"Quick, Get the Doctor!" 911 in Your Office, Are You Prepared?

Bonnie H. Hartstein, MD
Brooke Army Medical Center

Bonnie Hartstein, MD has no relevant financial relationships with commercial interests to disclose.

Emergencies In Your Office

- Preparedness
  - What do you need to do to prepare your office?
- Literature Review: When to send your patients to the ER for…
  - Head trauma
  - Toxicology- one pill or small dose killers
  - Early sepsis recognition and treatment

Preparation in Your Office

- Most Common Emergencies
  - Respiratory
  - Seizures
  - Infections in young infants
  - Dehydration
  - Sepsis

How to Prepare

- Perform a "self-assessment" of your office
  - Who?- you and your staff
  - What?- has happened in the past
  - Where?- are you located
  - When?- are you open, staffed
  - Why?- would your patients have problems
  - How?- are you going to get ready

American Academy of Pediatrics, Committee on Pediatric Emergency Medicine. Preparation for Emergencies in the Offices of Pediatricians and Pediatric Primary Care Providers. Pediatrics 2007; 120:200-212.

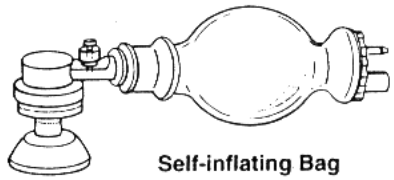
Preparing Your Staff

- Maintain your BLS, PALS or APLS certification
- Insure front desk staff awareness
  - Signs and Symptoms:
    - Labored breathing
    - Cyanosis
    - Stridor
    - Grunting
    - Seizures
- Drill in Mock Codes

Recommended Equipment- Essential

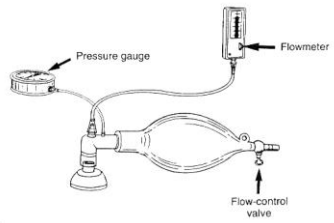
- Airway Management
  - Oxygen-delivery system
  - Bag-valve-mask (450 and 1000mL)
  - Oxygen masks- breather and non-rebreather, w reservoirs)
  - Suction device
  - Oropharyngeal airways
  - Pulse oximeter
- Misc
  - Color – coded tape or pre-printed drug doses
  - Backboard
  - Sphygmomanometer
  - Splints, sterile dressings

BVM Devices



Self-inflating Bag

BVM Devices



Flow-dependent anesthesia bag

Non-rebreather Mask

Intraosseous Infusion

Proximal Tibia

One finger width distal to tibial tuberosity OR if unable to palpate tibial tuberosity, two finger widths below the patella along the flat aspect of the medial tibia

Distal Tibia

One finger width proximal to the medial malleolus along the flat aspect of the medial distal tibia.

Color-coded Tape

Emergency Drugs

- Oxygen
- Albuterol
- Epinephrine (1:1000 and 1:10,000)
- Activated Charcoal
- Anticonvulsants
- Corticosteriods
- Dextrose (25%)
- IV Diphenhydramine
- Atropine
- Naloxone
- Sodium Bicarbonate (4.2%)
- Normal Saline (500mL)
- D5 ½ NS (500mL)

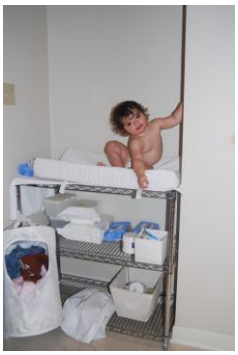
Imaging in Pediatric Head Trauma

What will you do?

"Go to the ER"
"Keep an eye on her and return for change in behavior, vomiting…"

Case Study

- 18 month old child presents for her well-child visit and parents report she just fell off the changing table before the visit. No loss of consciousness. She was initially fussy is now acting normally and drinking from a sippy cup. She has a frontal hematoma. GCS 15. Normal neuro exam.
- Should you send her to the ED for a CT scan?



PECARN- Pediatric Emergency Care Applied Research Network

- Kupperman N, et al. Identification of children at very low risk of clinically-important brain injuries after head trauma: a prospective cohort study. Lancet 2009;374:1160-70.
- 25 North American emergency departments
- 42,412 children enrolled
  - 10,000 younger than 2 years old
- Prospective study with Derivation and Validation groups

PECARN Lancet Study 2009

< 2 yo	> 2yo
• Altered Mental Status • Not behaving normally per parents • Non-frontal Scalp Hematoma • Palpable skull fracture • LOC for > 5 seconds • Severe injury mechanism	• Altered Mental Status • Signs of basilar skull fracture • Vomiting • Severe headache • LOC for any length of time • Severe injury mechanism

Suggested Algorithm <2 yo

- GCS = 14 or AMS, or palpable skull fx = CT
- If NO, does pt have:
  - Occipital or parietal or temporal scalp hematoma
  - History of LOC of > 5 sec,
  - Severe mechanism of injury
  - Not acting normal per parents
- If YES, Obs vs CT
- If NO, no CT

Suggested Algorithm >2yo

- GCS = 14 or AMS, or signs of basilar skull fx = CT
- If NO, does pt have:
  - History of LOC
  - Vomiting
  - Severe headache
  - Severe mechanism of injury
- If YES, Obs vs CT
- If NO, no CT

Skull fracture and Scalp Hematoma

- Scalp hematomas – almost always present with skull fracture (95%)
- Skull fractures are highly predictive of intracranial injury – increase 5-20x

Head-Injured Infants

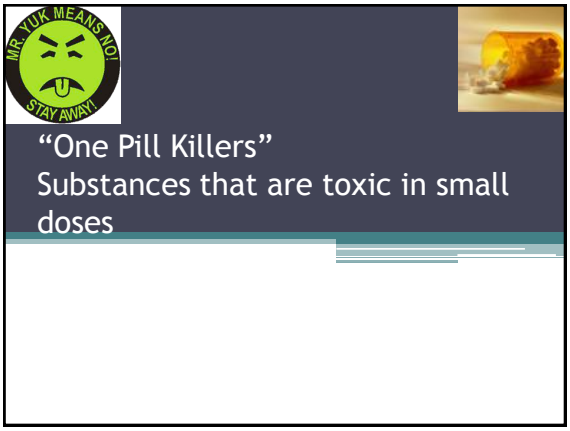
- Boston Children's- level I trauma center
- Children under 1 yrs of age
- Asymptomatic: no lethargy, loc, seizures, > 3 episodes vomiting, non-bulging fontanelle, abnormal or focal exam
- 422 enrolled, 172 had imaging (skull x-ray or CT)
- 45/422 (11%) had SF, 13/422 (3%) ICI
- All traumatic SF w/o hematoma were <3 mo

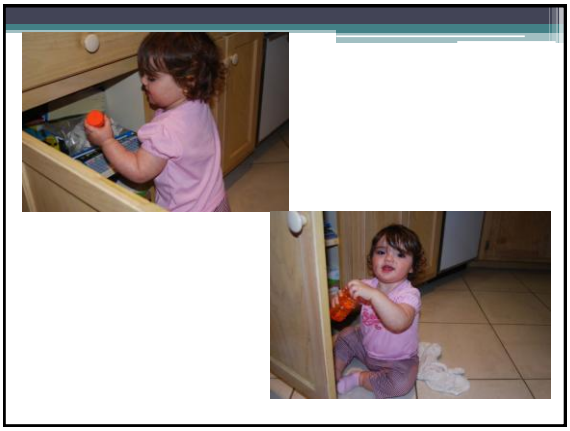
Greenes DS, et al. *Clinical significance of scalp abnormalities in asymptomatic head-injured infants. Pediatr Emerg Care.* 2001 Apr;17(2):88-92.

Greenes-Schutzman Scalp Score

Risk points	Age	Hematoma Size	Hematoma Location
0	> 12 months	None	Frontal
1	6-11 months	Small (barely palpable)	Occipital
2	3-5 months	Medium (easily palpable)	Temporal or parietal
3	0-2 months	Large (boggy)	

SCORE >3, image (< 3 mo, parietal/temporal, or large hematoma)
SCORE 6, 80% Skull fx, 40% ICI
SCORE 7-8, 100% Skull fx (50%, 33% ICI)





DANGER- One pill or One sip

- Salicylates
- Camphor
- Ca Channel Blockers
- Beta Blockers
- Clonidine
- Imidazolines
- Cyclic Antidepressants
- Sulfonureas
- Toxic Alcohols
- Benzocaine
- Opiods
- Lomotil

Case Study

- Busy day. Office is packed. Front desk nurse comes back carrying a tube of Ben-Gay- explains that a family just arrived with a baby who looks great but they are worried because they think he just ate some of dad's Ben-Gay. She wants to know what to tell them?

Your response:

A. "No problem, check them in and I'll see them and I'll reinforce childproofing.
B. "Bring them back right now "
C. Call 911
D. B and C

BEN GAY

- Combination of
  - SALICYLATES
  - CAMPHOR

SALICYLATES

1 TSP = 90 Baby aspirin

- BEN GAY
- OIL of Wintergreen
- (Pepto-Bismol)
- (Aspirin)
- Maalox Total Relief
- Minimal toxic ingested dose: 150mg/kg
- Symptomatic >30mg/dL
- >100mg/dL life threatening

Salicylism

- Nausea, vomiting, diaphoresis, tinnitis, neuro sx: agitation, delirium, hallucinations, lethargy.
- Brainstem effects: hyperventilation and hyperpnea
- Hyperthermia
- Labs: mixed acid-base disorders: metabolic acidosis with respiratory alkylosis
- Impaired glucose metabolism: hyper or hypoglycemia and ketonuria

Management of Salicylate Exposure

- Determine salicylate concentration
- Done nomogram has no use
- Charcoal
- Urine alkalinization ("ion trapping")
  - Bolus with IV sodium bicarb
  - Increases anionic form and reduces reabsorption in the distal tubules
- Hemodialysis
  - Pulm edema, AMS/cerebral edema, renal failure, no response to standard tx, level >100mg/dL

Camphor

Aromatic terpene ketone derived from plants with distinct odor and pungent taste

Camphor

- Vick's VapoRub, Ben-Gay(caphor + salicylate), Tiger Balm
- Acts as a topical rubefacient inducing local hyperemia and warmth to treat pain, cough, itching

Camphor Poisoning

- Usually rapid onset symptoms (10-20 minutes)
- Gastrointestinal distress and generalized sensation of warmth
- CNS hyperactivity: excitement, delirium, seizures
- Coma, respiratory distress
- Tell by the Smell

Imidazolines

- Used as vasoconstrictors: reduce eye redness, nasal congestion
- Local alpha-adrenergic effects
- SE from central alpha-2 adrenergic receptors
- MAY CAUSE: decreased heart rate, drowsiness, hypotension, shock

VITAL SIGNS

CAUTION: DO NOT MAKE CLINCIAL DECISIONS WITHOUT LOOKING AT THE VITAL SIGNS AND MATCHING AGAINST AGE REPORTED NORMS

COUNT OUR OWN RESPIRATORY RATE!! RECTAL TEMPS IN < 1 YO!!

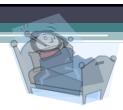
3 yo female fever x2 days, cough, very tired, "looks sick."

- HR 172, RR 33, T103.4°F, O_2 Sat 99% RA
- BP 84/48
  - <70 mmHg+ (2 x age in yrs)

Systemic Inflammatory Response Syndrome (SIRS) in Children
2 of 4

- Temp >38.5°C or <36°C (>101.3°F or < 96.8°F)
- Tachycardia (if <1 yo bradycardia)
  - Mean HR > 2 SD
- Tachypnea >2 SD
- Wbc > or < for age

- SEPSIS = SIRS + Infx
  - Suspected infection OR Proven infection
- SEVERE SEPSIS = SEPSIS+
  - Cardiovascular dysfunction
  - ARDS
  - AMS/Renal/Hepatic/Heme

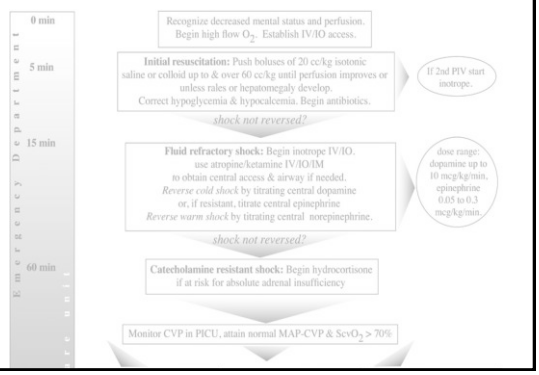


Pediatric Septic Shock

- BP is a LATE FINDING in sick kids
  - Hypotension: <70 mmHg+ (2 x age in yrs)
- Early Goal Directed Therapy
  - Aggressive Fluids > 60ml/kg
  - Early Antibiotics
  - Early Inotropes (Dopamine, Dobutamine, Epi)
  - Monitor glucose, calcium
  - EARLY TRANSFER

Cruz AT, Perry AM, et al. Implementation of Goal-Directed Therapy for Children With Suspected Sepsis in the Emergency Department. Pediatrics 2011;127:e759- 766.

Brierly J, Carcillo JA, et al. Clinical practice parameters for hemodynamic support of pediatric and neonatal septic shock: 2007 update from the American College of Critical Care Medicine. Crit Care Med 2009;37(2):666-688



QUESTIONS?