

# Occult Injury Screening



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Think Less

Test More

Test Routinely

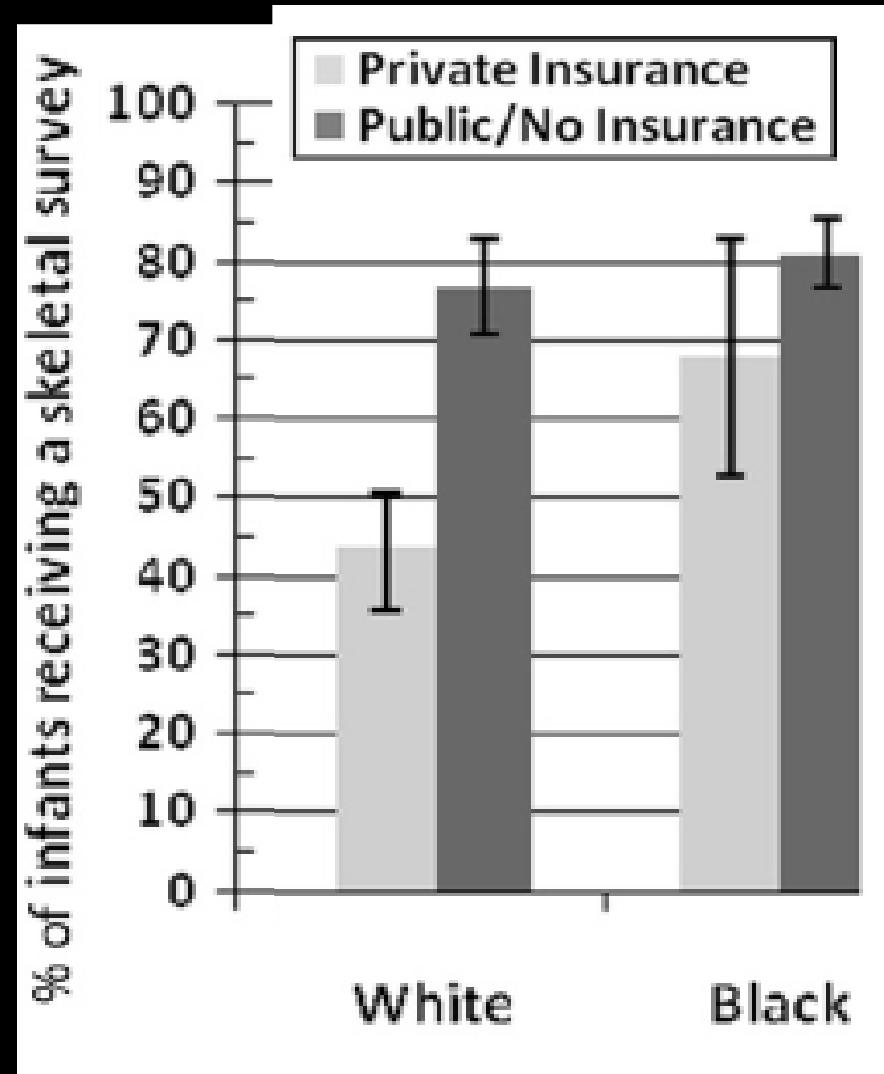
# Missed Abuse - Anecdotes



# More than Anecdotes

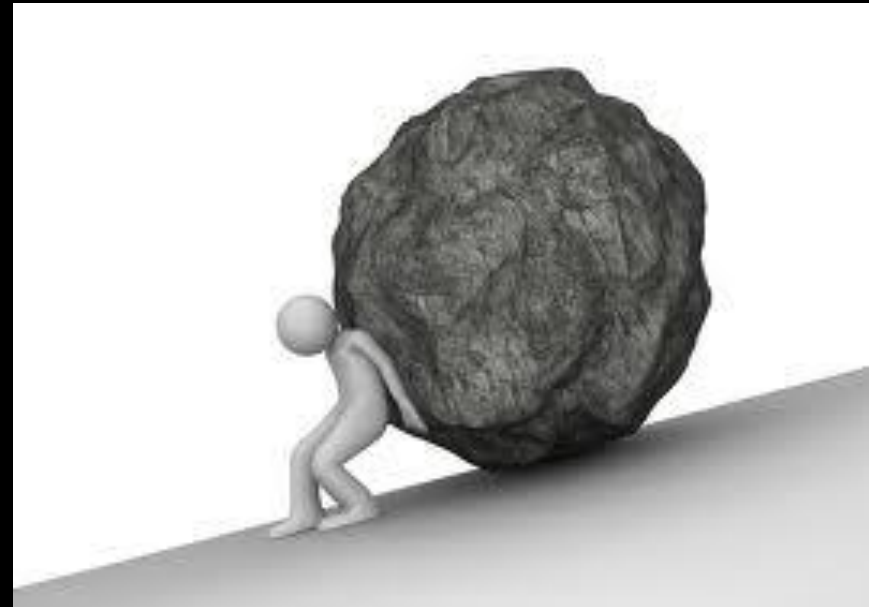
- Missed Abuse
  - 30% of Abusive Head Trauma
  - 20% of Abusive Fractures
- ~1% of parents report abusive “punishment”
- Child deaths from maltreatment 40% higher than from traffic collisions

# Fairness

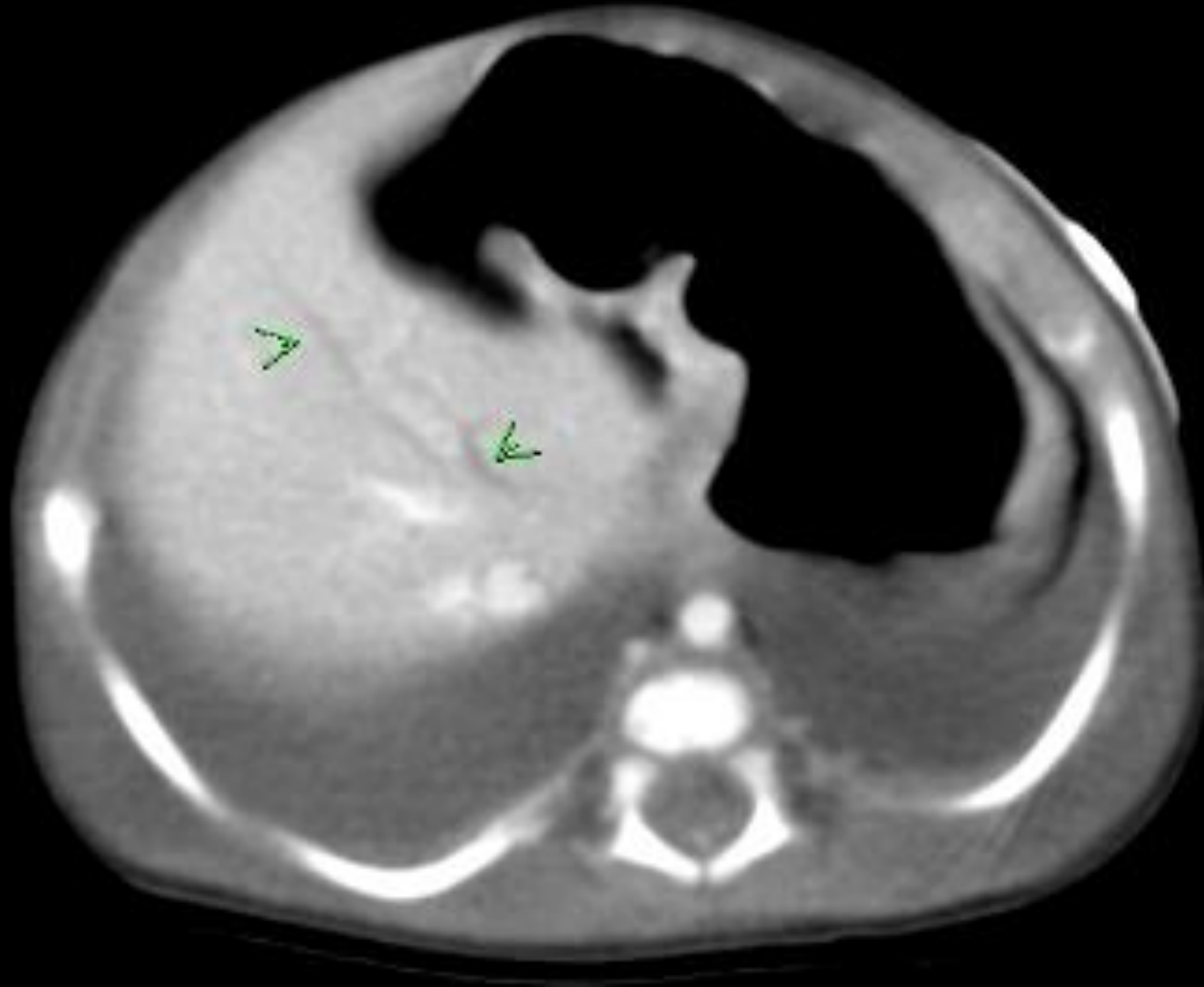


# “Emotional Burden”

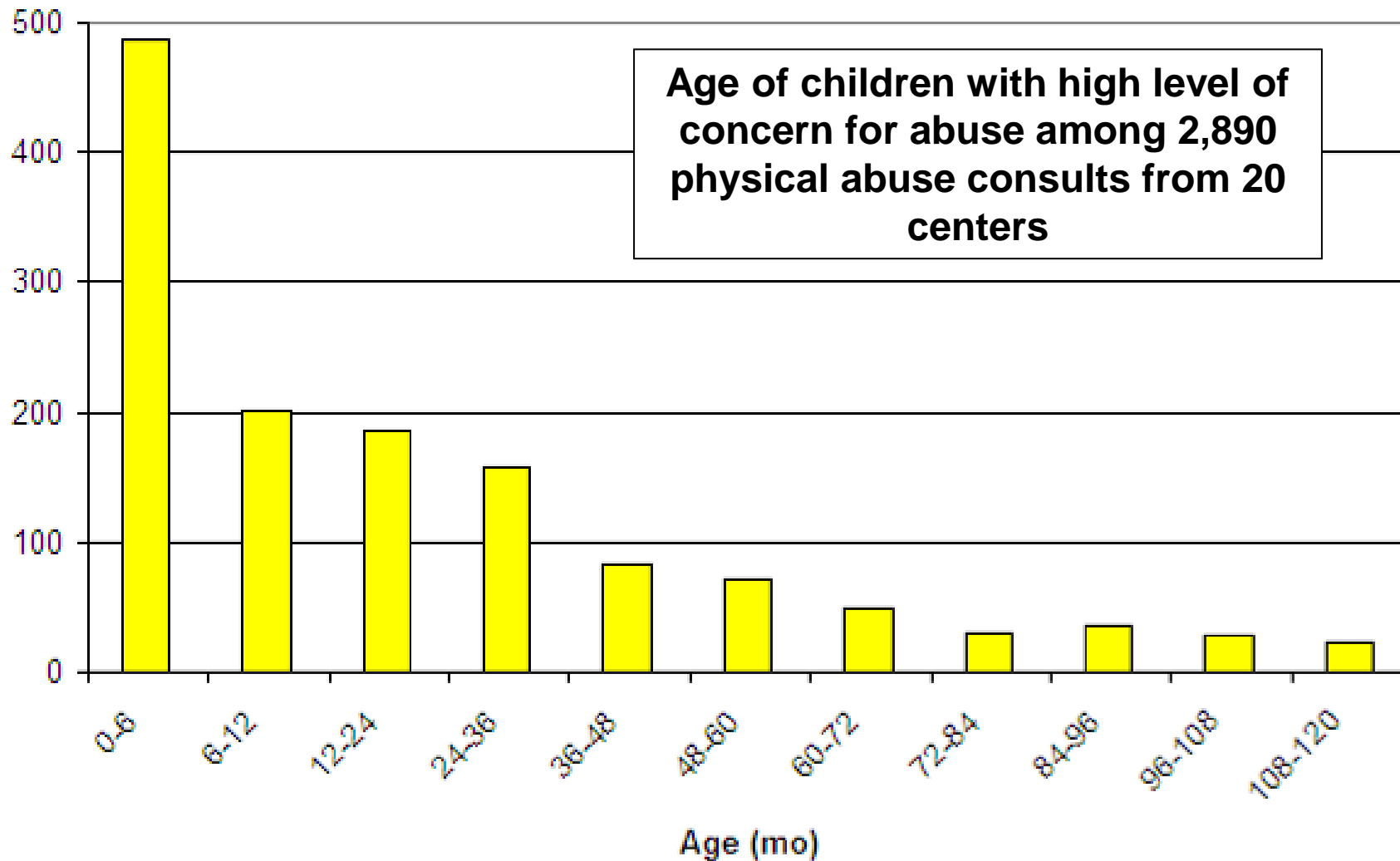
- To the patient
- To the provider



Diagnosis = Treatment



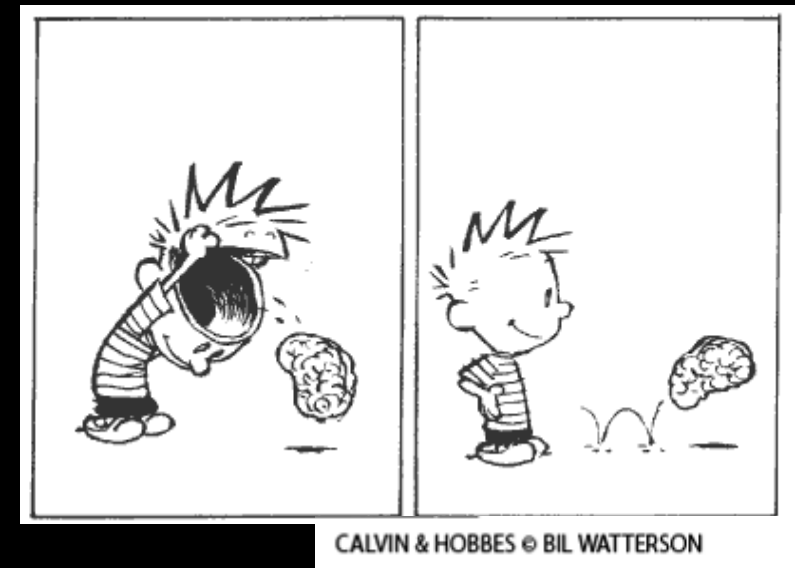
# Age – The Important Demographic





# Don't Think, Just Screen\*

- Bruising <6 months
- Rib fractures
- Long-Bone Fractures in Infants (<12 months)
- Abdominal Injuries
- Oral/Pharyngeal Injuries  
(non-ambulatory)



\* Traffic crashes generally excepted

# Other “Sentinel Injuries”

- Patterned burn/bruise
- Multiple episodes of trauma
- Injury in a non-mobile child
- Child reports abuse or fear



# OK, How?

- You're not asking permission
- Not personal: "someone" not "you"
- Differential:
  - "more injury than we would expect"
  - "additional trauma or a medical problem"
- Matter-of-fact: "Our next step. . ."
- Routine: "Whenever we see this. . ."

# OK, How?

- Physical Exam for everyone
- Skeletal Survey for patients <24 months
- AST/ALT for “serious injuries”
- Neuroimaging?



# Physical Examination

- Scalp/Fontanel
- Growth chart
- Ears
- Mouth (lips, palate, frena, teeth)
- Skin
- Genitalia



# The AAP on Skeletal Surveys

**TABLE 2** Indications for Obtaining a Skeletal Survey

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All children <2 y with obvious abusive injuries

All children <2 y with any suspicious injury, including

Bruises or other skin injuries in nonambulatory infants;

Oral injuries in nonambulatory infants; and

Injuries not consistent with the history provided

Infants with unexplained, unexpected sudden death (consult with medical examiner/coroner first)

Infants and young toddlers with unexplained intracranial injuries, including hemorrhage and hypoxic-ischemic injury

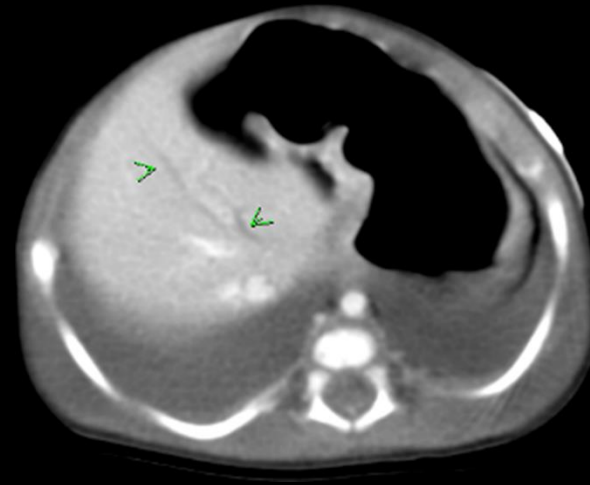
Infants and siblings <2 y and household contacts of an abused child

Twins of abused infants and toddlers

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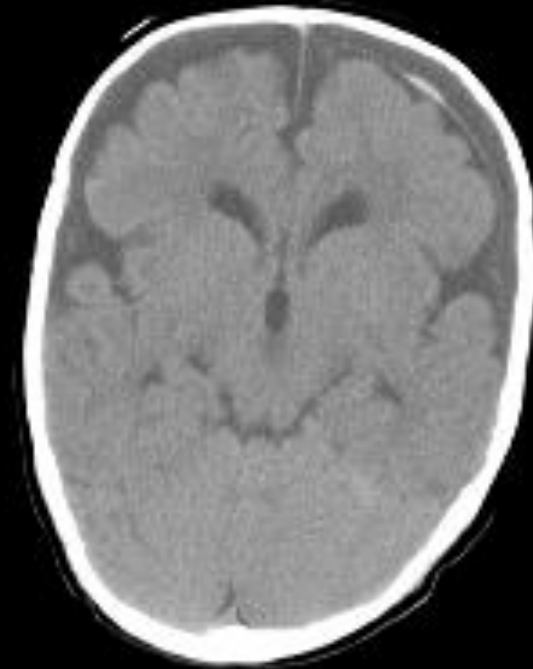
# AST/ALT

- Belly injuries more uncommon (3%)
- Among kids with AST or ALT >80 (20%)
- AAP - Any child with concern for abuse and a 'serious injury'



# Neuroimaging?

- Can't scan every kid
- Can't rely on Physical Exam
- 6 months? 12 months?
- Fast MRI





# Beyond the Basics

- Retinal Exams
- Sibling/Contact Evaluations
- Tox Screens
- Mimic Testing
- Follow-up testing
- Abdominal Imaging
- Spine Imaging

# In Summary

- Don't rely on your gestalt
- This is not personal
- Screen for abuse routinely with sentinel injuries
- Transfer if needed
- Routine Testing – physical exam, skeletal survey, +/- neuroimaging, LFTs, retinal if neuroimaging +
- Report reasonable concerns



# Questions?





# Additional Resources

- 1-844-CO-4-KIDS
- 720-777-3990 – CHCO Child Protection
- ChildProtector (Smartphone app)
- CO Dept. Human Resources Website
- Allison.Gonzales@state.co.us

# What's Missing? Retinal Exams

- Still needed if head CT is positive
  - Not if Negative
- Don't use to screen



# Cognitive Handicaps

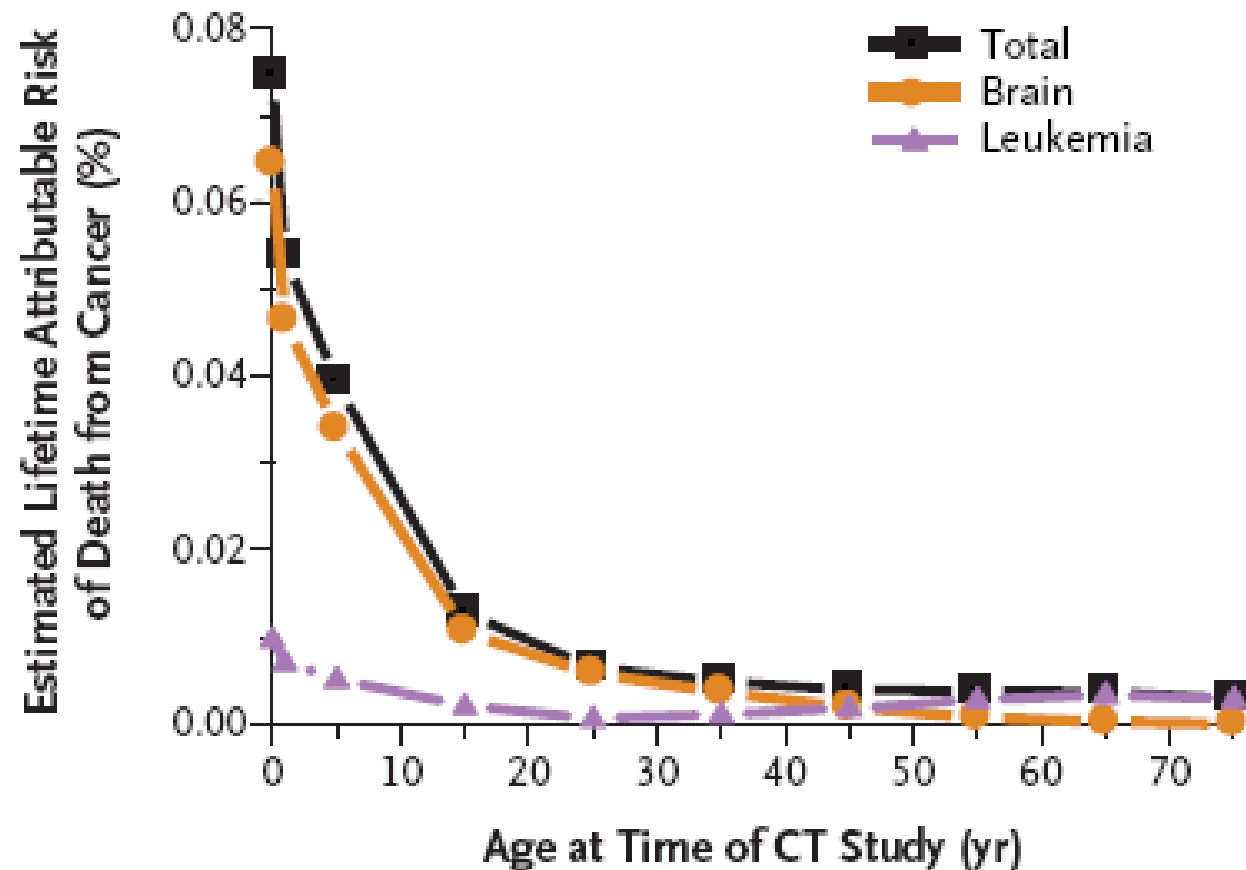
- Family-Centered Care
- Clinically Significant Injuries
- ALARA



# A.L.A.R.A.

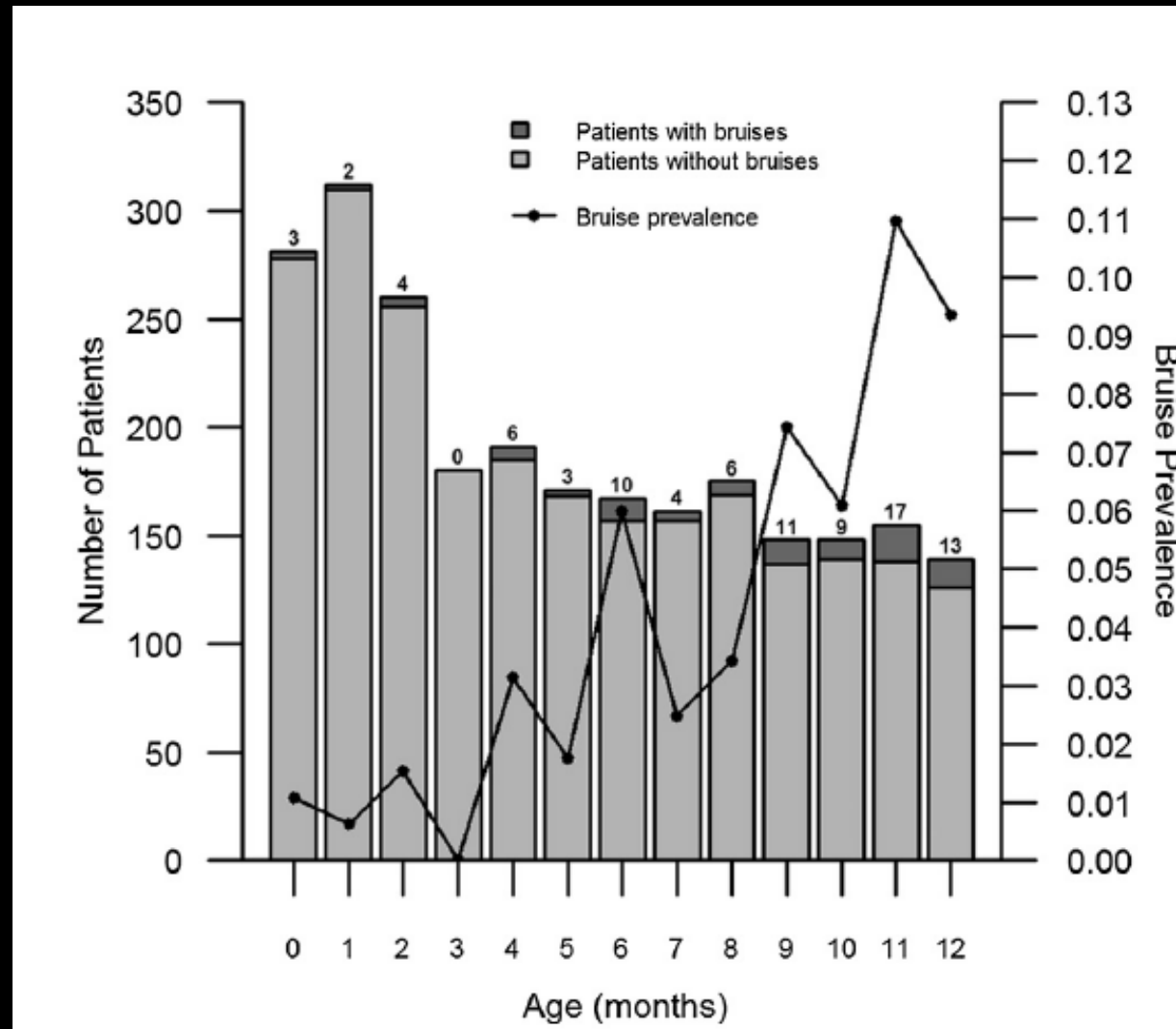
*As Low As Reasonably Achievable*

C Head CT, 340 mAs





# Even in the ED



# Cruising & Bruising

## Bruises in Infants and Toddlers

*Those Who Don't Cruise Rarely Bruise*

Naomi F. Sugar, MD; James A. Taylor, MD; Kenneth W. Feldman, MD;  
and the Puget Sound Pediatric Research Network

**Table 1. Bruises by Age and Developmental Stage of Child\***

Age, mo	Precruiser	Cruiser	Walker
0-2	1/225 (0.4)	...	...
3-5	1/141 (0.7)	...	...
6-8	4/99 (4.0)	2/8 (25)	...
9-11	4/38 (10.5)	12/63 (19.0)	7/18 (38.9)
12-14	1/8 (12.5)	3/24 (12.5)	23/49 (46.9)
15-17	...	1/6 (16.7)	26/57 (45.9)
18-23	...	...	39/79 (49.4)
24-35	...	...	70/115 (60.9)
Total†	11/511 (2.2)	18/101 (17.8)	165/318 (51.9)

# And when they do . . .

Among 146 kids <6 months referred for  
apparently isolated bruising

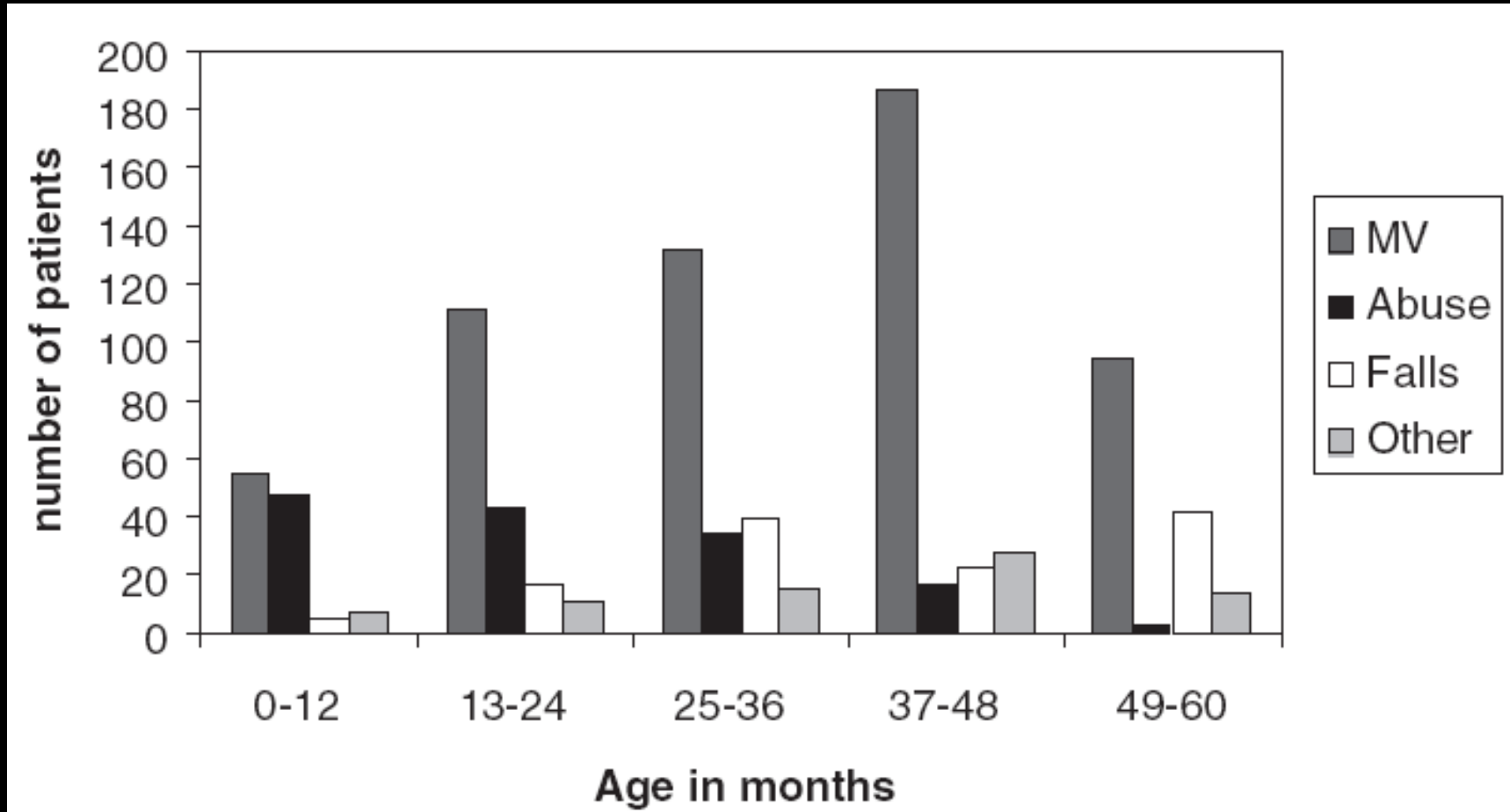
- Skeletal Survey
  - Fracture(s) identified in 34/137 (24%)
- Neuroimaging
  - Injury identified in 37/121 (28%)
- Abdominal Screening
  - Injury identified in 3/95 (2%)

Overall, 73 (50%)  
had at least one  
serious injury.

# Fractures in Infants

	0–11 mo		12–23 mo	
	No. of Fractures	Proportion From Abuse, %	No. of Fractures	Proportion From Abuse, %
Ribs	809	69.4	96	28.5
Radius/ulna	261	62.1	103	19.8
Tibia/fibula	493	58.0	192	16.1
Humerus	518	43.1	545	6.8
Femur	1257	30.5	761	4.8
Clavicle	227	28.1	65	16.7
Skull	3363	17.1	948	8.6

# Abdominal Injuries



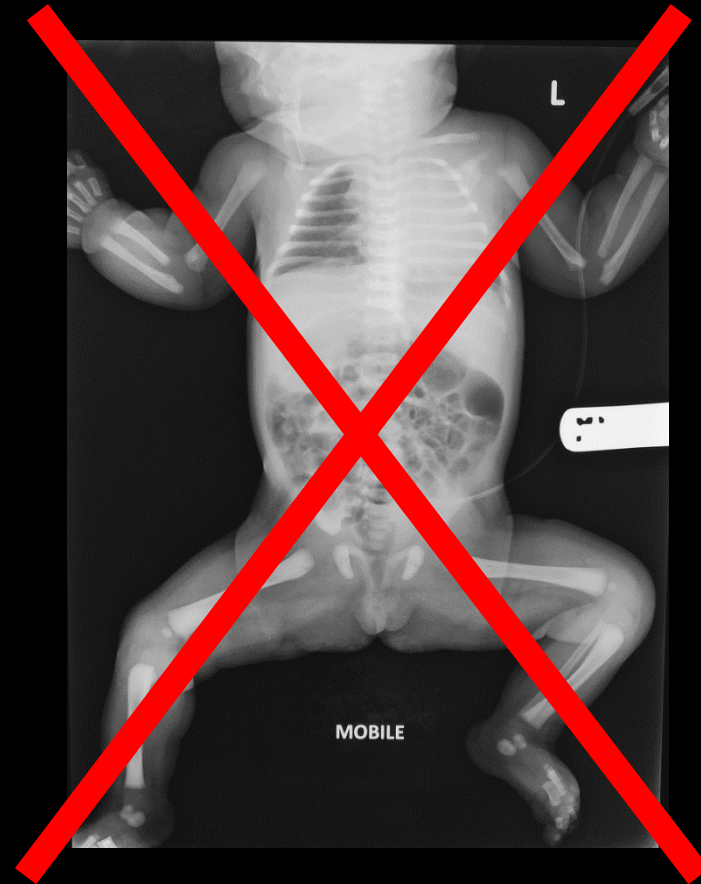
# Oral/Pharyngeal Injuries

- Specifically in non-ambulatory kids
- 17% associated with abuse



# Skeletal Survey <24 months

- Transfer to get this right
  - Radiologists
  - TECHs
- 10-20% are positive
- Radiation is low
- Diagnostic significance high



# Beyond the Basics – Siblings & Contacts

- Overlapping abuse is common
- Remember to ask
- Twins/triplets at highest risk

