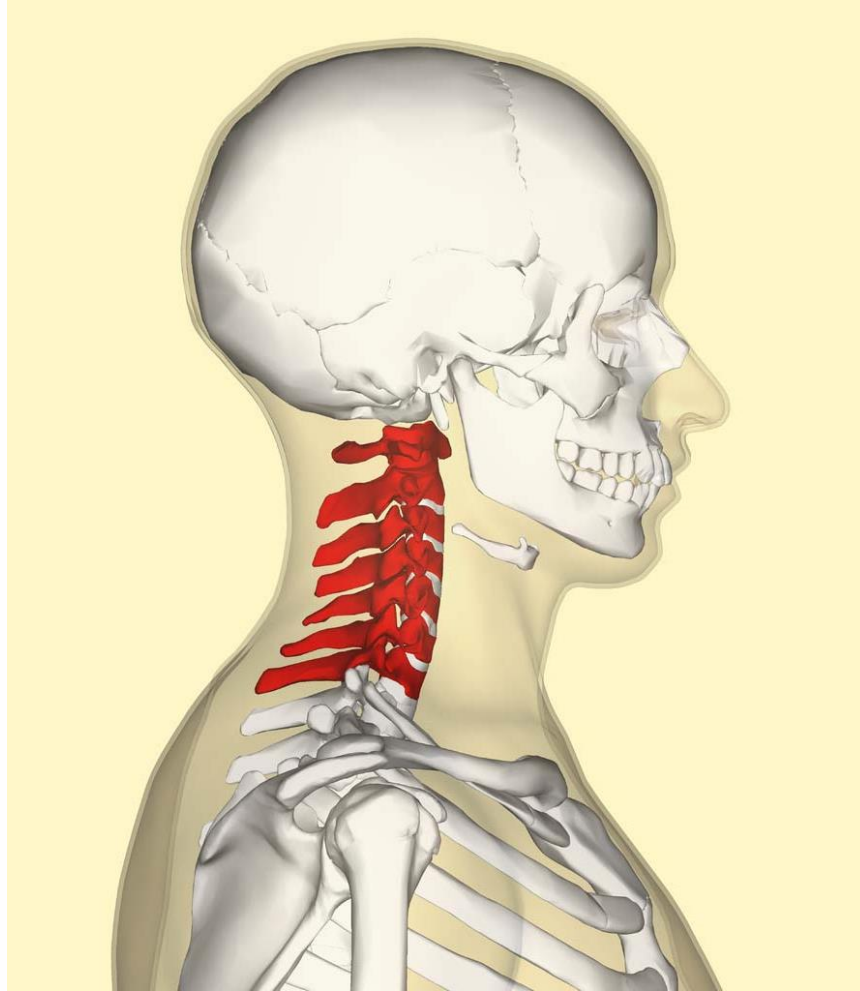




Connecting | Increasing | Improving

Connecting chiropractors
Increasing chiropractic market share
Improving education of chiropractors

Cervical Spine: Pearls and Pitfalls



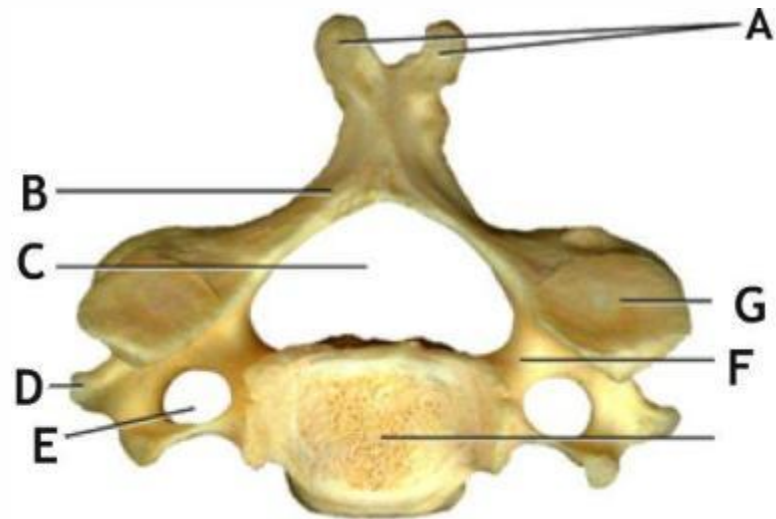
Presenters

- **Dr. Rob Donkin**
 - Functional Anatomy
 - Current research
 - Cervical Radiculopathy
- **Dr. Gert Ferreira**
 - Red flags
 - Case Study
 - Kinesio Taping
- **Chris Neethling**
 - Gonstead adjusting

Functional Anatomy

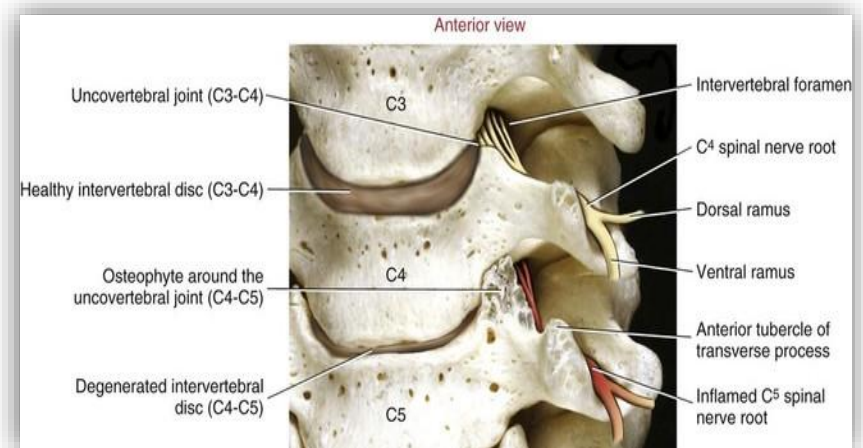
- Typical vertebrae



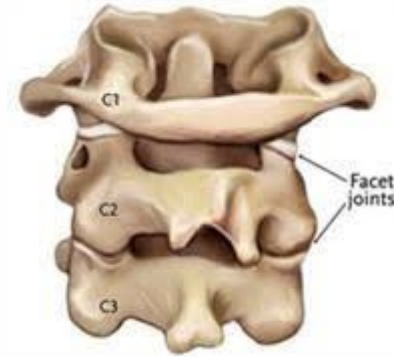


Uncinate process

- Saddle appearance of superior surface
- Forms the anteromedial wall of the IVF
- Uncovertebral joints angled orientation contributes to the coupled movements of the cervical spine.



Facet joints

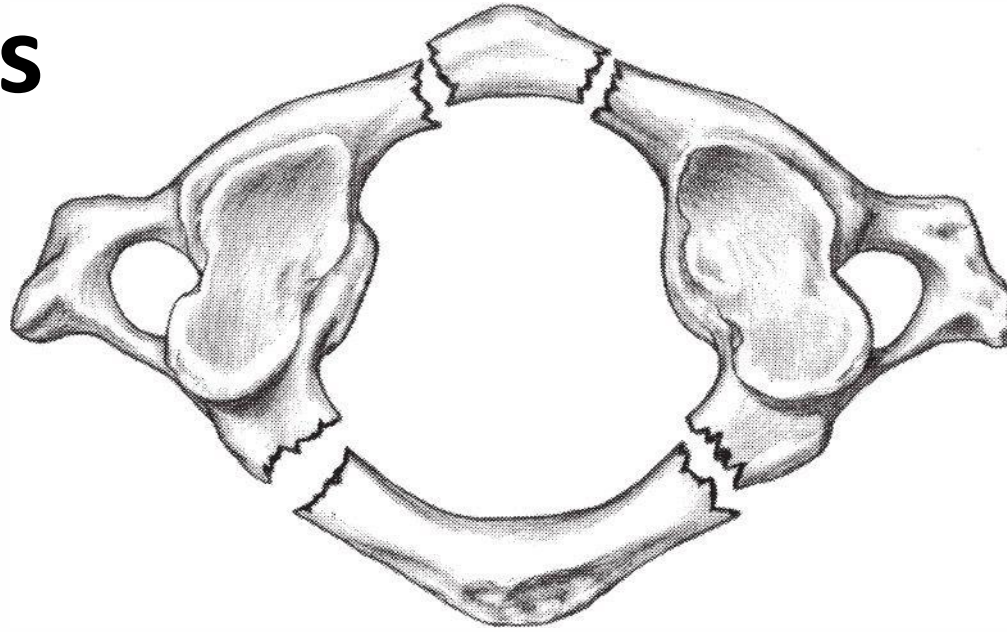


- Rotated at 125 degrees
- This causes rotation and lateral flexion to the same side to happen simultaneously in the primary couple movement pattern of the cervical spine.
- Osteophytes formed on the superior articular process can encroach the IVF

Atypical vertebrae

- Atlas
- Axis
- Seventh cervical vertebrae

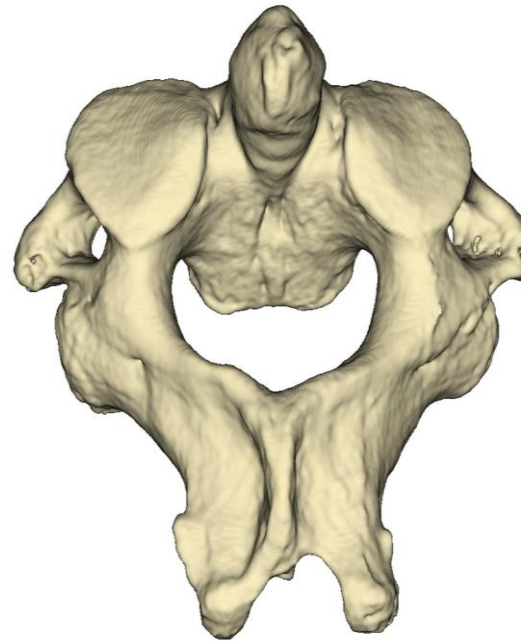
Atlas



- Ring shaped with no vertebral body
- Weight of head carried by lateral masses
- Anterior arch : longus colli attaches to the midline
- Posterior arch: no spinous process but posterior tubercle serves as the origin of rectus capitus posterior minor muscle.

Axis

- Atlanto-axial rotation is free because of the lack of an articular process and intervertebral disc
- No IVF
- Spinous process is the superior most attachment for muscles that move the lower cervical spine.



Cervical rib



Cervical rib

- Prevalance 0.7 to 6.2 %
- Relevant in patients with thoracic outlet syndrome
- may attach to the superior portion of the first rib or sternum distally
- Subclavian artery and lower trunk of brachial plexus pass superior to cervical rib and not between the cervical rib and first rib.
- Ligamentous bands may also be present & not seen on x-ray.

Thoracic spine

- Facet joints are more vertical and are slightly rotated so that rotation is favoured over lateral flexion.
- Thoracic discs are very thin relative to the vertebral body height



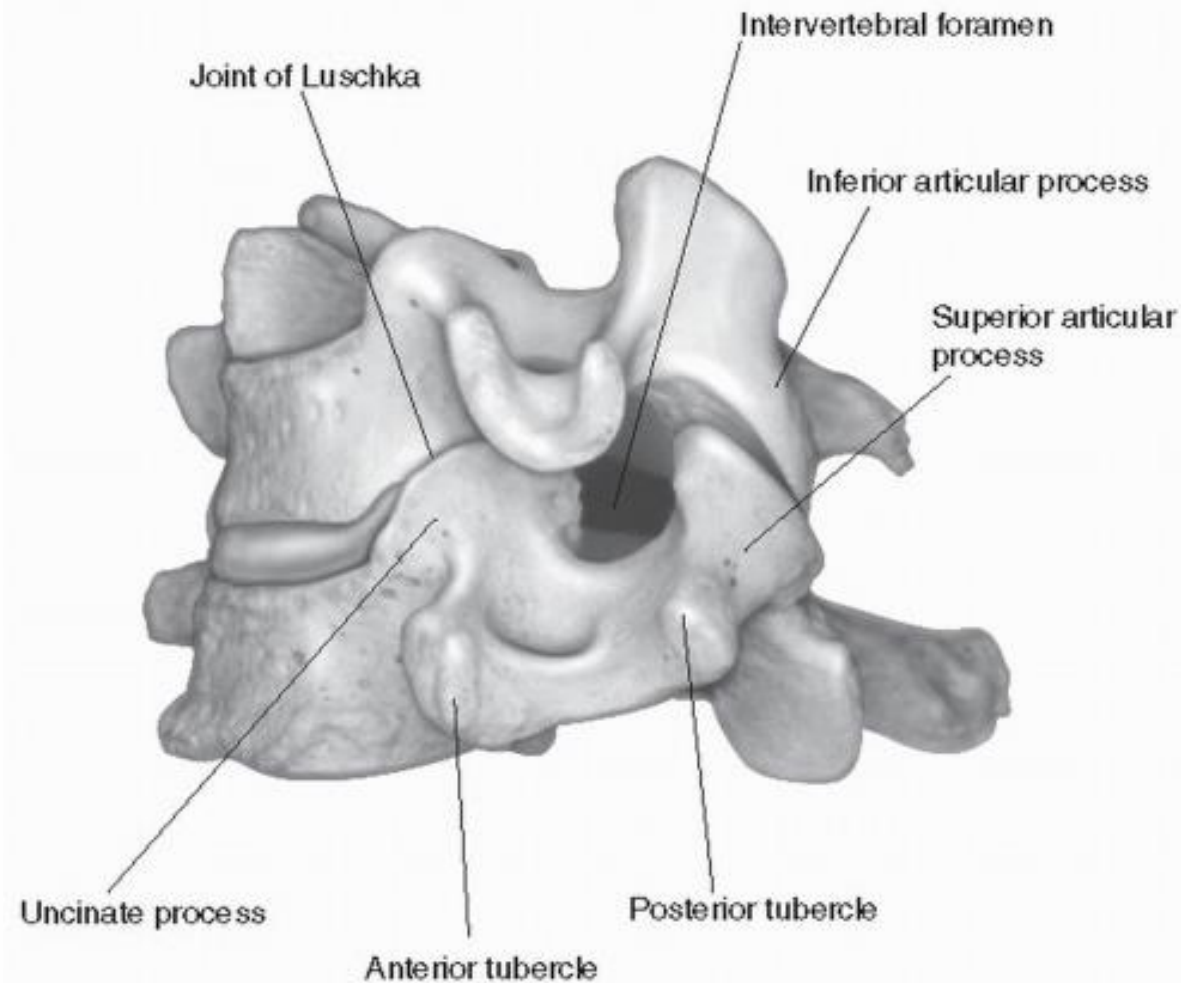
Muscles of the neck

- Axioscapular muscles: trapezius, levator scapulae, rhomboid major and minor
- Splenius capitus and cervicus used in ipsilateral rotation, lateral flexion and extension.
- rectus capitus major may have fatty infiltration which can cause chronic pain, soft tissue palpatory findings and poor balance.
- Longus colli and longus capitus are deep neck flexors of the neck

IVF

- Neural structures of occupy almost *half of the space* of the IVF
- Neural contents
 - Ventral and dorsal spinal nerve roots
 - Dorsal root ganglion
 - Spinal nerve
 - Meninges
 - Recurrent meningeal nerve.

IVF borders



Does cervical adjusting work?

- One cervical manipulation = pain relief
- Multiple cervical manipulations = mobilisations
- Manipulation = exercise

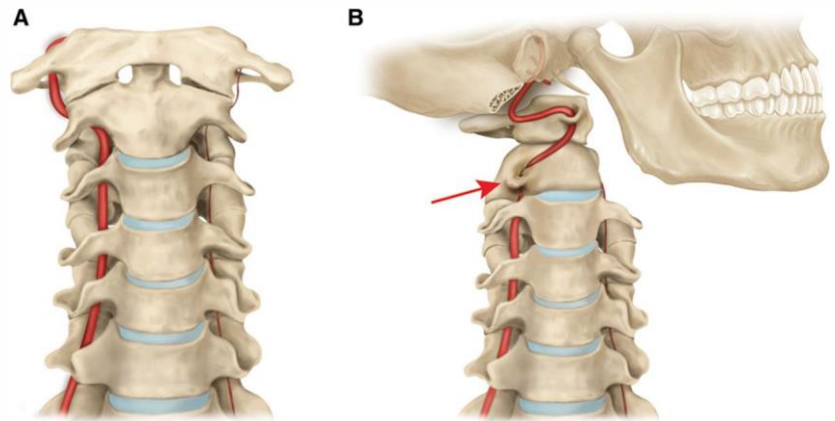


- Cervical manipulations > analgesics and NSAIDS.
- Chronic cervicogenic headache
 - spinal manipulations > massage or TENS.
- Thoracic manipulation reduced pain and improved function

(Cochrane review 2015)

Vertebrobasilar artery insufficiency (VBAI)

- Cervical rotation testing affected contralateral vertebral artery flow but did not produce VBAI symptoms in patients with VBAI
- Use cervical rotation (Wallenberg's) in absence of better tests. (Mitchell et al. 2005)



Imaging for cervical spine

- The use of imaging for neck pain lacks validity and utility (Haldemann et al.2008)
- X-rays are useful for ruling out instability but they are non specific for diagnosing radiculopathy (Childress et al. 2016)
- MRI is not indicated in most cases of CR because of the high rate of false positives and false negatives.
- 57% of patients without CR have degenerative changes and 26% have spinal cord impingement. (Teresi et al. 1987)

Imaging

- MRI is indicated for complex cervical radiculopathy (Bono et al.2011)
- CT can be helpful when identifying nerve compression when MRI studies are inconclusive.



Research for cervical spine surgery

- The difference in risk and benefits of various surgical techniques are small
- Cervical disc replacement (CDR) showed a higher rate of overall success, greater improvements in pain at long-term follow-up compared with those in the fusion group.
- The rate of adjacent segment disease was less in the CDR group versus the fusion group at 60 months (2.9% vs 4.9%).
- rates of revision and supplemental fixation surgical procedures were lower in the CDR group.
(Mummaneni et al. 2013)

Cervical Radiculopathy

- Acute CR caused by prolapse of nucleus pulposus in young patients
- Subacute CR is most common in patients with cervical spondylosis
- Chronic CR responds poorly to conservative treatment.



Provocative Test Cluster

- Upper limb tension test
- Arm squeeze test
- Spurlings test
- Shoulder abduction test
- Axial distraction
- (Thoomes et al. 2018)

Upper limb tension test

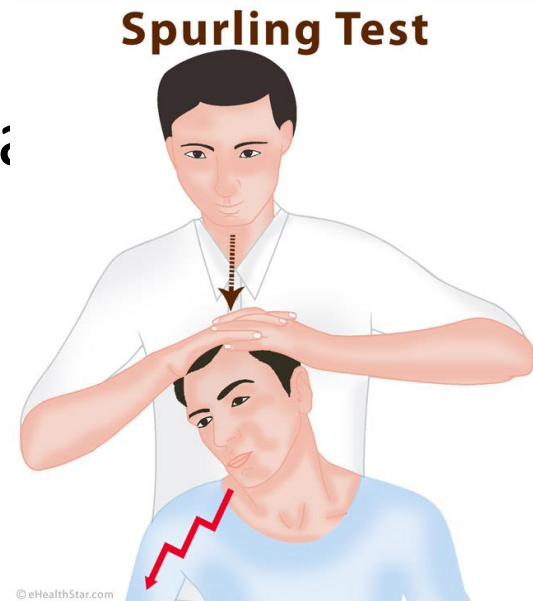
- Use ULTT *first* for screening patients to rule out CR.
- ULTT has high sensitivity to CR (acute or chronic)
- DEMO

Arm squeeze test

- Helps to distinguish between cervical radiculopathy and shoulder pathology in patients with shoulder pain.
- Sensitivity 96%, specificity of 91% has been reported (Gumina et al. 2013)
- DEMO

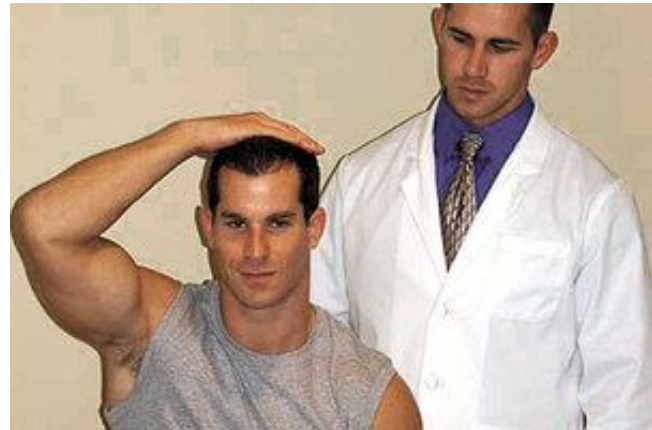
Spurlings Test

- High specificity 95%, mild to moderate sensitivity (Jones 2018)
- Patient seated. Examiner forward flexes neck and adds lateral flexion
- Reproduction of symptoms constitutes a positive test.



Shoulder Abduction Test

- The patient in the seated position actively places the palm of the affected extremity on top of the head.
- Positive signs were achieved when this position could relieve radicular pain
- Picture



Axial Distraction Test

