Non-Accidental Trauma: Child Abuse and Neglect

Sharon Record RN MSN CPNP, SANE-P
Nurse Practitioner Child Protection Team
Section of Public Health Pediatrics
I have no relevant professional, financial, or personal relationships or conflicts of interest to disclose.
Learning Objectives

• Identify different types of child maltreatment

• Recognize common risk factors for child abuse and neglect

• Recognize physical findings which should provoke a consideration of child physical abuse or neglect

• Identify the process of reporting suspected child abuse and neglect

• Identify strategies for the prevention of child abuse and neglect
The History
Child Maltreatment

• What is it?

- Any recent act or failure to act on the part of a parent or caretaker, which results in:
  - Death
  - Serious physical or emotional harm
  - Sexual abuse, or exploitation

or an act or failure to act which:

- Presents an imminent risk of serious harm

CAPTA
Child Maltreatment

• Physical Abuse

  - "Any non-accidental physical injury to the child"
    • Striking, kicking, burning, or biting the child
    • Any action that results in a physical impairment of the child
The Scope of Abuse: National Data

• 4.1 million CPS referrals involving 7.5 million children

• 674,000 victims of child abuse/neglect

• 1,720 child abuse/neglect fatalities

• 9.1 victims per 1000 children

National Data

• Children in the first year of life have the highest rate of victimization, 25.3 per 1000 in the same age group

• American Indian or Alaskan Native children have the highest rate at 14.3/1000

• African American children have the second highest rate of victimization at 13.9/1000

Child Maltreatment 2017, US DHHS
Child Maltreatment, 2017

Exhibit 3–G Victims by Age, 2017

The youngest children were the most vulnerable to maltreatment.

Rate per 1,000 children

Age

<1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

Based on data from 52 states. See table 3–5.
Exhibit 4-B Child Fatality by Age, 2017

Children <1 year old died from abuse and neglect at nearly four times the rate of children who were 1 year old.

Based on data from 44 states. See table 4-4.

Child Maltreatment, 2017
Texas Data on Abuse

• > 7 children are maltreated every hour

• 182 children are confirmed victims daily

• >3 child fatalities every week

https://www.texprotecs.org/cts.org
CPI Completed Abuse/Neglect Investigations: Victims

Region: (All)
County: (All)
Fiscal Year: 2018

FILTERS
- Confirmed Victim
  - (All)
- Victim Age
  - (All)
- Victim Gender
  - (All)
- Victim Race/Ethnicity
  - (All)

Click color legend below to highlight:
1. Lubbock
2. Abilene
3. Arlington
4. Tyler
5. Beaumont
6. Houston

Fiscal Year: 2018
Region: 6-Houston
County: Harris

Metrics for Region 6-Houston:
- Victims: 58,510
- Victims/1,000 Children Population: 31.24

Metrics for County:
- Victims: 39,288
- Victims/1,000 Children Population: 31.86

DFPS Data Book, 2018
Number and Rate of Child Maltreatment Cases/Victims: 1990-2016

Number of cases (in thousands, includes duplicate victims)
Number of cases (in thousands, unique victims)
Cases per 1,000 children (includes duplicate victims)
Cases per 1,000 children (unique victims)


WWW.childtrends.org
Table 5–5 Perpetrators by Relationship to Their Victims, 2017 (continues next page)

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Types of Child Maltreatment

- Neglect
- Physical Abuse
- Sexual Abuse
- Psychological Abuse
- Medical Child Abuse
- Child Torture
Risk Factors for Child Abuse and Neglect

- Domestic violence
- Alcohol and drug abuse
- Untreated mental illness
- Lack of parenting skills
- Stress and lack of support
Risk Factors for Child Abuse and Neglect

• Speech disorder, learning disability

• Failure to Thrive

• Intellectual disability, chronic or recurrent illness

• Prematurity

• Unplanned pregnancy or unwanted child

• < 3 years of age
Warning Signs of Child Abuse and Neglect

• Neglect
• Emotional abuse
• Physical abuse
• Sexual abuse
Neglect

• Any serious act of omission or commission which, within the bounds of cultural tradition, constitutes a failure to provide conditions that are essential for the healthy physical and emotional development of a child.

• Consider physical, medical, dental, emotional neglect
Neglect

• Failure to gain weight
• Extreme malnutrition
• Longstanding skin infections
• Extreme lack of cleanliness
• Worsening of chronic illness
FTT as Abuse

• Parental depression, stress, marital discord/divorce

• Parental history of abuse as a child

• Intellectual disability/psychological abnormalities in the parents

• Young and single mothers without social supports

• Domestic violence

• Alcohol and/or substance abuse

• Previous child abuse in the family
FTT as Abuse

• Social isolation and/or poverty

• Parents with inadequate adaptive and social skills

• Parents who are overly focused on career and/or activities away from home

• Failure to adhere to medical regimens

• Lack of knowledge of normal growth and development

• Infant with low birth weight or prolonged hospitalization
Girls weight

Single-Time Standard (cross-sectional)

- 97
- 50
- 3

Age, years

kg

Hospital

Care
Pediatrics
Child Physical Abuse

• Bruises, Burns, Bites, and Boo Boos (other cutaneous or muco-cutaneous injuries)

• Bones – Abusive Skeletal Trauma

• Brains – Abusive Head Trauma

• Bellies – Abusive Abdominal Trauma
Some Features of Child Abuse

• Usually some action of the caretaker
  - Hitting, shaking, breaking

• Usually results in an injury to the child
  - May not be externally obvious
  - May be trivial or fatal

• May not be premeditated
  - Loss of control
  - Lack of supervision
Bruises

• Bruises can not reliably be dated.
• Bruises can not reliably be dated.
• Bruises can not reliably be dated.
Bruises

• Most infant will have **no** bruises.
• Babies do **not** bruise themselves.
• Most infants with broken bones will **not** have any bruising.
• Most infants with bruising are victims of abuse.
• Some bruises have specific patterns.
Bruises in Infants and Toddlers

Those Who Don’t Cruise Rarely Bruise

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

Objectives: To determine the frequency and location of bruises in normal infants and toddlers, and to determine the relationship of age and developmental stage to bruising.

Design: Cross-sectional survey.

Setting: Community primary care pediatric offices.

Subjects: Children younger than 36 months attending well-child care visits.

Methods: Prospective data collection of demographics, developmental stage, and presence and location of bruises. Any medical condition that causes bruises as well as known or suspected abuse was also recorded. A χ² test or Fisher exact test was used to determine the significance of differences.

Main Outcome Measures: Presence and location of bruises as related to age and developmental stage.

Results: Bruises were found in 203 (20.9%) of 973 children who had no known medical cause for bruising and in whom abuse was not suspected. Only 2 (0.6%) of 366 children who were younger than 6 months and 8 (1.7%) of 473 children younger than 9 months had any bruises. Bruises were noted in only 11 (2.2%) of 511 children who were not yet walking with support (cruising). However, 17.8% of cruisers and 51.9% of walkers had bruises (P<.001). Mean bruise frequency ranged from 1.3 bruises per injured child among precruisers (range, 1-2 bruises) to 2.4 per injured child among walkers (range, 1-11). The most frequent site of bruises was over the anterior tibia and knee. Bruises on the forehead and upper leg were common among walkers, but bruises on the face and trunk were rare, and bruises on the hands and buttocks were not observed at any age. There were no differences in bruise frequency by sex. African American children were observed to have bruises much less frequently than white children (P<.007).

Conclusions: Bruises are rare in normal infants and precruisers and become common among cruisers and walkers. Bruises in infants younger than 9 months and who are not yet beginning to ambulate should lead to consideration of abuse or illness as causative. Bruises in toddlers that are located in atypical areas, such as the trunk, hands, or buttocks, should prompt similar concerns.

Arch Pediatr Adolesc Med. 1999;153:399-403
TEN-4

- Trunk
- Ear
- Neck
- Under 4 months of age
Bruises (Patterns)

- Recognizable patterns – hairbrush, slap
- Linear or geometric – belts, cords
- Bite-marks
  - At a place that the child cannot bite themselves
Burns

- Location, mechanism, access to the mechanism, supervision at the time of injury, presence or absence of clothing

- 10% of all child abuse

- 5-30% of all burns are abusive, outcome is usually poorer

- Often associated with other injuries

- Tap water burns are the most common
Time for Full Thickness Burn

- 10 min at 120°F
- 5 min at 122°F
- 1 min at 127°F
- 30 s at 130°F
- 5 s at 140°F
- 2 s at 150°F
- 1 s at 158°F

Temperature vs. Time, min

- Temperature in °F and °C

[Graph showing time for full thickness burn with various temperature and time points.]
Burns-Key Points

• Splash/spill

• Immersion

• Patterns

Common anatomic sites of accidental versus abusive burns *Pediatric Dermatology* Vol. 23 No. 4 July/August 2006
Burns-Key Points

‘Zebra stripe’ scald pattern

‘Doughnut hole’ sparing
Burns-Key Points

• Splash/spill

• Immersion

• Patterns

Common anatomic sites of accidental versus abusive burns Pediatr Dermatol Vol. 23 No. 4 July/August 2006
Skin protected by bottom of tub

Skin Protected by skin folds
“Smiley face” cigarette lighter burn
Bites

Courtesy Dr. C. Greeley
< 3 cm intercanine distance = most likely a child

Courtesy of Dr. M. Donaruma
Other Cutaneous and Muco-cutaneous Injuries

• Oral Injuries

• Eye injuries

• Abrasions

• Lacerations

• Ligature marks

• Petechiae
Bones - Abusive Skeletal Trauma

• 72% of fractures were without bruising within one week of the injury

• It is normal for children to have fractures without bruises

• “The presence or absence of bruising does not make the fracture more or less likely from abuse.”

Mathew et al, BMJ, 1998
Skeletal Trauma

- 50-75% of all abusive skeletal trauma occurs in <1 year olds

- Up to 45% of abusive skeletal injuries are clinically unsuspected

- Most common abusive fracture is a mid-shaft, long bone fracture

- Many fractures are common in both abusive and accidental injuries (appropriate history is the key)
**High specificity**
- Classic metaphyseal lesions
- Rib fractures, especially posterior
- Scapular fractures
- Spinous process fractures
- Sternal fractures

**Moderate specificity**
- Multiple fractures, especially bilateral
- Fractures of different ages
- Epiphyseal separations
- Vertebral body fractures and subluxations
- Digital fractures
- Complex skull fractures

**Common but low specificity**
- Subperiosteal new bone formation
- Clavicular fractures
- Long bone shaft fractures
- Linear skull fractures

Highest specificity applies in infants.
“Bucket-Handle”
Sudden jerk on extremity avulses metaphyseal tips
Posterior Rib Fractures
Posterior Rib Fractures
Posterior Rib Fractures
Fractures Of Different Ages

• “Are the result of at least two, and perhaps more, episodes of injury”

• There may be an explanation for one
  - May not be the same for the others

• Each fracture needs to be documented
Spiral Fracture Mechanism

Twisting of extremity
Toddler’s Fracture
Accidental Spiral Fracture
Skeletal Survey

• Used to identify occult fractures
  - Fractures can occur absent of bruising
  - Babies feel pain when their bones break
• In all suspected abuse < 2 years old
• From 2 – 5 years, helpful in selective cases
• Not indicated in children >5 years old
• “Baby-gram” is not acceptable
## Time of Healing

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</tr>
<tr>
<td>Soft callus</td>
<td>10–21 days</td>
<td>14–21</td>
</tr>
<tr>
<td>Hard callus</td>
<td>14–90 days</td>
<td>21–42</td>
</tr>
<tr>
<td>Remodelling</td>
<td>3 months–2 years</td>
<td></td>
</tr>
</tbody>
</table>

Kleinman, 1998
Repeat Skeletal Survey

• Important to repeat the skeletal survey in 2 weeks
  - Even if first survey was negative
  - Even if the first survey showed healing fractures
Brains – Abusive Head Trauma

- Scalp injury
- Skull fracture
- Epidural hemorrhage
- Subdural hemorrhage
- Parenchymal injury
Scalp Injuries

• External findings may not reflect internal injuries
  - Can have trivial external findings with fatal injuries
  - Can have fatal injuries without any external findings

• Scalp bruising indicates contact
Skull Fractures

• Results from contact forces (impact)
  - Head hit object, object hit head, head crushed
• Many different types of fractures
  - Different implications
• Simple linear fractures (parietal)
  - Most commonly seen in accidental injuries
  • Short falls
Diastatic Skull Fracture
Complex Skull Fracture
Comminuted Skull Fracture
Depressed Skull Fracture
Skull Fractures

• 3D CT reconstruction is the best modality
• Cannot be dated radiographically
  - Heal *without* callus formation
• Kleinman & Spevak, JPeds 1992
  - “…A skull fracture without overlying soft tissue swelling demonstrable by computed tomography is probably inconsistent with an acute injury”
Epidural Hematoma

• Typically seen with skull fractures
  - Bleeding just beneath the skull
• Are seen with trauma
• Usually accidental
Epidural Hematoma
Subdural Hematoma

• Blood between the dura and the brain
  - Tearing of bridging vessels

• Occurs from *rotational* forces
  - With, or without, contact

• The blood usually does not cause symptoms
  - The brain injury is the source of the symptoms
Acute SDH (CT)
Bilateral Frontal SDH
Different Densities
Parenchymal Injury

- Contusion
- Shear injury (gliding contusion)
- Cerebral edema
- Diffuse Axonal Injury (DAI)
- Parenchymal bleeding
  - Petechial hemorrhage
  - Interventricular hemorrhage
Bulging fontanelle
Subdural hemorrhage
Loss of grey-white matter differentiation
Cerebral Edema
Retinal Hemorrhages

• Rare, even in high-speed MVC
• “SBS” has a typical pattern
  - Not from CPR
• Location, layer and number
  - Throughout the eye
  - Multiple layers
  - “Too-Numerous-To-Count”
Normal Retina
Ophthalmologic Exam

• Very valuable in suspected cases of AHT
  - High level of specificity for AHT
• Should be obtained as soon as possible
  - Findings may change over the first few days
• Should include photographs or drawings
  - Number of hemorrhages
  - Layers of the hemorrhages
  - Extent of the hemorrhages
Take Home Messages

• Evaluation of suspected AHT is a team effort
• Thorough history and complete examination
• Uncontrasted Head CT (with 3D reconstruction)
• Skeletal Survey
  - Under 2 years of age
  - Repeated in 2 weeks
• If intracranial hemorrhage or persistent neurological symptoms...dilated fundus exam
• Extensive considerations of differential diagnosis
Bellies – Abusive Abdominal Trauma

• Type of blows resulting in perforation
  - Kicked by horse or mule
  - Object (200–250 lbs) fell on child
  - Surfboard blow
  - Run over by sand-filled truck tire
  - Dresser fell on child
  - Standing against wall and struck by bicycle
  - Go-cart accident

Intestinal Injury-Mechanism

• Shearing forces created in sudden deceleration accidents at areas of relative fixation, such as the beginning of the intestine after it leaves the stomach (MVC or fall)
Intestinal Injury-Mechanism

• Shearing or tearing forces

• Compression or crushing of the bowel against the front of the spinal column
Intestinal Injury-Mechanism

• Shearing or tearing forces

• Compression or crushing of the bowel against the front of the spinal column

• Bursting injuries from a sudden increase in pressure inside the intestine by a single point blow
What do you do?
What the Laws Says:

- Professionals have 48 hours to make a report (Texas Family Code Sec. 261.101)
- Confidential* (TFC Sec. 261.201)
- Does not breach patient confidentiality (TFC & Occupation Code, Sec. 159.003)
- Immunity from criminal & civil liability (TFC Sec. 261.106)
- Class B misdemeanor for failure to report suspected abuse (TFC 261.109)
- Class A misdemeanor for failure to stop or report sexual assault of a child (Texas Penal Code Sec. 38.17)

Mandated Reporters

“’professional' means an individual who is licensed or certified by the state or who is an employee of a facility licensed, certified, or operated by the state and who, in the normal course of official duties or duties for which a license or certification is required, has direct contact with children. The term includes teachers, nurses, doctors... employees of a clinic or health care facility that provides reproductive services...” (TFC Sec. 261.101)
Why report?

- Prevent further injury to or death of a child
- Maltreatment linked to life-long health consequences
- Healthcare staff have a moral and legal responsibility to ensure the safety and well-being of patients
- Legal obligation to report child maltreatment
- Consequences for not taking action may include criminal and civil actions against the professional and/or license and institution
How to Make a Report

• Call 1-800-252-5400
• Or report online at www.txabusehotline.org*

* Online reports are for situations where the children are NOT in immediate danger

When to Call 9-1-1 for Police:

• Deadly weapon used
• Known child sexual abuse
• To initiate a chain of custody for physical evidence
• Child is at risk of permanent injury or death
• Immediate danger to child or practice staff
• Refer to toolkit for additional information
Services offered by CPS

• Investigation
  - Type I – 24 hours to respond, Type II - 72 hours to respond
  - no investigation – “red flag” is placed on file

• Placement Assessment
  - If safe at home, offer family services and referrals
  - If not safe at home, will attempt to place with a relative prior to family services

• Services
  - counseling, day care, homemaker services, evaluation, treatment, anger management and parenting classes.

• Court Approves Permanency for Child:
  - If family matter is resolved, child is reunified with family
  - If matter is unresolved, child will be placed in permanent custody of relative, adoption or permanent custody of CPS
TCH Child Protection Team

- Nurse Practitioners
- Social Workers
- CAP Physicians (Attending Physicians and Fellows)
- Nurses
- Foster Care Clinic
- Child Protective Health Clinic
CAP Team Can Help With

- In-patient consults
- Out-patient consults and follow up care
- Coordination with other medical services, social service agencies, law enforcement, and the legal system
TCH Child Abuse Pediatric Services

• Child Protective Health Clinic: 832.824.6522
• Physical abuse consult service: 832.824.2099
• Children’s Assessment Center Medical Clinic: 713.986.3369

• Coordination with CPS, law enforcement & social services
• Consult service & physician-to-physician referral
• Medical staff experienced in testifying in court
• Child friendly atmosphere
• Proper examination equipment
Prevention

✧ Support
- Identify risk factors for abuse or neglect early
- Referral to appropriate services
- Early childhood home visitation

✧ Education & Anticipatory Guidance
- Period of Purple Crying
- Parenting classes
- Children’s personal safety
Take Home Points

• Keep abuse in mind

• Get thorough histories

• Ask for help

Call us!
References


References


References