Infusion Rate Calculations

1. The doctor orders an IV infusion of D5W 1000 mL to infuse over the next 8 hours. The IV set delivers 15 gtt/min. What is the correct rate of flow? (*Answer in gtt/min rounded to the nearest whole number*).

   a. 16 gtt/min
   b. 31 gtt/min
   c. 48 gtt/min
   d. 60 gtt/min

2. The 10:00 am medications scheduled for your patient include Keflex 1.5 G in 50 mL of a 5% Dextrose solution. According to the pharmacy this preparation should be administered in 30 minutes. The IV tubing on your unit delivers 15 gtt/mL. What is the correct rate of flow in drops per minute? (*Answer in gtt/min rounded to the nearest whole number*).

   a. 30 gtts/min
   b. 25 gtts/min
   c. 15 gtts/min
   d. 10 gtts/min

3. A patient, admitted with a head injury, has an order to start 1000 cc of D5NS at 30 mL/h. The IV tubing has a calibration of 60 gtt/mL. What is the correct rate of flow for this patient? (*Answer in gtt/min rounded to the nearest whole number*).

   a. 15 gtt/min
   b. 20 gtt/min
   c. 30 gtt/min
   d. 40 gtt/min

4. The doctor orders 1.5 litres of Lactated Ringers solution to be administered intravenously to your patient over the next 12 hours. Calculate the rate of flow if the IV tubing delivers 20 gtt/mL. (*Answer in gtt/min rounded to the nearest whole number*).

   a. 48 gtt/min
   b. 42 gtt/min
   c. 36 gtt/min
   d. 28 gtt/min

5. On Wednesday afternoon, your patient returns from surgery with an IV fluid order for 1000 cc every 8 hours. On Thursday morning at 8:00 am, you assess that 600 mL of a 1L bag has been absorbed. The physician orders the remainder of that bag to infuse over the next 6 hours. You know that the IV tubing used by your unit delivers 10 gtt/mL. What will be the correct rate of flow?

   a. 8 gtt/min
   b. 11 gtt/min
   c. 13 gtt/min
   d. 21 gtt/min

6. An intravenous line has been inserted into a patient. Fluid is being delivered at a rate of 42 mL/h. How much fluid will the patient receive in 2 hours?

   a. 42 mL
   b. 21 mL
   c. 84 mL
   d. 126 mL

7. A female patient is receiving Hartmann's solution at a rate of 125 mL/h. How much solution will she receive over 5 hours?

   a. 625 mL
   b. 375 mL
   c. 250 mL
   d. 875 mL

8. A boy is to be given dextrose 5% via an infusion pump. If the pump is set at 60 mL/h, how much dextrose will he receive in 12 hours?

   a. 360 mL
   b. 600 mL
   c. 780 mL
   d. 720 mL

9. A patient is to receive 100 mL of normal saline, I.V. If the infusion pump is set to deliver 150 mL/h, how long will the infusion take?

   a. 1 hour and 30 minutes
   b. 30 minutes
   c. 40 minutes
   d. 50 minutes

10. What is the required flow rate of a volumetric infusion pump to deliver 2 litres of dextrose 4% in 1/5 normal saline over 15 hours? (*Answer in mL/h rounded to the nearest whole number*).

    a. 67 mL/h
    b. 147 mL/h
    c. 113 mL/h
    d. 133 mL/h

11. What is the required flow rate of a volumetric infusion pump to deliver one litre of normal saline over 24 hours? (*Answer in mL/h rounded to the nearest whole number*).

    a. 21 mL/h
    b. 42 mL/h
    c. 62 mL/h
    d. 78 mL/h

12. What is the correct setting for a burette pump to administer 120 mL of fluid containing 500 mg of vancomycin in 50 minutes? (*Answer in mL/h rounded to the nearest whole number*).

    a. 144 mL/h
    b. 72 mL/h
    c. 2.4 mL/h
    d. 240 mL/h

13. What is the correct setting for a burette pump to administer 80 mL of fluid containing 80 mg of gentamicin in 45 minutes? (*Answer in mL/h rounded to the nearest whole number*).

    a. 54 mL/h
    b. 360 mL/h
    c. 122 mL/h
    d. 107 mL/h

14. A teenager is to receive 500 mL of dextrose 5% over 8 hours. The I.V. set emits 20 drops/mL. What is the required drip rate in drops per minute? (*Round answer to the nearest whole number*).

    a. 63 gtt/min
    b. 25 gtt/min
    c. 21 gtt/min
    d. 16 gtt/min

15. A male patient is to receive 1 1/2 litres of fluid over 10 hours. The giving set delivers 20 drops/mL. What is the required drip rate in drops per minute? (*Round answer to the nearest whole number*).

    a. 65 gtt/min
    b. 50 gtt/min
    c. 45 gtt/min
    d. 35 gtt/min

16. A postoperative adult male is to be given one unit of autologous blood in 4 hours. The unit of autologous blood has a volume of 500 mL. The giving set emits 20 drops/mL. What is the required drip rate in drops per minute for the blood infusion? (*Round answer to the nearest whole number*).

    a. 24 gtt/min
    b. 48 gtt/min
    c. 36 gtt/min
    d. 42 gtt/min

17. A patient is to be given one unit of autologous blood over 3 hours using a giving set that delivers 15 drops/mL. The unit of blood contains 480 mL. What is the required drip rate in drops per minute for the blood infusion? (*Round answer to the nearest whole number*).

    a. 44 gtt/min
    b. 40 gtt/min
    c. 36 gtt/min
    d. 38 gtt/min

18. At 0800 h, one litre of dextrose 4% and 1/5 normal saline is set up to run at 75 mL/h. At what time would the flask be finished?

    a. 1620 h
    b. 1840 h
    c. 2120 h
    d. 2320 h

19. At 0430 hours, an infusion pump is set to deliver 1.5 litres of fluid at a rate of 90 mL/h. After 10 hours the pump is reset to 75 mL/h. Calculate the finishing time.

    a. 2350 h
    b. 2230 h
    c. 2140 h
    d. 1530 h

20. A patient is receiving dextrose 5% at a rate of 55 mL/h. How much fluid will he receive in 5 hours?

    a. 275 mL
    b. 225 mL
    c. 285 mL
    d. 265 mL

21. An infusion pump is to be used to give one litre of fluid over 11 hours. At what flow rate should the pump be set?

    a. 46 mL/h
    b. 96 mL/h
    c. 91 mL/h
    d. 86 mL/h

22. A patient is to be given 1 1/2 litres of fluid over 10 hours. The giving set emits 20 drops/mL. What is the required drip rate in drops/min?

    a. 35 drops/min
    b. 45 drops/min
    c. 50 drops/min
    d. 55 drops/min

23. A litre of dextrose 5% is to be given I.V. The solution is to run at 75 mL/h for the first 6 hours, then the rate is reduced to 50 mL/h. Calculate the total time required to give the full volume.

    a. 13 hours
    b. 17 hours
    c. 15 hours
    d. 19 hours

24. The order is for D5LR 1500 mL IV to run for 12 hours. The drop factor is 10 gtt/mL. What is the correct flow rate? (*Answer to the nearest whole number*).

    a. 19 gtt/min
    b. 20 gtt/min
    c. 21 gtt/min
    d. 27 gtt/min

25. The physician's order is for D5LR IV at 75 mL/h for 8 hours. The drop factor is 10 gtt/mL. What is the total volume?

    a. 600 mL
    b. 300 mL
    c. 60 mL
    d. 460 mL

Answer Key to Infusion: Quiz 1

Q01	b	(1000 mL x 15 gtt/min) ÷ (8 hrs. x 60 min) = 31.25 --> 31 gtt/min
Q02	b	(50 mL x 15 gtt/mL) ÷ 30 min = 25 gtt/min
Q03	c	(30 mL/h x 60 gtt/mL) ÷ 60 min = 30 gtt/min
Q04	b	1.5 L x 1000 = 1500 mL; (1500 mL x 20 gtt/mL) ÷ (12 hrs. x 60 min) = 41.66 --> 42 gtt/min
Q05	b	1000 cc – 600 mL = 400 mL left; (400 mL x 10 gtt/mL) ÷ (6 hrs. x 60 min) 11.11 --> 11 gtt/min
Q06	c	42 mL/h x 2 hrs. = 84 mL
Q07	a	125 mL/h x 5 hrs. = 625 mL
Q08	d	60 mL/h x 12 hrs. = 720 mL
Q09	c	0.05 100 mL ÷ 150 mL/h = 2/3 hour or 40 minutes
Q10	d	2000 mL (2 litres) ÷ 15 hrs. = 133.3 --> 133 mL/h
Q11	b	1000 mL (1 litre) ÷ 24 hrs. = 41.6 --> 42 mL/h
Q12	a	120 mL x (60 min ÷ 50 min) = 144 mL/h
Q13	d	80 mL x (60 min ÷ 45 min) = 106.7 -->107 mL/h
Q14	c	(500 mL x 20 gtt/mL) ÷ (8 hrs. x 60 min) = 20.8 --> 21 gtt/min
Q15	b	1.5 L x 1000 = 1500 mL; (1500 mL x 20 gtt/mL) ÷ (10 hrs. x 60 min) = 50 gtt/min
Q16	d	(500 mL x 20 gtt/mL) ÷ (4 hrs. x 60 min) = 41.6 --> 42 gtt/min
Q17	b	(480 mL x 15 gtt/mL) ÷ (3 hrs. x 60 min) = 40 gtt/min
Q18	c	1000 mL (1 litre) ÷ 75 mL/h = 13 1/3 hours or 13 h and 20 minutes; 0800 + 1320 = 2120 h
Q19	b	1.5 L x 1000 = 1500 mL; 1500 mL - (90 mL/h x 10 hrs.) = 600 mL remaining; 600 mL ÷ 75 mL/h = 8 hrs. to complete; 10 hours + 8 hours + 0430 = 2230 h
Q20	a	55 mL/h x 5 hrs. = 275 mL
Q21	c	1 L x 1000 = 1000 mL; 1000 mL ÷ 11 hrs. = 90.9 --> 91 mL/h
Q22	c	1.5 L x 1000 = 1500 mL; (1500 mL x 20 gtt/mL) ÷ (10 hrs. x 60 min) = 50 gtt/min
Q23	b	1 L x 1000 = 1000 mL; 1000 mL - (75 mL/h x 6 hrs.) = 550 mL remaining; 550 mL ÷ 50 mL/h = 11 hours; 6 hours + 11 hours = 17 hours total to give the full volume
Q24	c	(1500 mL x 10 gtt/mL) ÷ (12 hrs. x 60 min) = 20.8 --> 21 gtt/min
Q25	a	75 mL/h x 8 hrs. = 600 mL