



Spring

Pediatric Math

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Administering Medications to Children

- Children birth to one year have a greater percentage of body water – causing a decrease in absorption of water-soluble drugs
- Ages 1-12 years metabolize drugs more readily than adults
- Immature physiological processes related to absorption, distribution, metabolism, and excretion – places the child at risk for overdose, toxic reactions, and possible death

Pediatric Dosage Calculation



- When medications prescribed
 - Weight
 - Height
 - Body surface
 - Age
 - Condition of the child
- 2 methods
 - Body weight
 - Body surface area



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Remember



- The 6 Rights of medication administration
 - Right client
 - Right medication
 - Right dose
 - Right route
 - Right time
 - Right documentation
- Always use 2 identifiers
 - Name and date of birth

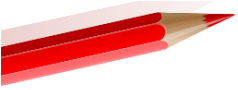


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Verifying Safe Dosages



- To verify safe dosing
 - Convert weight from pound to kilogram
 - Calculate safe dose in mg/kg or mcg/kg (most common)
 - Compare ordered dosage to recommended dosage and decide if dosage is safe
 - If safe, calculate the amount given and administer
 - If dosage seems unsafe/non-therapeutic, contact ordering provider

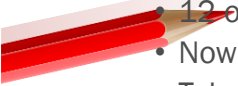


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Lb to Kg Conversions



- $1 \text{ kg} = 2.2 \text{ lb}$
- $1 \text{ lb} = 16 \text{ oz}$
- When converting pound to kilogram
 - Round kilogram to one decimal place (tenth)
 - $16.25 \text{ kg} = 16.3 \text{ kg}$
- What about when there are oz's? Example: 10 lb 12 oz
 - 12 oz: 12 divided by 16 = 0.75
 - Now you attach the 0.75 to 10 = 10.75
 - Take the 10.75 and divide by 2.2 = 4.9 kg



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Practice

- Convert weight to kilogram
 - 22 lb 14 oz
 - 10.4 kg
 - 70 lb 2 oz
 - 31.9 kg
 - 45 lb 6 oz
 - 20.6 kg
- 30 lb 10 oz
 - 13.9 kg
- 10 lb 4 oz
 - 4.7 kg
- 62 lb 5 oz
 - 28.3 kg
- 37 lb 8 oz
 - 17 kg

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Practice

A physician's order reads: Amoxicillin 200 mg/kg po every 8 hours.
The child weighs 22 lb.

- What is the child's weight in kg?

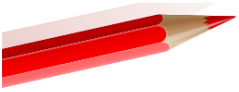
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Practice



A physician's order reads: Amoxicillin 200 mg/kg po every 8 hours.
The child weighs 22 lb.

- How many mg will be administered per dose?



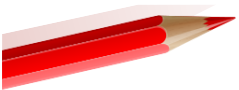
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Practice



A physician's order reads: Amoxicillin 200 mg/kg po every 8 hours.
The child weighs 22 lb.

- How many mg will be administered per day?



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Practice

A pediatrician has ordered ampicillin 50 mg/kg/day po in divided doses every 6 hours for a child who weighs 24 lb.

- How many kg does the child weigh?
- 

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Practice

A pediatrician has ordered ampicillin 50 mg/kg/day po in divided doses every 6 hours for a child who weighs 24 lb.

- How many mg should the child receive per day?
- 

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Practice

A pediatrician has ordered ampicillin 50 mg/kg/day po in divided doses every 6 hours for a child who weighs 24 lb.

- How many mg should the child receive per dose?



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Practice

The licensed prescriber orders diphenhydramine 28.4 mg IV Q 6 hrs. You have available diphenhydramine 12.5 mg/mL. The recommended daily dosage is 5 mg/kg/day in four divided doses. The child weighs 50 lbs.

- What is the child's weight in kg?



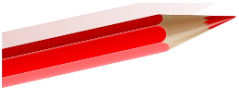
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Practice



The licensed prescriber orders diphenhydramine 28.4 mg IV Q 6 hrs. You have available diphenhydramine 12.5 mg/mL. The recommended daily dosage is 5 mg/kg/day in four divided doses. The child weighs 50 lbs.

- What is the safe dose per day for this child?



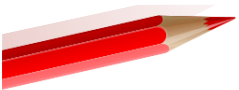
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Practice



The licensed prescriber orders diphenhydramine 28.4 mg IV Q 6 hrs. You have available diphenhydramine 12.5 mg/mL. The recommended daily dosage is 5 mg/kg/day in four divided doses. The child weighs 50 lbs.

- What is the safe single dose for this child?



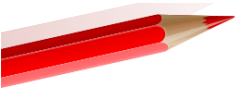
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Practice



The licensed prescriber orders diphenhydramine 28.4 mg IV Q 6 hrs. You have available diphenhydramine 12.5 mg/mL. The recommended daily dosage is 5 mg/kg/day in four divided doses. The child weighs 50 lbs.

- Is the order within the safe dose range?
- If so, calculate the amount to be given.



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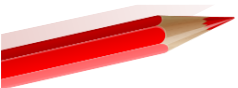
Practice



A physicians order reads: Amoxicillin 200 mg po every 8 hours. The child weighs 22 lb.

The drug reference book indicates the recommended dosage as 20-40 mg/kg/day in divided doses every 8 hours.

- What is the child's weight in kg?



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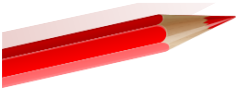
Practice



A physicians order reads: Amoxicillin 200 mg po every 8 hours. The child weighs 22 lb.

The drug reference book indicates the recommended dosage as 20-40 mg/kg/day in divided doses every 8 hours.

- Calculate the minimum dosage per day.



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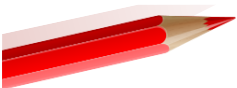
Practice



A physicians order reads: Amoxicillin 200 mg po every 8 hours. The child weighs 22 lb.

The drug reference book indicates the recommended dosage as 20-40 mg/kg/day in divided doses every 8 hours.

- Calculate the minimum dosage for each single dose.



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Practice

A physicians order reads: Amoxicillin 200 mg po every 8 hours. The child weighs 22 lb.

The drug reference book indicates the recommended dosage as 20-40 mg/kg/day in divided doses every 8 hours.

- Calculate the maximum dosage per day.
- 

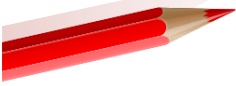
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Practice

A physicians order reads: Amoxicillin 200 mg po every 8 hours. The child weighs 22 lb.

The drug reference book indicates the recommended dosage as 20-40 mg/kg/day in divided doses every 8 hours.

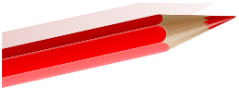
- Calculate the maximum dosage for each single dose.
- 

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Practice



Is the ordered dose safe?



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Review



- Converting lb to kg
 - Lb divided by 2.2
 - Round to the nearest tenth place
 - $16.25 = 16.3$ kg
- When calculating pediatric dose
 - Round to institutional policy – in this course to the nearest tenth unless it specifies something different
 - To the tenth – 65.7 mg
 - To the hundredth – 65.67 mg



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Not Done Yet...



- Remember basic dosage calculation

- Desire dose

Available x Quantity

- Example –

Doctor orders amoxicillin 500 mg every 8 hours. You have on hand amoxicillin 1000 mg/tablet.

- How many tablets will you administer per dose?

- How many tablets will you administer per day?

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Rounding Liquid/Parenteral Medications



- Dosage < 1 mL – round to the 100th

- 0.646 mL = 0.65 mL

- 0.643 mL = 0.64 mL

- Dosage > 1 mL – round to the 10th

- 1.86 mL = 1.9 mL

- 1.82 mL = 1.8 mL

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Review



- IV Calculations
 - mL/hr
 - Total volume
Total time equals mL/hr
 - gtt/min
 - Total volume
Total time in minutes x Drop factor = gtt/min
- Remember no “trailing zeros”
 - If the answer is .5, must write 0.5
- Drip rate round to whole number – gtt/min
- Flow rate round to whole number – mL/hr

ADD A FOOTER

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Practice



A client with herpes simplex virus 1 has acyclovir 700 mg in 200 mL of D5W order to infuse over 30 minutes. Drop factor is 60 gtt/mL.

- How many mL per hour?



- How many gtt/min?


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Practice



A client with herpes simplex virus 1 has acyclovir 700 mg in 200 mL of D5W order to infuse over 4 hours. Drop factor is 20 gtt/mL.

- How many mL per hour?

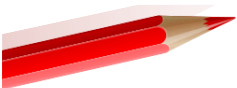
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- How many gtt/min?

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PCA Question



- You have a patient come from the PACU with Demerol PCA prescription for pain. Prescription reads:
- Basal rate: 4 mg/hour
- PCA dose: 2 mg/10 minutes
- How many mg can the patient receive in 8 hour?



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Insulin Sliding Scale



- The Healthcare Provider has prescribed sliding scale insulin for Ms. Jones. You perform a chemstick at 1130 and her glucose level is 245. Based on the chart below, how much regular insulin will Ms. Jones receive? **Circle your answer on the chart.**



Sliding Scale	Insulin Dosage
Blood Sugar: 0-150	Zero unit
Blood Sugar: 151-250	8 unit
Blood Sugar: 251-350	13 unit
Blood Sugar: 351-400	18 unit
Blood Sugar: >400	Call Doctor

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Reconstitution of Medications



- Powdered medications that are not stable in liquid form for prolonged periods of time
- Rules:
 - Must determine both the type and amount of diluent to be used (on med label)
 - Must determine the volume in mL of diluent to be used for the route ordered (on med label)
- Once medication is reconstituted – note the resulting supply dosage on the vial or what it “yields”

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Reconstitution of Medications



NDC 25021-100-10 **Rx only**

CEFAZOLIN
for Injection, USP

500 mg

SAGENT™

Equivalent to 500 mg of cefazolin activity For IM or IV Use

Sterile, Nonpyrogenic, Preservative-free

PREPARATION OF SOLUTION:
For IM Use - Add 2 mL Sterile Water for Injection, SHAKE WELL. Resulting solution provides an approximate volume of 2.2 mL (225 mg per mL). For IV Use - See insert. Discard unused solution 24 hours after reconstitution if stored at room temperature or within 10 days if stored under refrigeration, 5°C (41°F).

Each vial contains cefazolin sodium equivalent to 500 mg cefazolin. The total sodium content is approximately 24 mg (1.05 mEq sodium ion) per 500 mg of cefazolin.

USUAL DOSAGE: 250 mg to 1 g every six to eight hours. See insert. See package insert for detailed indications, IM or IV dosage and precautions.

Prior to reconstitution: Store at 20° to 25°C (68° to 77°F). [See USP Controlled Room Temperature.]

PROTECT FROM LIGHT.

SP100298

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(01)00325021100103

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Reconstitution of Medications



Each 5 mL of reconstituted suspension contains 125 mg cefdinir USP.

Usual Dosage: Children-14 mg/kg/day in a single dose or in two divided doses, depending on age, weight, and type of infection. See package enclosure for full prescribing information. This bottle contains 1.5 g cefdinir.

Do not accept if seal over bottle opening is broken or missing.

DIRECTIONS FOR RECONSTITUTION
Prepare suspension at time of dispensing by adding a total of 38 mL water to the bottle. Tap bottle to loosen the powder, then add about half the water, and shake. Add the remaining water and shake to complete suspension. This provides 60 mL of suspension.

Keep this and all drugs out of the reach of children.

Store dry powder and reconstituted suspension at 20° to 25°C (68° to 77°F); excursions permitted to 15° to 30°C (59° to 86°F) [see USP Controlled Room Temperature].

Use within 10 days. **SHAKE WELL BEFORE EACH USE.**
Keep bottle tightly closed.

Rx only NDC 65862-218-60

Cefdinir for Oral Suspension, USP
125 mg/5 mL

SHAKE WELL BEFORE USING.
Keep bottle tightly closed.
Any unused portion must be discarded 10 days after mixing.

RECONSTITUTE WITH 38 mL WATER

60 mL when reconstituted

Manufactured for:
Aurobindo Pharma USA, Inc.
2400 Route 130 North
Dayton, NJ 08810

Manufactured by:
Aurobindo Pharma Limited
Chitkul (V)-502 307, A.P., India

M.L.No.: 78/MD/AP/96/F/B/R

Batch :
Expiry :

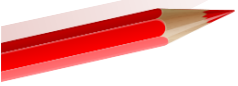
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Reconstitution



- Steps
 - The type and amount of diluent
 - The resulting volume after powder has been reconstituted
 - Example: added 2 mL of diluent to vial – resulting volume 2.2 mL
- So let's say the dosage of medication ends up being 125 mg/2.2 mL. The order is for 100 mg every 8 hours. How would you set this up?



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