# Child Physical Abuse

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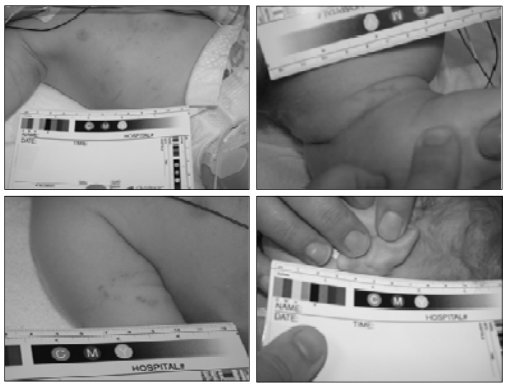
# Case Example

- **26 day old hospitalized for a presumed infection of the upper labial frenulum**
- **Hospitalized for 3 days and received ID and ENT consultations**
- **Discharged home**

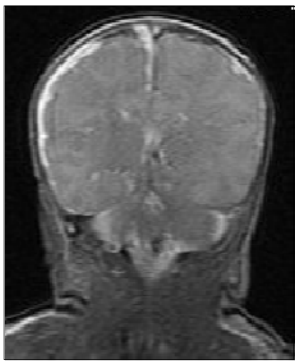
# Case Example

- **Returns to hospital at 40 days of age**
- **Spent majority of previous day with mother with no identified concerns**
- **Two hours after father assumes care of child, infant develops difficulty feeding with progressive lethargy**
- **Approximately 15 hours after initial symptoms, infant presents to emergency department with seizures**

# Initial Examination



# Head Imaging



# 20-20 Hindsight History

- Three children removed from the parents' care in the past for neglect
- History of IPV involving the mother and multiple past partners
- Both parents with history of arrest for theft
- This child's 5-month old step-sibling was evaluated for a transverse fracture of her distal tibia two months before this child's presentation, but no report of suspected physical abuse was made

http://en.wikipedia.org/wiki/File:Memphis_in_Front_of_Me,_Arkansas_in_Back_of_Me.jpg by Gary Bridgman is licensed under CC BY 2.5

# What is child maltreatment?

- Common types of maltreatment include:
  - Neglect
  - Physical Abuse
  - Sexual Abuse

# 2011 National Statistics

- CPS agencies received 3.4 million referrals
- An estimated 680,000 children were determined to be victims of child abuse or neglect
- 9.1 per 1000 children
- This is the tip of the iceberg - ***many*** cases are never reported

http://en.wiktionary.org/wiki/File:Iceberg_upernavik_2007-08-11_1.jpg by Kim Hansen is licensed under CC BY 2.5

Data obtained from U.S. Department of Health and Human Services

## Risk Factors for Child Abuse

- A child who…
  - Is young
    - Highest rate of maltreatment for children between birth and 3 years of age
    - Why?
      - Small physical size
      - Early developmental status
      - Need for constant care
  - Has a "difficult" temperament
  - Was unwanted or unplanned
  - Has a disability or chronic illness

## Risk Factors for Child Abuse

- A parent who…
  - Is young
  - Has a history of substance abuse
  - Has mental illness
  - Has poor coping abilities
  - Has unreasonable expectations for the child
  - Has been abused him/herself

## Risk Factors for Child Abuse

- A family with…
  - Intimate partner violence
  - Poverty
    - 22-25 times more likely to experience maltreatment
    - 16 times more likely to be a victim of physical abuse
    - 18 times more likely to be sexually abused
    - 44 times more likely to be neglected
    - 56 times more likely to be educationally neglected
  - Social Isolation

Data taken from Third National Incidence Study on Child Abuse and Neglect, 2001

## Risk Factors for Child Abuse

- A family with…
  - A single parent
    - 120% greater risk of being endangered by some type of child abuse or neglect
    - 220% greater risk of educational neglect
  - An unrelated adult in the home
  - Multiple children
    - $\geq$ 4 children: 2.5-3 times more likely to be neglected
  - Stressors (Work, $$)

Data taken from Third National Incidence Study on Child Abuse and Neglect, 2001

## Risk Factors for Child Abuse

- **A community with…**
  - **Poverty**
  - **Crime**
  - **Violence**
  - **Substance abuse**
  - **Social isolation**
  - **Lack of support systems**

## Child Abuse: Who is at risk?

- ***Any child at any age***
- ***Any* parent or caretaker can abuse a child**
- **Avoid the "not in my neighborhood" trap!**
- **Abuse is seen in:**
  - **All cultures**
  - **All ethnicities**
  - **All races**
  - **All socioeconomic groups**

## Child Abuse – Why We Care

- **It is self-protective:**
  - **We are *potentially* legally liable for missing abuse and definitely liable for identifying it and not acting upon it**
- **It is good medical care:**
  - **Timely identification of child abuse is critical to preventing additional harm, including death**

## Missed Abuse

- **Jenny 1999:**
  - **Reported 54 cases of abusive head injury missed upon the first hospital presentation**
    - **28% of these children were re-injured after the missed diagnosis**
    - **40% of these children experienced medical complications related to the missed diagnosis**
    - **At least four children died from what would have been preventable deaths**

## Increasing Morbidity/Mortality

- **Schmitt et al 1990**
  - **Studied abused children who were returned to the home in which the abuse occurred without any specific intervention or safety plan**
  - **Found those children had increased risk of recurrent abuse by 35-50% and a higher risk of a *fatal* recurrent episode by 5-10%**

## Increasing Morbidity/Mortality

- **Putnam-Hornstein 2011**
  - **Prospective population-based study of mortality following a nonfatal allegation of maltreatment**
  - **Followed over 4 million children in California**
  - **Children with a prior allegation of maltreatment:**
    - **Died from intentional injuries at a rate that was 5.9 times greater than unreported children (95% CI [4.39, 7.81])**
    - **Died from unintentional injuries at twice the rate of unreported children (95% CI [1.71, 2.36])**

## Ohio Trauma Registry Data

**Comparison of Victims of a Single Episode of Child Abuse to Victims of Recurrent Episodes of Child Abuse**

| | Single Episode NAI (n=1519) | Recurrent Episode NAI (n=53) | p value |
|---|---|---|---|
| Male | 58% (791/1519) | 66% (35/53) | 0.05 |
| Race | | | 0.02 |
| White | 67% (1024/1519) | 83% (44/53) | NA |
| Black | 25% (378/1519) | 13% (7/53) | NA |
| Hispanic | 10% (50/1519) | 4% (2/53) | NA |
| Pediatric trauma center | 69% (1054/1519) | 87% (46/53) | 0.008 |
| Mortality | 9.9% (151/1519) | 24.5% (13/53) | 0.002 |

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## Potential Strategies

- Case reviews
- Root cause analyses
- Education to "high-risk" providers:
  - ED/Urgent care providers
  - Ambulatory pediatricians
  - Dental/ENT specialists

## Acknowledging Bias

- Disparities exist in assessing for child abuse:
  - Jenny et al (1999): AHT missed more often in white children
  - Lane et al (2002): Minority children had higher rates of evaluation for abuse and reports for suspected abuse
  - Physical abuse considered more often in children with low SES (Lane et al, 2007 & Laskey et al, 2012)

## Physical Abuse Consult Tool

- Retrospective chart review with prospective implementation of the Physical Abuse Consult Tool
- Comparison of consults from year before introduction of tool (n=212) to consults from year after introduction of tool (n=302)

## Physical Abuse Consult Tool

- Have you started a child abuse evaluation in the ED?
- Is the child being admitted for an injury?
- Is the injury a burn, near-drowning, or isolated forearm/elbow fracture?
- Did the injury occur inside the home?

## Physical Abuse Consult Tool

- **Child Assessment Team consulted on any admitted child less than 5 years of age who sustains an injury in a residence**

## Physical Abuse Consult Tool

| | Pre-Tool | Post-Tool | |
|---|---|---|---|
| Age | Median: 0.75y (4d – 4y 11m) | Median: 1.08y (5d – 4y 10m) | Not significant |
| Insurance | Commercial: 18%<br>Public: 79%<br>Self-pay: 2% | Commercial: 20%<br>Public: 74%<br>Self-pay: 6% | Not significant |
| Race | White: 67% | White: 75% | $X^2=3.99$<br>$p<0.05$** |

## Standardizing the Approach

- **Recommended workup for *any infant* with a sentinel injury:**
  - **Full physical examination**
  - **Head CT (<6 months or head/neck injury)**
  - **Skeletal survey**
  - **AST/ALT/Lipase**
  - **Psychosocial assessment**

## Case Example

- **7-week old twins – each with an isolated bruise on examination during a well-child visit**

**TWIN A**

**TWIN B**

# Case Example

TWIN A

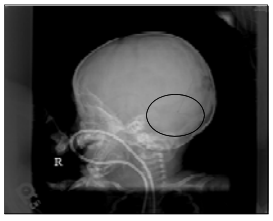
TWIN B

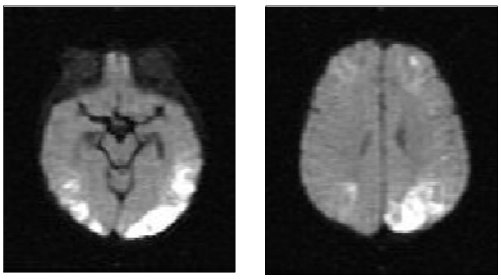
# Case Example

- 8 week old, former 27 week EGA seen in BPD clinic for follow-up
- Noted to have bruising to the left cheek
- Mother states child often sleeps on his pacifier and believes this is the cause of bruising
- No psychosocial concerns identified

# Case Example

- Child presents to ED 3 weeks later with irregular respirations, poor perfusion and seizure activity
- Child in the care of her father throughout the day – reports she awoke from nap “screaming” earlier in the day
- Found by grandmother





# Conclusion

- Child abuse is common
- Although the risk for serious physical abuse is highest in children less than three years of age, any child is at risk
- Strategies should be implemented to avoid bias and standardize the workup for children with suspected abuse

# Child Abuse

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**Clinical Professor of Surgery**
**Department of Surgery**
**Division of Pediatric Surgery**
**The Ohio State University Wexner Medical Center**

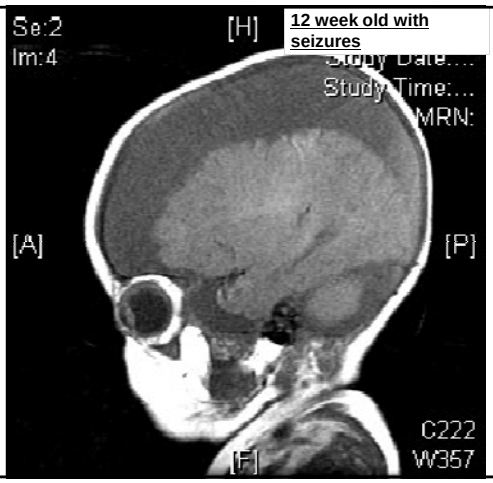
## Child Abuse – A surgeon's perspective

- Child abuse is among the top killers of injured children
- Child abuse is the number one cause of homicide of young children
- In one study of pediatric homicide, 97% of the cases, the assailant was known to the victim and was a family relative in 77%.

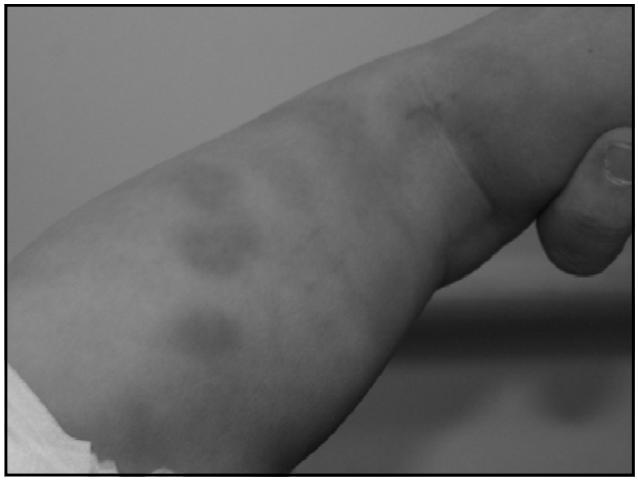
# Child Abuse – Diagnosis

**Child Abuse can mimic:**

- **coagulopathy**
- **Metabolic disease**
- **CNS disorders**
- **Dermatologic disease**
- **Infection**







## Diagnosis – History

- Injury occurred several days before ED visit
- Injury mechanism is vague or changes when history is retold
- Injury mechanism exceeds child's developmental abilities
- Injury far more severe than stated mechanism


## Physical Examination

- Injuries of different ages
- Injuries that are more severe than possible with the stated history
- Injury blamed on too-young sibling
- Injuries in unusual locations (cheeks, buttocks, genitalia)

## Skin and soft tissue injuries

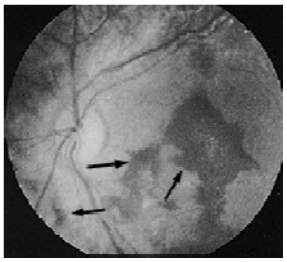
- Lip and labial frenulum lacerations in infants are highly suspicious for abuse
- Fresh bruises as well as resolving lesions
- Patterned marks on skin: light cord, belt, belt buckle, fingerprints

Bruises of different ages

Bruises on ear - unlikely to be unintentional

Marks from looped cord

## Retinal Hemorrhages



Are virtually pathognomonic of child abuse

## Burns

- Common form of abuse
- Contact burns are common: cigarettes, irons, radiators
- Immersion burns: “stocking pattern” on feet combined with burn on buttocks, no splash marks

## Visceral Injuries

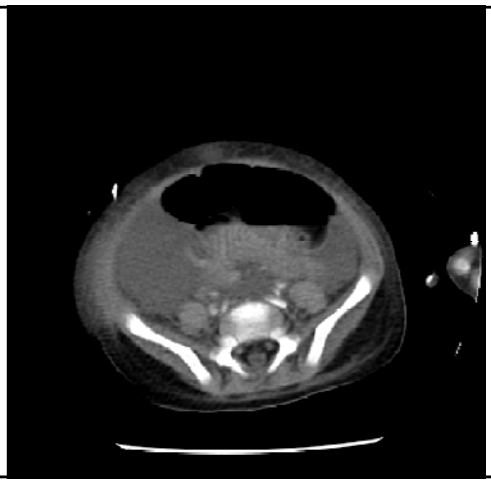
- 10-15% of children hospitalized for abuse have an abdominal or thoracic injury
- Abdominal bruising may or may not be present
- May mask as medical illness (meningitis, ruptured appendix, anemia)
- History is almost always obscure or unrealistic (such as a simple fall)

## Visceral Injuries

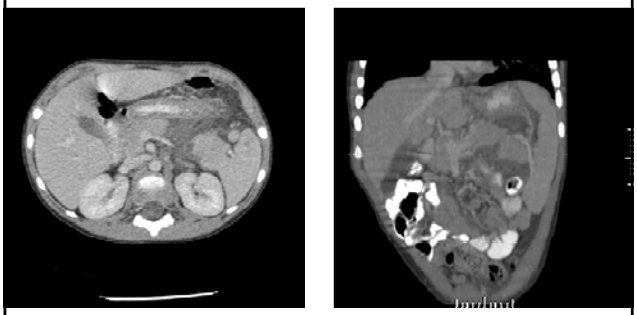
- Most common mechanism is thought to be compression of viscera against spine by a well-localized compressive force (such as a fist striking the mid-abdomen)
- deliberate thoracic trauma may cause pulmonary contusion or mediastinal emphysema.

## Visceral Injuries

- Solid organ injuries
- Intestinal perforation
- Duodenal hematoma
- Pancreatic trauma
- Mesenteric tears
- Rectal injuries



**Pancreatic transection in a 4 year old**



## Musculoskeletal trauma

- Fractures occur in 25% of children who suffer from physical abuse
- Fractures are caused by pulling or twisting, not falls
- Multiple fractures at various stages of healing is almost diagnostic
- Metabolic bone disorders must be excluded

## Musculoskeletal trauma

- Epiphyseal separations
- metaphyseal fractures
- “bucket handle fracture” - epiphyseal-metaphyseal separation (virtually pathognomonic of abuse)
- diaphyseal spiral fracture attributed to fall is highly suspicious for abuse

# Fractures

- **Order of frequency: humerus, femur, tibia, forearm bones, clavicle, facial bones, ribs**
- **Most fractures due to child abuse occur before age 3**
- **Any significant leg injury in a child less than 18 months old should be regarded as suspicious for intentional injury**

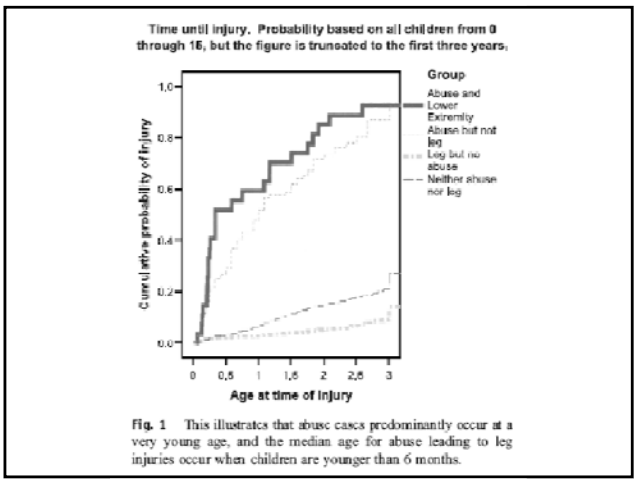



Fig. 1 This illustrates that abuse cases predominantly occur at a very young age, and the median age for abuse leading to leg injuries occur when children are younger than 6 months.

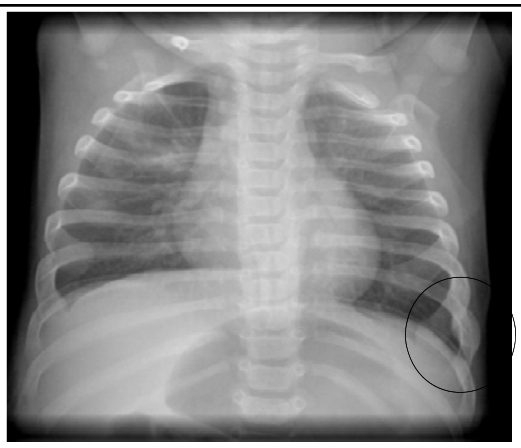
**Femur Fracture – 4 month old infant**

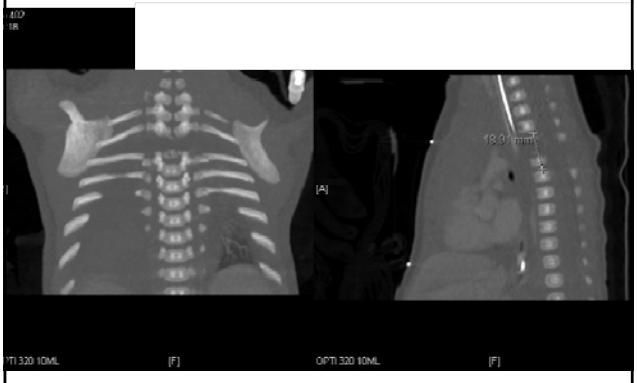

**Femur Fracture – 2 month old infant**

**Femur Fracture – 1 month old infant**

## Musculoskeletal trauma

- **Patients > 18 months with lower extremity injuries: 1% were due to abuse**
- **Patients < 18 months with lower extremity injuries: 66% were due to abuse**
- **Patients < 18 months with lower extremity fractures: 75% were due to abuse**
- ***The population sample was children admitted for treatment of injury***

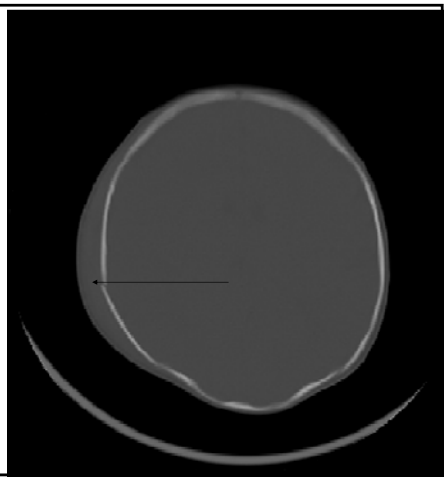




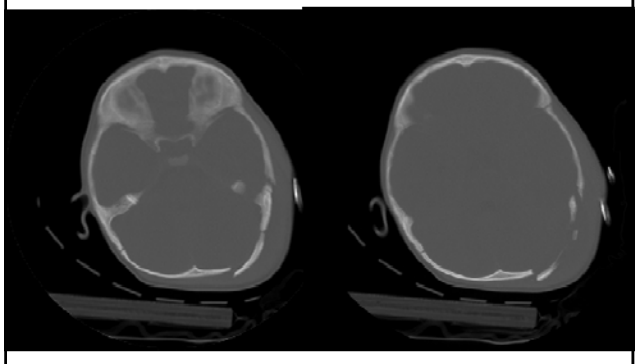
# Head Trauma

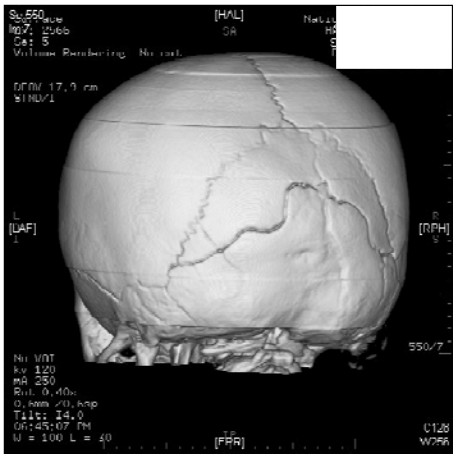
- **Third most common manifestation of child abuse**
- **Main cause of mortality due to child abuse**
- **a child with abusive head trauma may be comatose upon presentation with few signs of external injury**
- **Up to 30% of abusive head injuries can be missed by health care workers**

**Skull Fracture with soft tissue swelling in a 2 month old**



**Comminuted Skull Fracture in a 15 month old infant**






## Munchausen By Proxy

- Also called factitious disorder by proxy
- persistent illness that cannot be explained on a medical basis
- symptoms improve when child is removed from caregivers

## Munchausen By Proxy

- Long delay from onset of symptoms to diagnosis
- Mothers are most often perpetrator
- mothers often have history of abuse or Munchausen symptoms (66%)
- Medical training is common among perpetrators (55% worked in or studied health care)

## Munchausen By Proxy

- Can even occur in the Pediatric ICU (example: intentional extubation of patient)
- diagnosis may require covert video surveillance (in one study, made diagnosis in 50%)
- can frequently affect more than one child in the family

## Munchausen By Proxy

**Central venous catheters**

- **17% of MBP patients had CVLS**
- **>50% of MBP CVL patients had line sepsis**
- **2 CVL related homicides**
- **1.1% of CVLs placed at one institution were discovered to have MSBP**
- **surgeons should not become unwitting collaborators!**

Feldman KW, Hickman RO. J Pediatr Surg. 1998 Apr;33(4):623-7.

## Summary

- **Child abuse is a common injury mechanism and a common cause of death in children**
- **Most children who suffer physical abuse are less than three years old**
- **Factitious disorder by proxy is a rare and difficult to recognize form of abuse in chronically ill children**