The Sleepy Child

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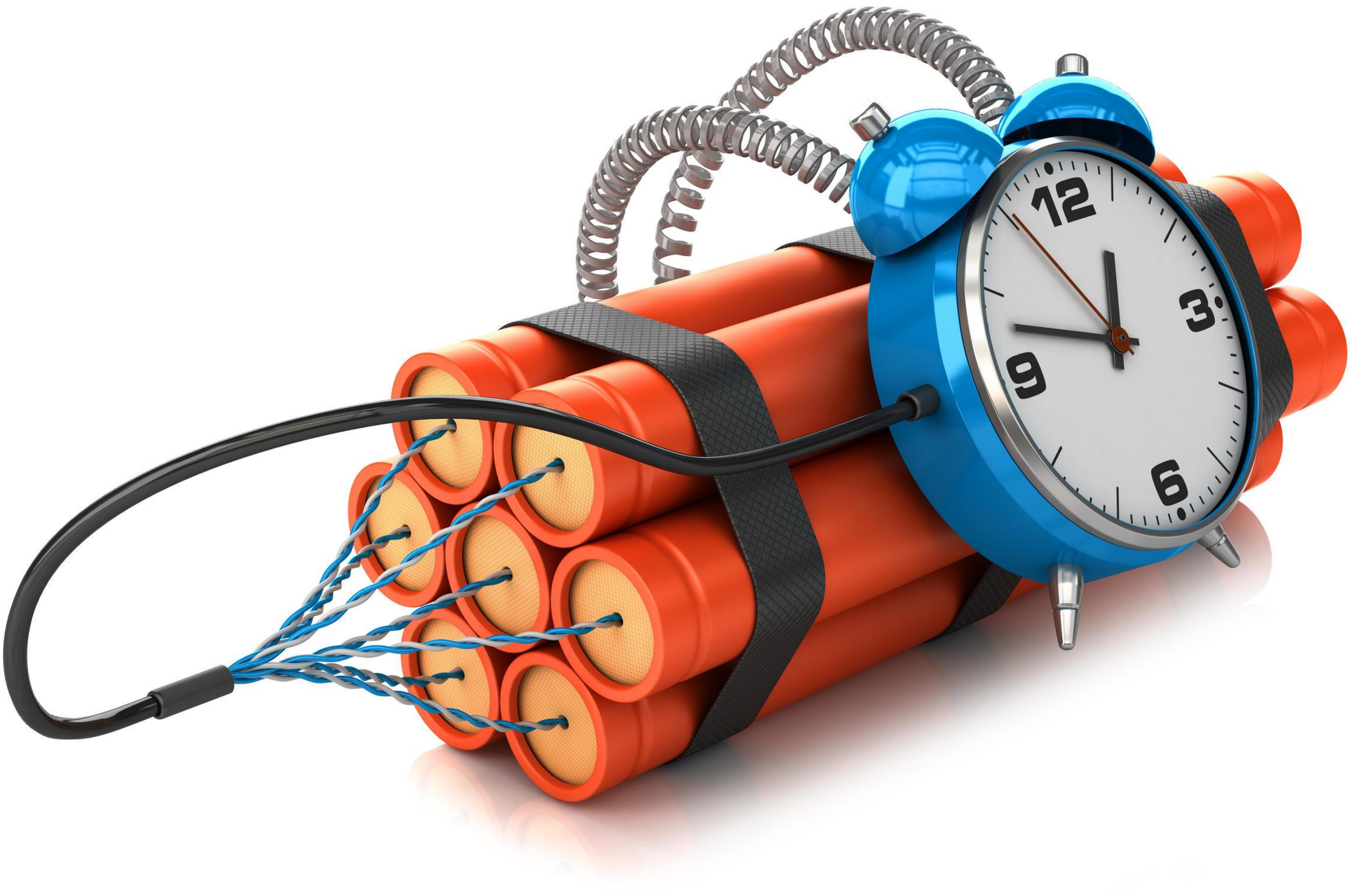
No Disclosures

Chief Complaint: Sleepy

What is an abnormally sleepy child?



The Differential Diagnosis

AEIOU TIPS - Causes of Altered Mental Status

A **A**lcohol, **A**cidosis, **A**mmonia, **A**rrhythmia
E **E**lectrolytes, **E**ndocrine, **E**pilepsy
I **I**nfection
O **O**verdose, **O**xygen, **O**piates
U **U**remia

T **T**emperature, **T**rauma, **T**hiamine
I **I**nsulin (hypoglycemia)
P **P**sychiatric, **P**oisoning
S **S**troke, **S**eizure, **S**yncope, **S**pace Occupying Lesions, **S**hunt (VP) Malfunction, **S**AH

AEIOU TIPS - PEM version

- Acidosis, ammonia
- Endocrine
- Infection, intussusception
- Overdose, oxygen
- Uremia
- Trauma, toxic ingestion, temperature
- Insulin
- Psych
- Seizure, Sepsis

“What the eye doesn't see and the mind doesn't know, doesn't exist”

D.H. Lawrence

The “I”s have it…..

- Injury
- Infection
- Ingestion
- Ictal (Seizure)
- Intussusception
- Insulin (hypo- and hyperglycemia)/ Inborn Errors

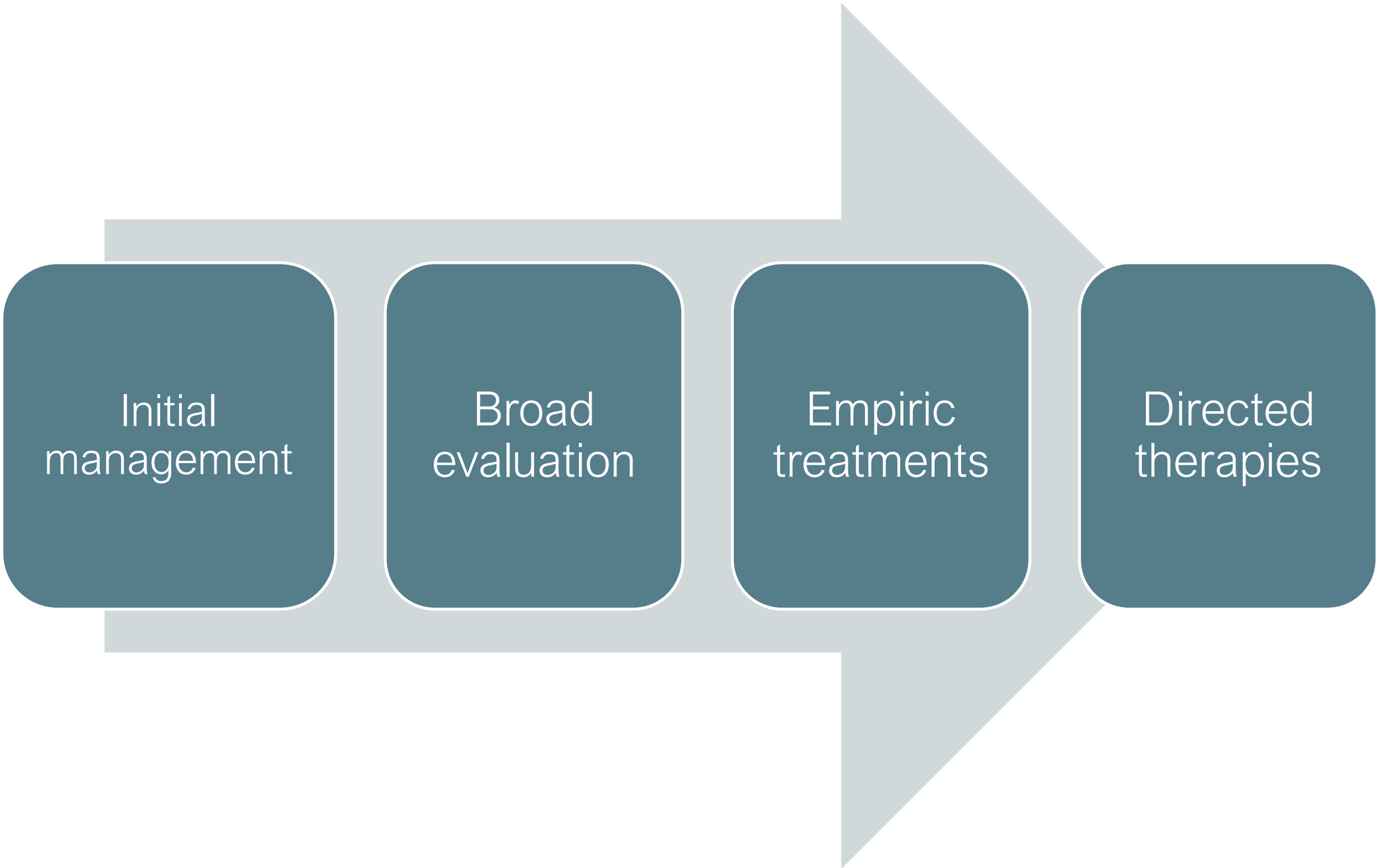
Case #1 – Lethargic baby

- CC: 6 mo male with lethargy
- 35.7ºC (rectal), P 167, RR 34, BP 130/84, 98% RA
- possible ingestion 2h prior
- Since waking from nap, vomiting and difficulty breathing

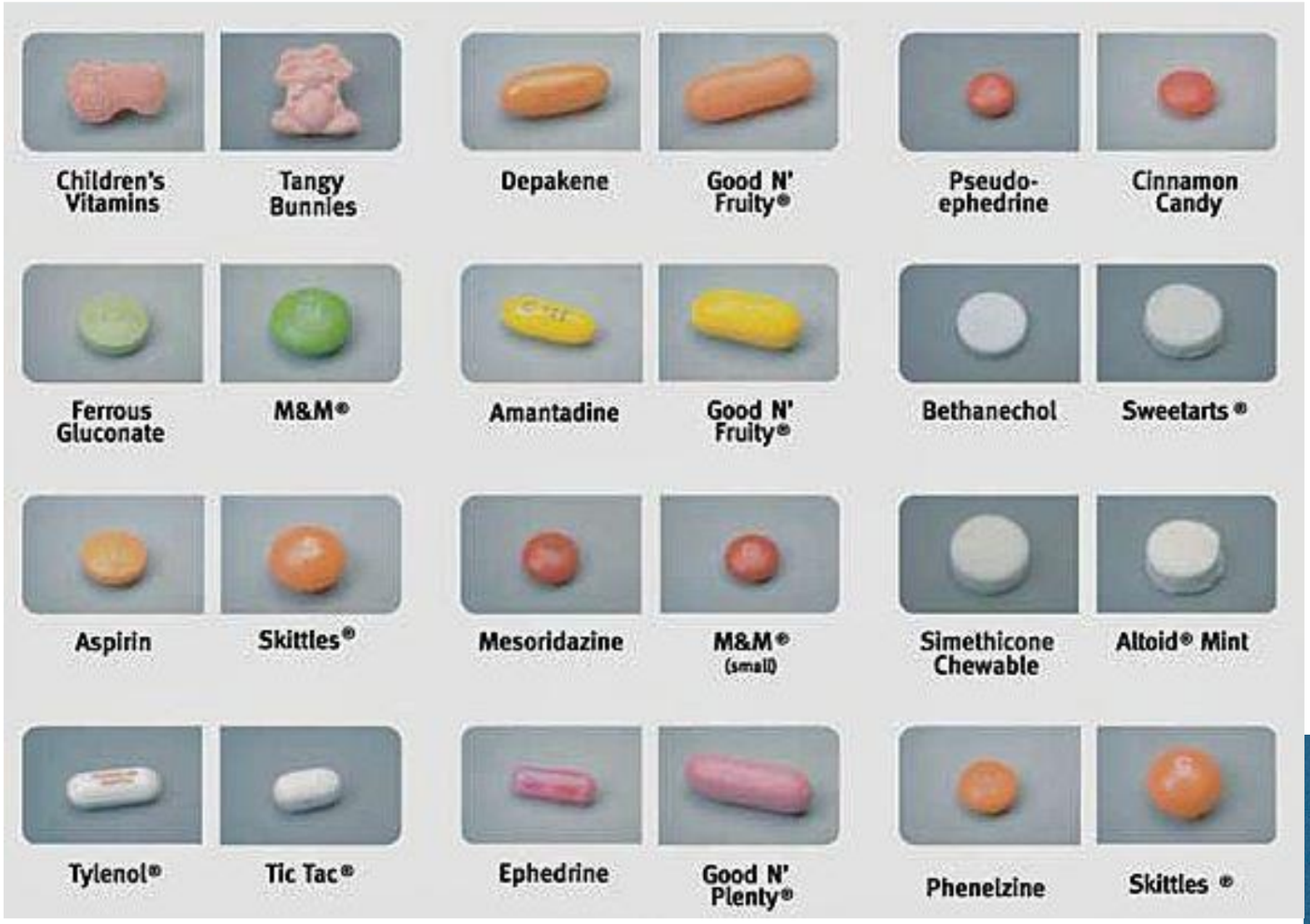
Case #1 – Lethargic baby

- What are you going to do?

General approach to pediatric ALOC



Toxicologic exposures


Children's Vitamins
Tangy Bunnies
Depakene
Good N' Fruity®
Pseudo-ephedrine
Cinnamon Candy
Ferrous Gluconate
M&M®
Amantadine
Good N' Fruity®
Bethanechol
Sweetarts®
Aspirin
Skittles®
Mesoridazine
M&M® (small)
Simethicone Chewable
Altoid® Mint
Tylenol®
Tic Tac®
Ephedrine
Good N' Plenty®
Phenelzine
Skittles®

Ethanol

Altered mental status, hypothermia, hypoglycemia

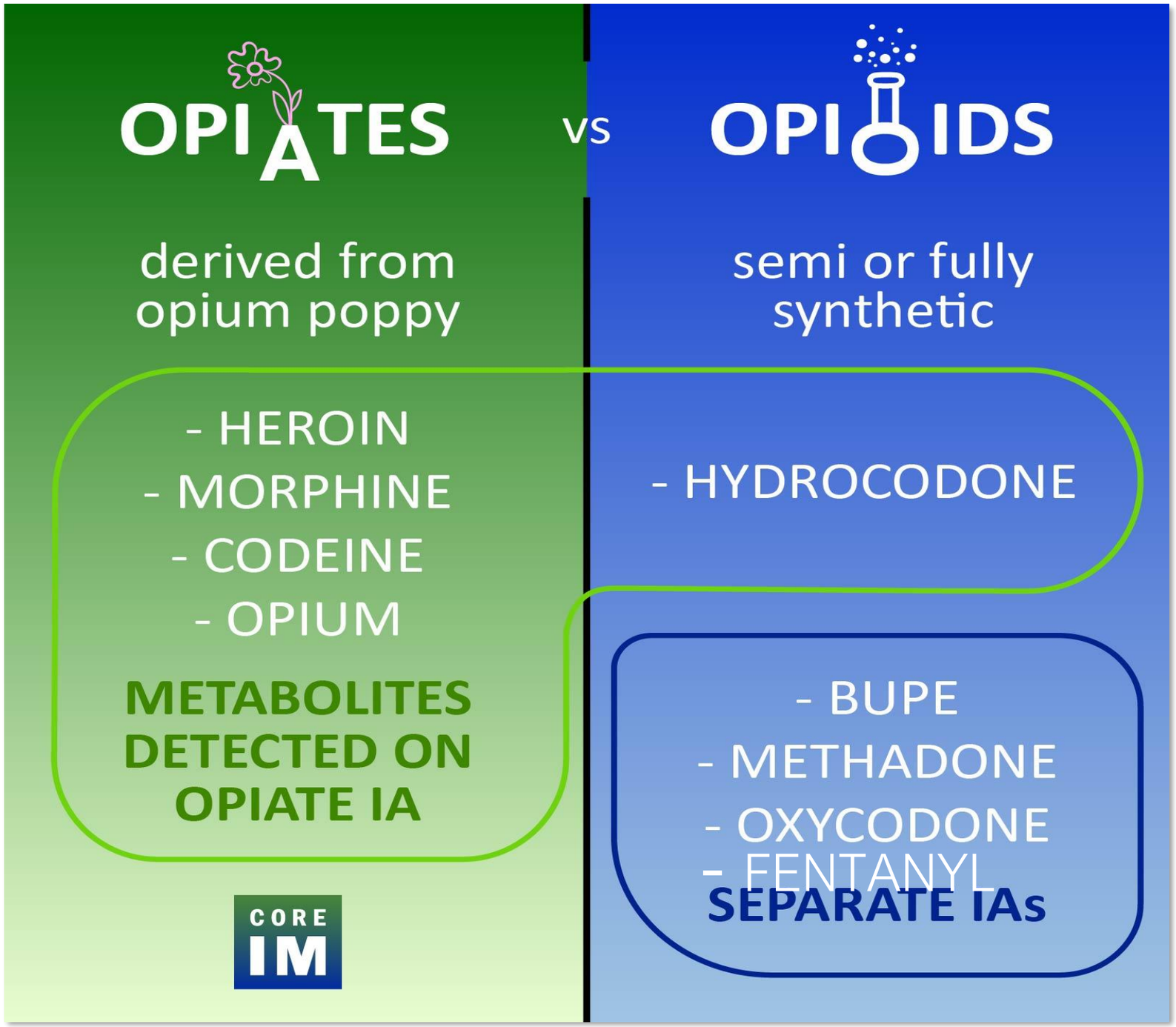
Tetrahydrocannabinol (THC)

Hypotonia, ataxia, tachycardia, hypoventilation

Imidazolines

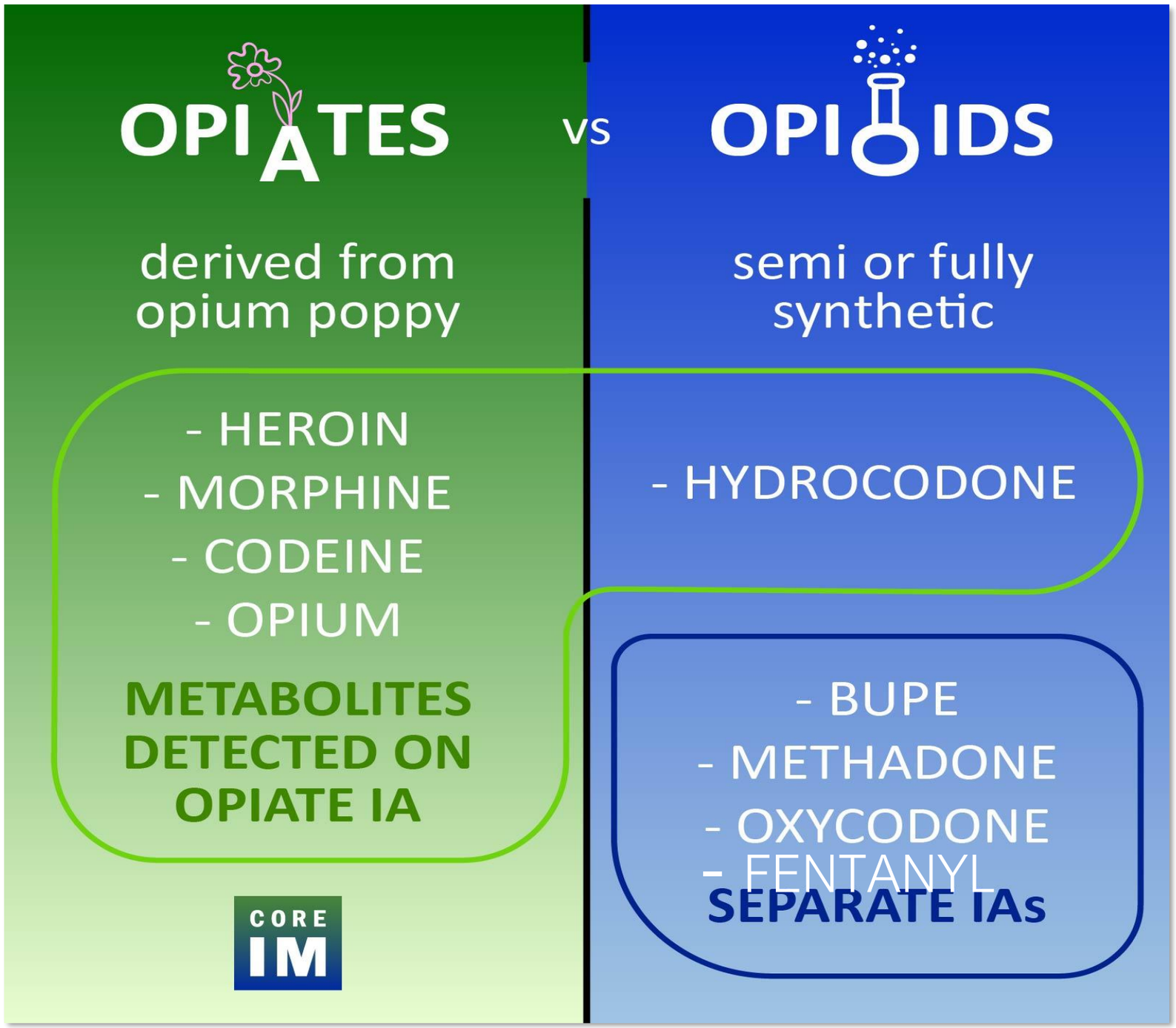
- Hypotension, bradycardia, miosis

Urine Drug Screen: Opioids



- UDS for Opioids (Immunoassay): Detects <u>natural opiates</u> (morphine, codeine, heroin metabolite 6-MAM)

Urine Drug Screen: Opioids



- **False Negatives:** Oxycodone, hydrocodone, fentanyl, methadone, buprenorphine, and tramadol

Case #1 - Lethargic baby – **WHAT IF…**

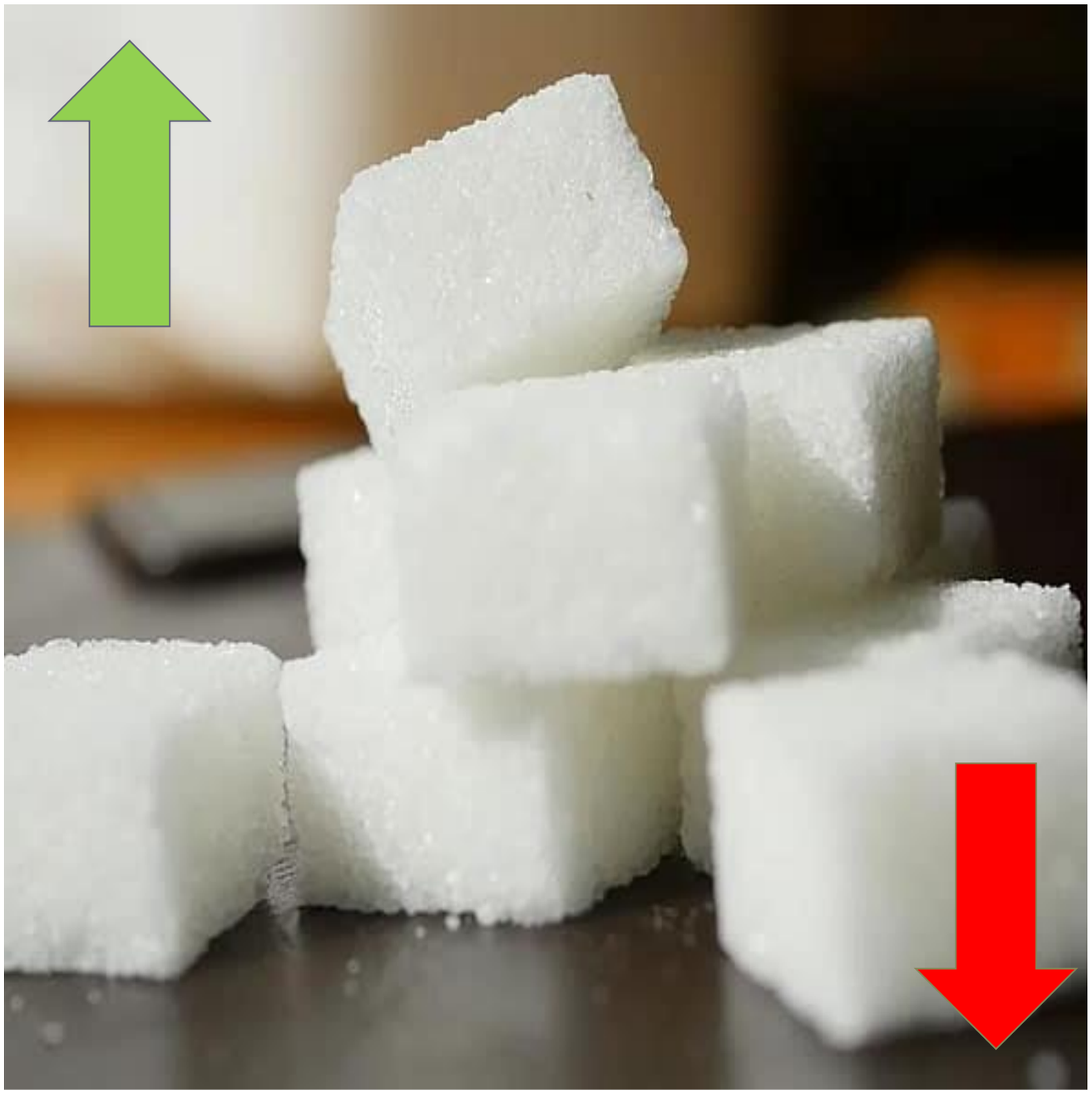
- Initial fingerstick 43

Would this change anything?

Dextrose

- Ill patients with depressed mental status are hypoglycemic until proven otherwise
- Treat for BS < 50
- Rule of 50
  - D_{10} 5 ml/kg (age < 1 year)
  - D_{25} 2 ml/kg (age 1 – 8 year)
  - D_{50} 1 ml/kg (age > 8 year)

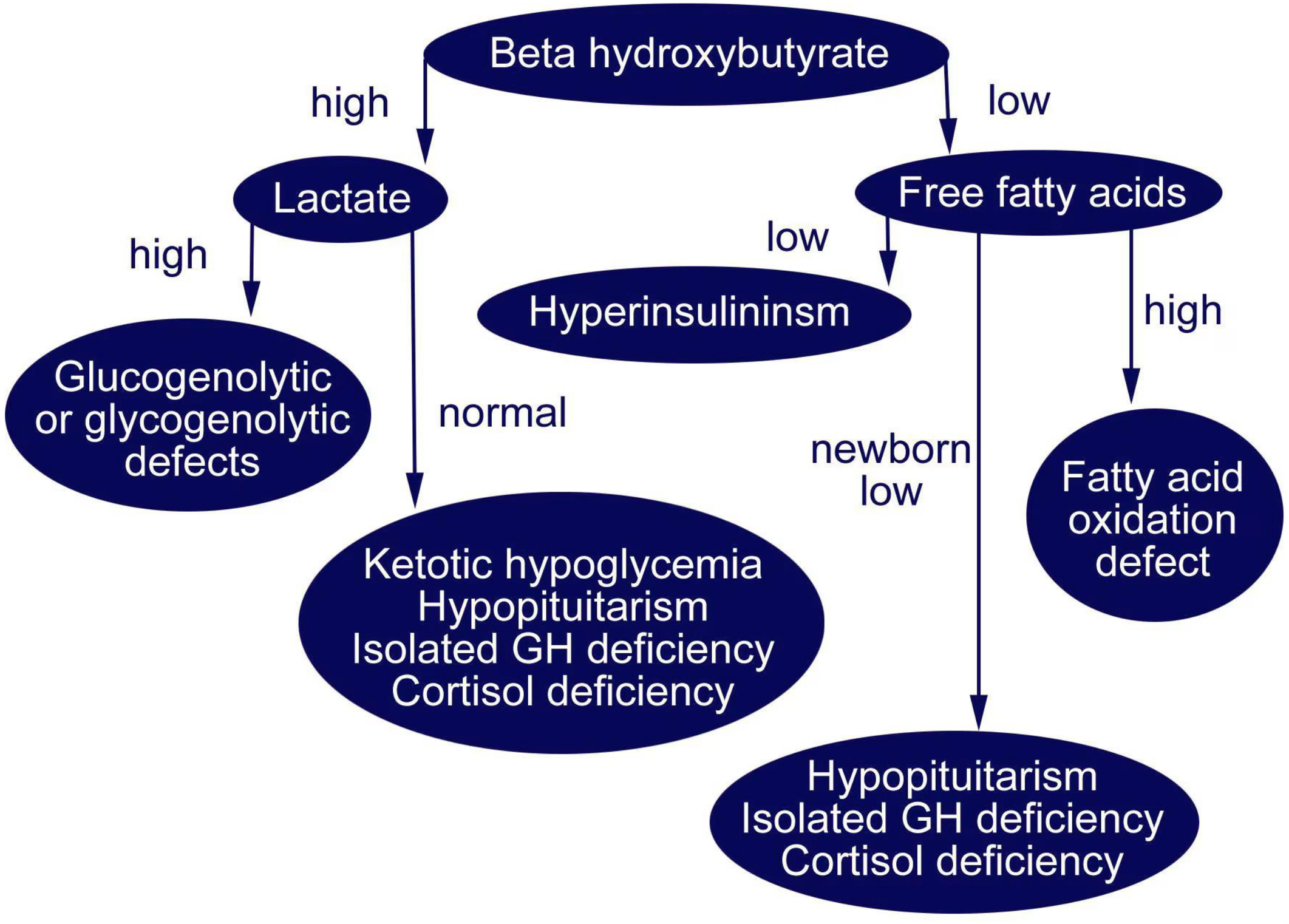
Insulin and Inborn Errors of Metabolism



“Digi”tube

- Urine organic acids
- Plasma amino acids
- Acyl carnitine profile
- Lactate
- Pyruvate
- Insulin
- Cortisol

Best obtained prior to correcting derangement… but don’t delay treatment!



Medscape:
Pediatric hypoglycemia, interpretation of the critical sample

CASE: 4 year ♀ presents to ED

- Vomiting and “low blood sugar”
  - Thin and pale
  - Decreased level of alertness
- FS = 38
- ROS:
  - Neg: fever, diarrhea, ingestions, trauma
- Fam Hx: neg

CASE: Ketotic hypoglycemia

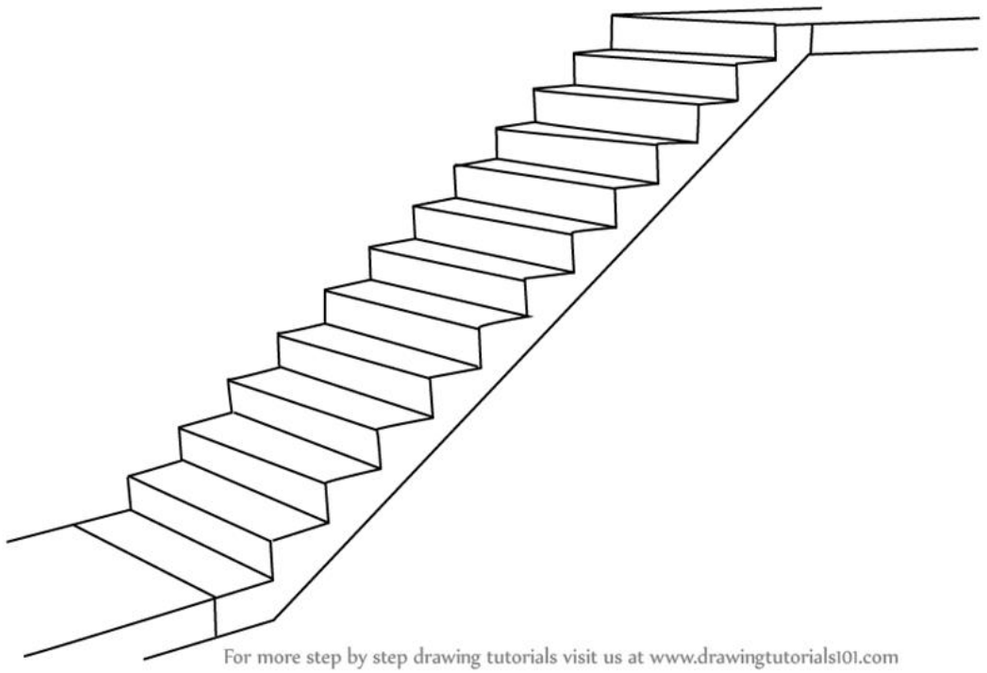
- Present: toddlers with lethargy or seizures after prolonged fast
- Inadequate gluconeogenesis
- Diagnosis of exclusion
- ED management: “digi”tube **before** glucose, IVF, dextrose
- Outgrow by 3rd or 4th grade

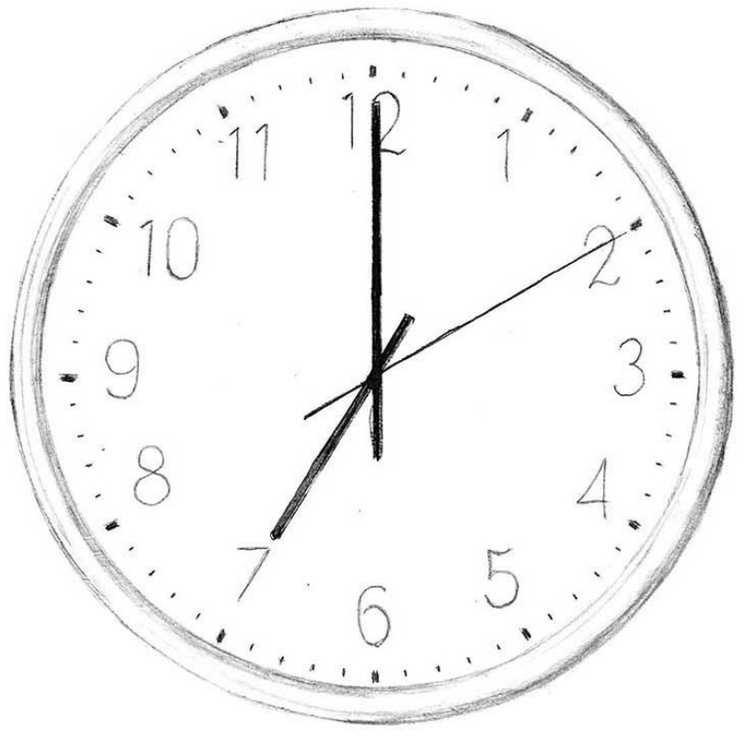
Back to the case…

Case #1 - Lethargic baby – **WHAT IF…**

- Fingerstick *actually* 104
- Initial lab results normal except for Hgb 8.3 with normal MCV
- Physical exam revealed ecchymosis on the chest just below the left nipple

Would this change anything?





Non-accidental trauma

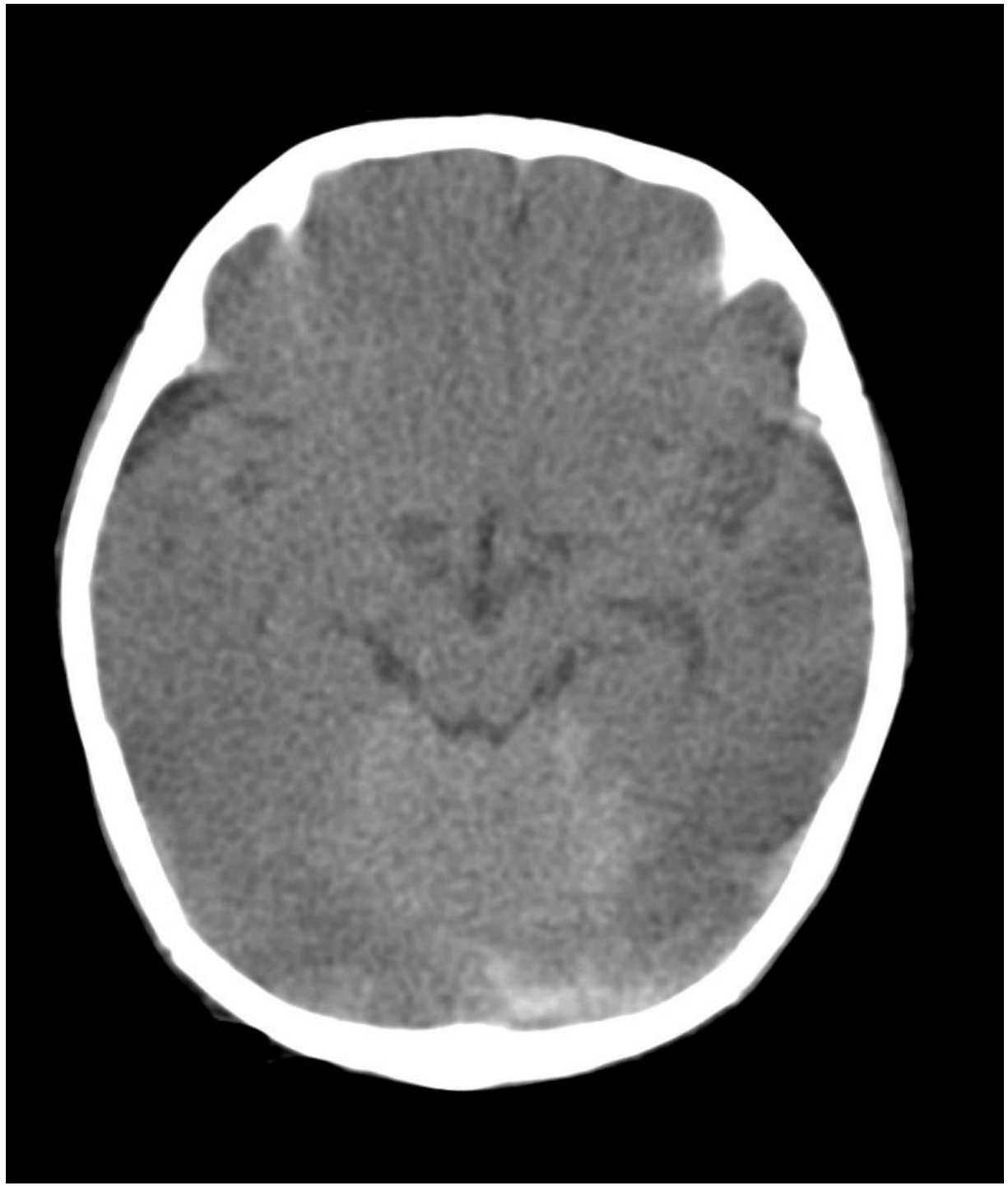
Abusive head trauma in infants

- Infants < 12 mos of age experience a disproportionately high victimization rate

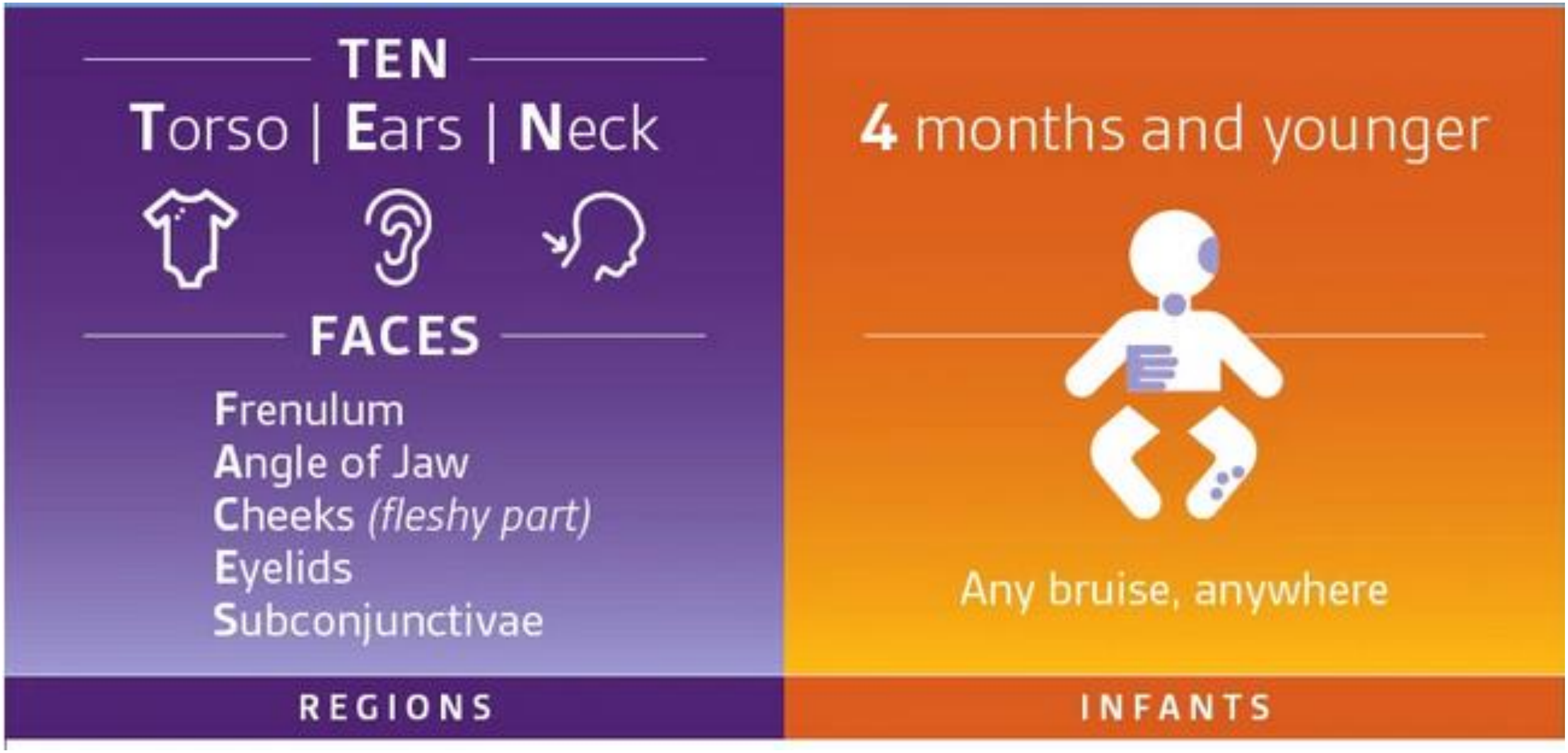
- ED visits may represent opportunities to screen for and recognize abuse
    - Letson et al, rates of missed abusive head trauma at 4 pediatric centers remained unchanged from 1999 to 2016 (31%)

- Standard screening protocols using clinical decision rules (e.g., TEN-4-FACESp) can be helpful

5 mo vomiting and lethargy



CDR for Bruising: TEN-4 FACESp

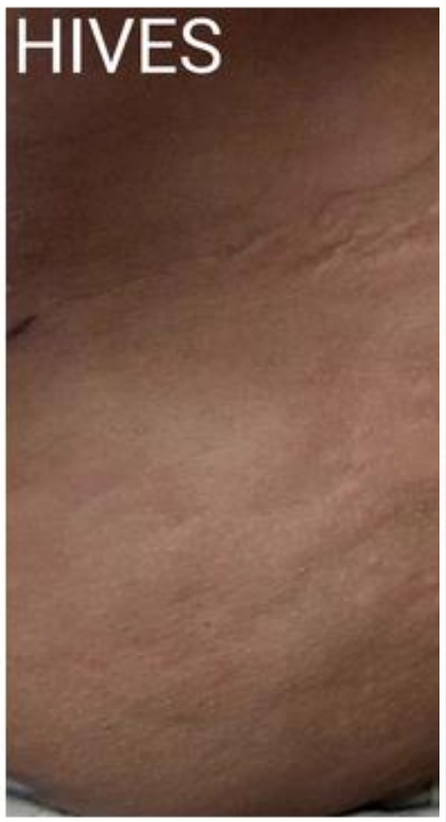


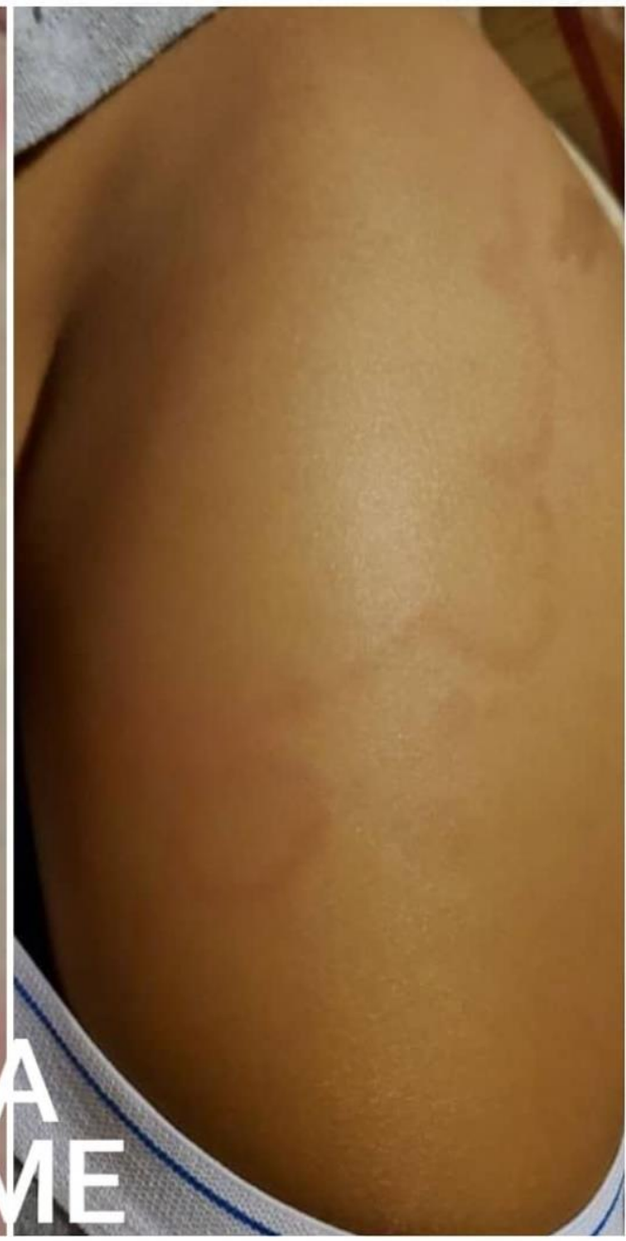
Pierce, MC et al. 2010; Pierce, MC et al 2021

CDR for Bruising: TEN-4 FACESp

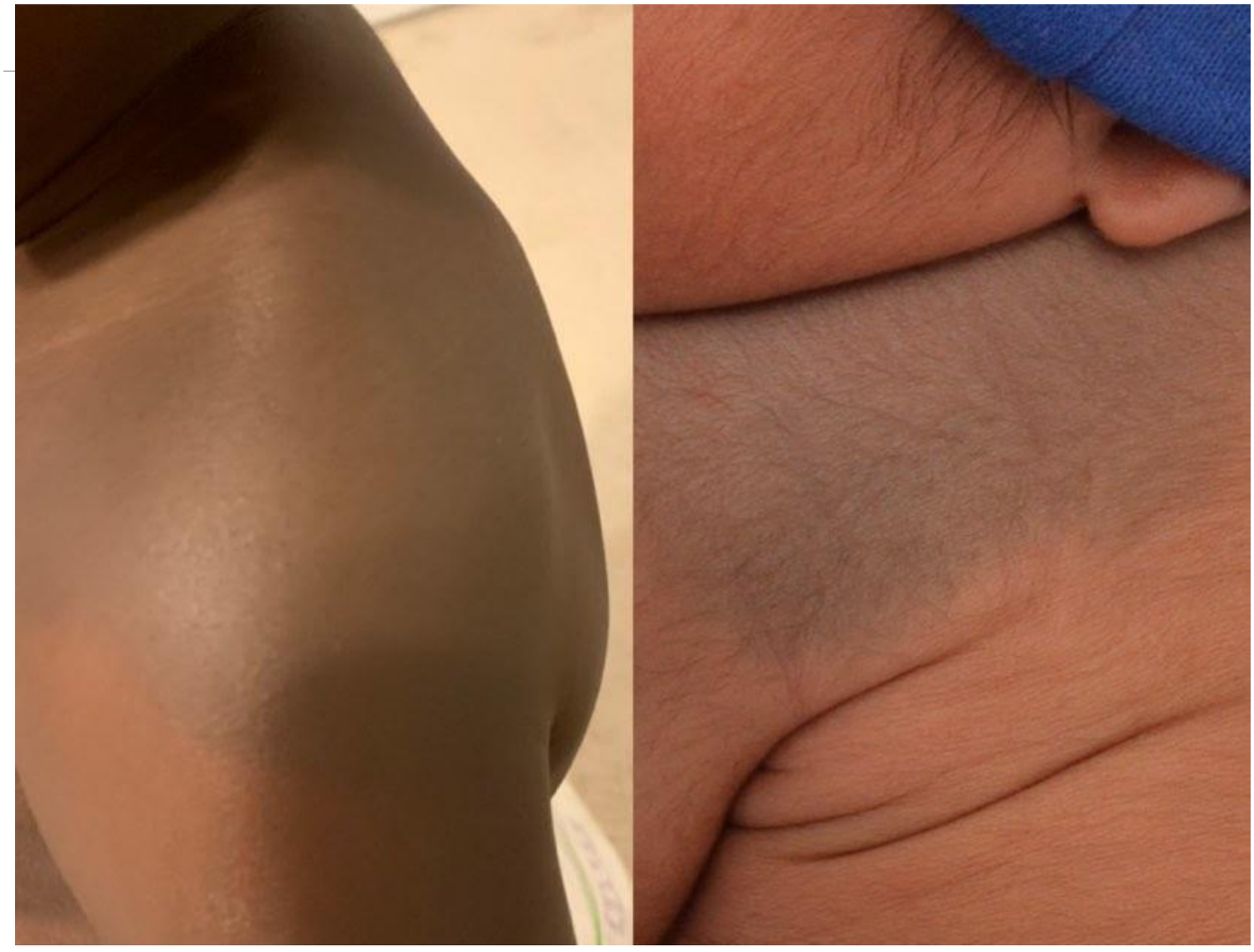
Pierce, MC et al. 2010; Pierce, MC et al 2021

BROWN SKIN MATTERS





BROWN SKIN MATTERS



Case #1 – Lethargic baby

- Infant was accepted as a transfer to PICU
  - time spent in ED 1:51

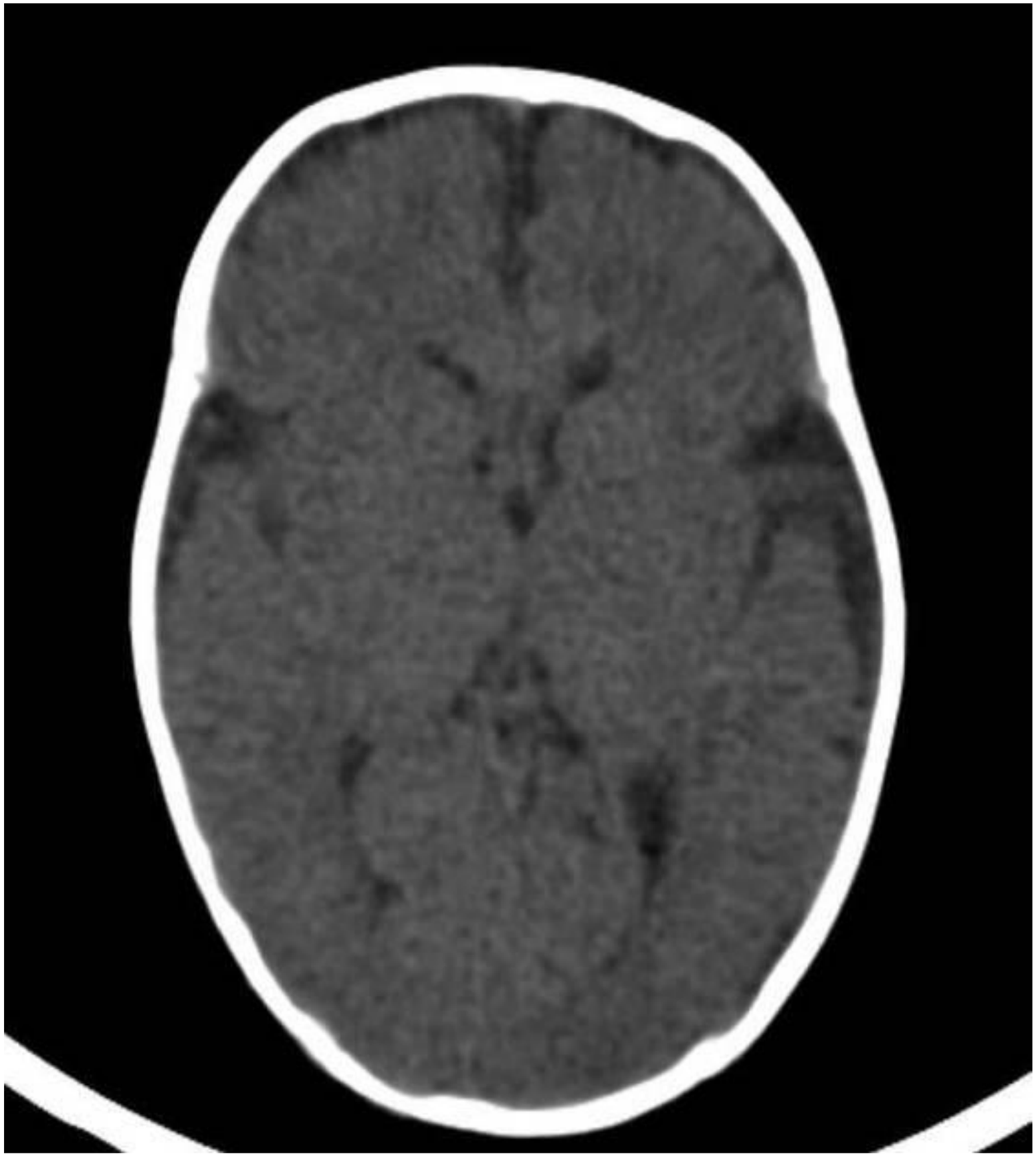
  - CXR was negative
  - Results as infant was being moved to transport gurney
  - Procalcitonin 0.28 (< 0.26),
  - CBC: WBC 17.1, plt 594K,
  - CMP and coags nml,
  - ETOH and ASA neg

  - Rectal temp 39.3ºC

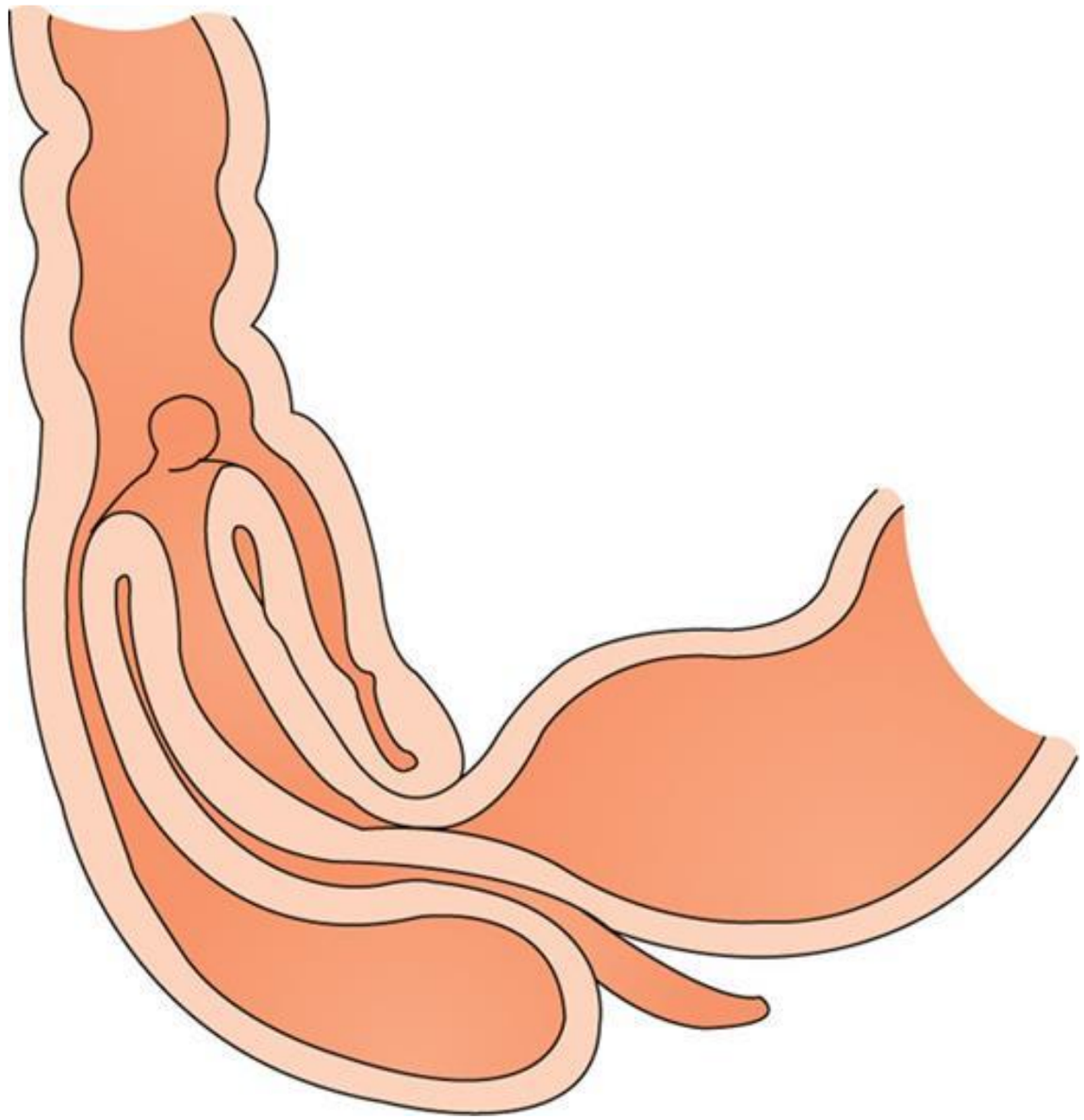
Case #1 – Lethargic baby

CC: 6mo male with lethargy; possible ingestion 2h prior

- Receiving ED: normothermic, tachycardic, hypotonic
  - Labs were repeated – WBC 6.7, lactate 1.8
  - Head CT and abd US were normal, brain and spine MRI negative
- Ceftriaxone given



Ultrasound???

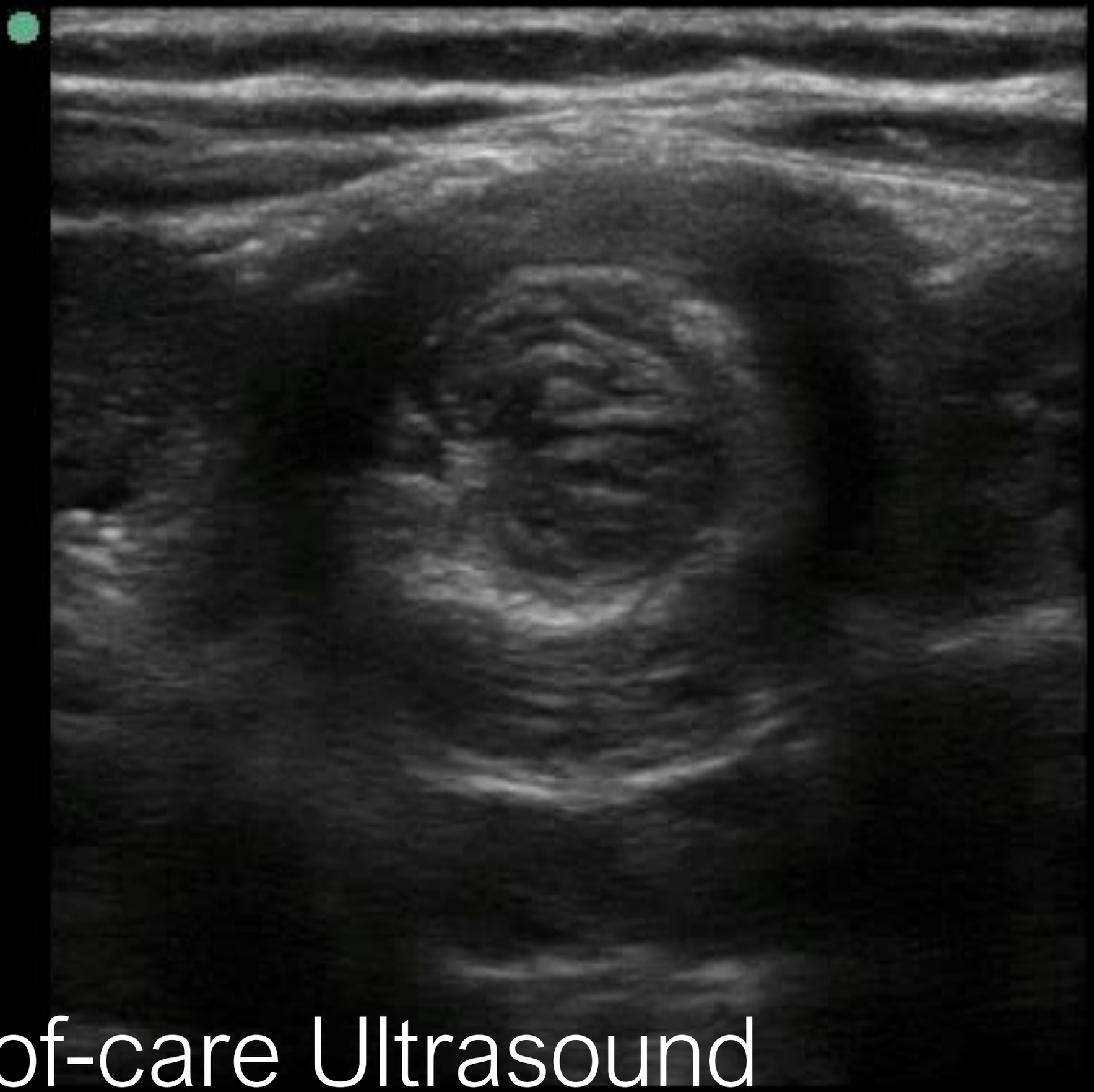


Ileocolic Intussusception

The neurologic presentation of the acute abdomen

Intussusception

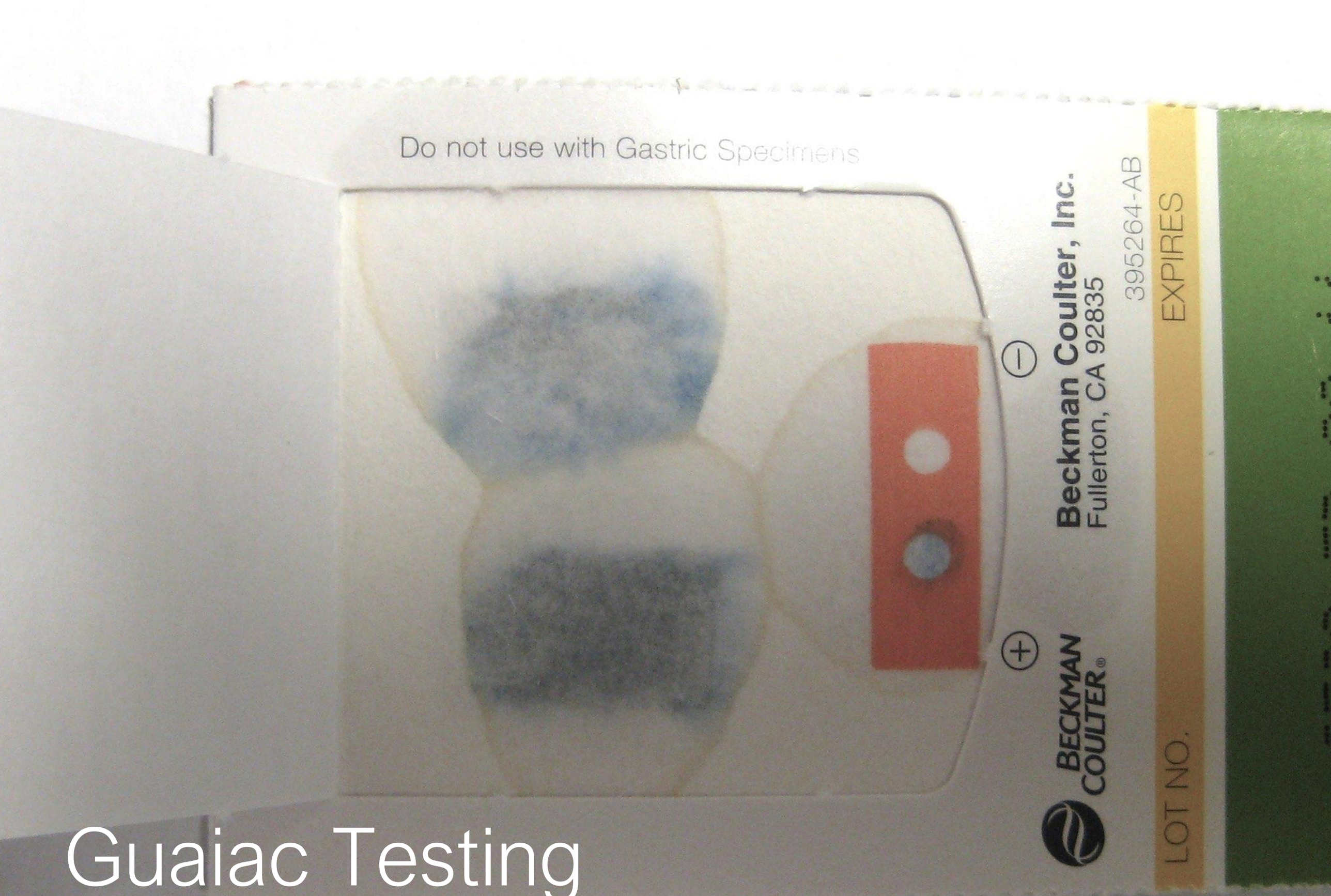
- Most common: ileo-colic
- 3 mo – 5 yrs (peak 6-11 mo)
- Causes:
  - Idiopathic, Meckel's diverticulum, Henoch-Scholein purpura, polyps, tumors
- 20% ALOC



Point-of-care Ultrasound

Riera A, et al. Diagnosis of intussusception by physician novice sonographers in the emergency department. *Ann. Emerg. Med.* 2012;60(3):264-268.

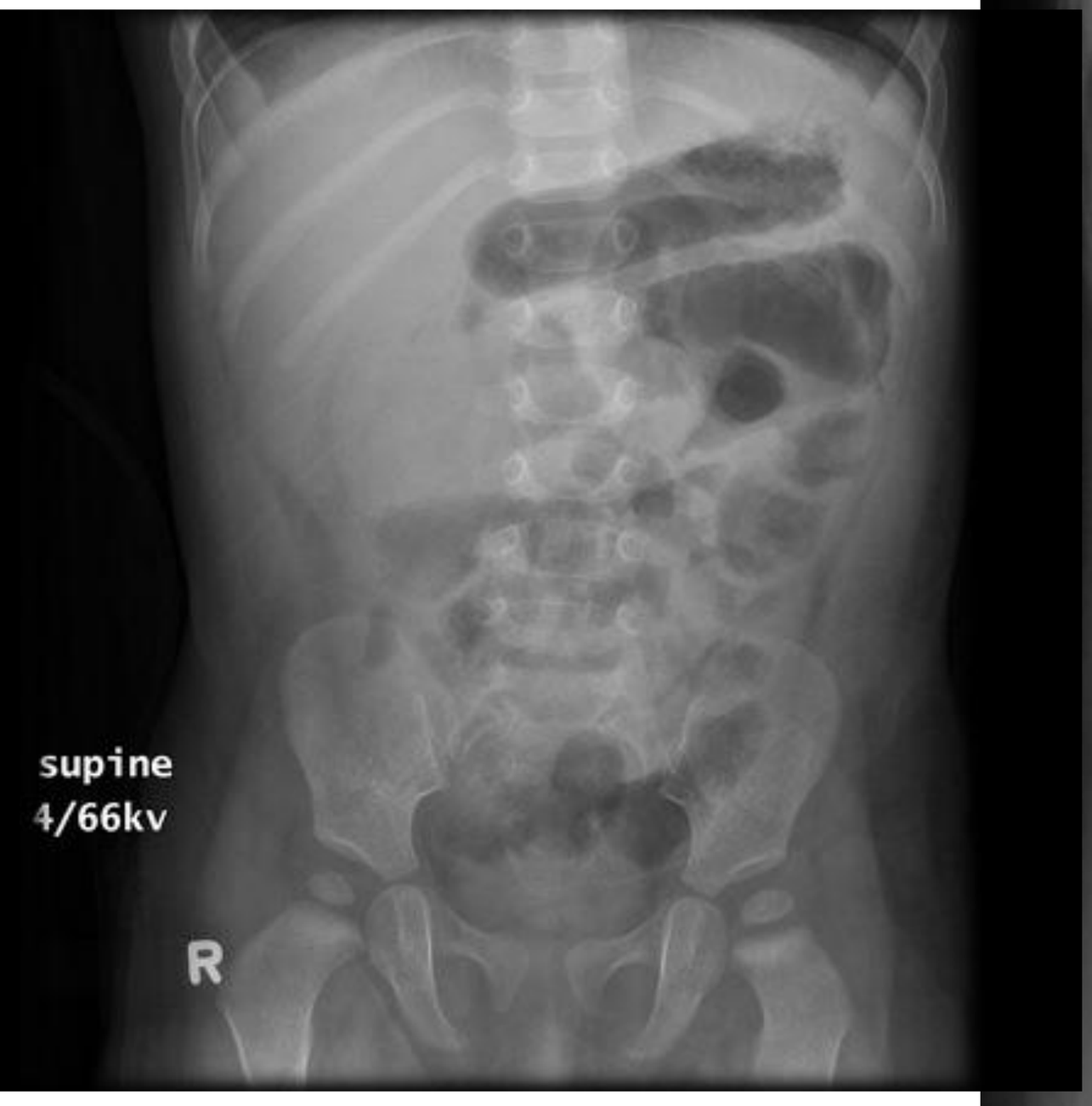
What if
<u>No</u> Ultrasound???

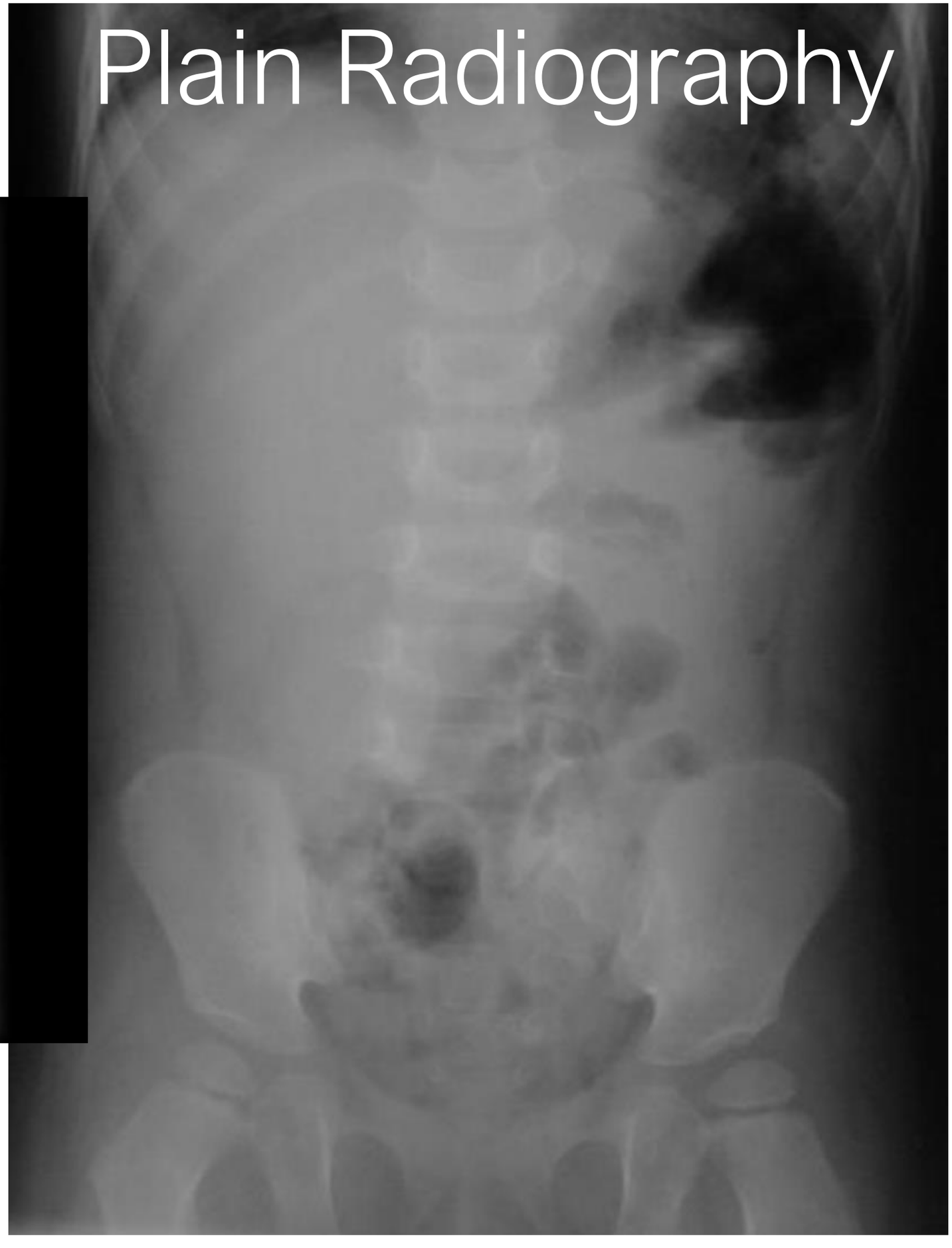


Guaiac Testing

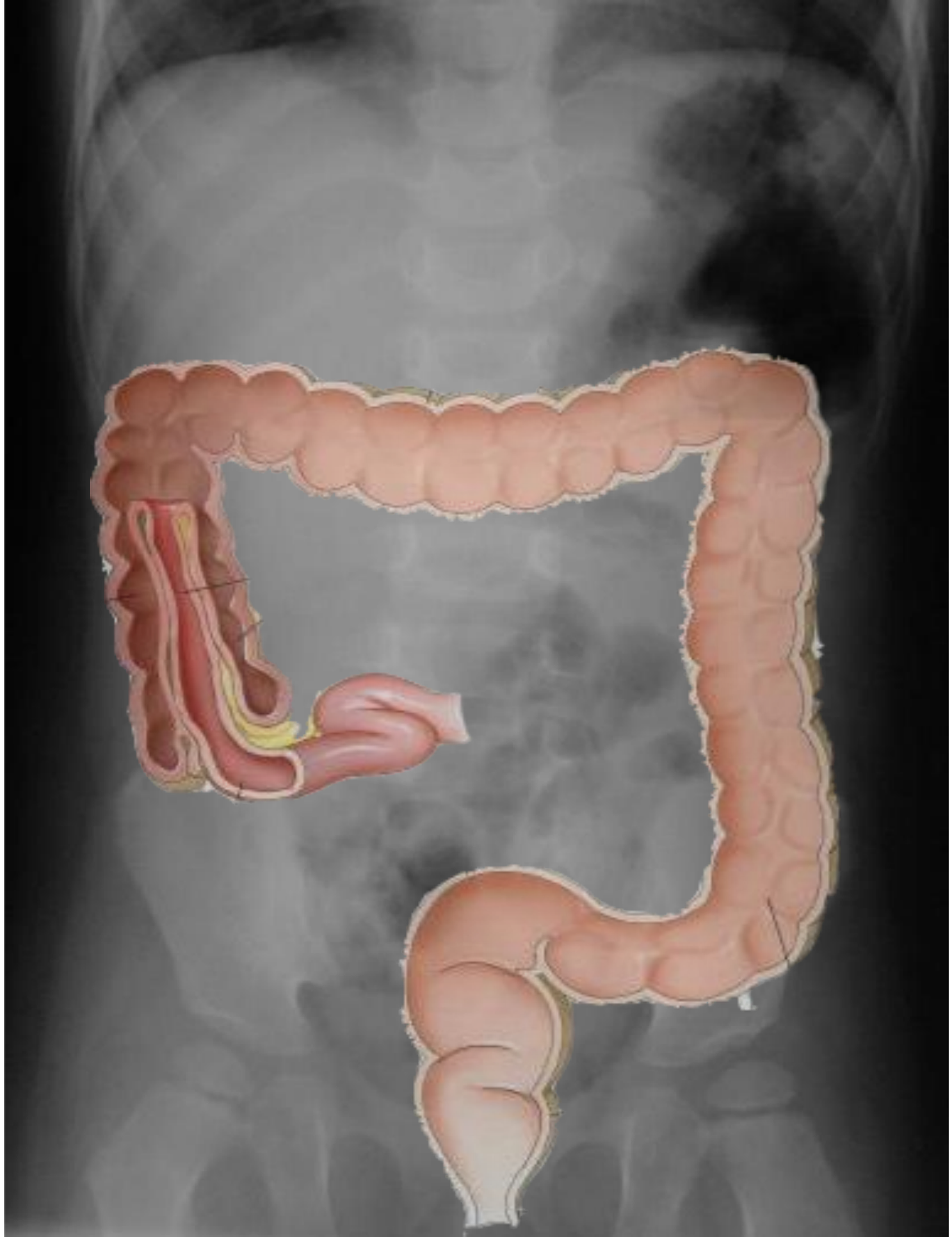
Losek JD. Intussusception and the diagnostic value of testing stool for occult blood. *Am. J. Emerg. Med.* 1991;9(1):1-3.

Plain Radiography





Roskind CG, et al. Accuracy of Plain Radiographs to Exclude the Diagnosis of Intussusception. *Pediatr. Emerg. Care* 2012;28(9):855-858.



Workup negative

Case #1 – Lethargic baby

CC: 6mo male with lethargy; possible ingestion 2h prior

- PICU, repeat procalcitonin > 100 and infant's blood culture returned + for **GBS**
    - S/p 15 days of ampicillin, discharged in good condition

Bottom line?

The “I”s have it…..

- Injury
- Infection
- Ingestion
- Ictal (Seizure)
- Intussusception
- Insulin (hypo- and hyperglycemia)/ Inborn Errors

Special Thanks

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UCSF Benioff Children's Hospitals

Thank you…

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