The Broselow™ Tape: Use it wisely

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Objectives

- List at least 3 benefits of “color-coding kids”

- Discuss exceptions to consider in length-based resuscitation

- Demonstrate use of a length-based resuscitation system in mock patient management
Pediatric Patients in MCI

- Critically ill or injured children may present to *any* and *all* hospitals
  - Accessibility issues for emergency responders
  - Transfer to specialized hospital may be impossible
    - Unstable patient
    - Shortage of vehicles
    - Impassable roads or bridges
    - Specialized hospital cannot accommodate
Ready for an Injured Kid?

- What’s the correct ETT size?
- How fast should I bag?
- What is the dose of mannitol?
- Is the child’s heart rate appropriate?
- How much fluid do I bolus?
- How much blood should I order?
- What is the correct Epi dose?
- What radiation dose for CT?
How About Lots of Kids?

Multiple chances for ERROR!
“THE SOPHISTICATION OF SIMPLICITY...OPTIMIZING EMERGENCY DOSING”

--- ROBERT LUTEN, MD & ARNO ZARITSKY, MD

SOCIETY FOR ACADEMIC EMERGENCY MEDICINE

Cognitive Stress

- Pediatric resuscitation: “multi-tasking”
- **Goal:** single endpoint = delivery of therapeutic drug dose
  1. Knowledge of weight-based dose
  2. Estimation of patient’s weight
  3. Calculation of weight-based dose
  4. Conversion of dose into volume in milliliters
  5. Error-free administration of drug
- Timing, route and potential drug-drug interactions
Broselow Tape

Color zones based on National Health and Nutrition Examination Survey (NHANES) data:

- Predict 50\textsuperscript{th} percentile weight for height = estimate of ideal body mass
- Studies: less variation in weight for length than observed for weight to age
Length-based Color Zones

- 60% of the time patient placed in correct zone for weight
- ~30%, actual weight falls in heavier zone
  - “moderately obese”
- ~10%, actual weight falls in lighter zone
- <1% are outliers, weight falls in more than one zone from predicted
  - “morbidly obese”
Drug Volume of Distribution (VOD) and Clearance

Plasma/water-soluble

- Small VOD = best dosed by ideal body weight (IBW)
- Theophylline, epinephrine, sodium bicarb, calcium, magnesium, adenosine

Lipid-soluble

- Large VOD = best dosed by actual body weight
- Midazolam (↑ risk of apnea), succinylcholine

Use IBW for resuscitation

- Most meds are given by bolus = initial distribution in lean body mass
- Morbidly obese patient is an outlier
  - Consider one zone higher for med dosing only
  - Fluid volumes, tidal volume, equipment sizes correlate best with patient length
Joint Commission > Standard Concentrations*

*HMC color-coded med sheets are based on crash cart concentrations
Tape “fine-tunes” dosing

- Incremental dosing based on differing requirements by age is incorporated in tape
  - Succinylcholine and midazolam: greater dose in very young; morphine: lower dose

- Error-free preparation and administration
  - Knowledge of drug timing, route and potential drug-drug interactions, potential side effects
  - Use immediately accessible reference materials
Color Code Is A Pediatric “Vital Sign”

Ideally…

- Every kid is color-coded upon triage in field and ED
  - Wristband or dot
- Color-coding of:
  - Supplies
  - Code sheets
  - Medications
  - CT radiation dose
Why “Every Kid Every Time”

- Pediatric resuscitations cause significant cognitive stress for care providers
  - High potential for error and time delay

- Standardized process
  - Reduces cognitive stress
  - Allows clinician to focus on assessment, prioritization and interventions

- Color coding has been shown to decrease errors in care*

  “In a disaster children will have to be cared for by non-pediatric or generalist trained clinicians.”

The Child Emergency Plan

Questions?
Comments?