

The clinical challenge in evaluation of the injured child

Pål Aksel Næss

Dept. of Pediatric Surgery & Trauma Unit
Ullevål University Hospital
Oslo

PAN-2008

Background

- Although “uncommon”
- the leading cause of mortality & morbidity in children
- Emotionally complicated

PAN-2008

Epidemiology*

- Blunt trauma > 90% of pediatric injuries
- Almost exclusively nonintentional....
- Boys : Girls = 2 : 1
- MVA
- Death rate in-hospital 3.2%

PAN-2008

*NPTR

Epidemiology UUH 2002 – 2005*

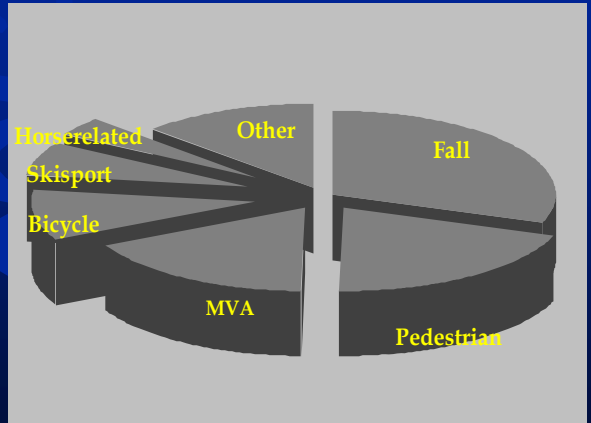
- 333 patients < 14 years
 - 210 (63%) boys, 123 (37%) girls
 - Age $7,0 \pm 3,9$ år
 - ISS $12,3 \pm 11,2$ ISS > 15 in 32%
 - Blunt trauma: 97%
 - Mortality: 9 (3 %)

PAN-2008

* Trauma Registry, UUH

Most common causes of pediatric trauma

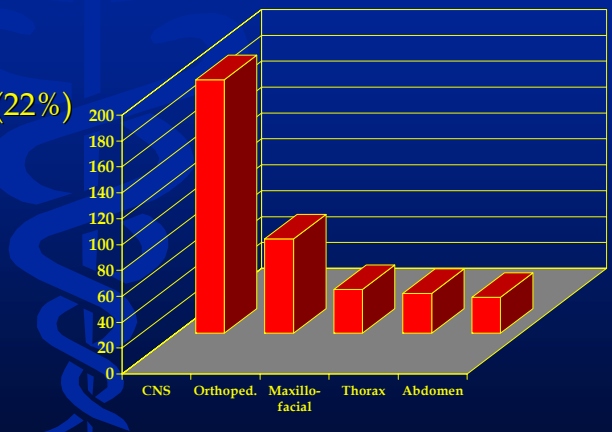
- Fall 102 (31%)
- Pedestrian 65 (19%)
- MVA 58 (17%)
- Bicycle 32 (10%)
- Ski 21 (6%)
- Horserelated 12 (3%)
- Other 43 (14%)



PAN-2008

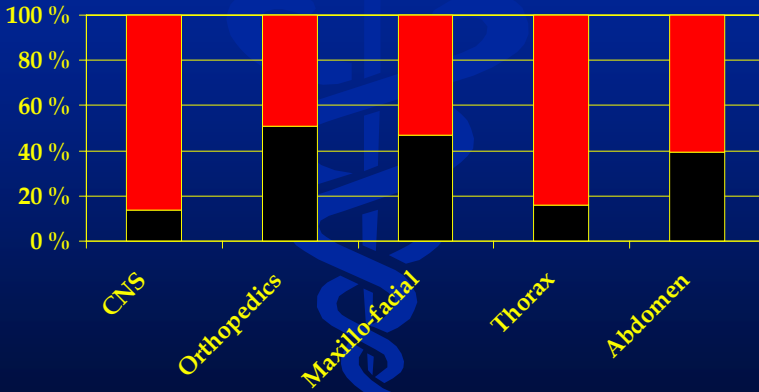
Distribution of injuries

- CNS 196 (59%)
- Orthopedic injuries 73 (22%)
- Maxillo-facial 34 (10%)
- Thorax 31 (9%)
- Abdomen 28 (8%)



PAN-2008

Operative treatment



PAN-2008

General differences compared to adults

- Size and shape
 - Less subcutaneous tissue
 - Energy transferred over a smaller area
 - Rib cage
- Proportions
 - Head
 - Internal organs
- Skeleton
 - Incomplete ossification
- Surface area
 - Hypothermia

PAN-2008

General differences continued

- Tranfusions
- Hemostasis
- Thrombosis
- Operations

PAN-2008

Initial assessment Make no further harm

A
B
C
D
E

PAN-2008

Adjuncts



- X-rays
 - Chest
 - Pelvic
 - ?
- Blood samples

PAN-2008

Now what?



- Observation?
- Transfer?
- Further diagnostics?
- Operation?

PAN-2008

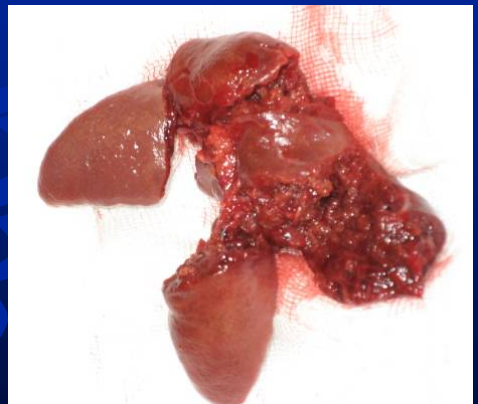
CT

- CT of the head and C-spine – low threshold
 - Pseudosubluxation
 - SCIWORA
- Contrast CT of the chest and abdomen
 - Gold standard

PAN-2008

Abdominal injuries

- The vast majority do not require operative intervention!
- The challenge however,.....



PAN-2008

Diagnostic approach

- What happened?
- Clinical findings
- Lab & Rad



PAN-2008

Spleen injuries

- > 95% of patients can be managed nonoperatively
- < 5 % of patients require blood transfusion



PAN-2008

Liver injuries

- 90% of patients can be treated nonoperatively
- 10% of patients require blood transfusions
- Liver enzymes



PAN-2008

Pancreatic injuries

- Rare, diagnosis difficult
- Contusions treated nonoperatively
- Transections treated operatively



PAN-2008

GI- injuries

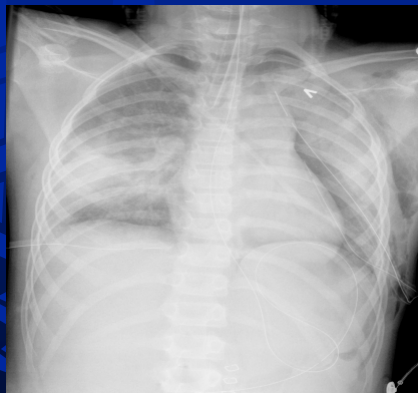
- Specific injury patterns
 - Seat belt syndrome
- Delayed diagnosis



PAN-2008

Chest injuries

- Pulmonary contusion
- Pneumothorax
- Hemothorax
- Rib fractures



PAN-2008

Genitourinary tract injuries

- Renal injuries
 - > 95% best treated nonoperatively
- Bladder
- Hematuria



PAN-2008

Musculoskeletal injury

- Complications
 - Early ischemia
 - Growth disturbances
 - Vascular necrosis

PAN-2008

Burns

- > 60% < 4 years
- Scald burns most common
- Abuse?



PAN-2008

?

PAN-2008

???????



PAN-2008