



# **BROSELOW**

# **Pediatric Emergency Tape**

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# Introduction

- The Broselow Pediatric Emergency Tape is a color-coded length and weight-based tape used in pediatric emergencies.
- The tape uses a child's **length** to determine a **weight range (in kg)** corresponding to a **color** to provide appropriate dosages, equipment, and defibrillation shock voltages.
- The Broselow Tape is designed for children up to approximately **12 years** of age who have a maximum weight of roughly **36 kg** (80 lbs).
- It is used by paramedics, nurses and doctors, and is utilized in the AHA's pediatric advanced life support classes (PALS).



# History

Created by physicians to solve the number of emergency medication errors with children.

- Emergency physician James Brose low
- Dr. Robert Luten, one of the early PEDS EMT leaders who was part of the original PALS subcommittee
- Dr. Allen Hinkle, Dartmouth pediatric anesthesiologist

Brose low made an at-home prototype of the tape in 1985 using a strip of leather that his wife wrote lines and dosages on.

*“The simple, honest answer is that it was born out of my own anxiety in learning to care for sick children” - Dr. James Brose low*

Brose low, 2012

# Matching Carts

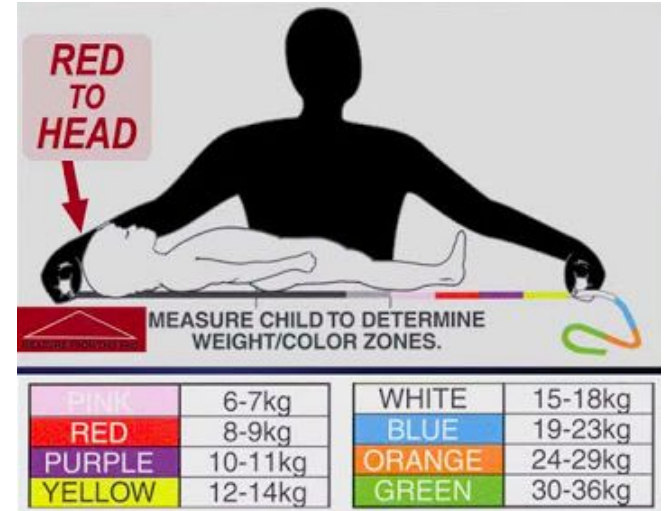
## Pediatric Crash Cart

- Color-coded carts containing medications and supplies designed to simplify care and eliminate errors.
- Each color-coded drawer contains appropriately sized equipment for that weight's color.
- When a child measures blue, everything in blue drawer drawer should be sized blue.



# Steps for Use

1. Position the tape on a flat surface with the color-coded weight side visible
2. Align the **red-end** side of the tape with the top of the patient's **head**
  - a. **“Red to Head”**
  - b. Never measure a child in the seated position.
  - c. Be sure to maintain proper placement at the head of the patient.



# Steps for Use (cont.)

3. Measure the patient from the **head** to the **heel** of the foot.  
(i.e. NOT to the toes)
4. The section at the heel of the patient's foot indicates the approximate weight in kgs and the patient's color zone
5. Use the information within the Color Zone to make correct equipment choices and obtain drug dosage information







# Nursing Practice

- Nurses are in charge of medication preparation and administration during pediatric codes (e.g. med nurse).
- Studies show that the average rate of human error jumps from 3% to 25% in stressful situations.
- In an emergency situation, call out the color clearly so the medical team can access the correct size supplies and dosages.
  - Closed-loop communication is key
  - The drawer/kit will contain ET tubes, IV catheters/start kits, airway adjuncts, etc.

# Considerations

- Pediatric obesity is on the rise; thus, the Broselow Tape does not always provide accurate height and weight conversions
  - Dosages are calculated using the 50th percentile weight for the length range within each colored zone
- Best practice is to use pediatric med calculator (when available, located in most EHR systems), to obtain the most accurate dosage for a specific patient

## Pediatric Emergency Calculator

Patient Name: John Doe

MRN: 999999999

Age: Years 3

Weight is 15 Kilograms

Electrotherapy	Initial Dose	Subsequent Dose 1	Subsequent Dose 2
Defibrillation	2 J / kg = 30 Joules	4 J / kg = 60 Joules	4 to 10 J / kg = 60 to 150 Joules
Cardioversion	0.5 J / kg = 7.5 Joules	1 J / kg = 15 Joules	2 J / kg = 30 Joules

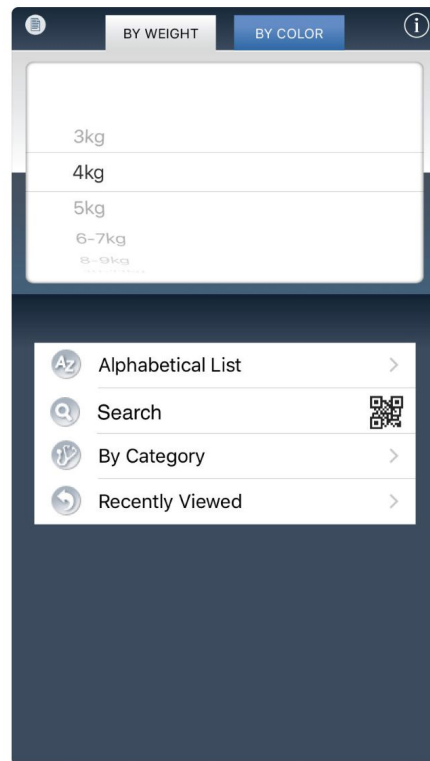
Code Medications	Concentration	Dose / kg	IV / IO Dose (may round)	Volume (may round)	Comments
EPINEPHRINE	0.1 mg / ml 1:10,000	0.01 mg / kg	0.15 mg	1.5 ml	Repeat every 3 to 5 minutes.
Adenosine	3 mg / ml	0.1 mg / kg	1.5 mg	0.5 ml	Rapid bolus and flush with 5 - 10 ml NS. Double dose if no effect.
Amiodarone	50 mg / ml	5 mg / kg	75 mg	1.5 ml	For pulseless VF/VT, give rapid bolus. For perfusing tachycardia, infuse over 20 - 60 minutes. Max dose: 15 mg / kg per 24 hrs. Use 0.22 micron filter.
Atropine	0.1 mg / ml	0.02 mg / kg	0.3 mg	3 ml	May repeat once in 3 - 5 min; maximum total dose 1mg.
Calcium Chloride 10%	100 mg / ml	20 mg / kg	300 mg	3 ml	Repeat as needed. Infuse slowly. Use central venous or IO line if possible.
Dextrose 50%	0.5 Gm / ml	0.5 Gm / kg	7.5 Gm	15 ml	May repeat as needed. Max infusion rate: 0.2 Gm / kg over 1 minute. Dilute 1:1 with sterile water for peripheral IV.
Flumazenil	0.1 mg / ml	0.01 mg / kg	0.15 mg	1.5 ml	Maximum cumulative dose is 1 mg.
Lidocaine 2%	20 mg / ml	1 mg / kg	15 mg	0.8 ml	Rapid bolus. Follow with infusion.
Magnesium Sulfate	500 mg / ml	50 mg / kg	750 mg	1.5 ml	For torsades, give rapid bolus. Repeat right away if not effective. Dilute dose with 10 mL of normal saline.
Naloxone: Partial Reversal	1 mg / ml	0.01 mg / kg	0.15 mg	0.15 ml	Titrate to effect. Repeat as needed.
Naloxone: Full Reversal	1 mg / ml	0.1 mg / kg	1.5 mg	1.5 ml	Titrate to effect. Repeat as needed.
Sodium Bicarbonate 8.4%	1 mEq / ml	1 mEq / kg	15 mEq	15 ml	May repeat as needed. Infuse slowly. Use only if ventilation is adequate.

For continuous infusions refer to facility-specific reference.

# SafeDosePro

Drs. Broselow and Luten joined forces to develop the **eBroselow Initiative** to bring treatment information to the *desktop, tablet, or smart phone* of every emergency practitioner with the **SafeDosePro App**.

Available for download in the app store.



The screenshot shows the medication information for acetylcysteine. At the top, there is a header with a home icon, a weight range of "24-29kg", and icons for a prescription and a person. Below the header, the medication name is "acetylcysteine - Acetaminophen Overdose, 1st Maintenance IV (Acetadote)". The dosage is "50 mg/kg/dose over 4 hours". There is a "Mixing Instructions" button. Below that is a table with the following data:

	1325 mg
Total volume over 4 hours (5.2 mg/mL)	254 mL
Rate per hour	64.1 mL/hr

Below the table, there is a section for "Administration" which states: "Administer via syringe or infusion pump over 4 hours." There is also a section for "Pediatric Administration" which states: "The syringe or infusion pump must be set to deliver the 'Total volume over 4 hours' mL amount. Medication dilutions follow the recently revised manufacturer's recommendations. Please note that patients 8-18 kg will not receive all of the prepared solution. The 'Total volume over 4 hours' mLs will provide a 50 mg/kg/dose for each zone." There is also a section for "Remarks" which states: "Serious anaphylactic reactions have been reported with patients receiving IV Acetylcysteine. Use with caution in patients with history of asthma or bronchospasm."

# References

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