

Spine Injury and Back Pain in Sports

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Back Pain

- Increases with Age
- Girls>Boys in Teenage years
- Anywhere from 15 to 80% of children and adolescents have back pain depending on the studies

Back Pain

- Most common cause is muscular
- History and Exam to rule out other causes
- Most patients with back pain need core strengthening

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Back Pain - Is it Serious?

- Symptoms
 - Night Pain
 - Duration
 - Onset
 - Location
 - Is it affecting activities
 - Alleviating and Aggravating Activities

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Back Pain - Is it Serious?

- Symptoms
 - Bowel or Bladder
 - Neurologic
- Stresses - associated Family Factors

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Back Pain - Is it Serious?

- Constitutional Symptoms
 - Fever
 - Weight Loss
 - Night Sweats

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Spine Examination

- Observation
 - Postural Shift
 - Walking
- Range of Motion
 - Forward Bending
 - Extension
- Spine Symmetry
- Rib Rotation especially on Forward Bending
- Limb Length
- Shoulder Height

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Spine Examination

- Straight Leg Raise
- Contralateral Straight Leg Raise
- Faber Test

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Cervical Spine Injury

Bone
Ligaments
Disc
Spinal Cord
Nerve Roots
Peripheral Nerves

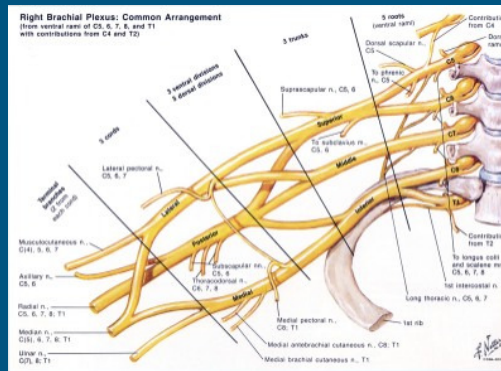
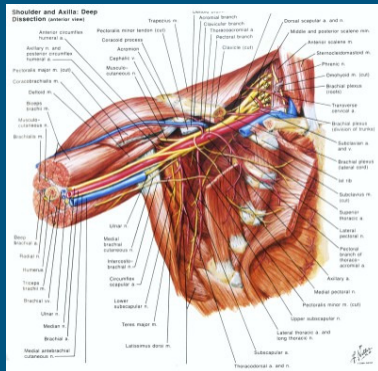
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Nerve Root and Brachial Plexus Injury

- Pinch or Stretch of the Cervical Nerve Roots or Brachial Plexus
- “Burners”
- Most Common
- Poorly Understood
- Rarely does nerve root disruption occur

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Brachial Plexus



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Nerve Root and Brachial Plexus Injury

- Short Lived
- Shoulder and elbow weakness
- Normal neck range of motion
- Stretch
- Compression

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Nerve Root and Brachial Plexus Injury Mechanism

- Traction - flexion of neck away from side
- Lateral Neck Flexion

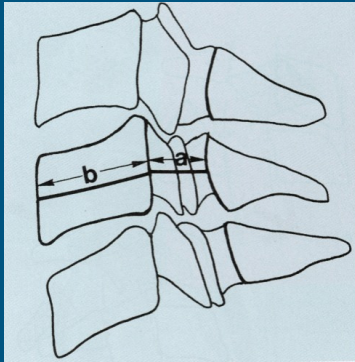
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Nerve Root and Brachial Plexus Injury Treatment

- Return to activity with normal exam
- Transient
- If any neck pain, weakness, tingling, lack of range of motion they may not return and require medical evaluation
- Patients with cervical stenosis have been found to be more likely to have burners - Pavlov ratios

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Torg Ratios



Ratio of 0.8 or less is
Indicative of canal narrowing

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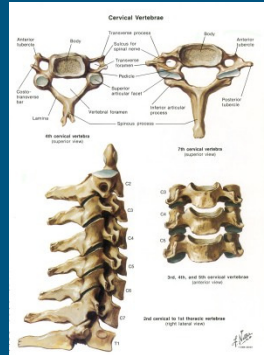
Spinal Cord Neuropraxia and Transient Quadriplegia

- Tingling
- May have motor weakness
- Involves both arms, both legs or all 4 extremities
- Transient and most recover within 15 minutes
- Neck pain is minimal

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Spinal Anatomy

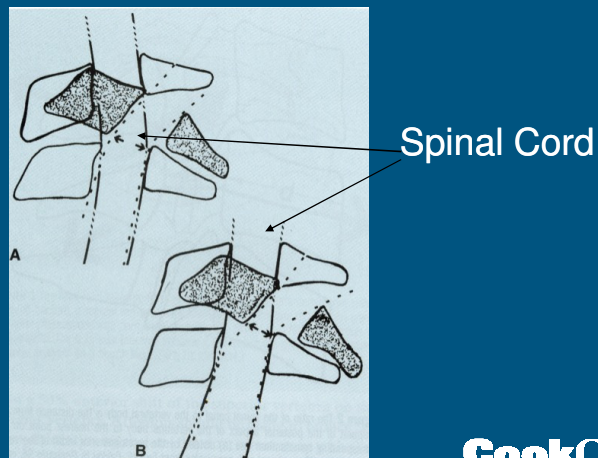
- Average spinal cord is about 10mm in diameter
- Spinal Canal less than 14 mm is abnormal
- Pavlov ratio



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Mechanism of Spinal Cord Neuropraxia or Transient Quadraparesis

- Pincer Mechanism - hyperextension



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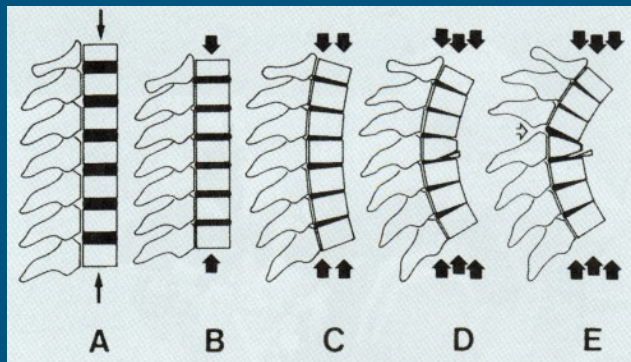
Recurrence of Transient Spinal Cord Neuropraxia

- Up to 56% in football
- The narrower the canal the higher the recurrence rate
- Return to sports controversial depending on the anatomy

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Permanent Cervical Paralysis and Quadraplegia

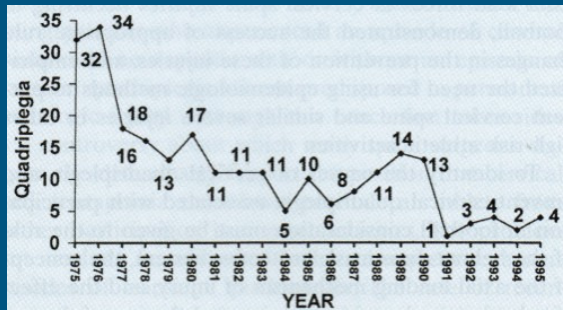
- Most are related to Axial loading not hyper - flexion
- When head is flexed 30 degrees forward it straightens the cervical spine making it more susceptible to axial loading



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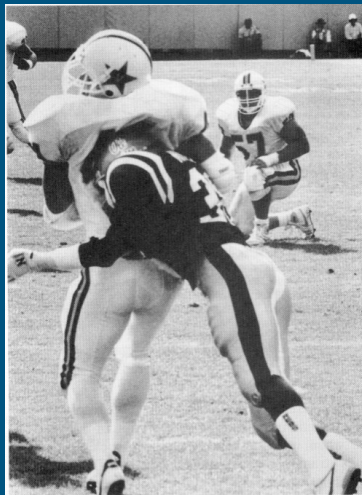
Rule Changes against Spearing with the helmet

- Direct hitting with top of head produces larger forces on the cervical spine than forces applied further forward on the head



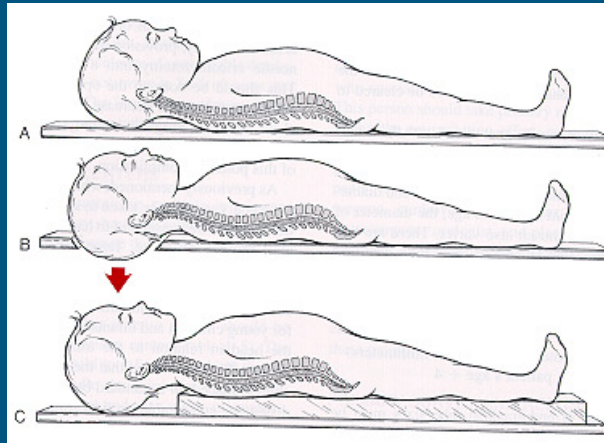
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Cervical Quadraparesis



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Cervical Spine Injuries



Backboard
and
head position

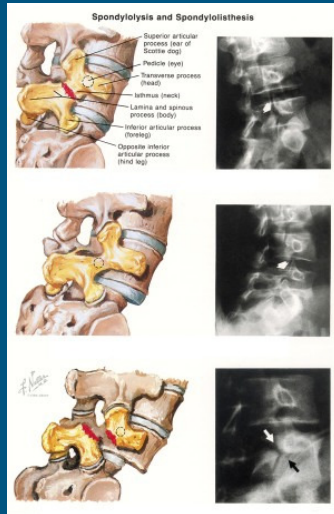
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Cervical Spine Immobilization

- Head and neck held still
- Helmet - remove face mask leave the helmet in place
- If helmet must be removed for the airway then remove cheek pads and carefully remove
- If the helmet is removed the shoulder pads will elevate the trunk - must account for this by keeping head and neck in a neutral position

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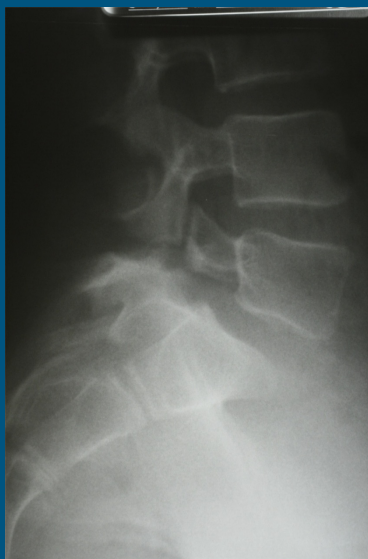
Spondylolysis and Spondylolisthesis Lumbar Spine



4 to 6 % of the population
Most typically seen at L5

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Spondylolysis and Spondylolisthesis Lumbar Spine



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Spondylolysis and Spondylolisthesis

- Up to 47% of young athletes with low back pain
- 1/3 of gymnast and ballet dancers
- Also seen in weightlifters, down lineman, wrestlers, divers, etc.

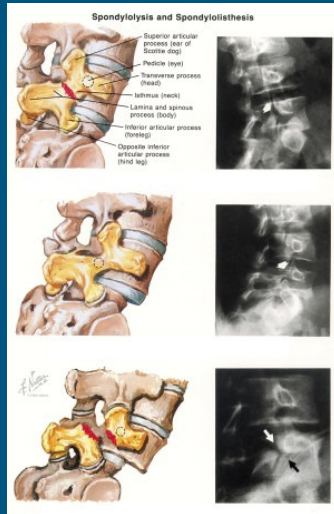
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Spondylolysis and Spondylolisthesis

- Pain with hyperextension
- Treat with stretching, core strengthening, and bracing
- Surgery rarely needed
- Most can return to sports

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Spondylolysis and Spondylolisthesis Lumbar Spine



4 to 6 % of the population
Most typically seen at L5

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History

- 13 y.o. mid back pain
- Posture is poor
- Aching pain after standing



Standing and
Forward Flexion

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Scheurmann's

- Kyphosis and wedging of vertebral bodies
- Fixed - it is not passively flexible like postural round back
- Exercise for core strength
- Rarely brace or surgery
- Most common cause of structural kyphosis in adolescents

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History

- 14 y. o boy with back and leg pain
- Acute onset with lifting weights
- Pain down both legs
- Pain with Valsalva
- Excellent pain relief with oral steroids but it has recurred off the medicine
- Hurts with forward flexion and hurts with sitting
- Hamstring tightness and positive Straight leg raise

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Central Disc Herniation



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Herniated Disc

- Uncommon in teenagers
- Rest
- Oral analgesic
- Injection
- If no improvement surgery

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History

- 16 year old down lineman
- Sudden “pop”
- Extreme pain on forward flexion
- Immediate Pain down both legs

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Apophyseal End Plate Fracture



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Apophyseal End Plate Fracture



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Apophyseal End Plate Fracture

- Adolescent Boys
- Associated with vigorous activity
- Symptoms and Signs are consistent with a herniated disc
- Disc Material and Fragment of Bone and Cartilage in the Spinal Canal
- Typically L4
- Most require operative intervention for pain relief
- Like herniated disc they are uncommon

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History

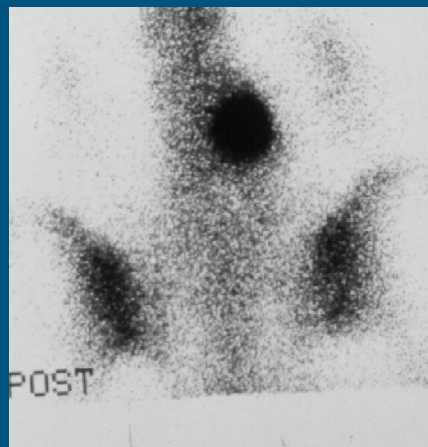
- 14 y.o. girl soccer player with lower back pain
- Pain at night
- Postural Shift
- Limited Range of Motion



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Radiographs



Osteoblastoma



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History

- 12 y.o. girl with neck pain
- Constant
- Hurts everywhere
- Pain at Night
- Limited Neck Motion
- Neck Range of Motion is Limited

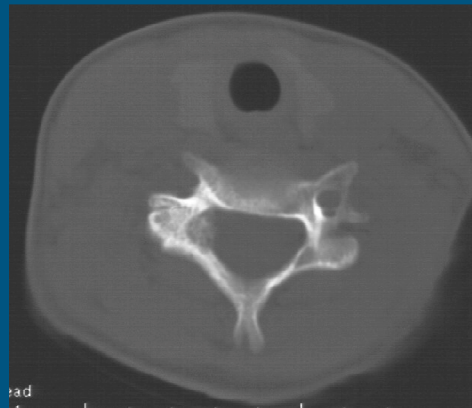
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Radiographs



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Bone Scan and CT Osteoblastoma



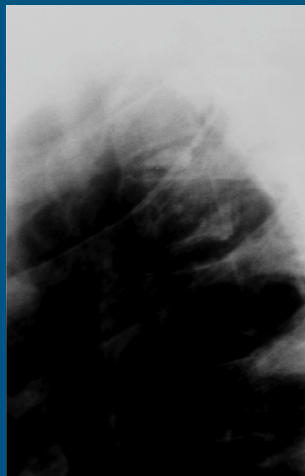
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History

- 11 y.o. girl - acute onset of back pain
- No fever
- Constant
- Between shoulder blades
- Pain at night
- Hurts with forward flexion

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Idiopathic Disc Calcification



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Idiopathic Disc Calcification

- Often Abrupt Onset
- Nuclueus Pulposa calcifies
- Mild elevation ESR
- May have fever

- Treatment is Symptomatic