

Drug Dosage: Pediatric Dosages

The pediatric population is a special population in nursing, especially when it comes to medication dosing and administration. In this handout, the following questions will focus on calculating Body Surface Area (BSA), determining the dosage based on weight or BSA, converting between adult and pediatric dosages, and calculating pediatric safe dosages. For a list of common conversions and formulas, refer to the [Nursing Conversions and Formulas](#) handout.

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Calculating BSAs

Round all answers to the nearest hundredth as applicable.

1. Find the BSA of a child who is 40 lb 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 114 kg and is 168 cm tall?
4. Find the BSA of someone whose weight is 65 lb and whose height is 3'4" 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 lb with a height of 72 in.

Calculating Pediatric Dosages Based on Weight or BSA

Round all weights to the nearest tenth before continuing with further calculations. Round all final answers to the nearest tenth as applicable.

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^2 , if the recommended dosage is 250 mg/m^2 ?
5. The physician orders a drug according to the recommended dosage: Tylenol $10 \text{ mg/kg/dose q.3-4h p.r.n.}$ for fever $> 99^\circ\text{F}$ 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 $3.3 \text{ mg/m}^2 \text{ IV}$. 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^2 .

Protocol: 600 mg/m^2 initially followed by 30 mg/m^2 at 4-hour intervals for 2 doses; then give $300 \text{ mg/m}^2 \text{ q.12h}$ for 2 days. Calculate the total dosage received.
8. Child is 30 inches tall and weighs 25 pounds. Order: Zovirax (acyclovir) $250 \text{ mg/m}^2 \text{ IV q8h}$. 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^2 if the recommended dosage range is $10 \text{ to } 20 \text{ mg/m}^2/\text{day}$?
10. What is the dosage of one dose of Interferon Alpha-2b required for a child with a BSA of 0.82 m^2 if the recommended dosage is $2 \text{ million units/m}^2$?

Converting Adult Dosages to Child Dosages

Round all answers to the nearest hundredth as applicable.

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^2 is to be given 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^2 . 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^2 when the normally prescribed adult dosage is 1,500 mg.
8. If a child has a BSA of 0.91 m^2 , what is the appropriate individual dosage for the child when the average adult dosage is 120 mg?

Calculating Pediatric Safe Dosages

Round all answers to the nearest tenth as applicable.

1. Order: Give Benoject 22 mg IV q.8h. Child has BSA of 0.44 m^2 . Recommended safe dosage of Benoject is $150 \text{ mg/m}^2/\text{day}$ in divided dosages every 6-8 hours. Is this a safe dosage?
2. Order: Accutane 83.75 mg IV q.12h for a child with a BSA of 0.67 m^2 . The recommended safe dosage range is 100 to $250 \text{ mg/m}^2/\text{day}$ in 2 divided doses. Is this dosage safe?
3. Order: Cerubidine 9.6 mg IV on day 1 and day 8 of cycle.
Protocol: 25 to 45 mg/m^2 on days 1 and 8 of cycle. Child has BSA of 0.32 m^2 . Is this dosage safe?
4. Order: Give quinidine 198 mg p.o. every day for 5 days. Child has BSA of 0.22 m^2 . Recommended safe dosage of quinidine is $900 \text{ mg/m}^2/\text{day}$ given in 5 daily doses. Verify safe dosage, and calculate total milligrams received over 5 days of therapy.
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 is $50\text{-}100 \text{ mg/kg/day}$ 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. A pediatric patient weighs 40 pounds. The doctor orders 5,000 mcg/kg to be given q.8 hours. The determined safe range for this medication is 15-45 mg/kg/day. Is the ordered dosage safe? If so, and pharmacy dispenses an oral suspension with a concentration of 100 mg/5 mL, how many milliliters would the nurse administer to the patient for one dose?
7. 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
8. 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?

Answers

Finding BSAs

- | | |
|-----------------------|-----------------------|
| 1. 0.78 m^2 | 4. 0.91 m^2 |
| 2. 0.17 m^2 | 5. 0.73 m^2 |
| 3. 2.31 m^2 | 6. 2.09 m^2 |

Calculating Pediatric Dosages Based on Weight or BSA

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|------------------------|---|
| 1. 182 mg | 5. 120 mg/dose |
| 2. 14 mL | 6. 1.2 mL |
| 3. a. 45 mg/kg/day | 7. 1,897.2 mg |
| b. AM: 9 mL; PM: 18 mL | 8. 7.4 mL/day |
| c. 17 days | 9. 5.9-11.8 mg/day |
| 4. 250 mg | 10. 1,640,000 units or 1.64 million units |

Converting Adult Dosages to Child Dosages

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

Calculating Pediatric Safe Dosage

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|----------------------------------|--------------------------------------|
| 1. Yes | 5. No, the order is too high |
| 2. Yes | 6. Yes, safe; administer 4.6 mL q.8h |
| 3. Yes | 7. 1.8 mL/dose |
| 4. Yes, safe; give 990 mg/5 days | 8. Yes |