Why do this conference?
The number and rate of victims have fluctuated during the past 5 years. Comparing the national rounded number of victims from 2012 (656,000) to the national estimate of victims in 2016 (676,000) shows an increase of 3.0 percent.
### Exhibit 4–A Child Fatality Rates per 100,000 Children, 2012–2016

<table>
<thead>
<tr>
<th>Year</th>
<th>Reporting States</th>
<th>Child Population of Reporting States</th>
<th>Child Fatalities from Reporting States</th>
<th>National Fatality Rate Per 100,000 Children</th>
<th>Child Population of all 52 States</th>
<th>National Estimate of Child Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>51</td>
<td>74,277,427</td>
<td>1,621</td>
<td>2.18</td>
<td>74,542,811</td>
<td>1,630</td>
</tr>
<tr>
<td>2013</td>
<td>51</td>
<td>74,121,591</td>
<td>1,551</td>
<td>2.09</td>
<td>74,383,731</td>
<td>1,550</td>
</tr>
<tr>
<td>2014</td>
<td>51</td>
<td>74,086,682</td>
<td>1,588</td>
<td>2.14</td>
<td>74,346,098</td>
<td>1,590</td>
</tr>
<tr>
<td>2015</td>
<td>49</td>
<td>70,416,380</td>
<td>1,589</td>
<td>2.26</td>
<td>74,349,174</td>
<td>1,680</td>
</tr>
<tr>
<td>2016</td>
<td>49</td>
<td>72,009,469</td>
<td>1,700</td>
<td>2.36</td>
<td>74,338,157</td>
<td>1,750</td>
</tr>
</tbody>
</table>

Data are from the Child File and Agency File. National fatality rates per 100,000 children were calculated by dividing the number of child fatalities by the population of reporting states and multiplying by 100,000.

If fewer than 52 states reported data, the national estimate of child fatalities was calculated by multiplying the national fatality rate by the child population of all 52 states and dividing by 100,000. The estimate was rounded to the nearest 10. If 52 states reported data, the national estimate of child fatalities was calculated by taking the number of reported child fatalities and rounding to the nearest 10. Because of the rounding rule, the national estimate could have more or fewer fatalities than the actual reported number of fatalities.
Exhibit 4–B Child Fatalities by Age, 2016

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

Based on data from 44 states. See table 4–4.
What are the barriers to Diagnosis?
What is child abuse?

- Child abuse is when a parent or caregiver, whether through action or failing to act, causes injury, death, emotional harm or risk of serious harm to a child. There are many forms of child maltreatment, including neglect, physical abuse, sexual abuse, exploitation and emotional abuse.
24 yo male boyfriend of the mother of the patient who has been very frustrated with work and his lack of sleep because of the 4 month old who won't stop crying while he is supposed to be napping is bring in the child because he shook him until he stopped crying.
Minority children >12 months old were 3 times more likely to be reported to Social services than their white counterparts.

Minority children >12 months <3 yo were significantly more likely to receive a Skeletal survey.
The rate of African-American child fatalities (4.65 per 100,000 African-American children) is 2.2 times greater than the rate of White children (2.08 per 100,000 White children) and nearly 3 times greater than the rate of Hispanic children (1.58 per 100,000 Hispanic children).
CONCLUSIONS: One fifth of children with abuse-related fractures are missed during the initial medical visit. In particular, boys who present to a primary care or a general emergency department setting with an extremity fracture are at a particularly high risk for delayed diagnosis.
Classic BONE Signs of Abuse

- Bucket handle fractures
- Corner fractures
- Long bone fracture in non ambulatory infants
- Rib fractures
Fig. 5.—Diagrams of corner-fracture and bucket-handle patterns of classic metaphyseal lesions (CML) in distal tibia. Fractures (arrows in A and C) extend adjacent to chondro-osseous junction and then veer proximally to undercut larger peripheral segment that encompasses subperiosteal bone collar. When physes is viewed tangentially, CML appears as corner-fracture pattern (A and C). When view is obtained with beam angulation, a bucket-handle pattern results (B and D).
A and B, Diffuse forms.
C and D, Localized forms.
<table>
<thead>
<tr>
<th>Injury</th>
<th>Odds Ratio for Abuse</th>
<th>P</th>
<th>Odds Ratio for Abuse</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rib fractures</td>
<td>23.7 (9.5-59.2)</td>
<td>&lt; 0.001*</td>
<td>9.1 (3.3-25.0)</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Tibia/fibula fracture</td>
<td>12.8 (5.1-32.6)</td>
<td>&lt; 0.001*</td>
<td>2.1 (0.7-6.2)</td>
<td>0.172</td>
</tr>
<tr>
<td>Humerus fracture</td>
<td>2.3 (1.3-4.1)</td>
<td>0.004*</td>
<td>0.29 (0.1-0.7)</td>
<td>0.005*</td>
</tr>
<tr>
<td>Femur fracture</td>
<td>1.8 (1.2-2.7)</td>
<td>0.005*</td>
<td>0.30 (0.1-0.7)</td>
<td>0.003*</td>
</tr>
</tbody>
</table>

*Statistically significant.

Age and sex-adjusted odds ratios calculated using binary logistic regression, without eliminating variables for lack of significance (enter method).

CI indicates confidence interval.
The skeletal survey with oblique views of the ribs still remains the gold standard for evaluating occult skeletal trauma.
High specificity
- CMLs
- Rib fractures, especially posteromedial
- 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
Pediatric Femur Fracture
Femur Shaft Fractures in Toddlers and Young Children: Rarely from Child Abuse

- Misperception 1: Toddlers rarely break their femurs
Femur Shaft Fractures in Toddlers and Young Children: Rarely from Child Abuse

- Misperception 1: Toddlers rarely break their femurs
- Misperception 2: Lots of force is required to break the femur
Femur Shaft Fractures in Toddlers and Young Children: Rarely from Child Abuse

- **Misperception 1:** Toddlers rarely break their femurs
- **Misperception 2:** Lots of force is required to break the femur
- **Misperception 3:** There is a high risk of abuse if a child has a femur fracture
Femur Shaft Fractures in Toddlers and Young Children: Rarely from Child Abuse

- Misperception 1: Toddlers rarely break their femurs
- Misperception 2: Lots of force is required to break the femur
- Misperception 3: There is a high risk of abuse if a child has a femur fracture
- Misperception 4: If unsure, report the incident, it can't hurt
## References in order of slides

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