

# Pediatric Dose Calculation Information for IV Therapy

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This information is for educational purposes only. The clinician must use it in the context of good medical practices and as interpreted through their own clinical judgement.

## Dose Adjustments for Pediatrics:

Clark's Rule is a medical term referring to a procedure used to calculate the amount of medicine to give to a child aged 2-17. The procedure is to take the child's weight in pounds, divide by 150lbs, and multiply the fractional result by the adult dose to find the equivalent child dosage.

$$\text{Pediatric dose} = [\text{child's weight (lb)} / 150 \text{ (lb)}] \times \text{Adult dose}$$

### For example:

If an adult dose of medication calls for 30mg and the child weighs 30lbs. Divide the weight by 150 (30/150) to get 1/5. Multiply 1/5 times 30mg to get 6mg. (Or convert the fraction to a decimal and multiply – 0.20 in this case).

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## Dose Adjustments for Pediatrics:

### Common IV example:

- Adult goal dose is 40 mL of drug
  - Child weighs 25 pounds
  - [25 lb / 150 lb] x 40 mL
- 1/6 x 40 mL [convert to a decimal]
- 0.167 x 40 mL = 6.7 (7) mL dose

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## HDIVC (with DMSO) Scaling for a 10 Kg Child @ max 1.25 G / Kg dose Dose Escalation IV #-1 to 4 (Max Dose)

	5 Gm	7.5 Gm	10 Gm	12.5 Gm
D5W	100	100	100	200
C-500	10	15	20	25
CaCl	0.5	1	1	1
MgCl	0.5	1	2	2
KCl	-0-	-0-	-0-	0.5
DMSO	0.5	0.5	0.5	1.0

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## Nutrient Scaling for Pediatrics:

- The calculation on the prior slide can be used for all additives in an IV, provided that the additive is acceptable for pediatric infusion.
- Such calculations are a guideline and not a hard and fast rule. They will however generally help create an appropriately scaled infusion Rx that is safe for a pediatric patient.

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## Volume Adjustments:

- In Rehydration a common calculation is 20 mL / Kg body weight.
  - <http://emedicine.medscape.com/article/801012-treatment>
- In Therapeutic / Hypertonic IV's the volume for a pediatric patient can be calculated based on the following considerations:
  - How close to the 20 mL/Kg is the total volume?
  - Is the solution hypertonic and should the solution volume be increased?
  - Just as in an adult, if headache or other signs of dehydration develop then a following infusion of an isotonic solution may be made at the 20 mL/Kg dose.

***This chart is an estimate by weight for isotonic solutions / hydration in a pediatric patient. Therapeutic IV solutions should generally not exceed these volumes.***

Kg-Weight	5	10	15	20	25
mL Isotonic Solution	100	200	300	400	500

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## Pediatric IV Clinical Notes

- If adjusted and dosed appropriately IV therapies are well tolerated in pediatrics.
- Have all emergency medication doses calculated for the individual pediatric patient based on current weight (see chart below) and have those doses on paper with the patient at each IV visit.
- Central IV access flushing volumes (and some procedures) are different for pediatric patients. Assure you have all required information and supplies prior to starting IV therapy.
- Monitoring of vital signs and other clinical markers as common to all IV therapy is required.

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## Pediatric IV Clinical Notes

- Children can experience temporary severe dehydration with hypertonic IV therapies.
  - If pre-verbal they will often start screaming due to pain.
  - If doing HDIVC or other IV with osmolarity over 400 mOsm/L consider pre hydration with 0.9 NS or 0.45 NS as noted in the slides above.
  - Notify the parents / caregivers before any IV of this potential and that you are hydrating the child (or adjusting the IV osmolarity to 350 – 450 mOsm/L) as a preventive measure.
  - If needed give the child an oral analgesic and assure you have a pediatric dose form (and dose for that patient pre-calculated) of the analgesic on hand.

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## Pediatric Emergency Medications

Dosing of Epinephrine and Diphenhydramine – NOTE: Epi has TWO columns					
Age Group Dose	Weight * In kg	Weight * In lbs	Epinephrine Dose – IMI 1 mg/mL injectable (1:1000 dilution) IM	Diphenhydramine (Benadryl) 12.5 mg/5 mL liquid 25 and 50 mg capsules or tabs 50 mg/mL injectable	Epinephrine Dose – IVI 1 mg/mL injectable (1:10,000 dilution) IV
1-6 mos	4-7 kg	9-15 lbs	0.05 mg (0.05 ml)	5 mg	0.06 mg (0.6 mL)
7-18 mos	7-11 kg	15-24 lbs	0.1 mg (0.1 ml)	10 mg	0.1 mg (1 mL)
19-36 mos	11-14 kg	24-31 lbs	0.15 mg (0.15 ml)	15 mg	0.15 mg (1.5 mL)
37-48 mos	14-17 kg	31-37 lbs	0.15 mg (0.15 ml)	20 mg	0.15 mg (1.5 mL)
49-59 mos	17-19 kg	37-42 lbs	0.2 mg (0.2 ml)	25 mg	0.2 mg (2 mL)
5-7 yrs	19-23 kg	42-51 lbs	0.2 mg (0.2 ml)	30 mg	0.2 mg (2 mL)
8-10 yrs	23-35 kg	51-77 lbs	0.3 mg (0.3 ml)	35 mg	0.3 mg (3 mL)
11-12 yrs	35-45 kg	77-99 lbs	0.4 mg (0.4 ml)	40 mg	0.4 mg (4 mL)
13 yrs & older	45+ kg	99+ lbs	0.5 mg (0.5 ml)	50-100 mg	0.5 mg (5 mL)

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