

# PEDIATRIC INJURY PATTERNS

Samuel P. Mandell, MD, MPH, FACS  
Assistant Professor of Surgery



HARBORVIEW  
MEDICAL CENTER

UW Medicine  King County



# DISCLOSURES



- Nothing to disclose

Previous Photo: Aaron Brethorst



THE PRIORITIES AND ORGANIZATION OF  
TRAUMA CARE FOR CHILDREN ARE THE SAME  
AS FOR ADULTS

# INJURIES BY AGE

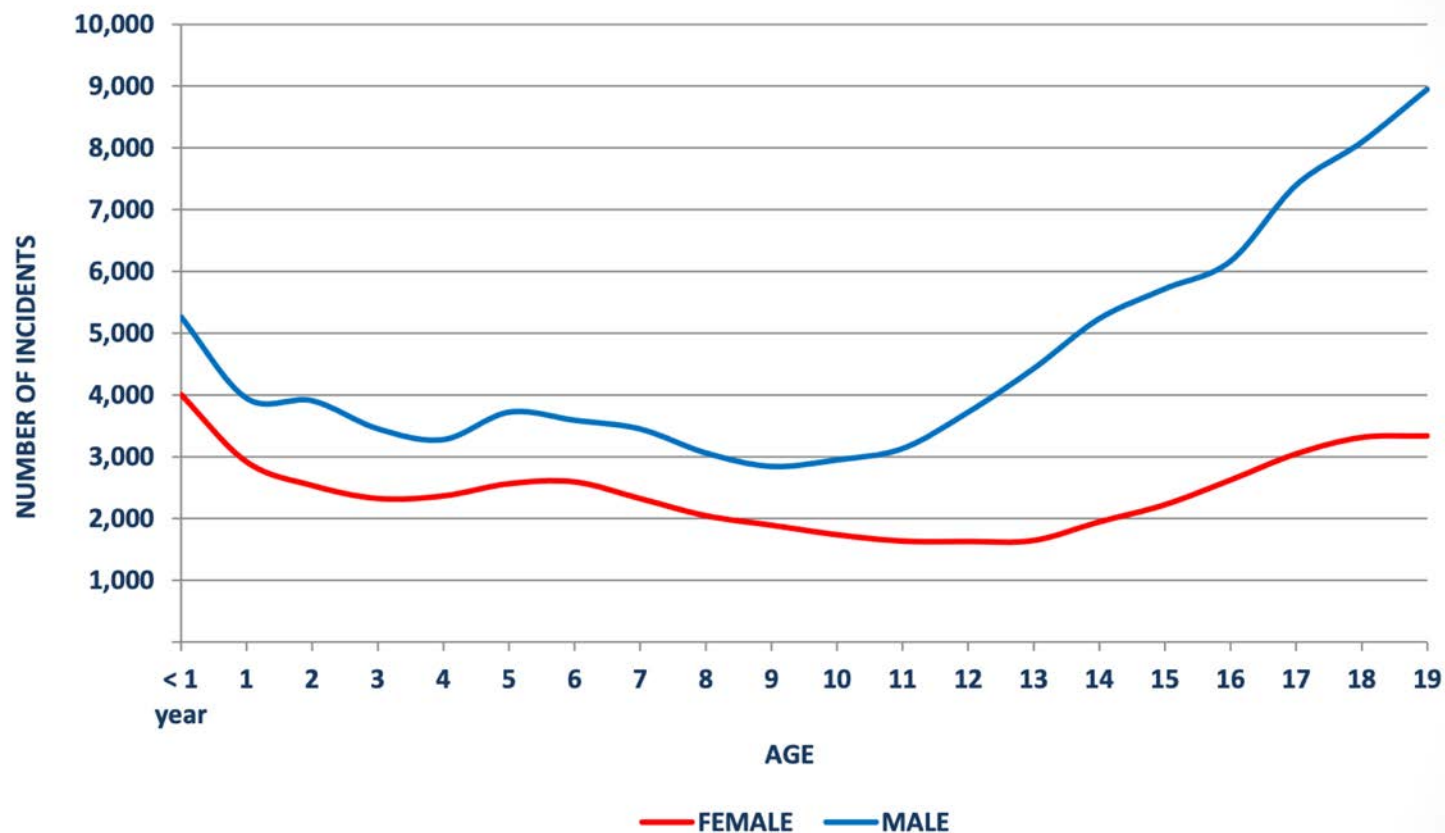


Fig 7A and 8A, Committee on Trauma, American College of Surgeons. NTDB Annual/Pediatric Report 2016. Chicago, IL. The content reproduced from the NTDB remains the full and exclusive copyrighted property of the American College of Surgeons. The American College of Surgeons is not responsible for any claims arising from works based on the original data, text, tables, or figures.

# MECHANISM OF INJURY

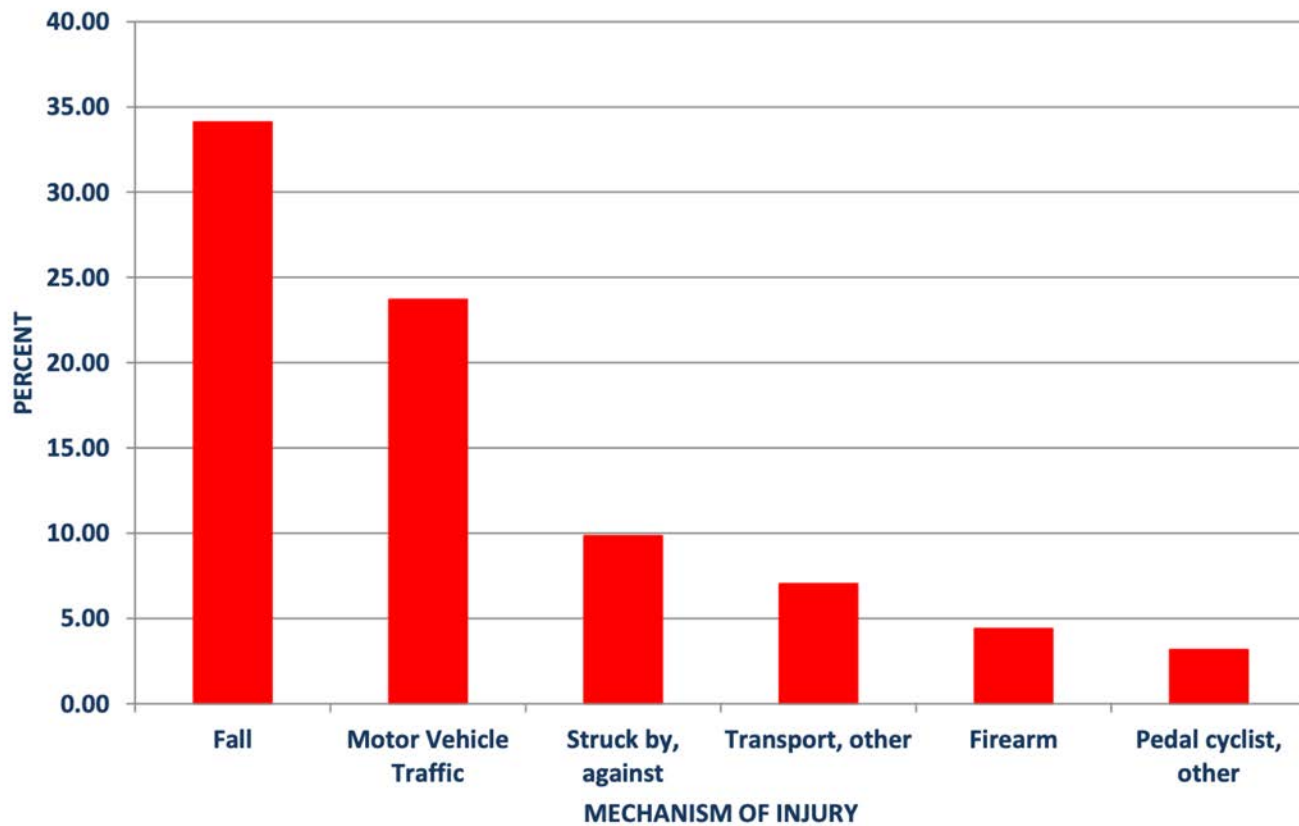


Fig 12A, Committee on Trauma, American College of Surgeons. NTDB Annual/Pediatric Report 2016. Chicago, IL. The content reproduced from the NTDB remains the full and exclusive copyrighted property of the American College of Surgeons. The American College of Surgeons is not responsible for any claims arising from works based on the original data, text, tables, or figures.

# FATALITY BY MECHANISM

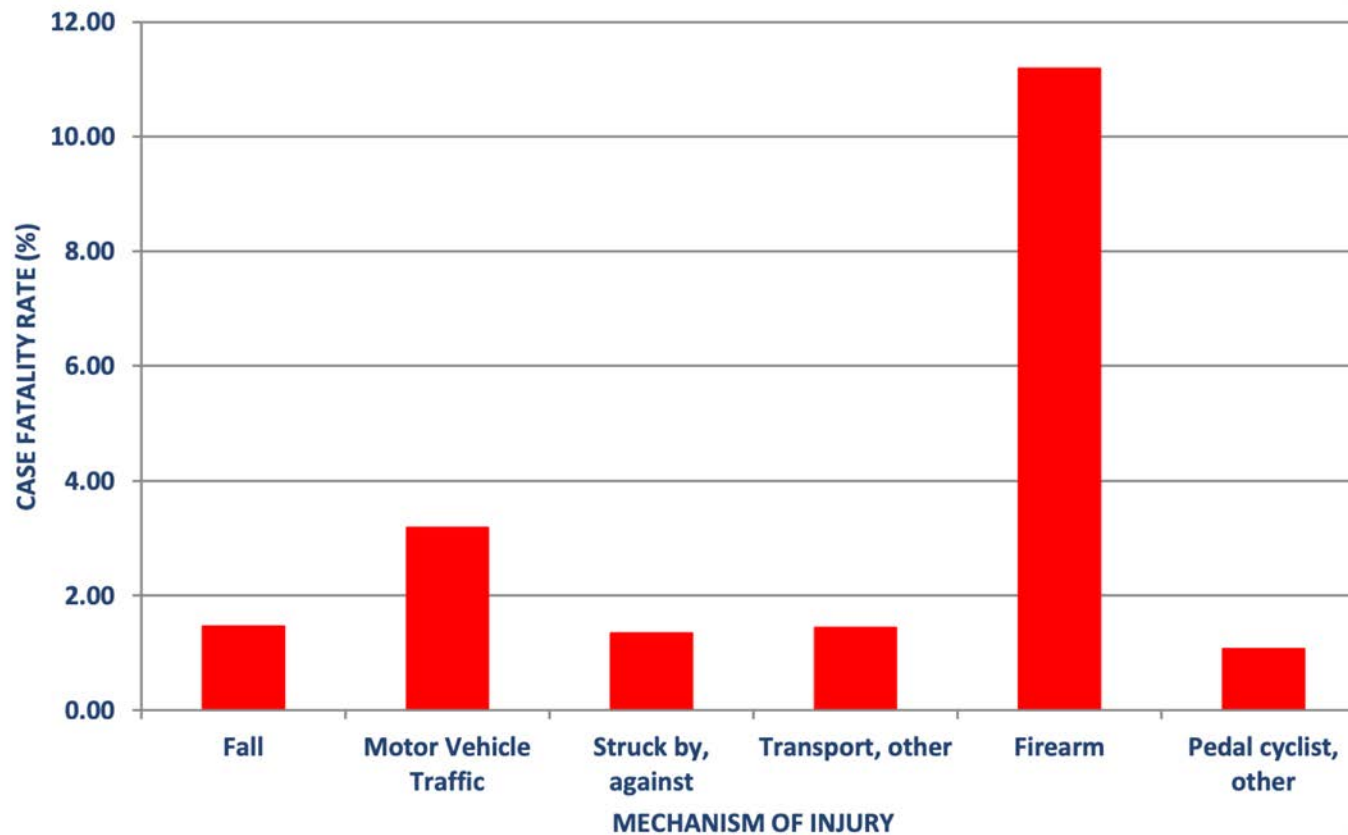


Fig 12B, Committee on Trauma, American College of Surgeons. NTDB Annual/Pediatric Report 2016. Chicago, IL. The content reproduced from the NTDB remains the full and exclusive copyrighted property of the American College of Surgeons. The American College of Surgeons is not responsible for any claims arising from works based on the original data, text, tables, or figures.

# CHANGES WITH AGE...

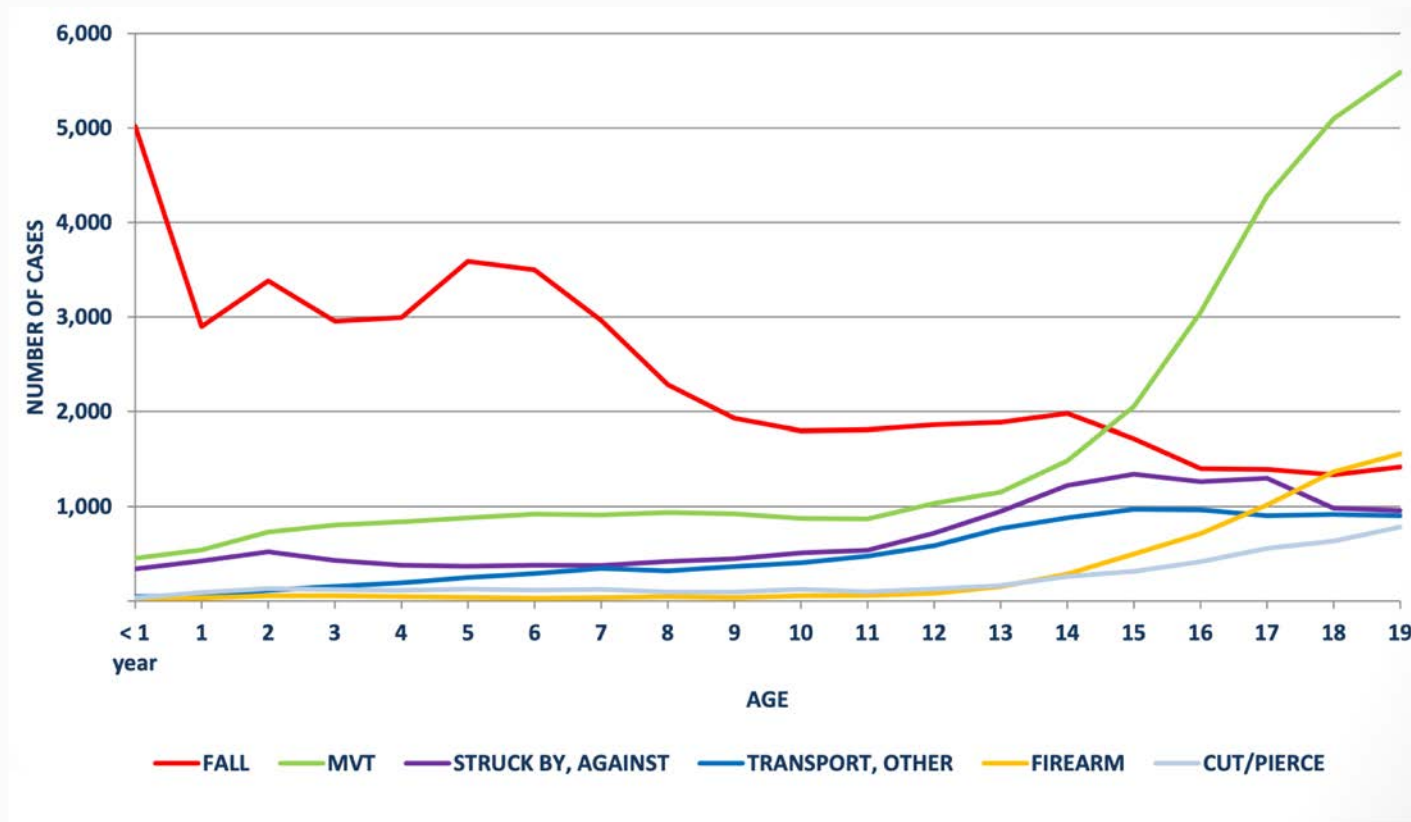


Fig 13, Committee on Trauma, American College of Surgeons. NTDB Annual/Pediatric Report 2016. Chicago, IL. The content reproduced from the NTDB remains the full and exclusive copyrighted property of the American College of Surgeons. The American College of Surgeons is not responsible for any claims arising from works based on the original data, text, tables, or figures.

# UNITED STATES 2016

## AGES 10-24



- 74% of all deaths from 4 causes
  1. Motor Vehicle Crashes 22%
  2. Other Unintentional Injury 20%
  3. Suicide 17%
  4. Homicide 15%

# WHERE ARE THE BAD INJURIES?

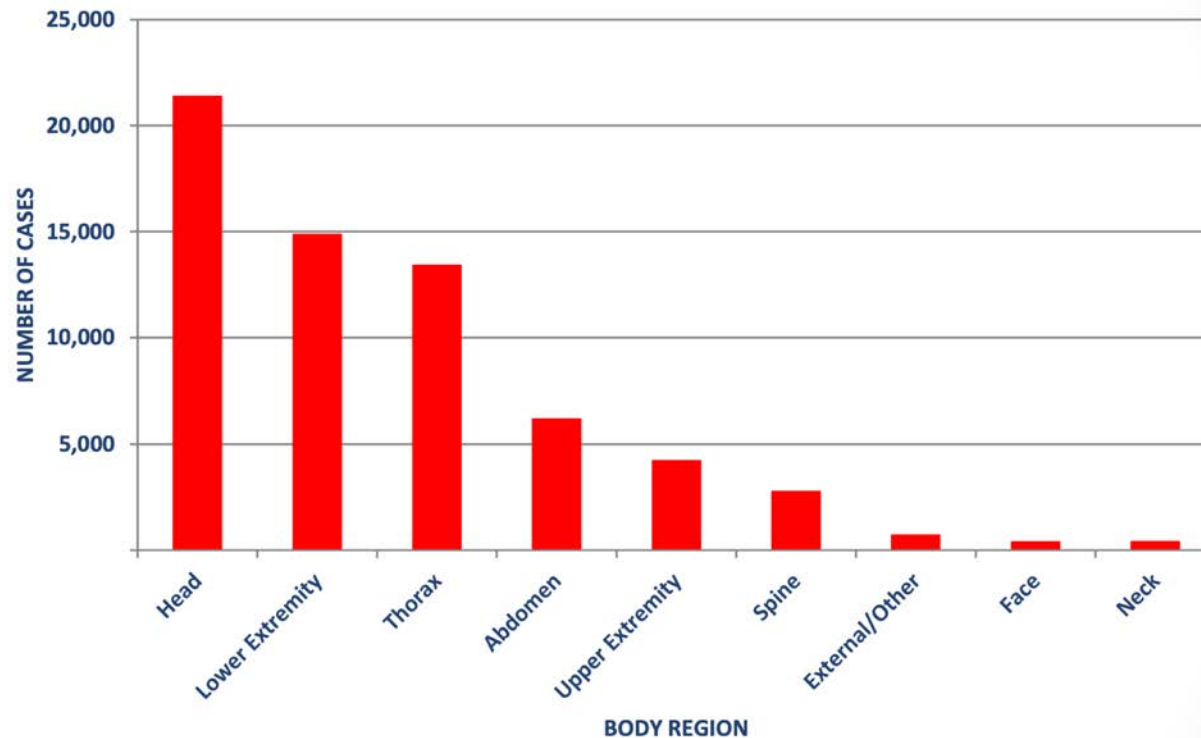


Fig 12B, Committee on Trauma, American College of Surgeons. NTDB Annual/Pediatric Report 2016. Chicago, IL. The content reproduced from the NTDB remains the full and exclusive copyrighted property of the American College of Surgeons. The American College of Surgeons is not responsible for any claims arising from works based on the original data, text, tables, or figures.

# BODY REGIONS OF DEATH

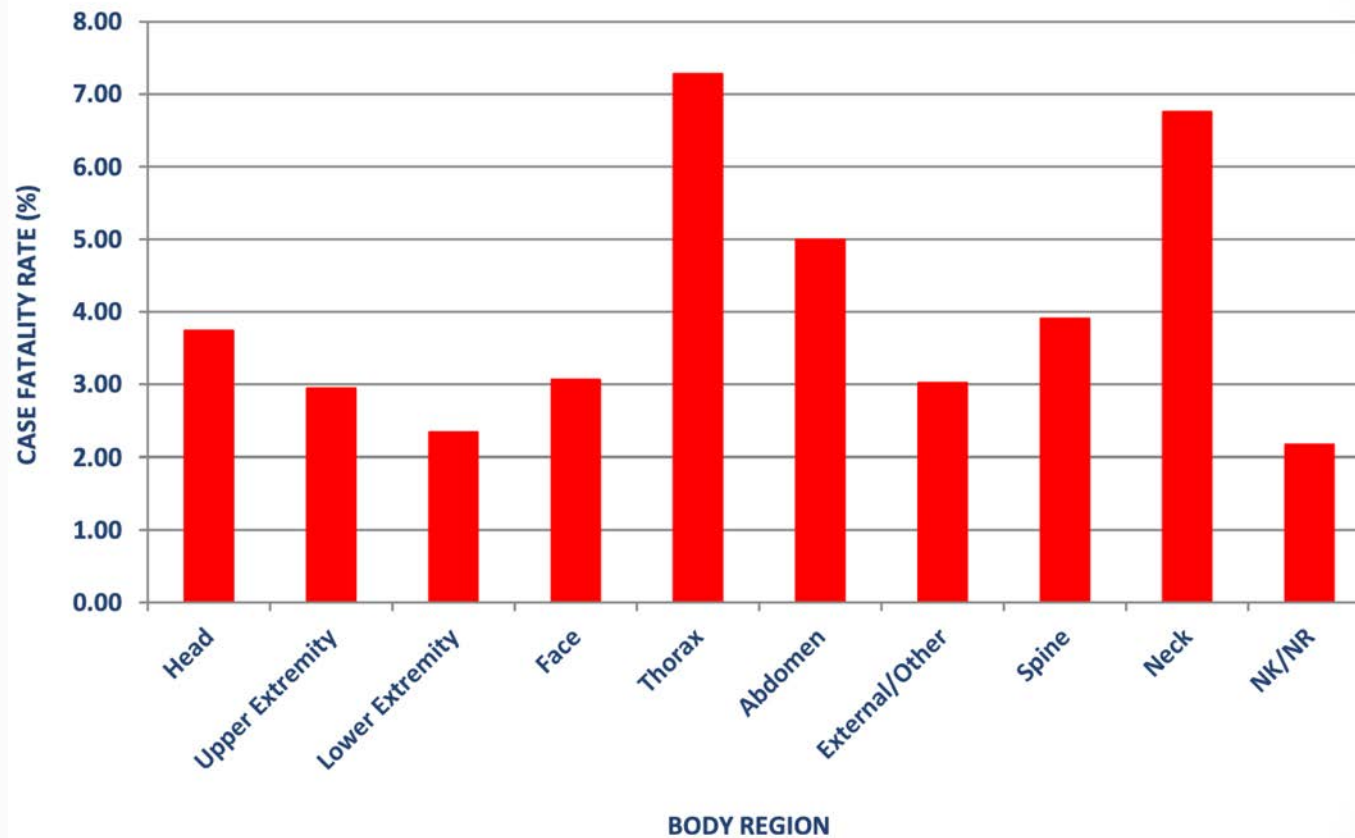


Fig 22A, Committee on Trauma, American College of Surgeons. NTDB Annual/Pediatric Report 2016. Chicago, IL. The content reproduced from the NTDB remains the full and exclusive copyrighted property of the American College of Surgeons. The American College of Surgeons is not responsible for any claims arising from works based on the original data, text, tables, or figures.

# HEAD AND NECK



- Kids <8 have big heads
- Head trauma common and leading cause of death
- SCIWORA – flexibility may lead to injury without fracture

# MINOR HEAD TRAUMA AND NORMAL NEURO EXAM



- >2 years old
  - 3-7% TBI on CT
  - 1% clinically important
  - 0.1- 0.6 require surgical intervention
- <2 years old
  - 3-10% TBI on CT
  - 1% clinically important
  - 0.2 required surgery

# CONCUSSION (MILD TBI)



Mechanical energy to the head from external physical forces with 1 or more of:

1. confusion or disorientation
2. loss of consciousness for 30 minutes or less
3. post-traumatic amnesia for less than 24 hours and/or other transient neurological abnormalities such as focal signs, symptoms, or seizure
4. Glasgow Coma Scale of 13-15 after 30 minutes post-injury or later upon presentation

Lumba-Brown A, Yeates KO, Sarmiento K, et al. Centers for Disease Control and Prevention Guideline on the Diagnosis and Management of Mild Traumatic Brain Injury Among Children. *JAMA Pediatr*.2018;172(11):e182853. doi:10.1001/jamapediatrics.2018.2853

# CHEST



## Blunt Injury

- Pulmonary contusions → 50%
  - Pneumo / hemothorax → 38%
  - Rib fracture → 35%
- 
- Low rib fractures may be a sign of abdominal injury

# ABDOMEN



- Blunt torso trauma → 5-10% have abdominal injury
- Up to 25% in children with multisystem injuries
- Liver and spleen most commonly injured

## Physical Exam:

- Peritoneal irritation present: 44 percent
- Abdominal distension present: 31 percent
- Any abdominal tenderness present: 13 percent
- Bowel sounds absent: 8 percent

# SEAT BELT SIGN



- Independent risk factor
- In one study, seat belt sign was 232 X more likely to have abdominal injury

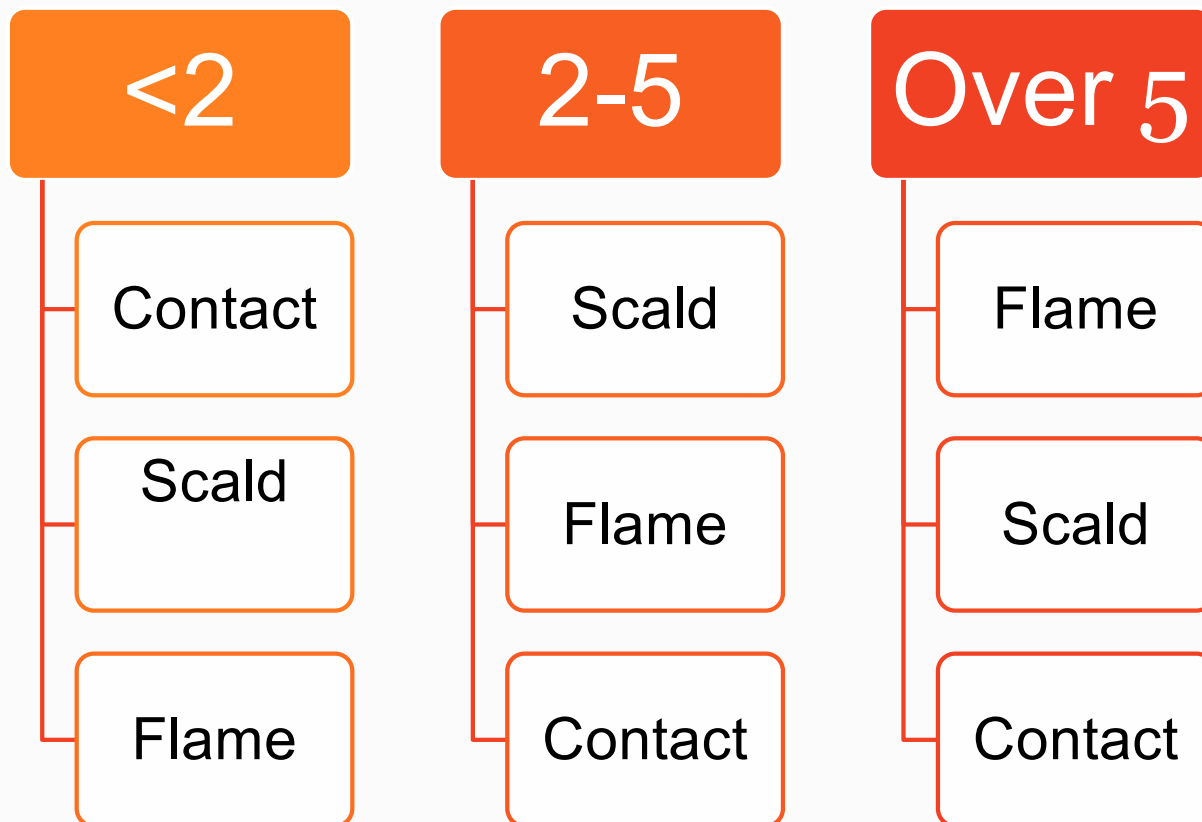


Lutz et al. J Pediatr Surg. 2004;39(6):972

# BURNS

- Occur mostly in the home (84%)
- Supervision plays a large role
- Injury type changes with time





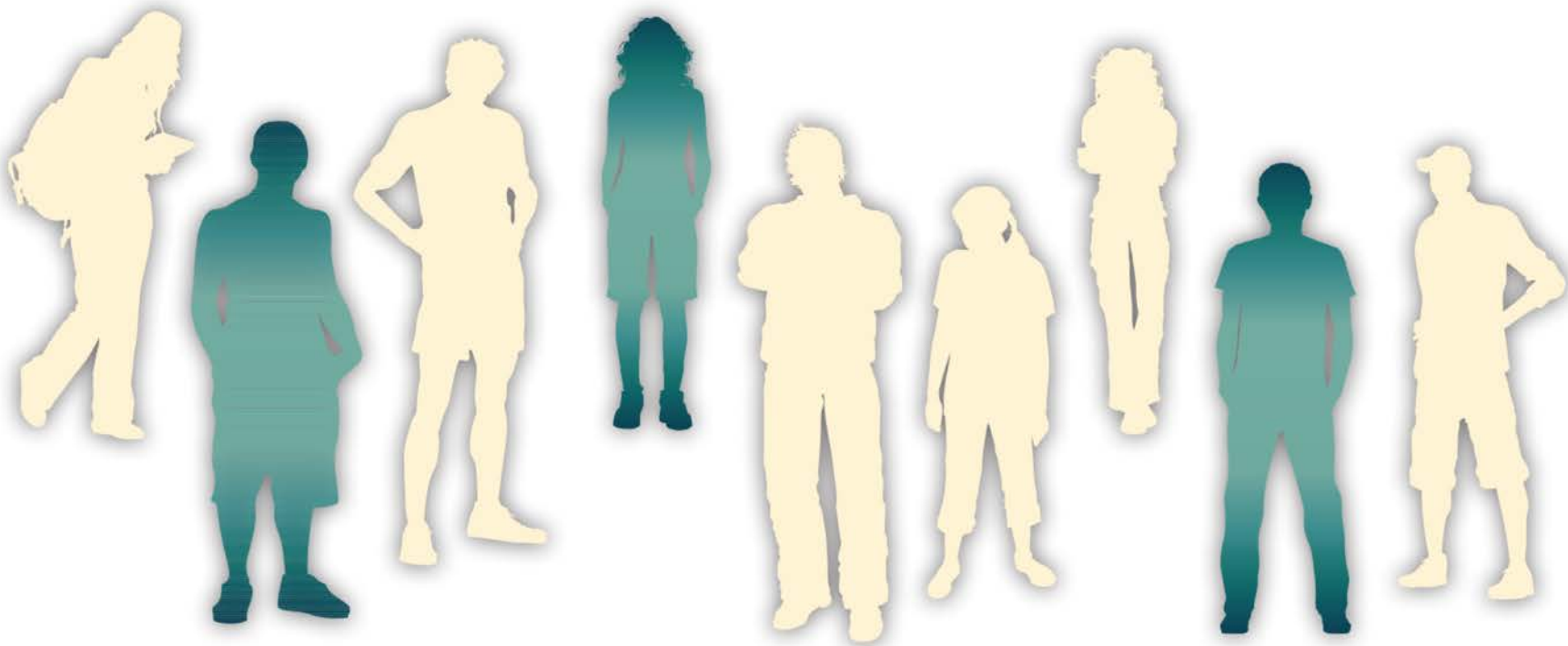
# RISK IS NOT EVENLY DISTRIBUTED



**Home**  
**Education**  
**Activities**  
**Drugs**  
**Suicide**  
**Sex**



Katzenellenbogen. HEADSS: The Review of Systems for Adolescents. JAMA Ethics. 2005 Mar; 7(3): 231-233.



**1 in 3 children starts drinking by the end of 8th grade  
... and of them, half report having been drunk.**

Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2011). Monitoring the Future national survey results on adolescent drug use: Overview of key findings, 2010. Ann Arbor: Institute for Social Research, The University of Michigan, 77 pp.

# PTSD



- 62 percent of youths experienced at least one traumatic event in their lifetime
- 19 percent have experienced three or more such events
- 8-15% develop PTSD
- Whatever happened to them is likely the scariest and most impactful event in their life so far

## Address this risk by:

- normalizing the experience and the feelings of fear, threat and avoidance that most will have
- minimizing the added trauma of the healthcare experience: control pain, provide information and choices, mobilize peer and family emotional support




# THANK YOU

mandells@uw.edu  
@spmandell



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