

# Management of Spine Fractures (without paralysis)

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# Disclosures

- None



# Learning Objectives

- Management of c-spine injuries
- Imaging for C spine injuries
- Clearing and Removing c-collars safely
- Thoracic and lumbar spine fractures



# C-spine

C 2 and C7 most common fractures

typically divided into three groups: C1, C2 and the sub-axial spine (C3 to C7).

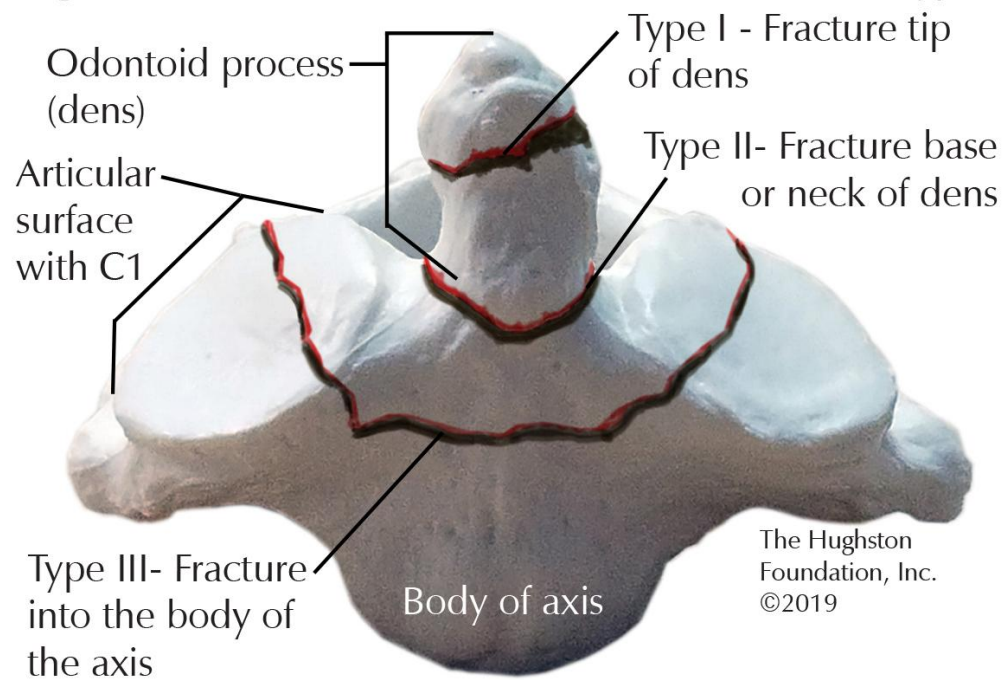
bone fracture is associated with 56% of cervical spinal cord injuries

Falls account for the most common cause followed by motor vehicle accidents, biking, and diving. Mortality ranges from 5-10%



# C2 Fracture

**Fig. 3.** Anterior (front) view of C2 (axis) with fracture types

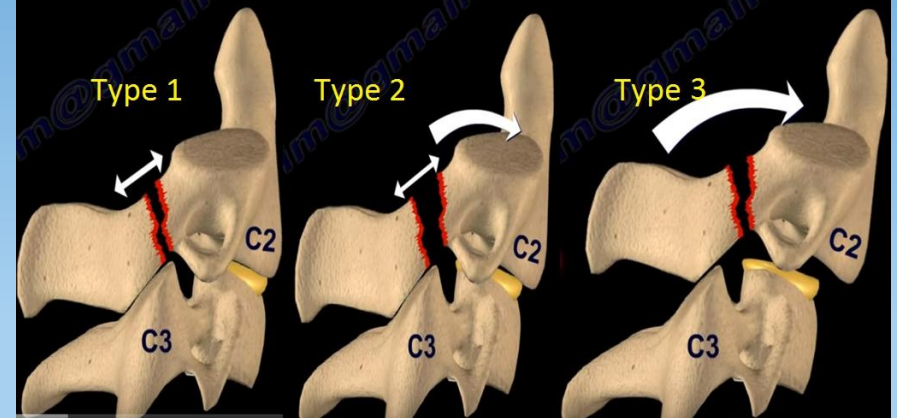


- A **dens fracture**, also known as an **odontoid fracture**
- **Treatment** depends upon on where the **fracture** occurs within the second vertebre. A **type 1** (tip avulsion) and a type 3 (fracture through the vertebral body) typically don't require surgery as long as there is no neurologic problem. Patients wear a hard neck collar 6-12 weeks.
- Type 2 may require surgical fixation or Halo stabilization



# Hangman's Fracture

- A hangman's fracture is a break in the second vertebra of your neck, called the C2, or axis
- A hangman's fracture occurs when your head is forcefully snapped back and up. This is a hyperextension injury, meaning that your neck is extended beyond its normal range
- Often unstable needing surgical fixation



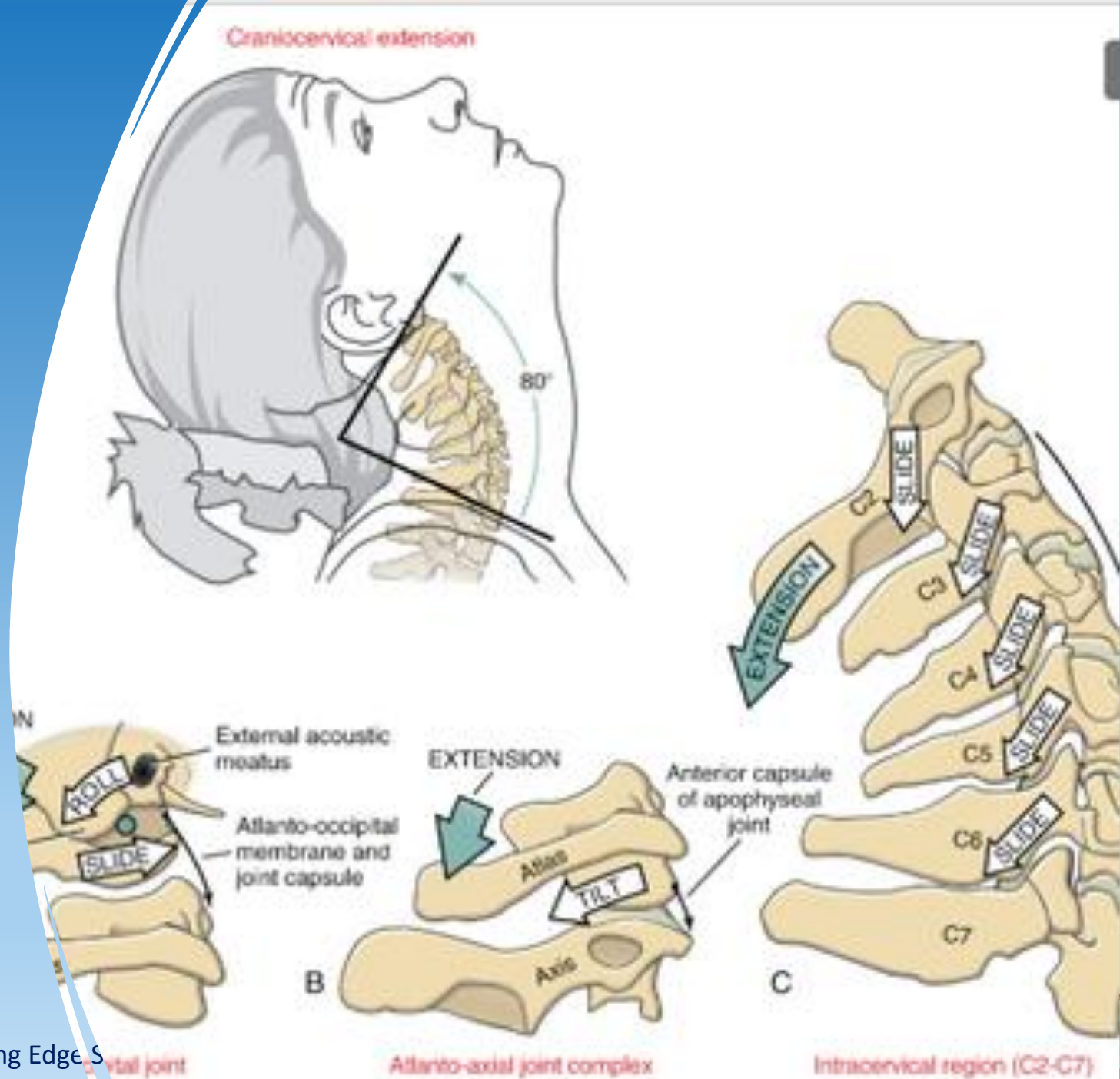


# Jefferson Fracture

- The **Jefferson fracture** occurs most likely because of a motor vehicle accident or sport related mishaps like shallow diving or hard tackles. The mechanism of injury are either a hyperextension or axial compression injury of the **C1** vertebra



- A Jefferson fracture can be either stable or unstable<sup>12</sup>. The stability depends on the integrity of the transverse ligament.
- Need MRI to evaluate



# C Spine evaluation ( non pediatric)

- Clinical Examination

- Patient awake? → if no do not proceed
- Patient under the influence of drugs or alcohol? → if no then proceed
- Patient have distracting injury? → if no then proceed
- Does the patient have midline tenderness → → if no then proceed
- Does the patient have negative CT of c spine? → if Yes proceed
- Spine can be cleared. If any of these are not met then the patient needs MRI to clear or evaluation later. C collar stays in place!



# C Collar types that can be left in place



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These need  
to be  
changed out  
ASAP



# C Spine evaluation

- Clinical examination
- CT spine for trauma
  - Three view x-rays are essential out and slow down the process
- IF there is a fracture of the mandible, mastoid, facial bones or cervical spine ct angiogram of the vertebral arteries is warranted to rule out injury. If there is an injury the stroke risk can be as high as 20%
- C collar stays on if fracture and mri noncontrast is ordered
- IF no fracture and midline tenderness MRI is ordered to rule out ligamentous injury





# Thoracic/ Lumbar Spine Fractures

- Compression fractures
- Burst Fractures
- Stable Vs Unstable



# Thoracic/ Lumbar Spine Fractures

**Stable fractures** occur when the bones are aligned properly and do not pose a risk of spinal cord injury or further vertebral instability.

**Unstable fractures** can cause serious problems and compromise the integrity of the spine

# Compression Fractures → usually stable

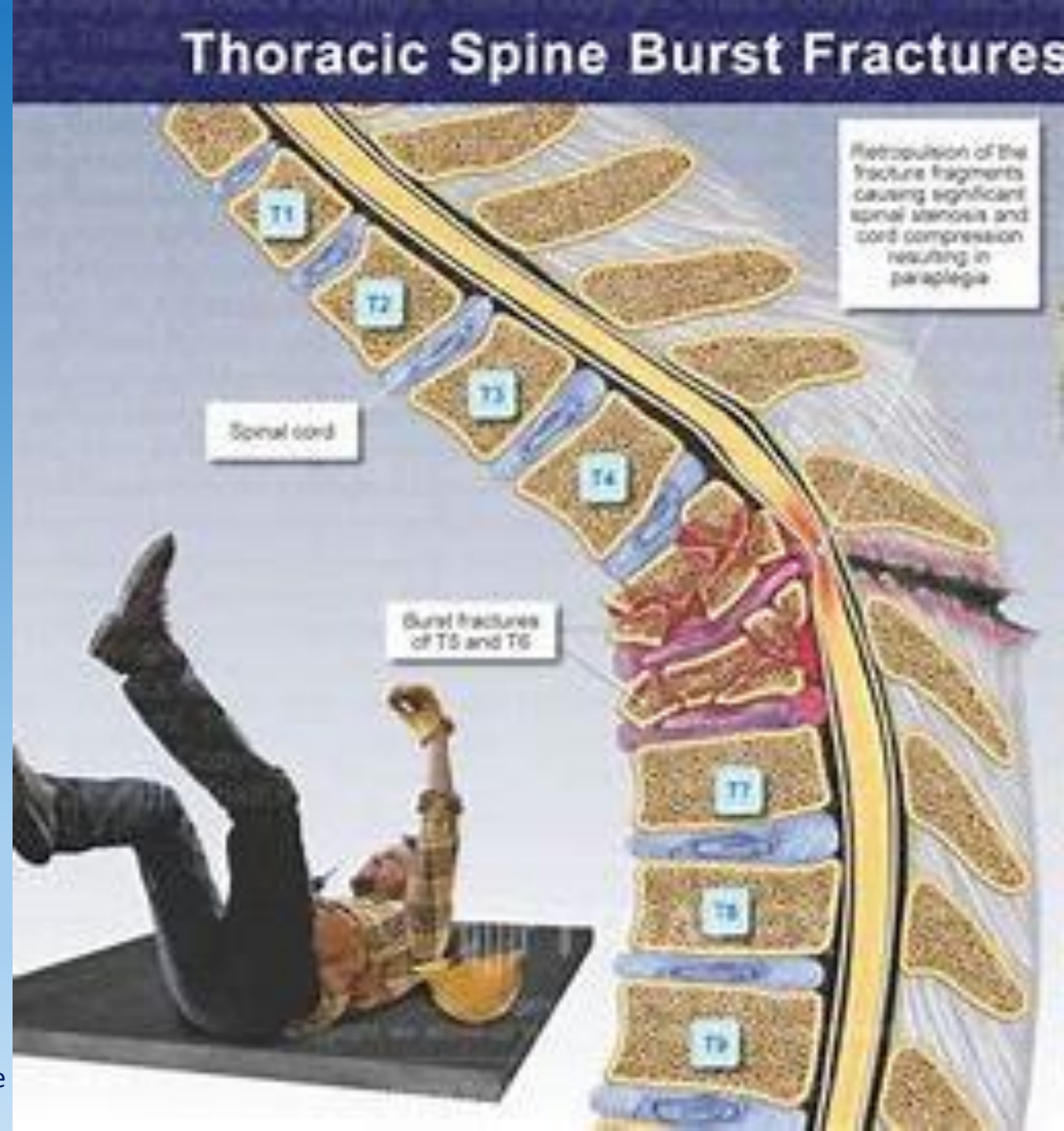
- Are small breaks in the vertebrae (bones in your spine).
- Are more common in women over 50.
- Occur due to weakened bones, often from osteoporosis.
- Can result from falls or everyday activities.
- Cause the spine to collapse and curve over time.
- Treatment includes rest, medications, braces, and minimally invasive surgery.
- Worst compression fracture ever →



# Burst Fracture of the spine

- A **burst fracture of the spine** is a serious injury where the vertebra breaks in multiple directions, often due to high-energy trauma such as a fall or car accident. This type of fracture can lead to **disruption of the vertebral body** and may cause fragments to press into the spinal canal, potentially compressing the spinal cord. Symptoms may include severe back pain, neurological deficits, and loss of mobility. Treatment typically involves a combination of **surgery and rehabilitation** to stabilize the spine and restore function. Prompt medical attention is crucial for managing this condition effectively.

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## Examples of Different Thoracolumbar Injuries



Compression fracture



Burst fracture

VirtualMedStudent.com



Flexion /  
distraction



Fracture /  
dislocation

## Spectrum of Fractures



# Summary



Compression fracture usually stable and will only require brace for 3 months



Burst fracture unstable and will require surgery with or without paralysis



Flexion injury is unstable and needs surgery → most often without paralysis



Flexion- distractions unstable and most often with paralysis. Needs surgical stabilization



# References

- [c spine fractures – Search](#)
- [Cervical Spine Fractures Overview - StatPearls - NCBI Bookshelf](#)
- [dens fracture - Search Images](#)
- [Hangman's Fracture: What Is It, What Causes It, and How It's Treated](#)
- [Hamgmans fracture - Search Images](#)
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- [jefferson fracture c1 – Search](#)
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