ÷ 5,000 = 0.64 mL. New infusion: 18 + 2 = 20 units/kg/h. 80 × 20 = 1,600 units/h. 1,600 ÷ 100 = 16 mL/h

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