

Medicolegal aspect of Road Traffic accidents

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Objectives

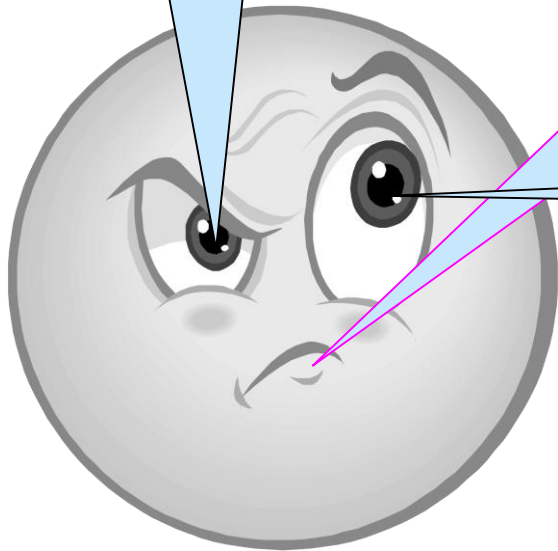
- 1- What are the road traffic accidents ?
- 2- Pattern injuries to Pedestrians
- 3- Factors affecting pedestrian injuries



Pedestrian

**Occupants of vehicle
(driver and passenger)**

Cyclist / motorcyclist



The road traffic accidents

Pattern injuries to Pedestrians

1- Primary impact Injuries

First impact of the victim by the vehicle

2- Secondary impact Injuries

Subsequent impact of victim by the same vehicle.

3- Secondary or Tertiary Injuries

The victim was struck by another vehicle or other objects such as pole, tree or the ground

4- Run-over Injuries

vehicle runs over some part of victim



Bumper
impact



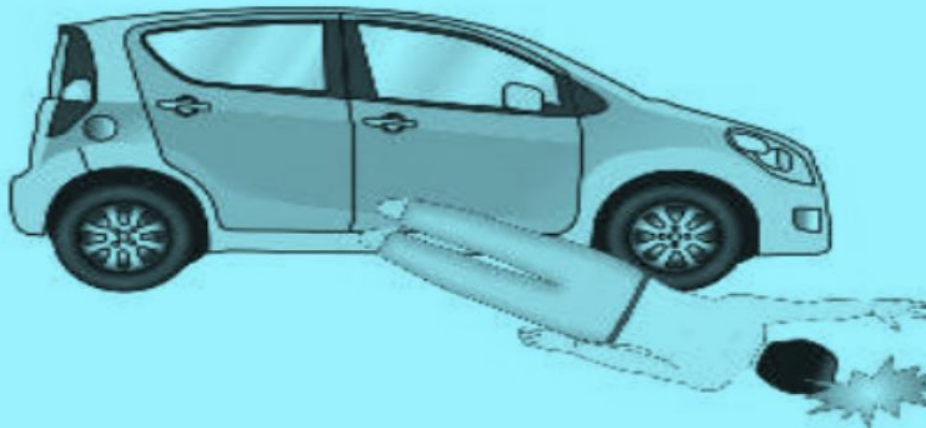
Primary
impact
injury



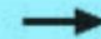
Hood and
Windscreen
impact



Secondary
impact
injuries



Ground
impact



Secondary
injuries

Factors affecting pedestrian injuries

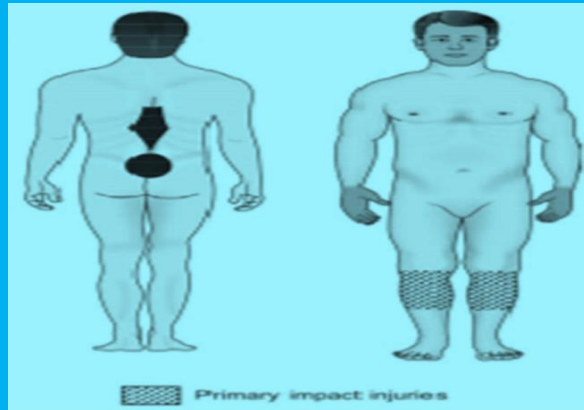
The body part that suffers from the injury depends on the position of pedestrian and Vehicle:-

- 1. Pedestrian is standing, walking or lying on the road.**
- 2. Pedestrian is struck by the front or side of the vehicle.**
- 3. Vehicle is braking violently at the movement of impact or not.**

because the front end of the vehicle dips down and the legs will get injured at a lower level.

Primary Impact injury

- Site of injury determines position and height of pedestrian and kind of vehicle involved in the Incident.
- It causes bumper fracture in tibia & fibula of one or both legs.



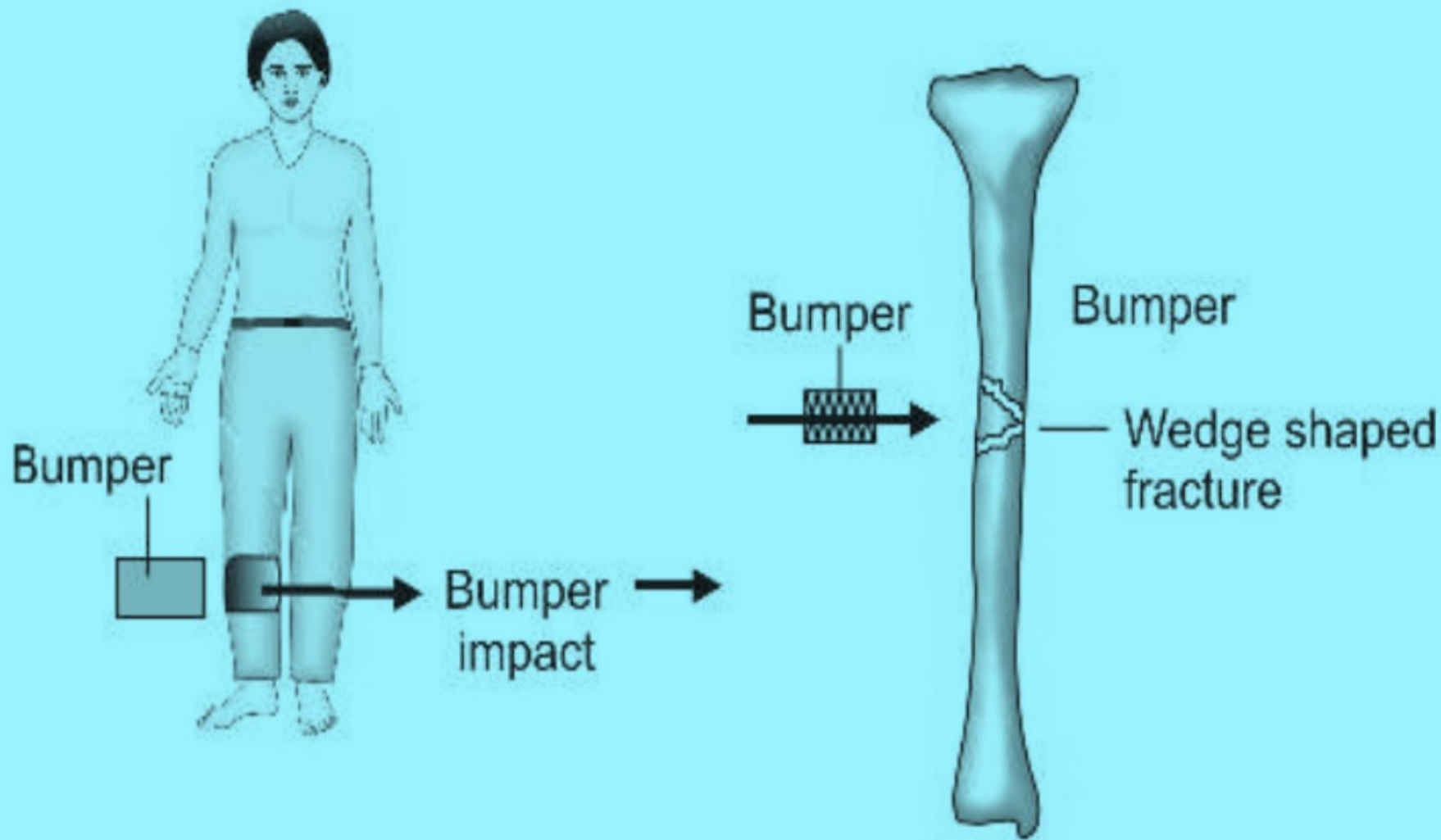
- The body of victim may bear pattern of the part of vehicle in form of imprint abrasion.
- Impact with headlamp or mudguard cause fracture of pelvis or sacroiliac joint dislocation.

Types of Primary Impact injuries

- Person was struck from behind (legs) and foot fixed → back and buttocks come in contact with vehicle → fracture - dislocation of lumbar and thoracic spine.
- If the feet side forward → the body fall backward → head impact with windshield or he is thrown into the air or to one side to strike ground.
- Facing → intra-abdominal and intra thoracic injuries or head injuries.
- Door handles → tearing wounds
- Side of vehicle → Fracture rib, rupture lung, liver and spleen.

Bumper Fracture

- Bumper fracture involves tibia and produces femur fracture in children
- It is wedge shaped, base of triangular fragment indicating the site of impact and apex pointing the direction of vehicle.
- Bumper injuries are at different level of the two legs or absent on one leg, it means the victim was walking or running when struck.
- If bumper injuries are at the same level on both legs, it means the person is standing.
- Level of bumper injury (height of injury from the ground) varies with height of bumper of different vehicle, so the offending vehicle can be identified.



Secondary impact injuries

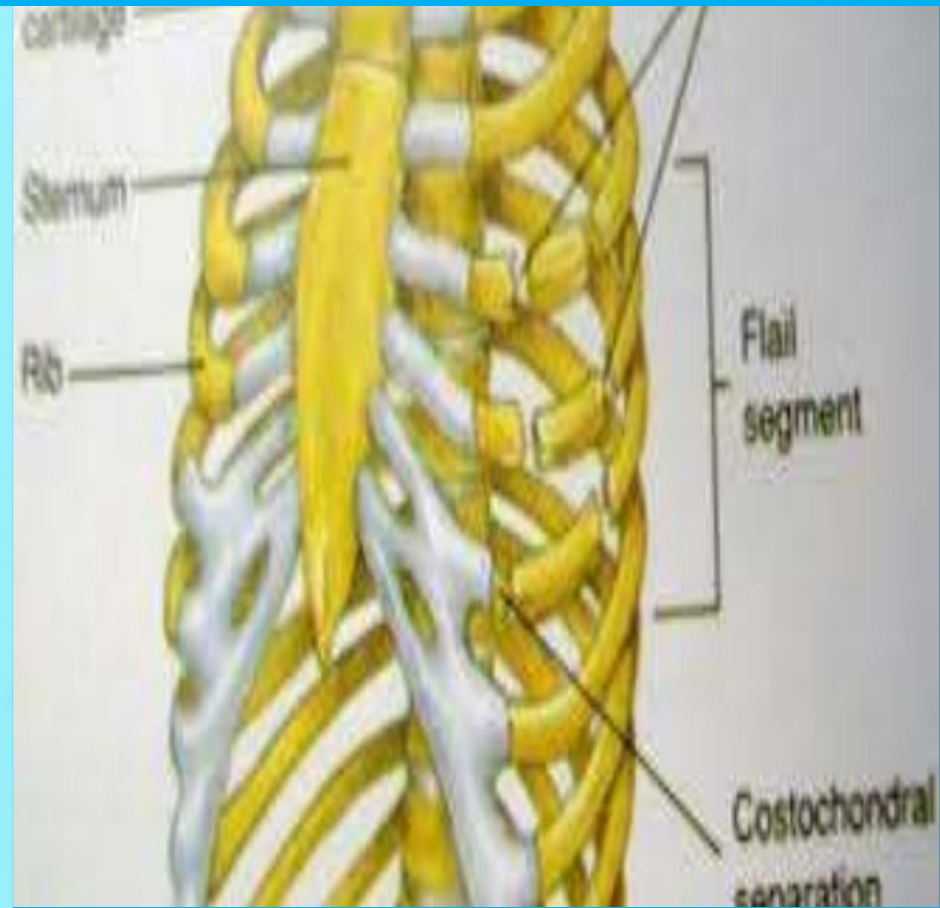
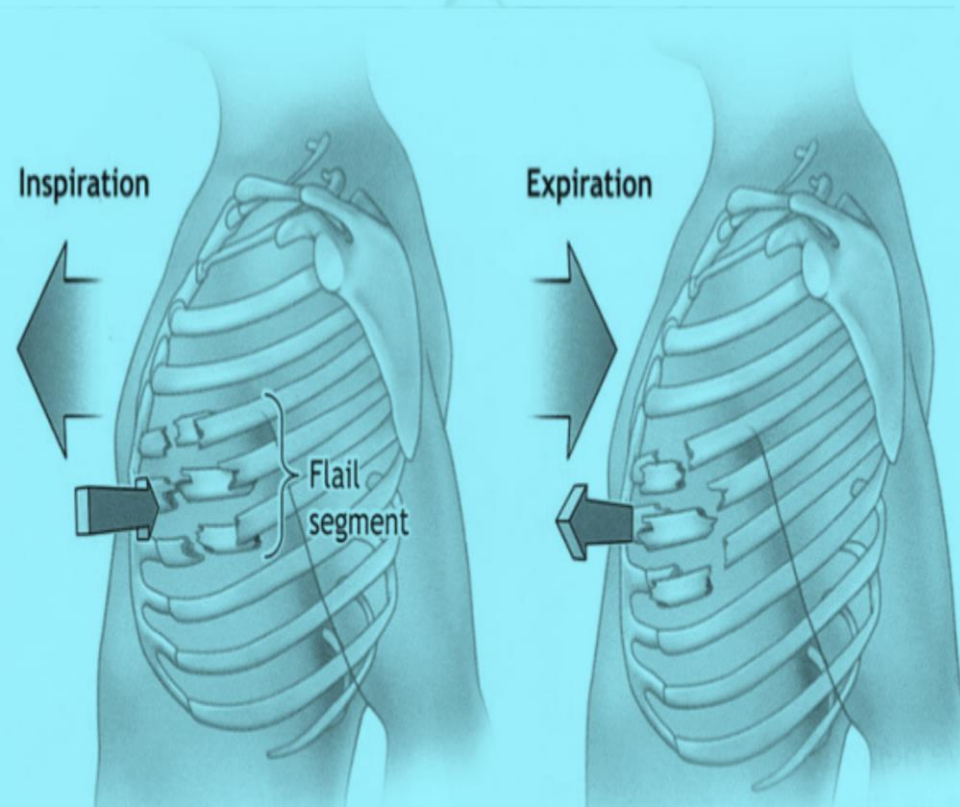
- It is due to the impact of victim with the vehicle for a second time.
- Victim strikes to windshield or bonnet or placed on the top of car.
- It is found on the opposite side to primary impact over the unclothed areas of the body.
- Extensive abrasions, bruises and lacerations .
- Burning, singeing of skin and hair by hot exhaust discharge.



Flail Chest

Chest compression causes multiple rib fractures and a “flail chest” with rupture of internal organs along with the fracture of spine, sternum and ribs.

Flail Chest:-



Run-over Injuries

- Vehicle runs over pedestrian if his gravity center is lower than the impact side.
- Severity of injury (variability) depends on the part of body run over and weight of the vehicle
- Tyre marks, abrasions, lacerations, skin burn, rupture of internal organs and avulsion.
- Tyre marks are over the unclothed or clothed areas of body with graze like abrasions on the opposite side of body.
- Gross distortion and externalization of the brain may occur due to the crushed head.
- Severe chest, pelvis and abdomen injuries may occur .

Secondary Injuries

- It is after second impact injuries where victim is lifted off the ground and thrown off the vehicle on the ground.
- Brain injury may occur without skull fractures.
- Skull and ribs fracture may occur
- Spine fracture is due to hyperflexion or extension .
- Limbs fracture are common but apart from toes of the legs.
- Victim may be run over by the same vehicle or another vehicle.
- It is very difficult to identify the injuries as primary or secondary impact or secondary injuries.
- Common cause of death is head injuries and fracture dislocation of cervical spine in pedestrian accidents.
- Injuries to the chest and abdomen are minimal.

Determine

- 1- Cause of accident (criminal)
- 2- Cause of death
- 3- Accident reconstruction

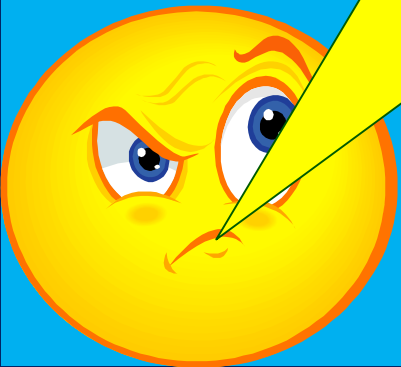
Identify

- 1- Victim
- 2- injuries
- 3- Scene of accident



Role of Forensic Expert

How to investigate the road traffic accident by forensic expert



Scene

**Road marks, Blood
(size and direction) and
Broken car parts**

Vehicle

**Speed, Direction
and Type & Extent
of damage**

Investigation of traffic accident

Victim

**Position, Distance
Clothes and Body
injuries, Drag mark**

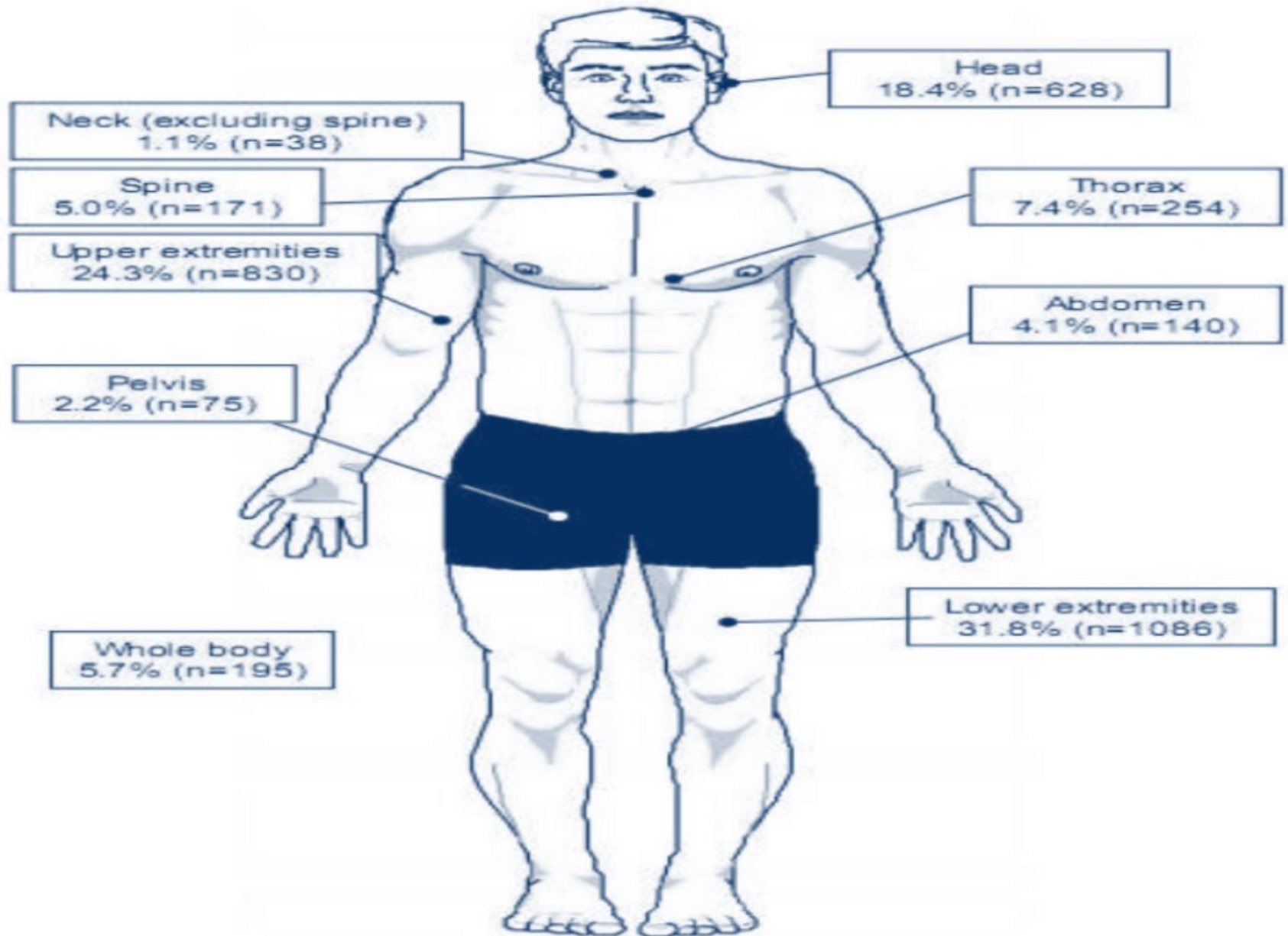
Cause of death

**Traumatic injuries
Trauma and natural
disease**

Cause of accident

**Natural disease, Drug and alcohol,
Suicide & Psychic factors and
Highway cause**

Risk areas



Thank you