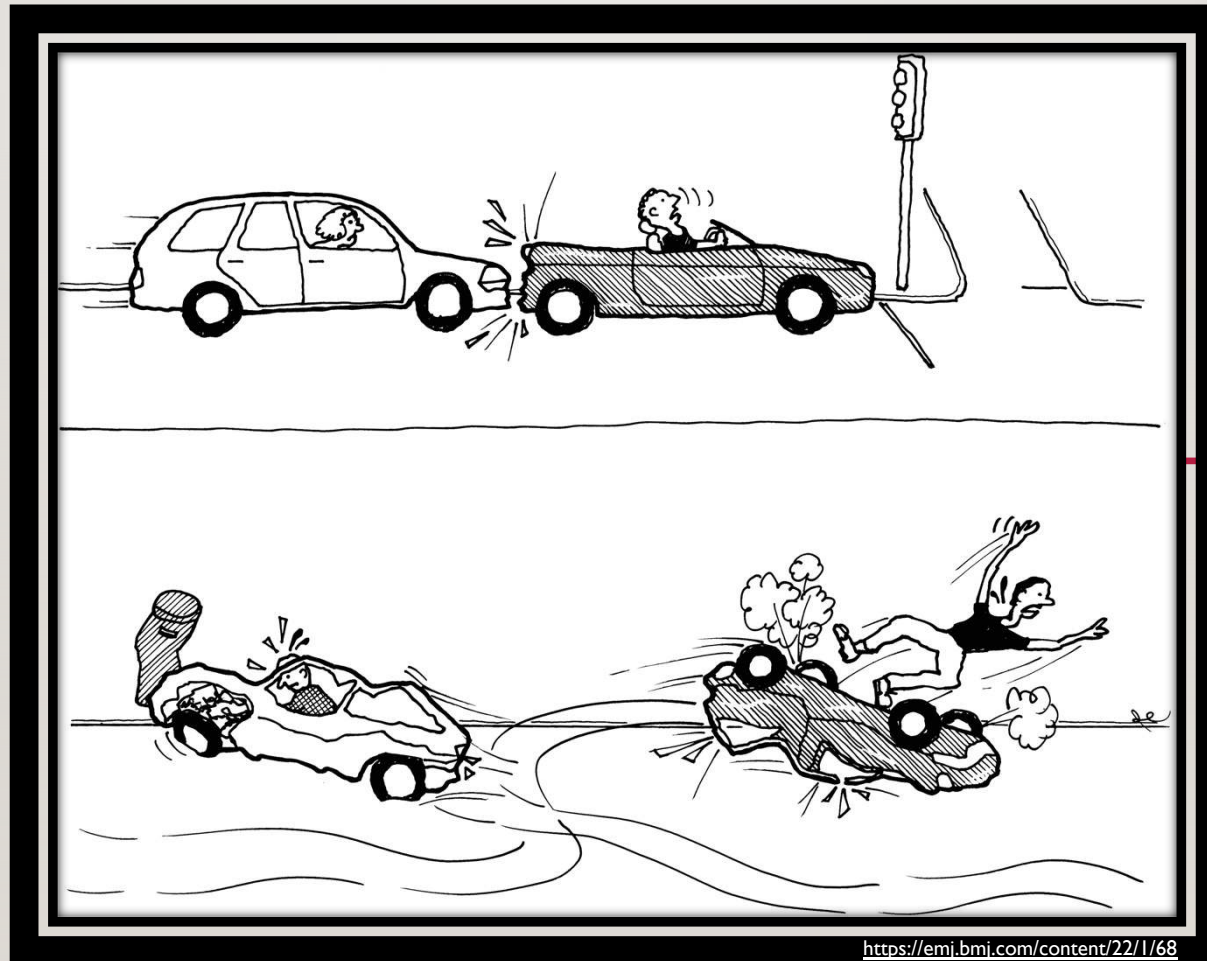


Mechanism of Injury (MoI)



Mechanism of Injury (MoI)

The Biomechanics of Trauma:

THE CAUSATIVE AGENT IN TRAUMA IS ENERGY

Biomechanics plays an important role in mechanism of injury, especially in motor vehicle accidents.



<https://www.askadamskutner.com/motorcycle-accident/how-do-car-accidents-compare-to-motorcycle-accidents/>

Details of the event can provide clues to identifying 90% of the patient's injuries.



Mechanism of Injury (MoI)

Mechanism of injury can be classified as blunt, penetrating, thermal or blast.

Understanding injury potential involves analysing the following:

- 1) The nature and amount of force**
- 2) Patient characteristics**
- 3) Characteristics of wounding agent**
- 4) Tissue characteristics**



Mechanism of Injury (MoI)



https://www.123rf.com/photo_34302098_stock-vector-illustration-of-a-car-accident.html

It is not the speed that kills but the actual
STOP!

The greater the deceleration distance the greater the opportunity for the force to be dissipated away from the patient.



<https://www.dnaindia.com/mumbai/report-two-killed-in-separate-road-accidents-in-mumbai-2570312>



Mechanism of Injury (MoI)

As health care providers to trauma patients, the majority of injuries encountered are a result of mechanical or gravitational forces.

Types of energy in order of frequency:

Mechanical

Gravitational



<http://www.uppermountainfire.com/open-house-2013-kitchen-fire-prevention/>

Thermal

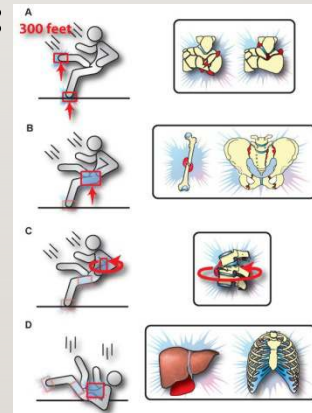


<https://consumervoiceblog.wordpress.com/2012/09/03/simple-tips-for-electrical-safety-around-the-home/>

Chemical

Electrical

Radiant

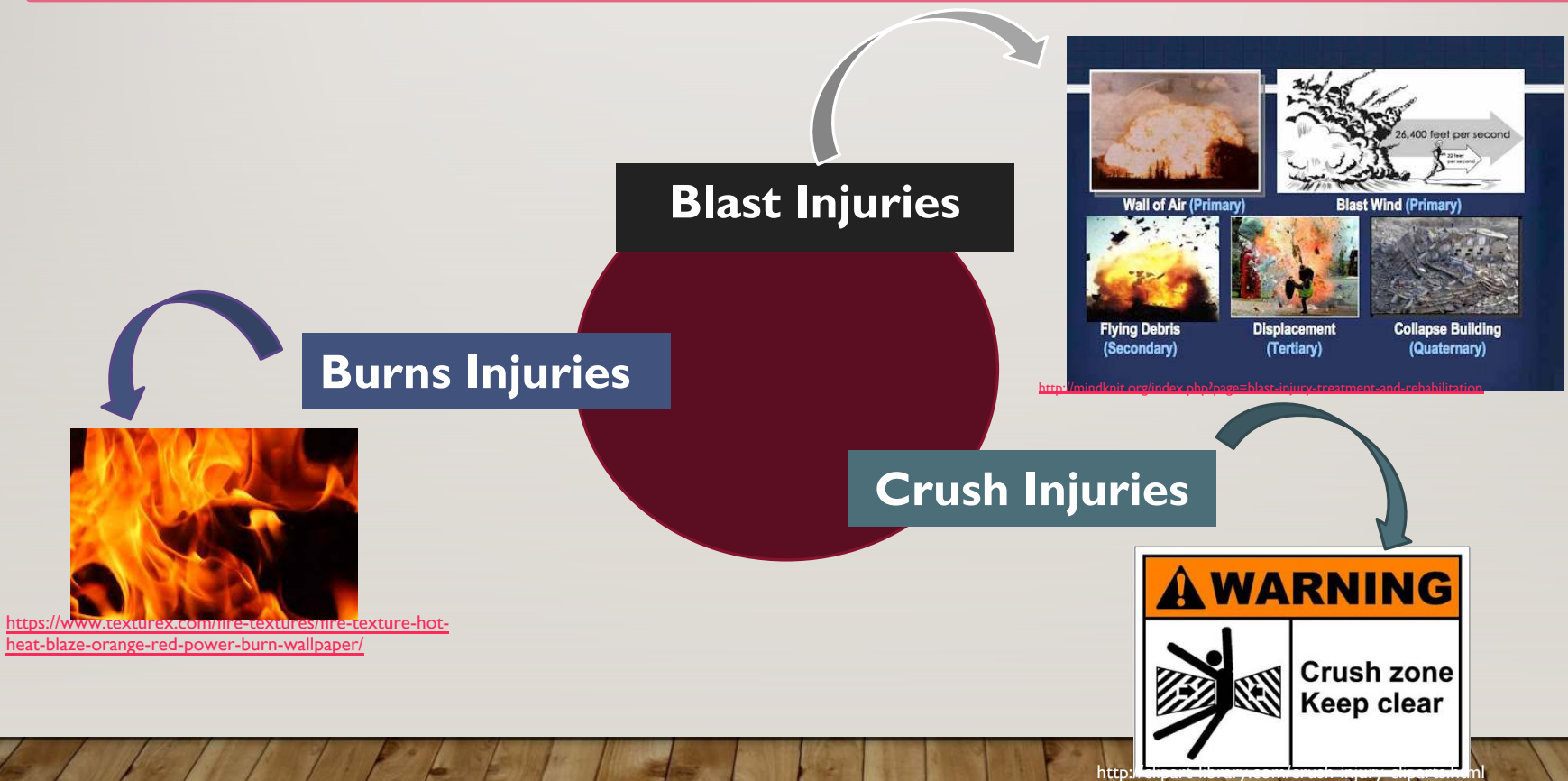


https://www.researchgate.net/figure/Presumed-trauma-mechanism-resulting-from-a-300-feet-vertical-fall-in-the-present-case_fig9_51745140

BURNS

Mechanism of Injury (MoI)

Injury mechanism is described as the means by which the energy is transferred to the tissues



Mechanism of Injury (MoI)

BLUNT TRAUMA:

- Road Traffic Collisions
- Falls and jumps
- Auto-pedestrians
- Blows (struck by or against an object)

In a Road Traffic Collision where does the force go?

The vehicle:



Bonnet

Body Frame

Bumper



Mechanism of Injury (MoI)

The Occupants:

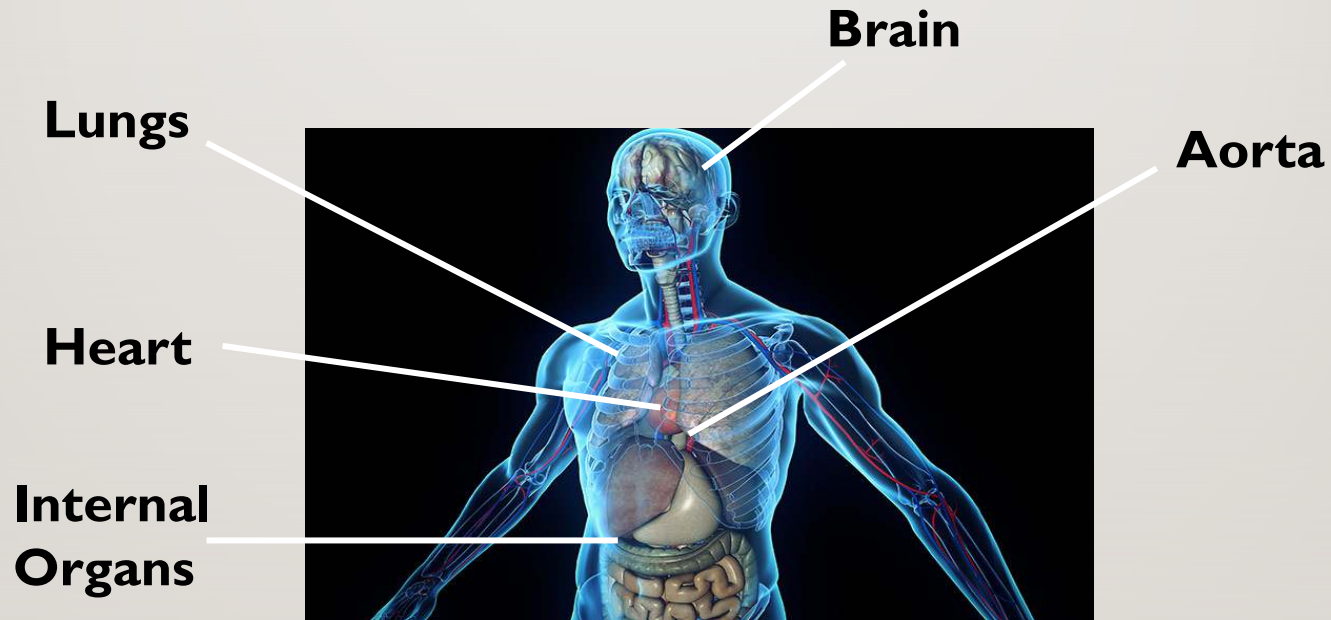


<http://www.stuff.co.nz/motoring/7554281/Why-it-was-always-male-crash-test-dummies>



Mechanism of Injury (MoI)

Internal organs:



<https://www.1800lionlaw.com/common-internal-injuries-caused-in-car-accidents/>

Secondary impacts:

- **Flying objects**
- **Unrestrained passengers**



Mechanism of Injury (MoI)

Fall from height

- ✓ Head injury
- ✓ Axial spine injury
- ✓ Abdominal visceral injuries
- ✓ Fractured pelvis or acetabulum
- ✓ Bilateral lower limb fractures, including calcaneal fractures



https://www.researchgate.net/figure/Extensive-head-injury-sustained-due-to-a-fall-from-height-Subarachnoid-bleed-multiple_fig3_43352708



https://en.wikipedia.org/wiki/Calcaneal_fracture



<https://www.cambridge.org/core/books/emergency-radiology-coffee-case-book/axial-skeleton-trauma/37EAF6102822849997D06B1B6BDDC2B1>



Mechanism of Injury (MoI)

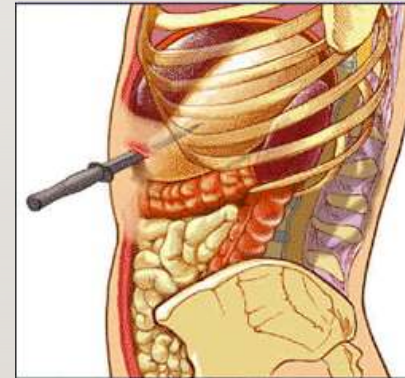
Penetrating Trauma:

Firearm injuries



<https://phys.org/news/2020-03-algorithm-crime-scene-bullets-segment.html>

Stab/slash injuries



Impalement injuries



<https://abc13.com/spear-idaho-man-impaled-by-freak-accident/739350/>



Mechanism of Injury (MoI)

Tissue characteristics:

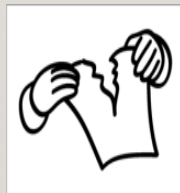
Solid structures



Hollow structures



Fixed points



TEAR



Mechanism of Injury (MoI)

Thermal Injuries

Thermal burns



<https://www.superiorglove.com/blog/guide-to-burns-degrees-treatment-and-prevention>

Electrical burns



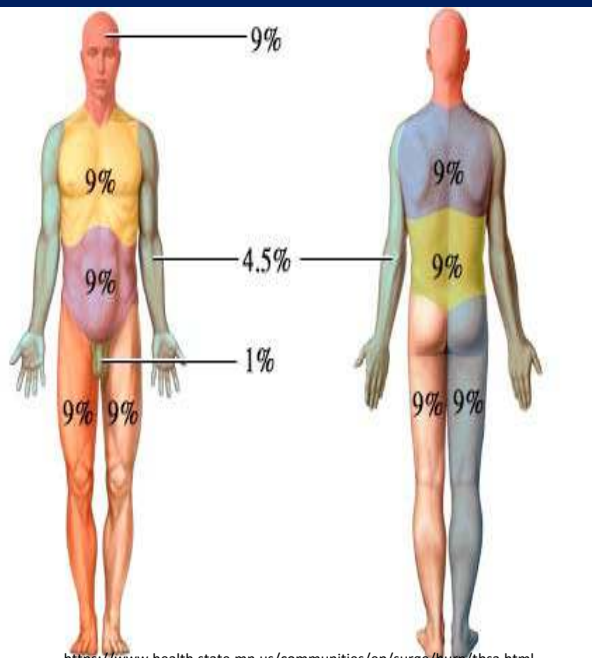
<https://www.whlaw.com/blog/electrical-burn-injuries>

Inhalation burns



<https://www.rockwool.com/learning/advice/smoke-kills-more-people-than-fire/>

The treatment of a major burn requires an ABCDE assessment and a full primary survey. Body surface area of the burn is done by using the Rule of Nines



<https://www.health.state.mn.us/communities/ep/surge/burn/tbsa.html>

The body is divided into anatomical regions and assigns 9% or a multiple of 9% of the body surface area to each region

Mechanism of Injury (MoI)

References

- ATLS Student 10th Edition Manual.pdf
- TCAR Trauma Care After Resuscitation Course Syllabus (UK Edition), 2019