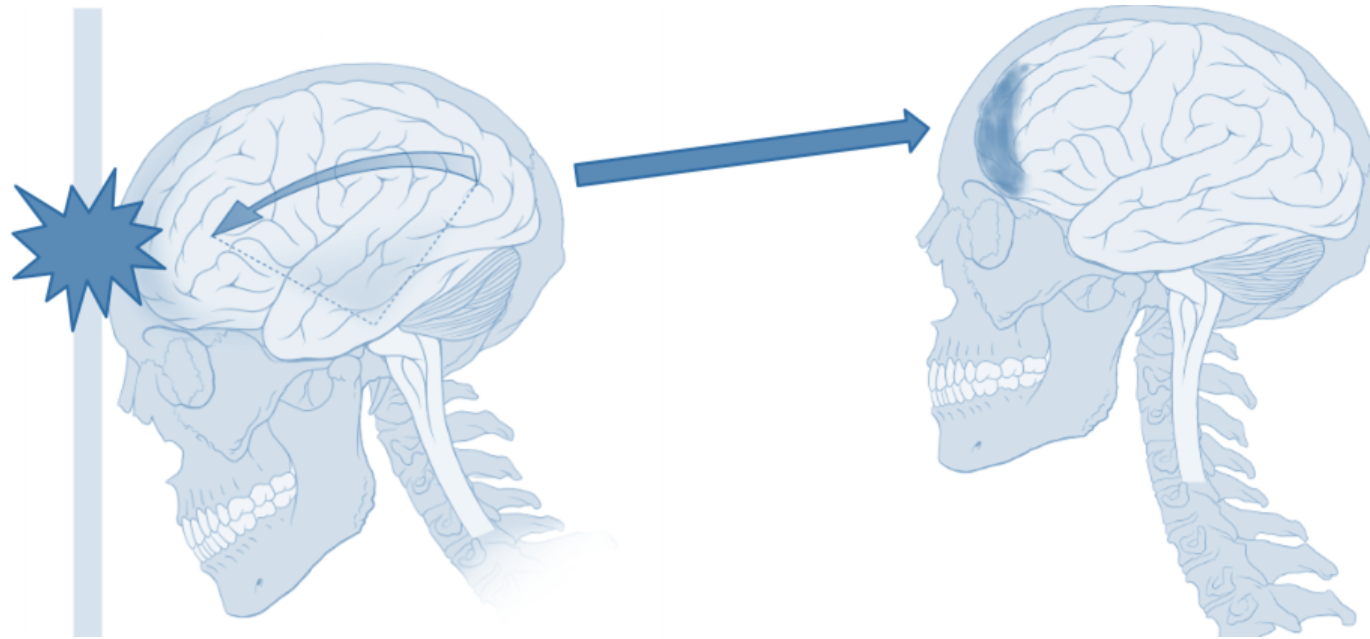


# The evidence: Trauma to soft tissue and bone



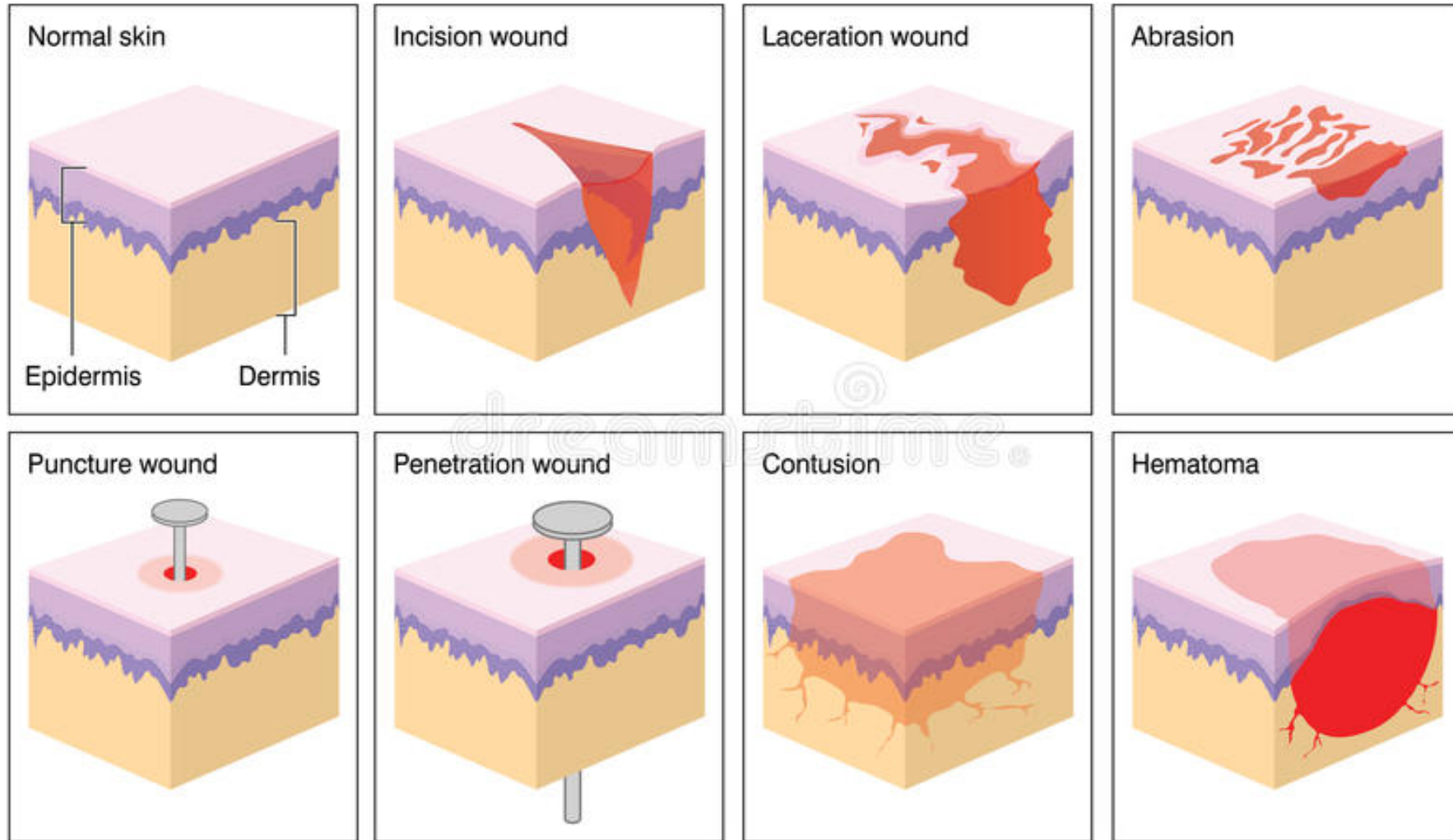
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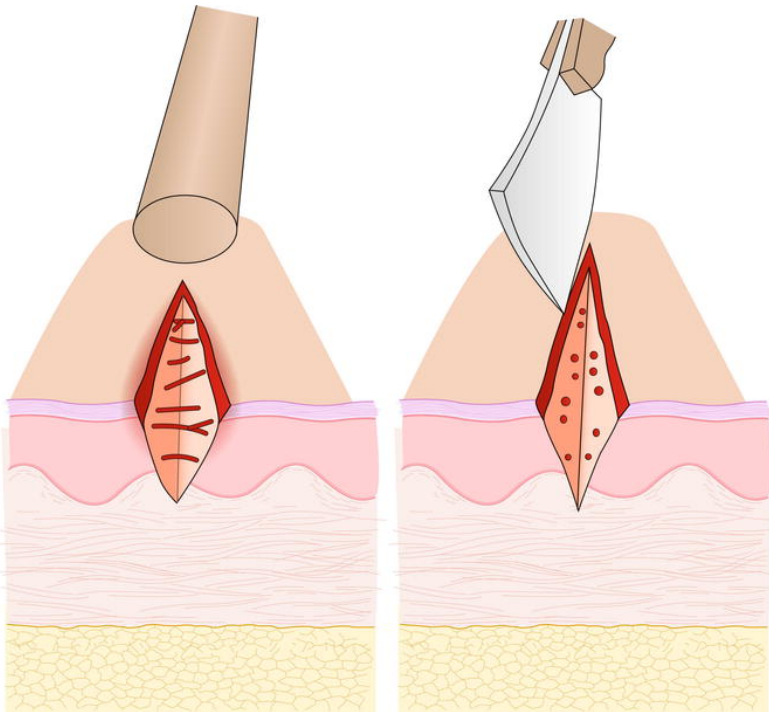


# Wound types



# Sharp force trauma on soft tissue

- Sharp force trauma- will have at least 1 sharp end (e.g screwdriver, knife, axe, scissors)
- Cause incision, penetration and puncture



# Sharp force trauma on soft tissue

Self-infliction / suicide	Homicide
Single stabs or close together	Multiple stabs
Heart region	Different stab, cut regions
Small depth of stabs/cuts	Deeper, broken stab canal, unreachable for the person himself, on the back
Bare skin	Cut clothes
Testing wounds, parallel testing cuts	Defensive wounds, different cut directions
Vertical traces of blood flow	Turbulent blood traces, backward

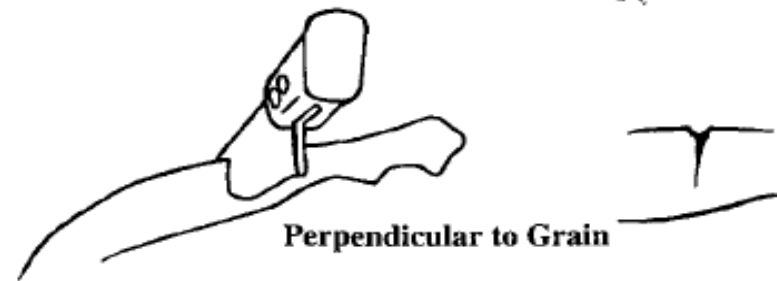


# Sharp force trauma on bone



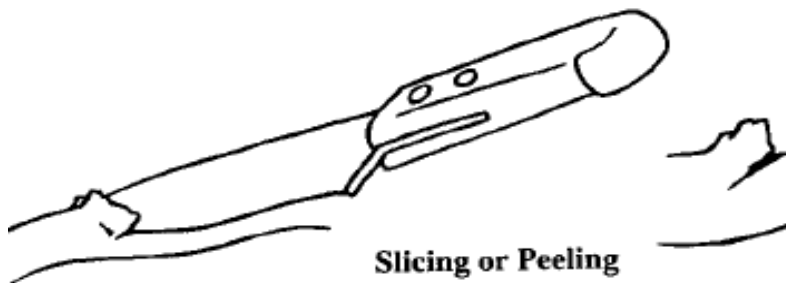
Splitting Along Grain

**FIGURE 10.11 BONE PENETRATION  
PARALLEL TO THE GRAIN**



Perpendicular to Grain

**FIGURE 10.12 BONE PENETRATION  
PERPENDICULAR TO THE GRAIN**



Slicing or Peeling

**FIGURE 10.13 ANGLED PENETRATION OF BONE**



Sharp and Blunt Defects  
in Adjoining Ribs

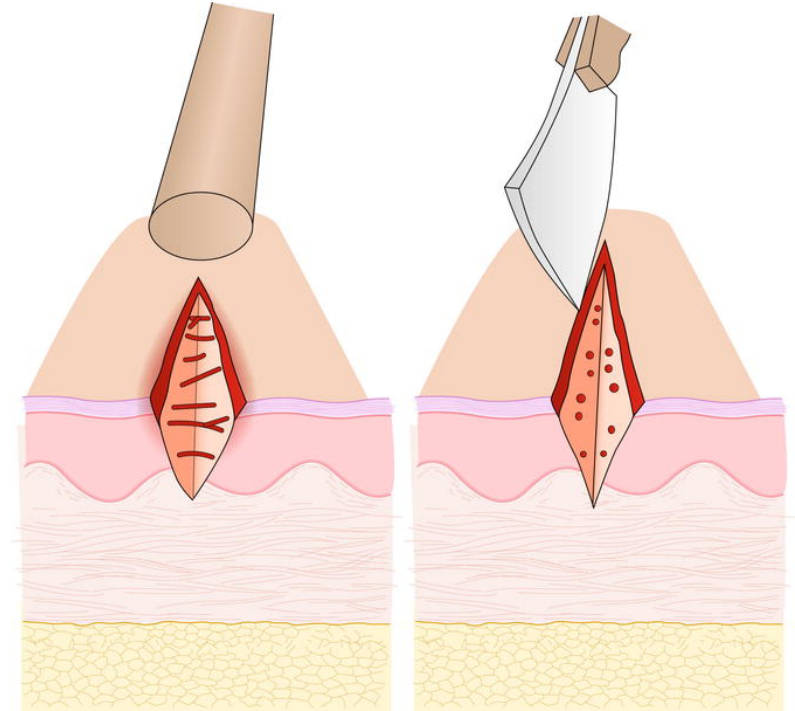
**FIGURE 10.14 INTERCOSTAL PENETRATION  
PRODUCING WOUNDS IN ADJOINING RIBS**



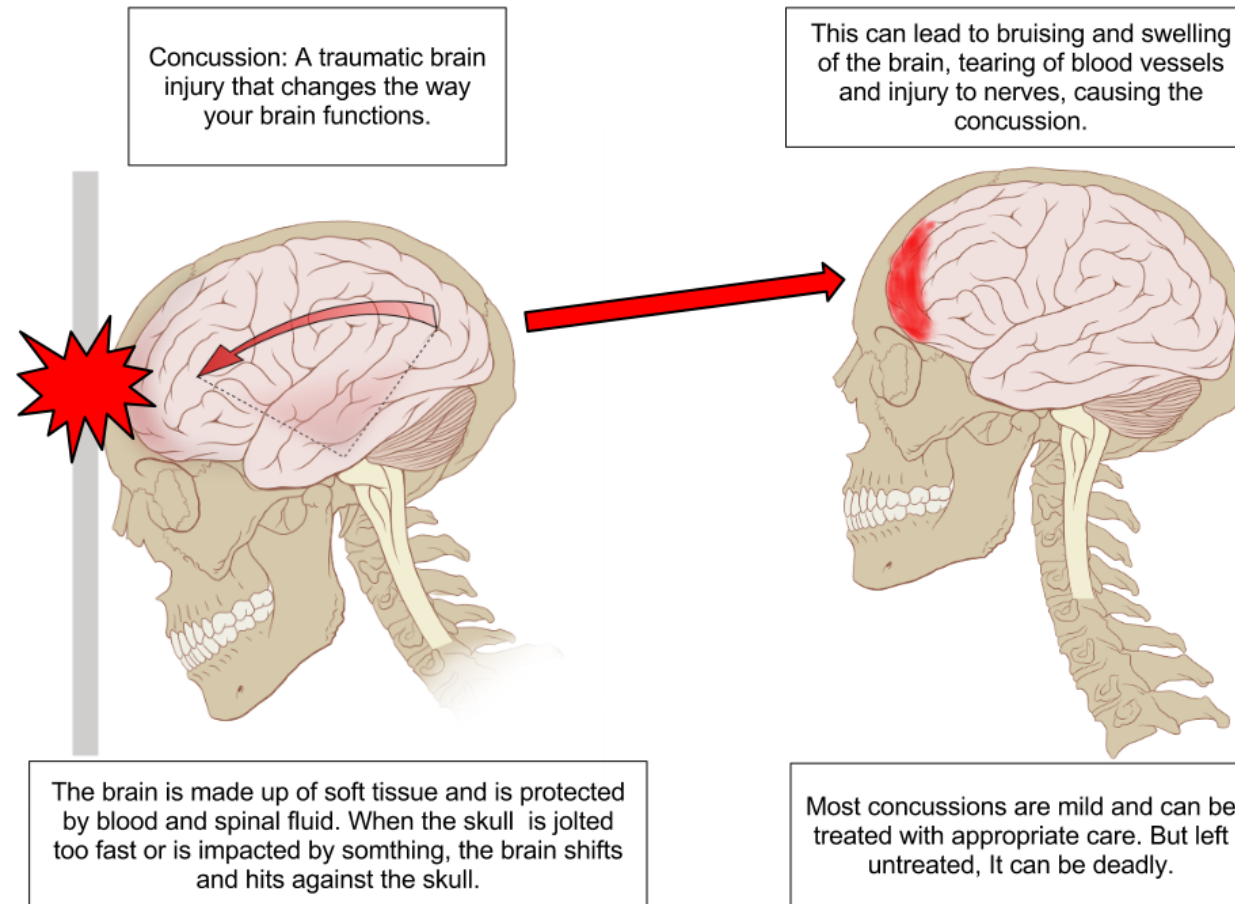


# Blunt force trauma on soft tissue

- Cause abrasions, lacerations or contusions
- If you use those terms, you are implying some form of blunt force trauma
- Specific weapons produce characteristic types of injuries.
- Slow trauma (km/hr)
- Fracture patterns can show direction and sequence of blow
  - Best understood by correlating soft tissue injuries with bone trauma

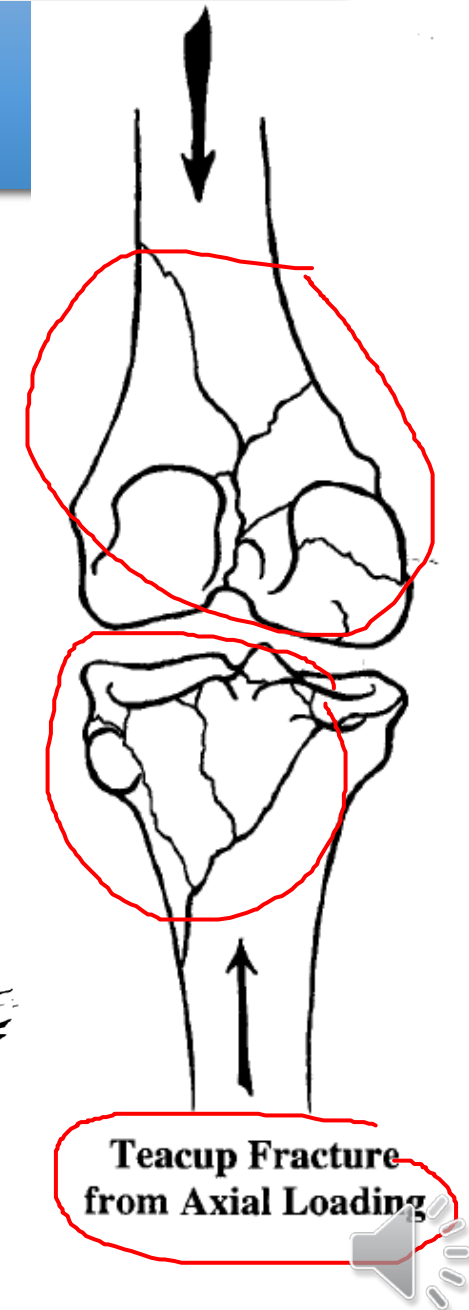
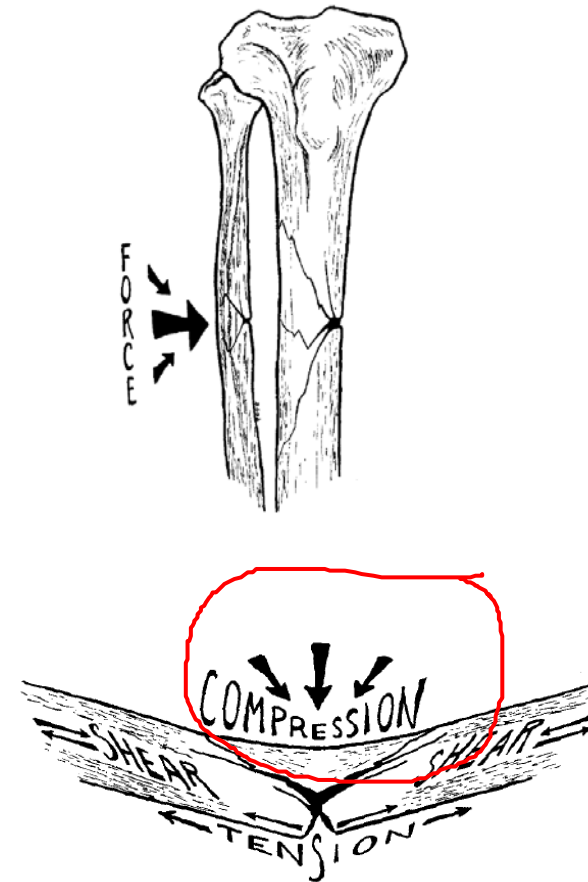


# Brain trauma



# Blunt force trauma on bone

- Radiating and concentric fractures – cranium
- Tension and compression fractures – long bones
  - Point of impact = compression
  - Opposite surface tension and sheering=
- Axial loading = long bone and forces in opposite directions







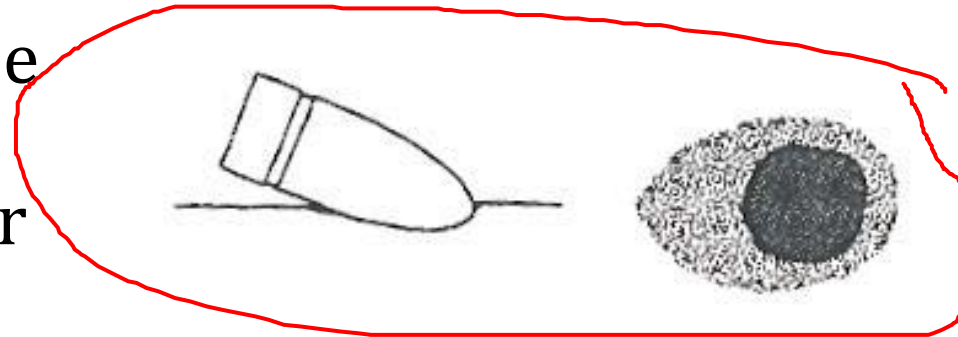
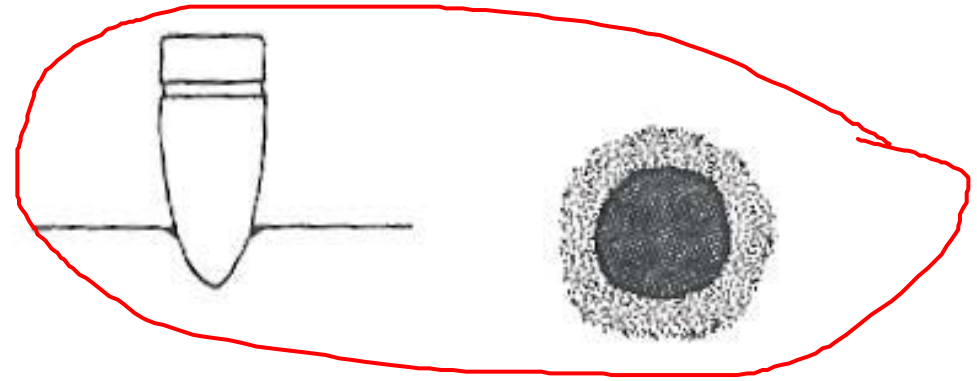
# Ballistic trauma on soft tissue

- Skin appears differently at entrance wound based on distance:
  - Near contact -  $< 1$  cm – round to oval entrance wound – wider zone of burning and blackening – no discrete tattooing
  - Intermediate – 1 cm to 1 m – central entrance defect surrounded by blackening and tattooing – blackening disappears around 15 mm
    - 10 - 15 mm: blackening and tattooing
    - $> 15$  mm: tattooing
  - Distant -  $> 1$  m – central defect with the collar of abrasion – no tattooing / burning / blackening



# Distant gunshot wounds

- Bullet enters the skin at right angle producing a regular, round abrasion collar
- Bullet enters at an oblique angle resulting in an eccentric or crescent-shaped abrasion collar



# Ballistic trauma on bone

- Entrance wounds:
  - Inward bevelling of bone
  - Usually the size of the projective
- Exit wound:
  - External bevel, outside cranial vault
  - Usually much larger than the entrance
- Initial Point of Impact > Radiating Fractures > Concentric Fractures

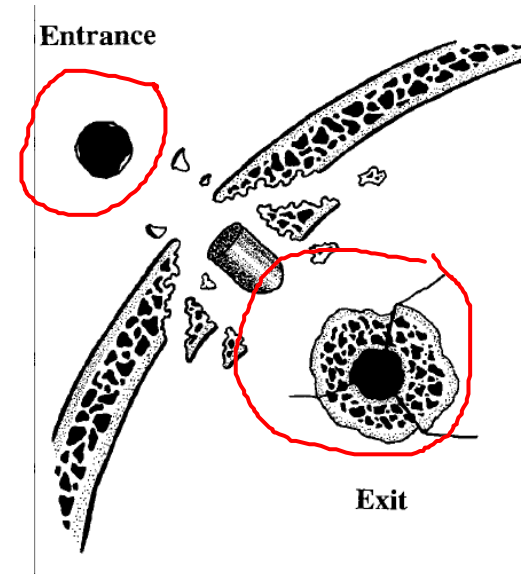
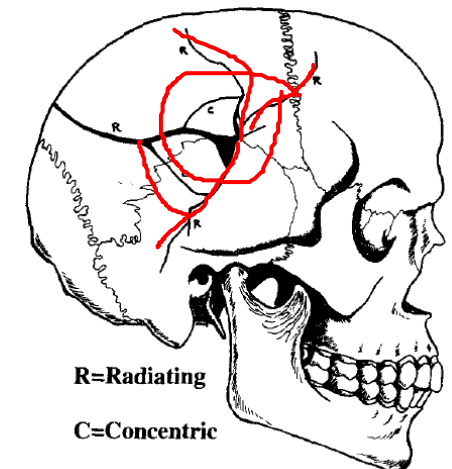


FIGURE 10.1 ENTRANCE AND EXIT WOUNDS



R=Radiating

C=Concentric



# Ballistic trauma on bone

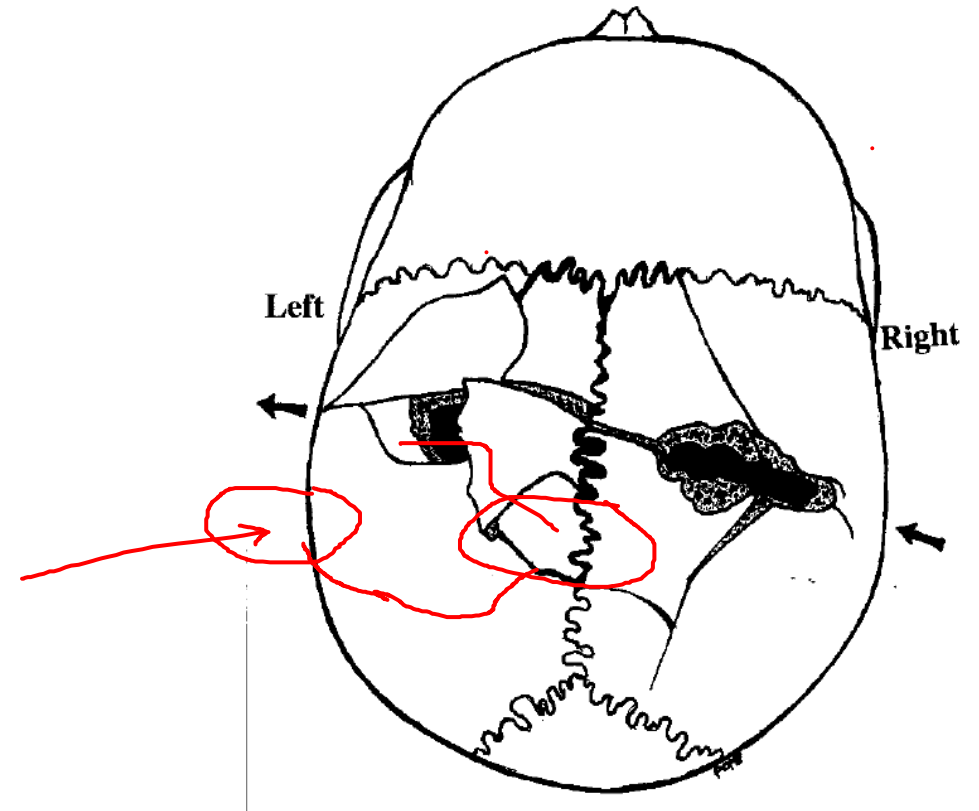
- Features of a key hole defect

1. Entrance is cleaner than the exit

2. Entrance:

- Long, oval shaped
- Metal residue
- Fan-shaped outer bevelling

3. Exit fractures dissipated into those from the ENTRANCE





Voice over: Elizabeth Dinkele

Slide design: Elizabeth Dinkele

Content adapted from Dr Gavin Kirk and Prof Lorna Martin



**CRIME SCENE DO NOT CROSS**

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