

## Advanced Level Drug Dosage Practice Problems

Topics covered:

Navigate to specific sections of this handout by clicking the links below.

### [Pediatric Calculations](#)

[Finding BSAs](#)-----page 2

[Calculating Pediatric Dosages Based on Weight or BSA](#)-----page 2

[Converting Adult Dosages to Child Dosages](#)-----page 3

[Calculating Pediatric Safe Dosages](#)-----page 4

[IV Flow Rates](#)-----page 6

[Heparin Calculations](#)-----page 10

## Pediatric Dosages

### Finding BSAs

1. Find the BSA of a child who is 40 lbs and is 48 in tall.
2. Calculate the BSA of an infant weighing 2 kg whose height is 52 cm.
3. What is the BSA of a person who is 400 kg and is 168 cm tall?
4. Find the BSA of someone whose weight is 65 lbs and whose height is 40 in tall.
5. What would a person's BSA be if they weighed 18 kg and were 106 cm tall?
6. Calculate a person's BSA if they are 190 lbs with at height of 72 in.

### Calculating Pediatric Dosages Based on Weight or BSA

1. The doctor orders a single dose of 20 mg/kg/dose of amoxicillin oral suspension for a toddler who weighs 20 lb. What is the dose in milligrams?
2. The doctor orders penicillin V potassium oral suspension 56 mg/kg/day in four divided doses for a patient who weighs 55 lb. The suspension that's available is penicillin V potassium 125 mg/5 ml. What volume should you administer for each dose?
3. Order for a 66 lb child: Depakene 450 mg p.o. at 8 AM; Depakene 900 mg p.o. at 8 PM. (NOTE: The child is taking a safe, individualized dosage verified with blood levels). Supply: 480 mL bottle of Depakene syrup 250 mg/5 mL
  - a. How many mg/kg/day does this child receive?
  - b. Calculate the amount to be given for each of the two daily doses.
  - c. How many full days will this bottle last?
4. What is the dosage of acyclovir required for a child with a BSA of 1 m<sup>2</sup>, if the recommended dosage is 250 mg/m<sup>2</sup>?
5. The physician orders a drug according to the recommended dosage: Tylenol 10 mg/kg/dose q.3-4h p.r.n., fever > 99°F for a child weighing 12 kg. How many milligrams of Tylenol per dose should the child receive?

6. Child is 45 inches tall and weighs 55 pounds. Order: Methotrexate 3.3 mg/m<sup>2</sup> IV q.d. Supply: Methotrexate 5 mg/2 mL. How many mL do you give per dose?
7. Order: Deferoxamine mesylate IV per protocol. Child has BSA of 1.02 m<sup>2</sup>. Protocol: 600 mg/m<sup>2</sup> initially followed by 30 mg/m<sup>2</sup> at 4 hour intervals for 2 doses; then give 300 mg/m<sup>2</sup> q.12h for 2 days. Calculate the total dosage received.
8. Child is 30 inches tall and weighs 25 pounds. Order: Zovirax (acyclovir) 250 mg/m<sup>2</sup> IV q.8h. Supply: Acyclovir 50 mg/mL. How many mL do you give in 24 hours?
9. What is the total daily dosage range of Mitomycin required for a child with a BSA of 0.59 m<sup>2</sup> if the recommended dosage range is 10 to 20 mg/m<sup>2</sup>/day?
10. What is the dosage of one dose of Interferon Alpha-2b required for a child with a BSA of 0.82 m<sup>2</sup> if the recommended dosage is 2 million units/m<sup>2</sup>?

### Converting Adult Dosages to Child Dosages

1. A child who needs chemotherapy is 36 in. tall and weighs 40 lb. What is the appropriate individual dose for this child if the average adult dose is 1,000 mg?
2. A pediatric patient with a BSA of 0.85 m<sup>2</sup> is to be given a medication with a 600 mg adult dosage. How many milligrams should the patient receive?
3. The child has a height of 48 in and a weight of 65 lb. What is the correct dosage for this child if the average adult dose of the medication is 750 mg?
4. A medication with an average adult dosage of 1,200 mg is prescribed for a child whose BSA is 0.61 m<sup>2</sup>. How many milligrams of the medication should the child receive?
5. How many milligrams of medication should a 100 cm child who weighs 90 kg receive if the average adult dosage is 150 mg?
6. A certain pediatric patient weighs 85 lb and is 40 in tall. What is the appropriate medication amount for the patient if the average adult dosage is 275 mg?
7. Calculate the correct dosage for a child whose BSA is 0.78 m<sup>2</sup> when the normally prescribed adult dosage is 1,500 mg.
8. If a child has a BSA of 0.91 m<sup>2</sup>, what is the appropriate individual dosage for the child when the average adult dosage is 120 mg?

**Calculating Pediatric Safe Dosages**

1. The doctor orders chloral hydrate 75 mg P.O. to sedate a 3 kg neonate for an electroencephalogram. The drug resource states the usual (recommended) dosage of chloral hydrate for a neonate is 35 mg/kg/dose for sedation prior to a procedure. Is the order safe?
2. The practitioner orders Vistaril 10 mg IM q.4-6h p.r.n., nausea. The child weighs 44 lb. The drug resource indicateds that the usual IM dosage is 0.5 mg to 1 mg/kg/dose every 4 to 6 hours as needed. Is this a safe dose?
3. The doctor orders Ceclor 100 mg p.o. t.i.d. The child weighs 33 lb. The recommended dosage on the drug label, "Usual dose: Children, 20 mg per kg a day... in three divided doses." Is this dosage safe?
4. Suppose the physician orders Amoxil (amoxicillin) 200 mg p.o. q.8h for a child who weighs 22 lb. The label describes the recommended dosage as, "usual child dosage: 20-40 mg/kg/day in divided doses every 8 hours." Is this dosage safe?
5. The physician orders Cefazolin 2.1 g IV q.8h for a child with a serious joint infection. The child weighs 95 lb. The drug reference indicates that the usual IM or IV dosage for infants and children in 50-100 mg/kg/day divided every 8 hours; maximum dosage is 6 g/day. This means that regardless of how much the child weighs, the maximum safe allowance of this drug is 6 g per 24 hours. Is the order safe?
6. The order reads ibuprofen 40 mg p.o. q.6h p.r.n., temp > 101.6°. The 7-month-old baby weighs 17 ½ lb and has a temp of 102.6°. The drug reference manual states "Children: 6 months-12 years: Temperature < 102.5°F - 5 mg/kg/dose; temperature > 102.5°F - 10 mg/kg/dose; given every 6-8 hr; Maximum daily dose: 40 mg/kg/day. Is the order safe?
7. Order: Chloromycetin 55 mg IV q.12h for an 8-day-old infant who weighs 2,200 g. The recommended dosage for Chloromycetin is 50 mg/kg/day IV divided q.12h. Is this dosage safe?
8. Order: Keflex 125 mg p.o. q.6h for a 44 lb child. If the recommended dosage is 25 mg/kg/day in four divided doses, is this a dosage safe?\_\_\_\_\_Keflex is available in an oral suspension of 250 mg per 5 mL. If the dosage is safe, give \_\_\_\_\_mL/dose.
9. Order: Gentamicin sulfate 18 mg IVPB q.8h for a 9 kg child.  
Supply: Gentamicin sulfate 20 mg/2 mL  
Recommended dose: Gentamicin sulfate 2 mg/kg/dose IV q.8h  
If safe, give\_\_\_\_\_mL/dose

10. The physician orders Versed 1 mg IM stat preoperatively for a child weighing 14 kg. The recommended dosage of Versed is 0.05 to 0.1 mg/kg per dose preoperatively. Is the dosage ordered safe?
11. If the safe dose range of fentanyl IV preoperatively is 1 to 2 mcg/kg/dose, how many milligrams of fentanyl could a child weighing 40 kg receive per dose (minimum and maximum)?
12. The recommended dosage range of Solu-Medrol is 1 to 2 mg/kg/day. Calculate the safe dosage range per day of Solu-Medrol for a child weighing 22 kg.
13. Order: Codeine 20 mg p.o. q.4h p.r.n., pain for a child who weighs 40 kg. The recommended dosage is 0.5 mg/kg/dose not to exceed 6 doses per day. Is this ordered dosage safe?
14. Order: Give Benoject 22 mg IV q.8h. Child has BSA of 0.44 m<sup>2</sup>. Recommended safe dosage of Benoject is 150 mg/m<sup>2</sup>/day in divided dosages every 6-8 hours. Is this a safe dosage?
15. Order: Accutane 83.75 mg IV q.12h for a child with a BSA of 0.67 m<sup>2</sup>. The recommended safe dosage range is 100 to 250 mg/m<sup>2</sup>/day in 2 divided doses. Is this dosage safe?
16. Order: Cerubidine 9.6 mg IV on day 1 and day 8 of cycle.  
Protocol: 25 to 45 mg/m<sup>2</sup> on days 1 and 8 of cycle. Child has BSA of 0.32 m<sup>2</sup>.  
Is this dosage safe?
17. Order: Give quinidine 198 mg p.o. q.d. for 5 days. Child has BSA of 0.22 m<sup>2</sup>.  
Recommended safe dosage of quinidine is 900 mg/m<sup>2</sup>/day given in 5 daily doses. Verify safe dosage, and calculate total milligrams received over 5 days of therapy.
18. Order: Albuterol 1.2 mg p.o. t.i.d. for an 18 kg child with severe asthma. Recommended dosage from the manufacturer: 0.2 mg/kg/day orally in three equally divided doses. Is the ordered dosage safe?
19. Order: Nebcin (tobramycin) 10 mg IM q.8h. The neonate weighs 4,000 g. The recommended dosage of tobramycin is 2.5 mg/kg/dose IM q.8h. Is this dosage safe?
20. Order: Suprax 120 mg p.o. q.d. for a 33 lb child. The recommended dosage of Suprax for children is 8 mg/kg/day p.o. as a single dose. Is this dosage safe?

## IV FLOW RATES

1. You receive an order that reads KCl 40 mEq in 100 ml of NS over 40 minutes. You proceed to use a controller for the infusion, along with a tubing set calibrated at 60 gtt/ml. What is the drip rate?
2. A patient needs 15 ml of erythromycin, which is equal to 500 mg. The infusion is to be completed in 30 minutes using a tubing set calibrated to 20 gtt/ml. What is the drip rate?
3. A patient needs 250 ml of normal saline solution over 2 hours. What is the infusion rate?
4. If you plan to infuse 1 L of D5W at 50 ml/hour, what's the infusion time?
5. A patient requires 500 ml of normal saline solution at 80 ml/hour. What's the infusion time? If the normal saline solution is hung at 5 a.m., what time will the infusion end?
6. The doctor prescribes 250 ml of normal saline I.V. at 32 gtt/minute. The drip factor is 15 gtt/ml. What's the infusion time?
7. Order: 3,000 mL D5W IV @ 125 mL/h. Drop factor: 10 gtt/mL. What is the drip rate?
8. Order: Two 500 mL units of whole blood IV to be infused in 4 h. Infusion rate is calibrated to 20 drops per milliliter. What is the drip rate?
9. Order: 3,500 mL D5LR IV to run at 160 mL/h. Drop factor: 15 gtt/mL. What is the drip rate?
10. Order: 500 mL D5W 0.45% Saline IV to infuse @ 165 mL/h Drop factor: 10 gtt/mL. What is the drip rate?
11. Order: 3 L NS IV to infuse @ 125 mL/h. Drop factor: 15 gtt/mL. What is the flow rate (gtt/min)?
12. Order: 1,000 cc NS IV @ 50 cc/h. Drop factor: 60 gtt/mL. What is the flow rate?
13. Order: 2,500 mL D5 0.45% NaCl IV @ 105 mL/h. Drop factor: 20 gtt/mL. What is the flow rate (gtt/min)?
14. Order 1,000 cc D5 0.45% NaCl to infuse over 8 hours. Drop factor: On electronic infusion pump. What is the flow rate (mL/h)?
15. Order: 500 cc LR to infuse over 4 h. What is the flow rate?

16. Order: 100 ml IV antibiotic to infuse in 30 min via electronic infusion pump. What is the flow rate?
17. Order: 1,500 mL Lactated Ringer's IV for 12 hours @ 125 mL/h. Drop factor: 20 gtt/mL. What is the flow rate (gtt/min)? After 6 hours, there are 850 mL remaining; describe your action at this time.
18. Order: 500 mL D5NS IV for 5 h @ 100 ml/h. Drop factor: 20 gtt/mL. What is the flow rate (gtt/min)? After 2 hours, there are 250 mL remaining, describe your action now.
19. Order: Ancef 1 g in 100 cc D5W IV PB to be infused over 45 min. Drop factor: 60 gtt/mL. What is the flow rate (gtt/min)?
20. Calculate the flow rate for each of the following: Order: Give 1,000 mL of 0.45% NaCl IV @ 200 mL/h
  - a. Drop factor 10 gtt/mL
  - b. Drop factor 15 gtt/mL
  - c. Drop factor 20 gtt/mL
  - d. Drop factor 60 gtt/mL
21. Order: Ampicillin 500 mg dissolved in 200 mL D5W IV to run for 2 h. Drop factor: 10 gtt/mL. What is the flow rate (gtt/min)?
22. Order: 1,000 mL D5W IV per 24 h KVO. Drop factor: 60 gtt/ml. What is the drip rate?
23. Order: 200 mL D5RL IV to run KVO for 24 h. Drop factor is 60 gtt/ml. What is the flow rate?
24. Order: 2.5 L NS IV to infuse at 125 mL/h. Drop factor is 20 gtt/mL. Calculate the flow rate.
25. Order: 1,000 mL D5W IV for 6 h. Drop factor is 15 gtt/mL Calculate the flow rate in gtt/min. After 2 hours, 800 mL remain. Describe your action now.

26. Order: Infuse 1 gram of Aminophylline in 1000 mL of D5W at 0.7mg/kg/hr. The client weighs 110 lb.

- a. Calculate the amount of drug in 1 mL \_\_\_\_\_
- b. Calculate the dosage in mg/hr \_\_\_\_\_
- c. Calculate the dosage in mg/min \_\_\_\_\_
- d. Reference states no more than 20 mg/min. Is the order safe? \_\_\_\_\_

27. Order: Dobutamine 500 mg in 500 mL D5W to infuse at 30 mL/hr. The client weighs 140 lb. You have available 20 mL vial with 250 mg Dobutamine.

- a. Calculate the amount of drug in 1mL \_\_\_\_\_
- b. Calculate the dosage in mcg/hr \_\_\_\_\_
- c. Calculate the dosage in mcg/min \_\_\_\_\_

28. Order: Infuse 500 mL D5W with 800 mg Theophylline at 0.7 mg/kg/hr. The client weighs 73.5 kg.

- a. Calculate how many milligrams should this client receive per hour \_\_\_\_\_

29. A client is to receive Lidocane 2 g in 250 mL D5W. The solution is infusing at 22 mL/hr. Calculate the following:

- a. Calculate the amount of drug in 1 mL \_\_\_\_\_
- b. Calculate the dosage in mg/hr \_\_\_\_\_
- c. Calculate the dosage in mg/min \_\_\_\_\_

30. Ringer's lactate 1000 mL is ordered to be given within 12 hours for a hyperthermic patient. Drop factor is 15 gtt/mL.

\_\_\_\_\_ mL/h  
\_\_\_\_\_ gtt/min



31. A hypertensive patient has orders for Nipride 50 mg in 250 mL D5W. Infuse at 3 mcg/kg/min for a patient weighing 82 kg. Drop factor is 60 gtt/mL.

\_\_\_\_\_ amount drug mcg/min for 82 kg patient  
\_\_\_\_\_ amount drug mcg/mL  
\_\_\_\_\_ gtt/min

32. The physician orders Nipride 50 mg in 500 mL D5W for a patient with hypertension. Infuse at 0.5 mcg/kg/min for a patient weighing 75 kg. Drop factor is 60 gtt/mL.

\_\_\_\_\_ amount drug/min for 75 kg patient  
\_\_\_\_\_ amount drug/mL  
\_\_\_\_\_ gtt/min

33. A patient returns from cardiac catheterization. The physician orders 250 mL N.S. within 12 hours. Drop factor is 60 gtt/mL.

\_\_\_\_\_ mL/h  
\_\_\_\_\_ gtt/min

34. A patient receives packed red blood cells 1 U (0.5L) for trauma and blood loss to infuse over 6 hours. Drop factor is 12 gtt/mL.

\_\_\_\_\_ mL/h  
\_\_\_\_\_ gtt/min

35. The physician orders Dobutamine 250 mg in 250 mL D5W for a cardiogenic shock patient. Infuse at 500 mcg/kg/min for an 80 kg patient. Drop factor is 60 gtt/mL.

\_\_\_\_\_ amount drug/min for 80 kg patient  
\_\_\_\_\_ amount drug/mL  
\_\_\_\_\_ gtt/min

36. The physician orders Dextran 12% 1000 mL within 8 hours for a post-trauma victim. Drop factor is 12 gtt/mL.

\_\_\_\_\_ mL/hr  
\_\_\_\_\_ gtt/min

## Heparin Calculations

1. Order: Heparin IV to infuse at 1,000 U/h. Is this dosage safe? Normal adult range is 20,000 to 40,000 U/24 h.
2. Order: Heparin IV to infuse at 850 U/h. Is this dosage safe? (same normal range as above).
3. Order: Heparin IV 2,000 U/h. is this dosage safe? (same normal range as above).
4. Order: Add 225 mg of a medication to 250 mL of IV solution and administer 3 mcg/kg/min via infusion pump for a person who weighs 110 lb. Determine the flow rate (mL/h).
5. Order: Lidocaine 2 g IV per 1,000 mL D5W at 4 mg/min. What is the flow rate?
6. Order: Pronestyl 0.5 g IV per 250 mL D5W at 2 mg/min. What is the flow rate?
7. Order: Isuprel 2 mg IV per 500 cc D5W at 5 mcg/min. What is the flow rate?
8. Order: Dopamine 800 mg in 500 mL NS IV at 15 mcg/kg/min. Calculate the flow rate.
9. Order: 1,000 mL 0.45% NS c heparin 25,000 U to infuse at 1,000 U/h. What is the flow rate? What is the daily heparin dosage (U/24h)?
10. Order: 500 mL D5W IV c heparin 40,000 U to infuse at 1,100 U/h. What is the flow rate?
11. Order: 500 mL 0.45% NS IV c heparin 25,000 U to infuse at 500 U/h. What is the flow rate?
12. Order: D5W 1,000 mL IV c heparin 40,000 U to infuse at 40 mL/h. What is the hourly heparin dosage?
13. Order: D5NS 500 mL c heparin 5,000 U added to infuse at 80 mL/h. What is the hourly heparin dosage?
14. Order: D5W 1L IV c heparin 40,000 U to infuse at 30 mL/h. What is the hourly heparin dosage?

## Answers

### Finding BSAs

1.  $0.78 \text{ m}^2$
2.  $0.17 \text{ m}^2$
3.  $4.32 \text{ m}^2$
4.  $0.91 \text{ m}^2$
5.  $0.73 \text{ m}^2$
6.  $2.09 \text{ m}^2$

### Calculating Pediatric Dosages Based on Weight or BSA

1. 181.8 mg
2. 14 mL
3. a. 45 mg/kg/day  
b. AM: 9 mL; PM: 18 mL  
c. 17 days
4. 250 mg
5. 120 mg/dose
6. 1.18 mL
7. 1,897.2 mg
8. 7.35 mL
9. 5.90mg-11.80 mg/day
10. 1,640,000 units

### Converting Adult Dosages to Child Dosages

1. 400 mg
2. 300 mg
3. 441.18 mg
4. 430.59 mg
5. 139.41 mg
6. 168.24 mg
7. 688.24 mg
8. 64.24 mg

### Calculating Pediatric Safe Dosages

1. No, too low.
2. Yes

3. Yes
4. No, order is too high.
5. No, order is too high.
6. No
7. Yes
8. Yes; 2.5 mL/dose
9. 1.8 mL/dose
10. Yes
11. 0.04-0.08 mg/dose
12. 22-44 mg/day
13. Yes
14. Yes
15. Yes
16. Yes
17. Yes, safe. Give 990 mg/5 days.
18. Yes
19. Yes
20. Yes

### IV Flow Rates

1. 150 gtt/min
2. 10 gtt/min
3. 125 mL/hr
4. 20 hours
5. Infusion time is 6 hrs 15 mins; infusion ends at 11:15 am or 1115 hours
6. 117 mins or 1 hr 57 mins
7. 21 gtt/min
8. 83 gtt/min
9. 40 gtt/min
10. 28 gtt/min
11. 31 gtt/min
12. 50 gtt/min
13. 35 gtt/min
14. 125 mL/hr
15. 125 mL/hr
16. 200 mL/hr
17. Flow rate is 42 gtt/min; increase to 47 gtt/min

18. Flow rate is 33 gtt/min; decrease to 28 gtt/min
19. 133 gtt/min
20. a. 33 gtt/min  
b. 50 gtt/min  
c. 67 gtt/min  
d. 200 gtt/min
21. 17 gtt/min
22. 42 gtt/min
23. 8 gtt/min
24. 42 gtt/min
25. Flow rate is 42 gtt/min; increase to 50 gtt/min
26. a. 1 mg/mL  
b. 35 mg/hr  
c. 0.6 mg/min  
d. Yes
27. a. 1 mg/mL  
b. 30,000 mcg/hr  
c. 500 mcg/min
28. 51.5 mg/hr
29. a. 8 mg/mL  
b. 176 mg/hr  
c. 2.9 mg/min
30. 83 mL/hr or 21 gtt/min
31. Amount of drug in mcg/min:  
246 mcg/min  
Amount of drug in mcg/mL:  
200 mcg/mL  
Drip rate: 74 gtt/min
32. Amount of drug in mcg/min:  
37.5 mcg/min  
Amount of drug in mcg/mL:  
100 mcg/mL  
Drip rate: 23 gtt/min
33. 21 mL/hr or 21 gtt/min
34. 83 mL/hr or 17 gtt/min
35. Amount of drug in mcg/min:  
40,000 mcg/min  
Amount of drug in mcg/mL:  
1,000 mcg/mL  
Drip rate: 2400 gtt/min
36. 125 mL/hr or 25 gtt/min

### Heparin Calculations

1. Yes
2. Yes
3. No
4. 10 mL/hr
5. 120 mL/hr
6. 60 mL/hr
7. 75 mL/hr
8. 0.56 mL/kg/hr
9. 40 mL/hr; 24,000 Units/day
10. 14 mL/hr
11. 10 mL/hr
12. 1,600 Units/hr
13. 800 Units/hr
14. 1,200 Units/hr