

Assessment of the trauma patient using mechanism of injury

Rhondda Paice
Trauma Co-ordinator
Trauma Service, Auckland Hospital



- Categories of trauma
- Injury related data from Auckland Hospital
- Common mechanisms of injury
- How not to miss an injury

The Injury

Is the pivotal event - result of the interaction between an individual, an activity and the environment that produces the injury.

The nature of the injury determines the outcome for the person and for society.



Mechanism of injury

The forces and the energy dissipated
to cause an injury

- thermal in the case of burns
or kinetic in the case of RTC & falls

Kinetic energy

Kinetic energy is the energy of motion
Function of an object's mass and velocity

As speed increases there is an even larger
increase in kinetic energy

Energy is classified as blunt or penetrating
forces

Blunt injury

Transmission of energy rather than the object which causes damage to the body



3 Types of Compressive Force are Involved

For example in RTC

- 1 car collides with an object
- 2 occupant collides with the inside of the car
- 3 internal organs / tissue of the occupant collide causing rupture/ shearing/ bruising



Penetrating injury

The object causes the damage as it passes through the body or tissue - may also be passed on to surrounding tissue if the energy or force of the object is significant



Assessment of the Trauma Patient

- Knowledge of anatomy and physiology essential
- Focus on what injuries can be predicted
- **Age ,circumstances and environment may suggest probability of other injuries**
- Co-morbidities - management of patients with pre existing medical conditions can be complex and demanding



Need more explanation??

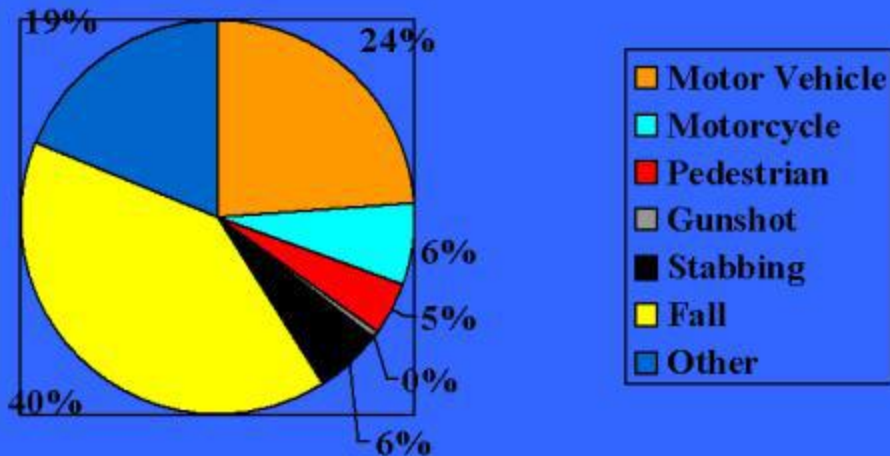
- Read the ambulance run sheet
- Quiz the ambulance officer about the mechanism and the environment - if possible
- Enact the mechanism that is reported
- Ask the patient to give their version of what happened - if possible



Trauma Admissions to Auckland Hospital January 1995 - December 2001

- Blunt 9214 (92%)
- Penetrating 799 (8%)
- Burns 2
- Other 3

Cause of Injury



Injury Severity Score

0 - 8	59%
9 - 12	20%
13 - 15	4%
16 - 24	9%
25 - 40	6%
41 - 75	2%

Commonly missed injuries include

- # or sprains of extremities - upper & lower
- Lacerations to scalp or mouth/ tongue
- # vertebrae - L1 and L2
- # teeth



MECHANISMS OF INJURY

Penetrating Injuries - Gunshots

- Kinetic energy of missile depends more on the velocity rather than the mass.
- Length of barrel is important
- Type of missile used is important
- Check for an entry and an exit wound

Penetrating Injuries - Stabbing

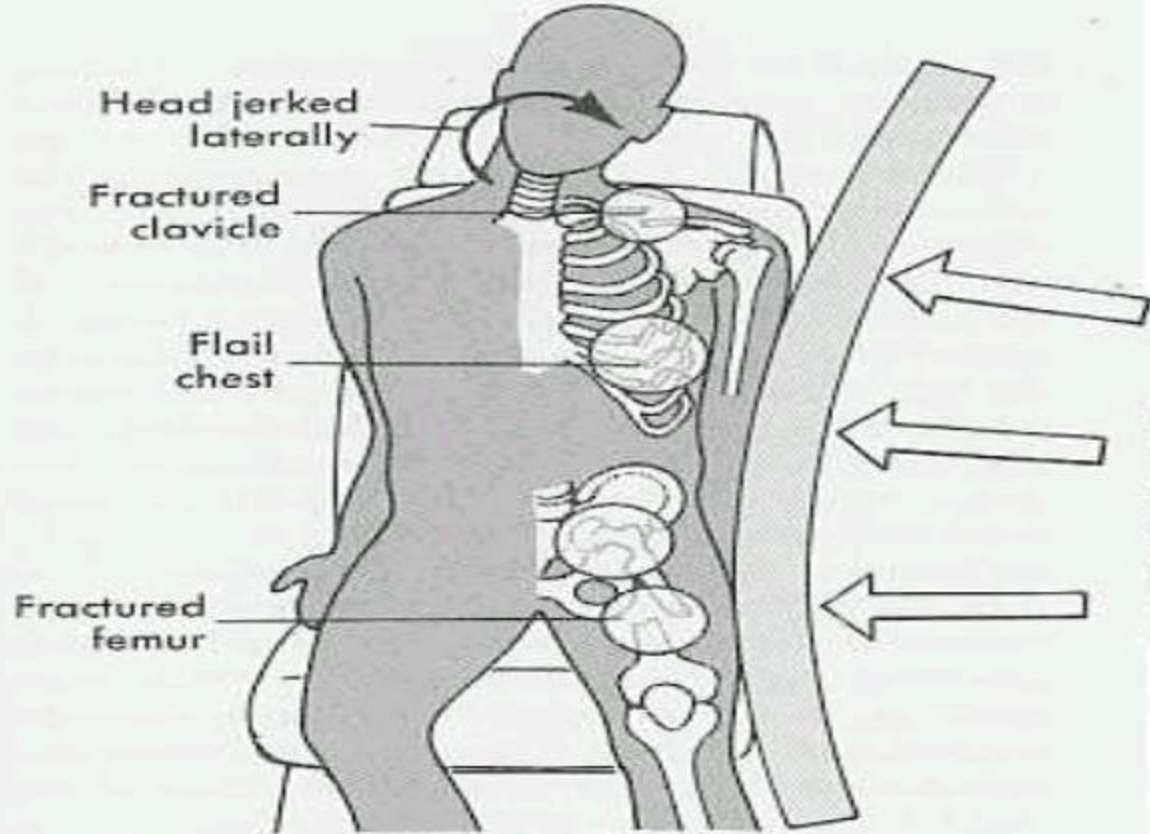
- Check all entry sites and acknowledge the anatomy that lies beneath them
- Find out about the type of and length of the weapon that caused the injury
- What physical position was the person in when they were attacked

Assaults

- Same principles as stabbings
 - acknowledge the anatomy that lies beneath damaged soft tissue
- Find out how the weapon used in the assault
 - fists, 4x2, baseball bat, boots - how many people



92 % of injuries admitted to Auckland Hospital
were as a result of blunt injury
- 35% as a result of RTC





Predictable injuries with restrained driver

- # clavicle
- # sternum
- Cardiac injuries
- Diaphragmatic rupture
- Bruising /laceration liver ,spleen, pancreas
- Pelvic # and injuries
- Bruising of lower abdomen, breast , shoulder

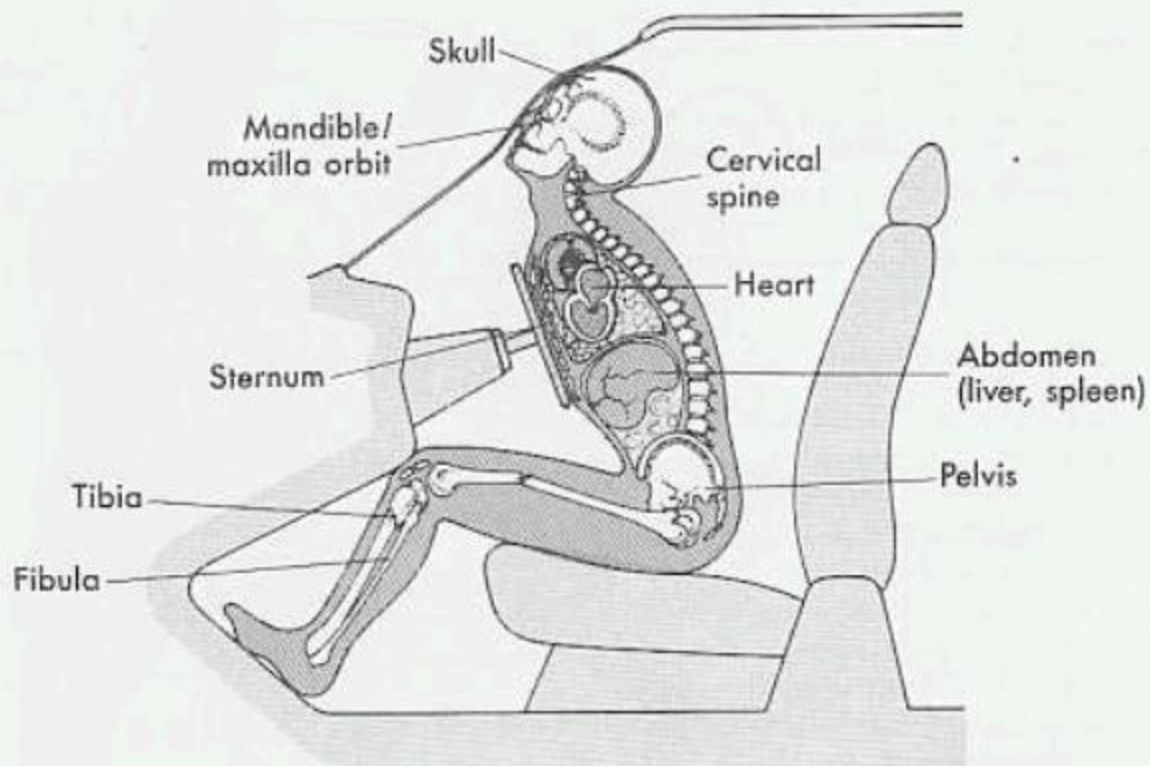


Figure 7-1 Potential injury sites of unrestrained driver.

Predictable injuries in unrestrained driver

- Head injuries
- Facial injuries
- # larynx
- # clavicle
- #Sternum
- Cardiac contusion
- Lacerated liver or spleen
- Lacerated greater vessels
- # patella and femur

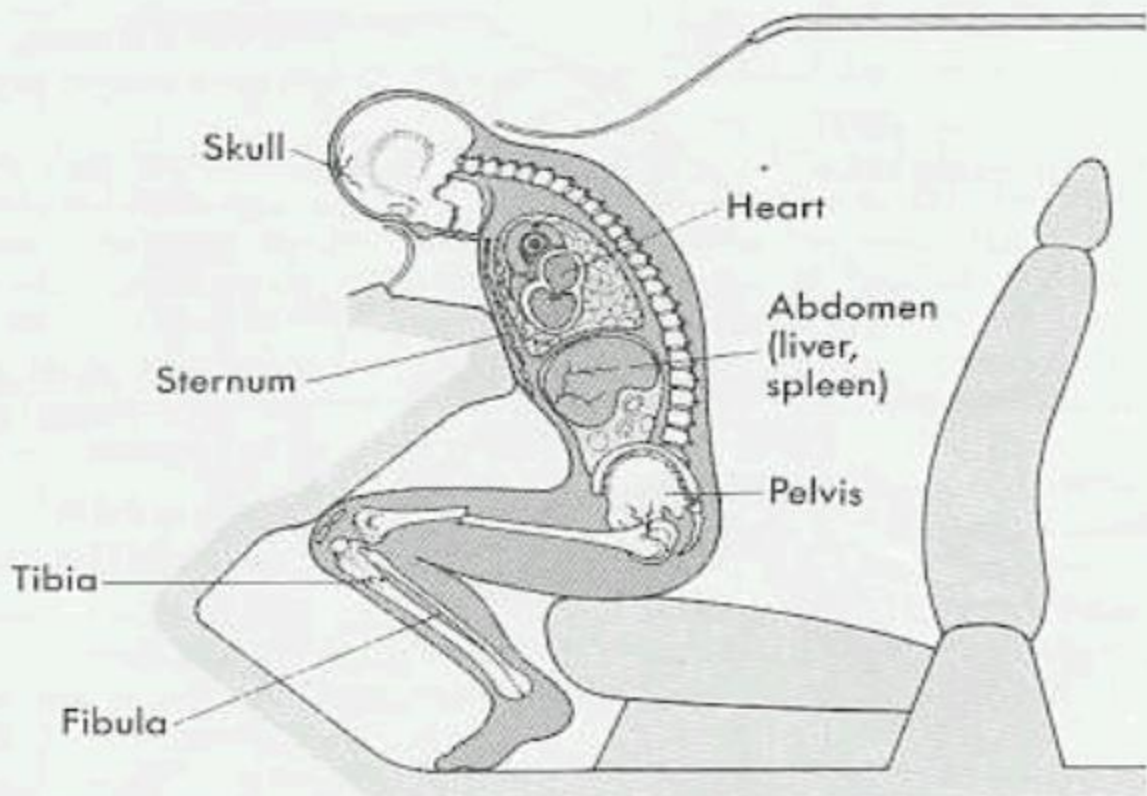


Figure 7-2 Potential injury sites of unrestrained passenger in front seat.

Pedestrian Injuries

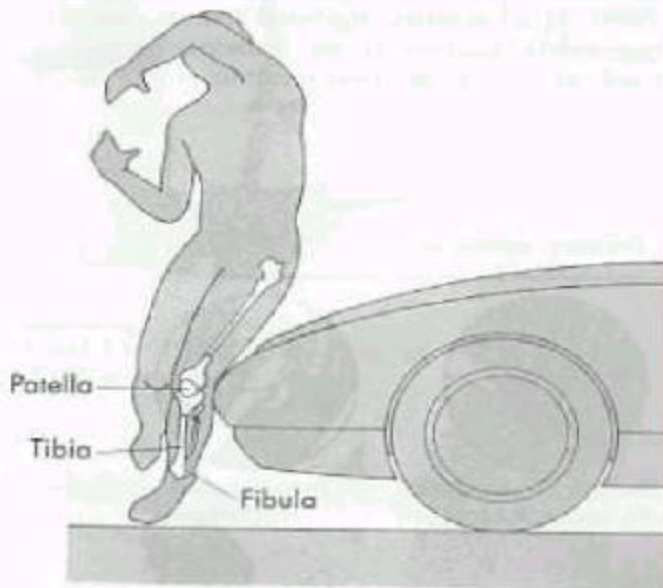


Figure 7-10 Potential primary injury sites of adult pedestrian.

Falls

40% of injuries admitted to Auckland Hospital occur as the result of a fall.



Fall of 3metres or more is a mandatory
Trauma Call at Auckland Hospital



Trauma in Pregnancy



Figure 7-6 Proper positioning of lap-shoulder belt during pregnancy.

Common injury patterns in pregnant woman

- Severity of injury parallels severity of damage to car
- Intra-peritoneal haemorrhage and hypovolaemic shock
- Likelihood of foetal death is proportional to severity of maternal injury
- Pelvic fractures are associated with high incidence of placental separation and foetal injury



Figure 7-7 Potential movement of child restrained with adult lap belt during motor vehicle crash.

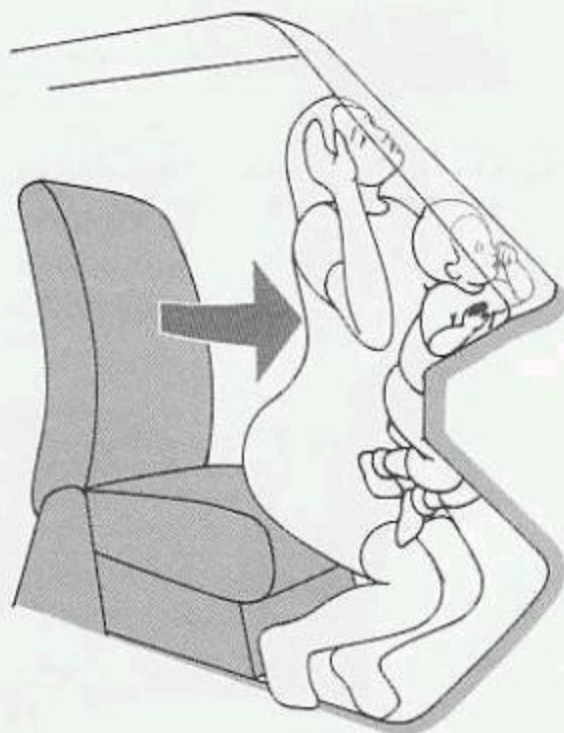
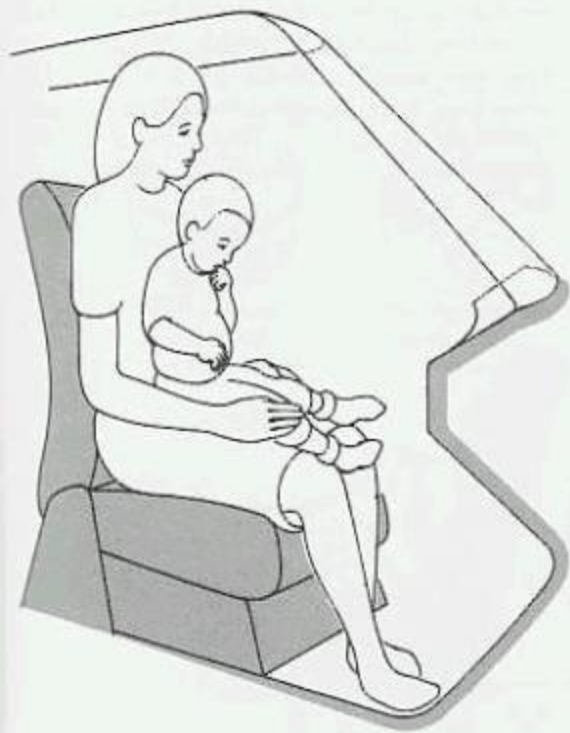


Figure 7-5 Potential injury sites of child held by adult.

Trauma in the Elderly

No elderly trauma patient should be considered “just trauma”.



Goals of assessment for the older person are:

To discover or rule out injury
or a medical cause of symptoms

Identify the degree of clinical compromise
that may be masked by physiologic changes
associated with ageing.

Trauma in the Elderly

- Trauma screening and scoring methods may be unreliable
- Medical conditions should be accounted for during the assessment
- Usual hearing, visual and mobility abilities should be acknowledged

Summary

- Use knowledge of anatomy & physiology to understand the mechanism of injury
- Investigate any symptoms that the patient reports at the time following the initial assessment
- Assess, report, and investigate any symptoms that the patient complains of while in hospital

Remember ...

A # arm caused by a fall is vastly different from a # arm caused by a motor bike versus car.

And

Bruce Willis uses stunt doubles
and the fight sequences are actually dance routines.

**H P ESTERHUYSE
KRAAIRIVIER**

**DANGER AHEAD
FASTEN SAFETY BELTS
AND REMOVE DENTURES**

**GEVAAR VOOR
MAAK GORDELS VAS
EN VERWYDER KUNSTANDE**