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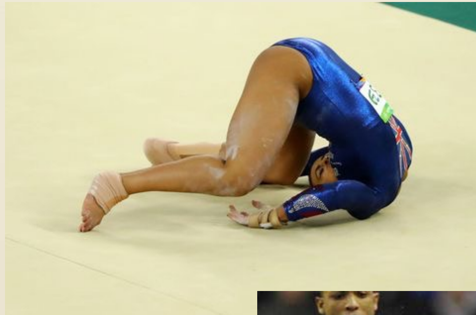
Cervical Spine injuries in Sport



Ulrik Sandstrøm BSc DC ICSSD FRCC FBCA FEAC

1st Team Chiropractor Leicester Tigers Rugby Club

Polyclinic Chiropractor 2012 London and 2016 Rio Olympic Games

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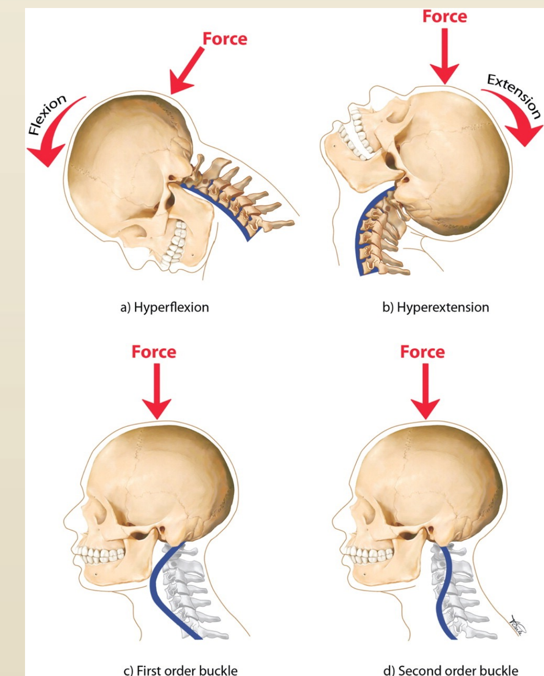
Specific Mechanism of Injury

- Speed
- Direction of impact
- Coup vs contre-coup
- Likely to only be of value in acute management – ie red flags
  - Or possibly prognosis
- You treat what you assess
  - The body heals



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Quebec Task Force Classification

QTFC Grade	Clinical presentation
0	•**No complaint about neck pain** •No physical signs
I	•**Neck complaints of pain, stiffness or tenderness only** •No physical signs
II	•Neck complaint •**Musculoskeletal signs including** • decreased ROM • point tenderness
III	•Neck complaint •Musculoskeletal signs •**Neurological signs including:** • decreased or absent deep tendon reflexes • muscle weakness • sensory deficits
IV	•**Neck complaint and fracture or dislocation**

Spitzer WO. et al. (1995). Scientific monograph of the Quebec Task Force on Whiplash-Associated Disorders: redefining "whiplash" and its management. Spine (Phila Pa 1976)., 20(8 Suppl), pp. 1-73

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Modified Quebec Task Force Classification

Taking into account

- Hypersensitivity
- Sympathetic Nervous System disturbances
- Psychological and posttraumatic stress

Sterling M. et al. (2006). Physical and psychological factors maintain long-term predictive capacity post-whiplash injury. Pain, 122, pp.102-108

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Modified Quebec Task Force Classification (Grade II)

QTFC Grade	Clinical presentation
II A	Neck complaint **Motor impairment** decreased ROM altered muscle recruitment patterns (CCFT) **Sensory Impairment** local cervical mechanical hyperalgesia
II B	Neck complaint Motor impairment decreased ROM altered muscle recruitment patterns (CCFT) Sensory Impairment local cervical mechanical hyperalgesia **Psychological impairment** elevated psychological distress (GHQ, TAMPA)
II C	Neck complaint Motor impairment decreased ROM altered muscle recruitment patterns (CCFT) **increased JPE** Sensory Impairment local cervical mechanical hyperalgesia **generalized sensory hypersensitivity (mechanical, thermal, ULNT)** **Some may show SNS disturbances** Psychological impairment elevated psychological distress (GHQ, TAMPA) **elevated levels of acute posttraumatic stress (IES)**

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Modified Quebec Task Force Classification (Grade III)

QTFC Grade	Clinical presentation
III	Neck complaint Motor impairment decreased ROM altered muscle recruitment patterns (CCFT) increased JPE Sensory Impairment local cervical mechanical hyperalgesia generalized sensory hypersensitivity (mechanical, thermal, ULNT) Some may show SNS disturbances **Neurological signs of conduction loss including:** decrease or absent deep tendon reflexes muscle weakness sensory deficits Psychological impairment elevated psychological distress (GHQ, TAMPA) elevated levels of acute post traumatic stress (IES)

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Canadian Cx spine rule

- Dangerous Mechanisms
  - Hyperflexion
  - Axial load

Any High Risk Factors?
ANY of the following:
- Age ≥ 65 years
- Dangerous Mechanism
- Paresthesias in extremities

Pt has high risk factor? *Well... then you should get....* → **Radiography**

None? *You may proceed...*

Any Low Risk Factors?
ANY of the following:
- Simple rear-end MVC
- Sitting position in ED
- Ambulatory at ANY TIME
- Delayed (i.e. not immediate) onset of neck pain
- Absence of midline C-spine tenderness

Not even one? *Then... they aren't low risk!* → **Radiography**

One of the above? *Excellent... proceed with ROM*

Able to Rotate Neck actively?
i.e. Rotate neck 45 degrees left & right.

Can't move their neck? *Then... they aren't low risk!* → **Radiography**

Great! *Based on the CCR...*

No Radiography

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Acute Cervical Pain

- Always consider concussion!
- If the force was big enough to cause a neck injury – it may also have caused a concussion

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Acute Cervical Pain

- Pain management
  - reassure, analgesia, taping, SMT (low force?)
- Restoring joint function
  - SMT, mob - consider into least painful range first, activator
  - Based around muscle testing findings
- STW
  - DNT, IASTM, massage, ART etc
- Rehab
  - Active - mainly based around ROM

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Radicular pain

- Check for obvious SMR (Sensory, Motor, Reflex) deficiencies
  - Consider imaging/surgical evaluation if non-responsive and unremitting SMR findings
- Find source of neural irritation (but remember double crush)
  - Doorbell test
  - Arm squeeze test
  - Neural tension test

Arm Squeeze Test: Eur Spine J. 2013 Jul;22(7):1558-63

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"Stinger" – acute neuropraxia

- Traction injury of lower Cx nerve roots and/or brachial plexus
- Usually caused by sudden depression of the shoulder girdle - eg a tackle
- Paraesthesia, pain, neural deficits
- Can last from seconds to months
- Often 'fragile' for a long time post recovery - watch for subsequent episodes

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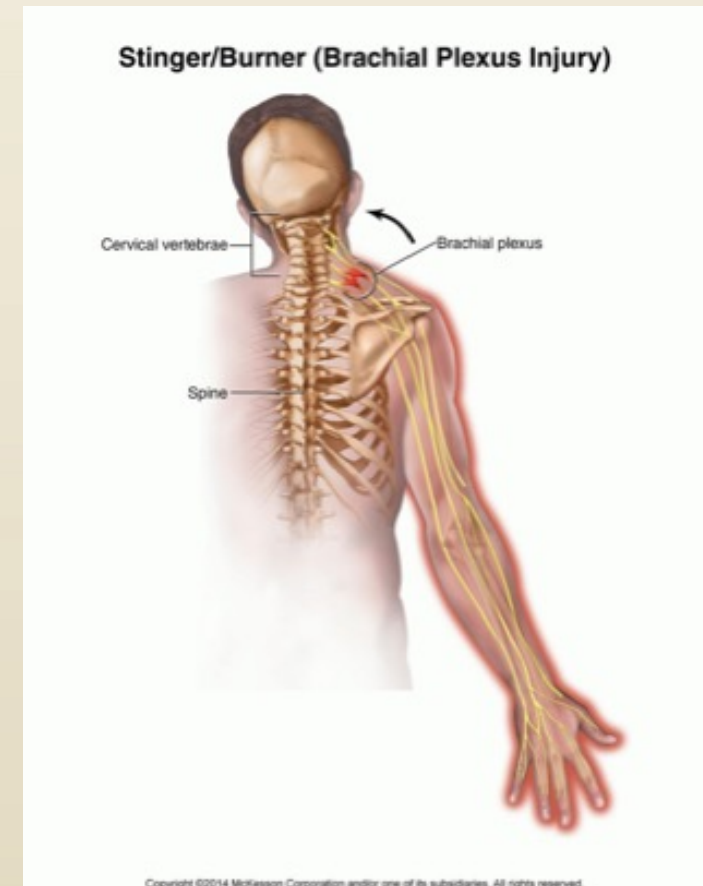
"Stinger" – management

- Cx/Tx adjusting
- Soft tissue release
  - esp Pec Min and Scalene
- Neurodynamic mobilisation - with IASTM
- Inhibition k-taping of Pec Min
- Breathing patterns
- Posture



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Myotomal testing

- If a weak muscle is found, test with changed cervical positioning to check for dynamic changes in efferent output
  - Anterior translation (often improves a discal compromise)
  - Cx rotation
  - Cx flexion
  - Cx lat flex
- Adjust in direction of increasing strength
- Test strength post Rx – often immediate change

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- 27 year old Senior team player for Tigers
- Mis-timed tackle vs. Harlequins – April 2012
- C/O severe right shoulder pain, failed c-spine tests
- C-spine immobilised, taken to Charring Cross Hospital
- Hx of comminuted glenoid fracture 2010
- X-rays NAD
- Returned to team in sling
- Presents for triage next morning
- Persistent R SH pn
- Referred for Chiro assessment and Rx

Leicester Tigers RFC
Sports Medicine &
High Performance Centre

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There is a grade 1 **spondylolisthesis** of C6 on C7.
There is **subluxation** of the right C6-7 facet joint.

There is a **fracture** of the inferior **articular facet** on the right at C5
There is a **fracture** through the right C6 **pedicle** with **moderate displacement** and separation of 6 mm. The fracture extends and splits the right C6 **lamina**.

There is an undisplaced fracture of the left C6 **pedicle** which extends anteriorly into the posterolateral C6 **vertebral body**.

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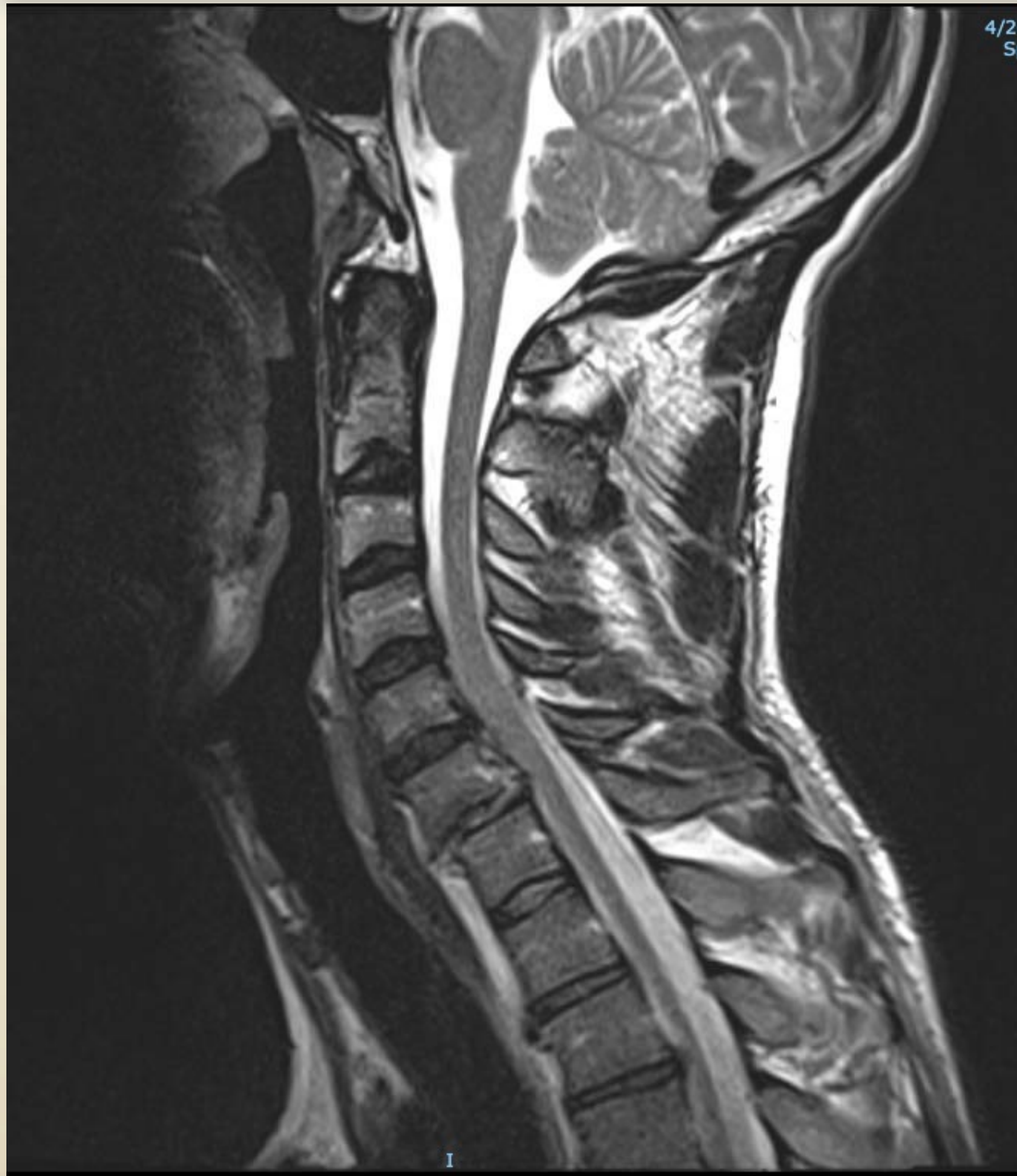

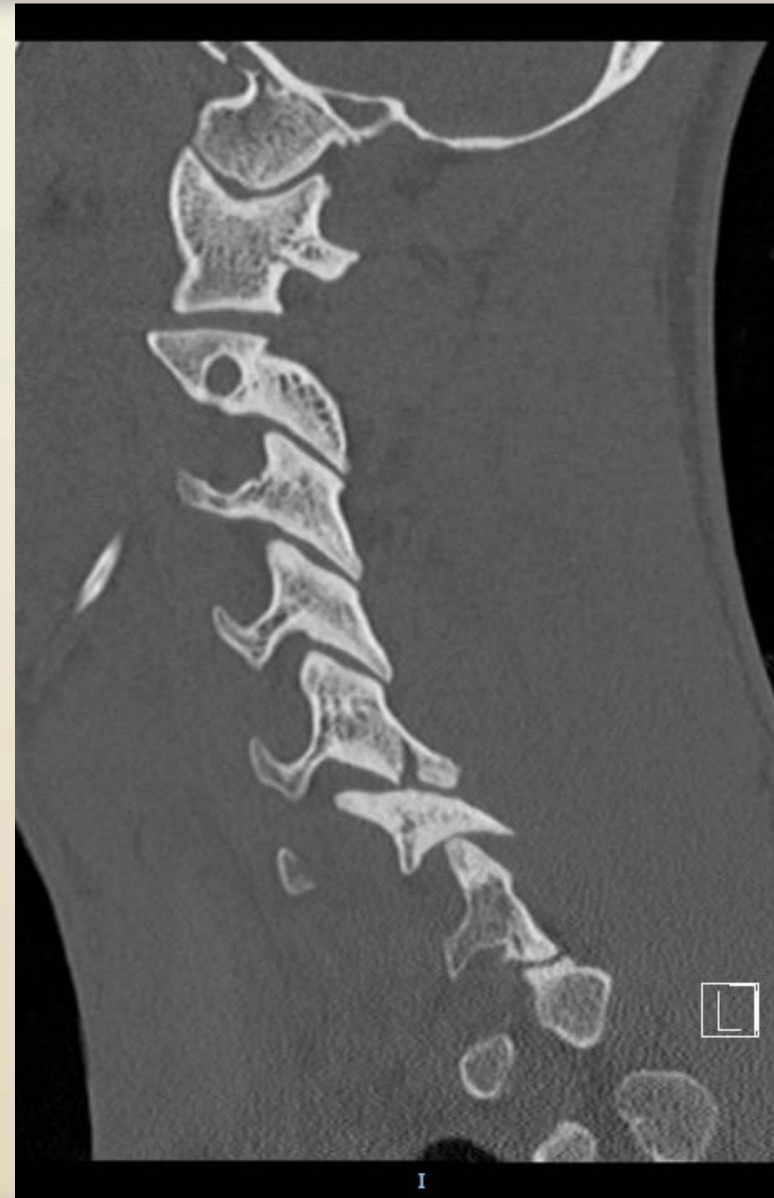

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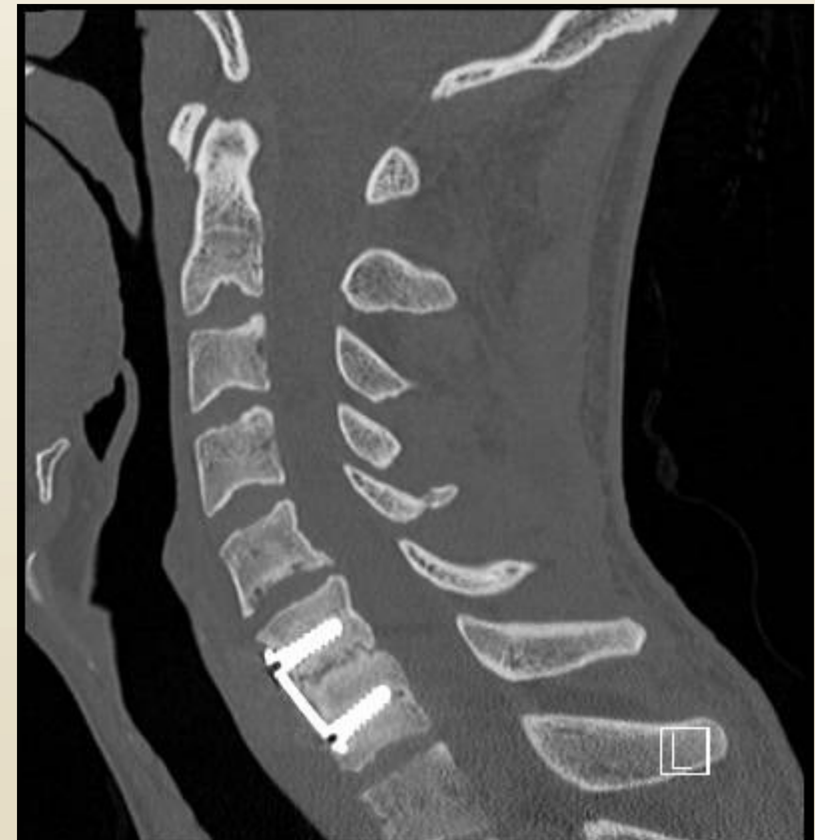
- Lessons:
  - Never assume
  - Keep good dialog with medical team
  - Own up
  - Help learning



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