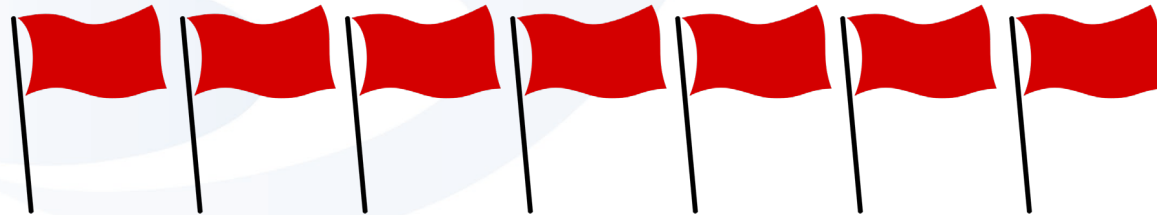


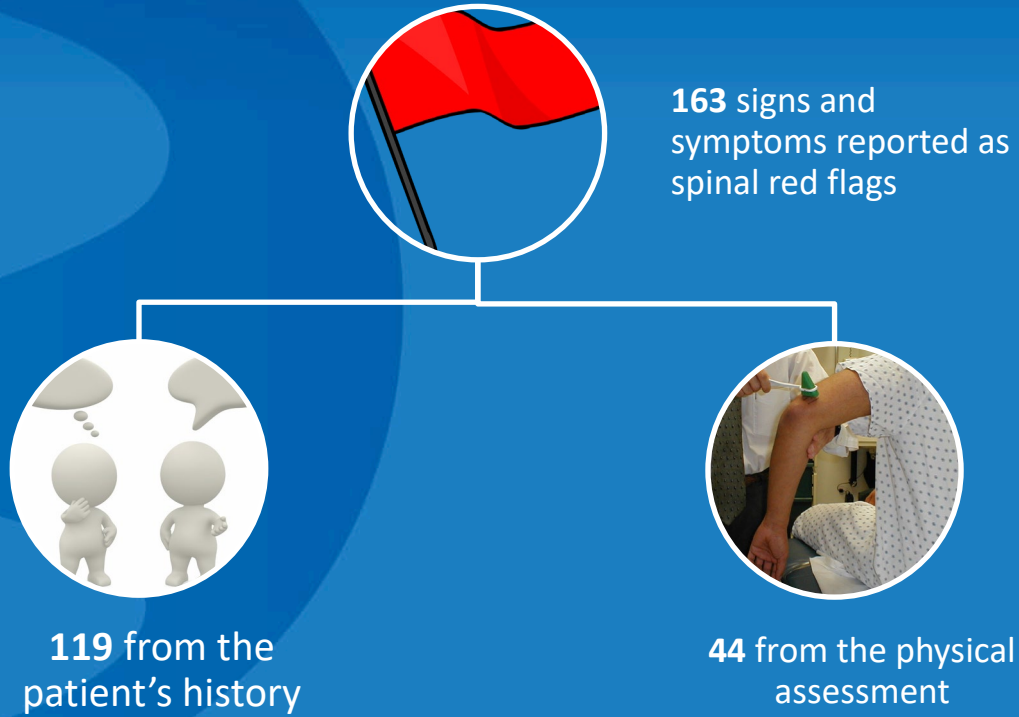
SPINAL RED FLAGS ASSESSMENT

Mr Jabir Nagaria & Ms Johanna Doyle
Consultant Neurosurgeon & Clinical Specialist MSK Physiotherapist

What To Look For?



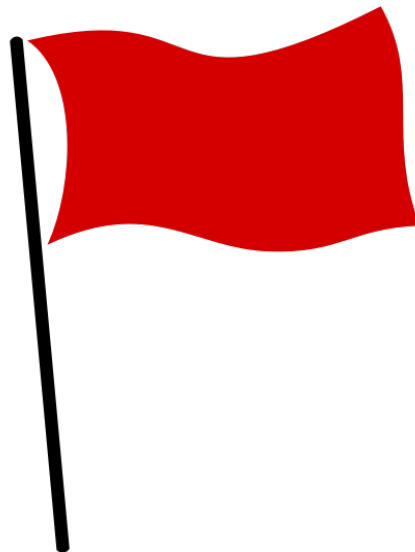
Assessing Red Flags



Red Flags

Typically we would consider the following as red flags in the patient's history

- Age <20 and >50 years
- Progressive symptoms
- Thoracic Pain
- Past history of Cancer
- Weight loss
- IVDU
- Night pain
- Systemically unwell (fever)
- Night sweats
- B&B dysfunction
- Sexual Dysfunction
- Gait disturbances



4 Key Categories For Red Flag Assessment

IFOMPT divide key focus of red flag assessment to identify:

1. **Cauda Equina Syndrome**
2. **Spinal Fracture**
3. **Malignancy (including Metastatic Bone Disease)**
4. **Spinal infection**



INTERNATIONAL FRAMEWORK FOR RED FLAGS FOR POTENTIAL SERIOUS SPINAL PATHOLOGIES[®]

Finucane L, Downie A, Mercer C, Greenhalgh S,
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*Endorsement: This clinical framework for identifying red flags for serious spinal pathologies is endorsed by the
International Federation of Orthopaedic Manipulative Physical Therapists (IFOMPT) a subgroup of the World
Confederation for Physical Therapists (WCPT)*

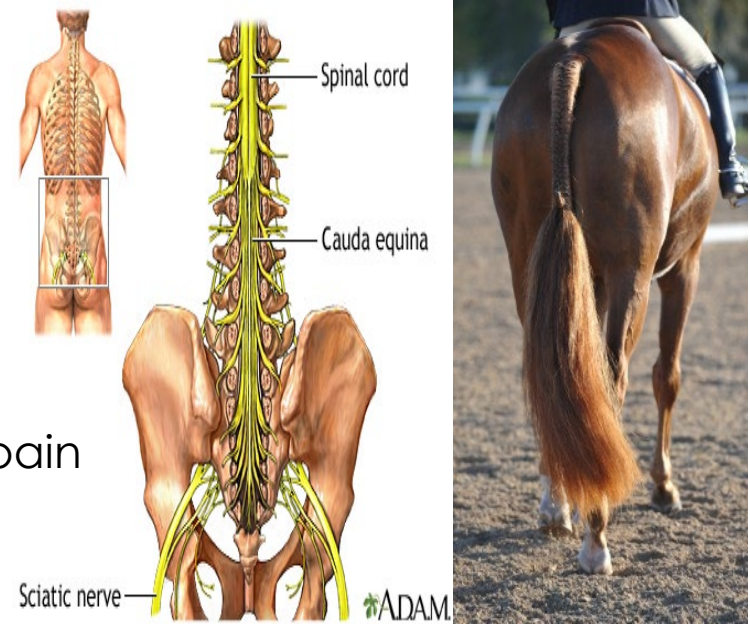
March 2020

1. Cauda Equina Syndrome – Key Features of Patient's History

Presentations that increase the likelihood of acute cauda equina:

Back pain WITH...

- Presence of saddle anaesthesia,
- bladder or bowel disturbance
- Age <50 years
- Unilateral onset progressing to bilateral leg pain
- Alternating leg pain
- Presence of new motor weakness
- Known disc prolapse of L4/5/S1



2. Spinal Fracture

Signs in patient's history:

- History of Osteoporosis or low bone density (vertebral most common OP#)
- Absorption disorders or eating disorders
- Trauma
- Previous spinal fracture
- Female > Male
- Older Age
- Thoracic pain (70% in thoracic; 10% in Cervical; 20% in Lumbar)
- Use of corticosteroids (>5mg 3/12)
- Severe pain
- Possible neurological symptoms



3. Spinal Malignancy

Risk Factors & symptoms:

- Past history of Cancer
- Unexplained weight loss
- Severe pain, may be worsening (not always linear)
- Night pain
- Unwell (late stages of disease)
- Thoracic Pain
- Neurological symptoms
- Unfamiliar back pain



4. Spinal Infection

Risk factors to consider:

- Immunosuppression
- Invasive surgery
- IVDU
- Social and environmental factors (living conditions, occupational exposure etc)
- Hx of TB
- Recent pre-existing infection



4. Spinal Infection

Possible Symptoms:

- Spinal pain – insidious onset, non-specific
- Neurological symptoms
- Fatigue
- Fever
- Unexplained weight loss /systemically unwell



What Will The Physical Assessment Tell Us?

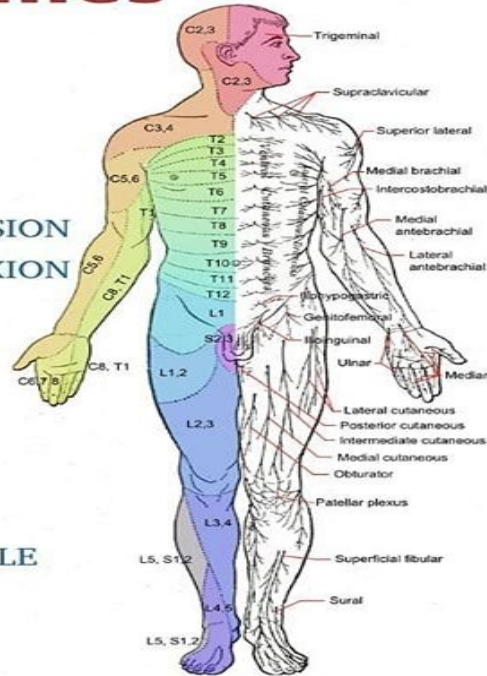
- Severity of symptoms
- Level of urgency for onward referral & management
- Create a clinical picture in addition to the subjective history
- Is there upper or lower motor neuron signs?
- Spinal level(s) affected
- Nerve root compromise?

What Might We Find?

Cauda Equina	Spinal Fractures	Malignancy	Spinal Infection
+/- Neuro signs	+/- Neuro signs	+/- Neuro signs	+/- Neuro signs
+/-Reduced Anal Tone (not always)	Spinal tenderness	Altered feeling in legs	Reduced ROM (muscle spasm)
Saddle sensory deficit	Spinal Deformity	Spinal Tenderness	
	Contusion/abrasion		

Myotomes

C1/C2: NECK FLEXION/EXTENSION
C3: NECK LATERAL FLEXION
C4: SHOULDER ELEVATION
C5: SHOULDER ABDUCTION
C6: ELBOW FLEXION/WRIST EXTENSION
C7: ELBOW EXTENSION/WRIST FLEXION
C8: FINGER FLEXION
T1: FINGER ABDUCTION
L2: HIP FLEXION
L3: KNEE EXTENSION
L4: ANKLE DORSI-FLEXION
L5: GREAT TOE EXTENSION
S1: ANKLE PLANTAR-FLEXION /ANKLE
EVERSION/HIP EXTENSION
S2: KNEE FLEXION



Key Takeaways

- Listen to the patient
- Use the assessment to help determine urgency for onwards referral and to build a clinical picture
- Trust your gut!

Reference For Framework:

Finucane, Downie, Mercer et al. (2020) *International framework for red flags for potential serious spinal pathologies*. International Federation of Orthopaedic Manipulative Physical Therapists

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Thoracic pain, Nocturnal Pain and Multiple Site Pain

- Fever and unexplained weight loss
- Bladder or bowel dysfunction
- History of carcinoma
- Ill health or presence of other medical illness
- Progressive neurological deficit
- Disturbed gait, saddle anaesthesia
- Age of onset <20 years or >55 years

Metastatic Disease

- Increased Life expectancy
- Progress in Oncology
- 70% of cancer patients
- Spine (50-75%)
- Pelvis, Femur and Proximal Humerus
- Breast, Lung, Prostate, Kidney and Blood

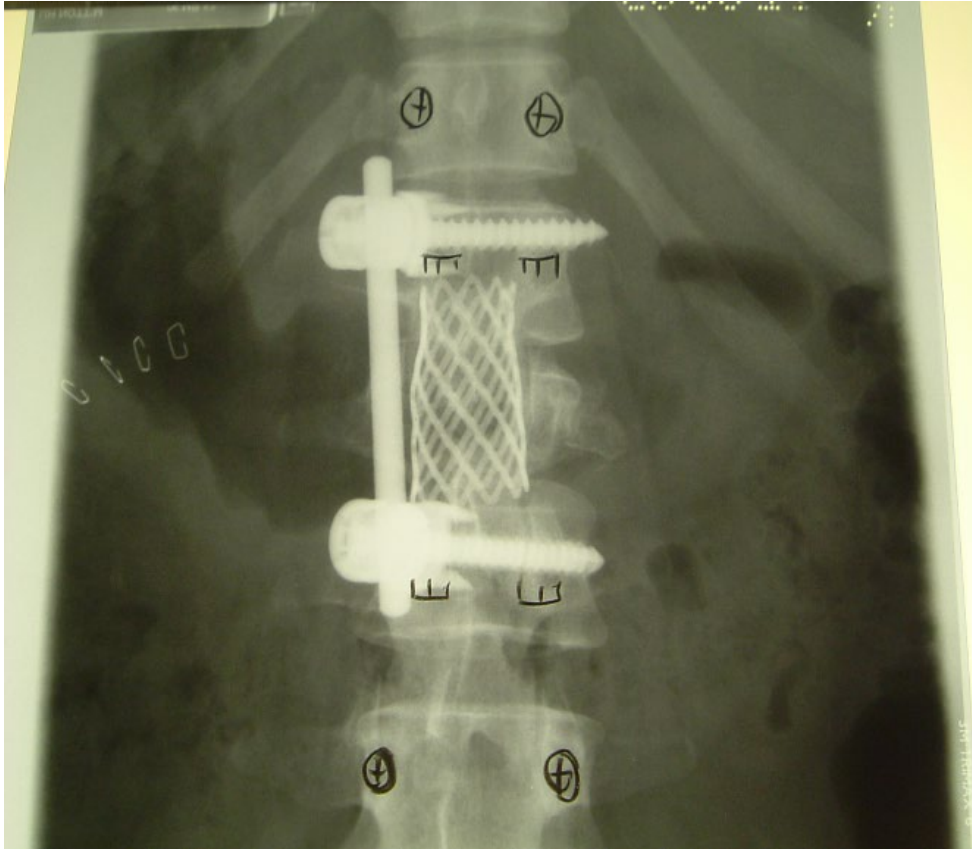
Metastatic Disease

- PAIN
- Biologic- early morning or night pain
- This pain will respond to steroids
- Mechanical- due to stability issues
- Walking, sitting or standing
- This pain will respond to narcotics

Red Flags Malignancy

- History of malignancy
- (Unexplained/unintentional) Weight loss
- (Increasing) Pain at night
- (Continuous) Pain at rest
- At multiple sites Over 1 month (duration)
- Pain at night that is not eased by prone position (or increasing in supine position)
- Failure to improve with treatment ([4–6 weeks) Age over 50 years
- Old age, Elevated erythrocyte sedimentation (ESR)
 - General malaise Multiple cancer risk factors Reduced appetite
 - Rapid fatigue Progressive symptoms, Fever, Paraparesi
 - Age (over 65), first episode of severe back pain with risk factors





Red Flags for Fracture

- History of Major/significant trauma
- (Systemic) Use of steroids
- Osteoporosis
- Age 60
- Older age (over 70)
- Pain Sudden onset Loading pain Minor trauma
- Fracture in history/previous fractures Low body weight Increased thoracic kyphosis Structural deformity Minor trauma with pain, history of osteoporosis and taking corticosteroids) Severe onset of pain (with minor trauma, age 50, prolonged steroid intake or structural deformity)

Hangman's Fracture



Odontoid Peg Fractures

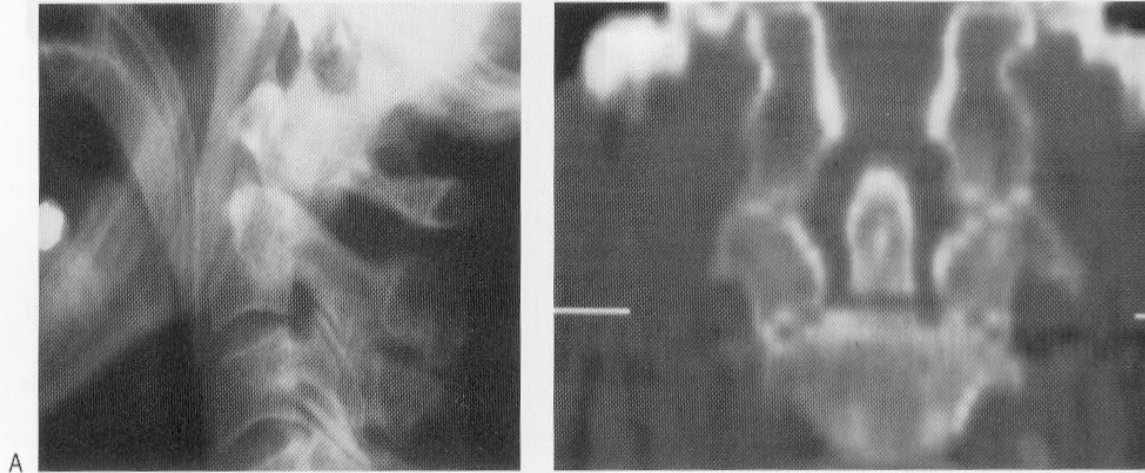
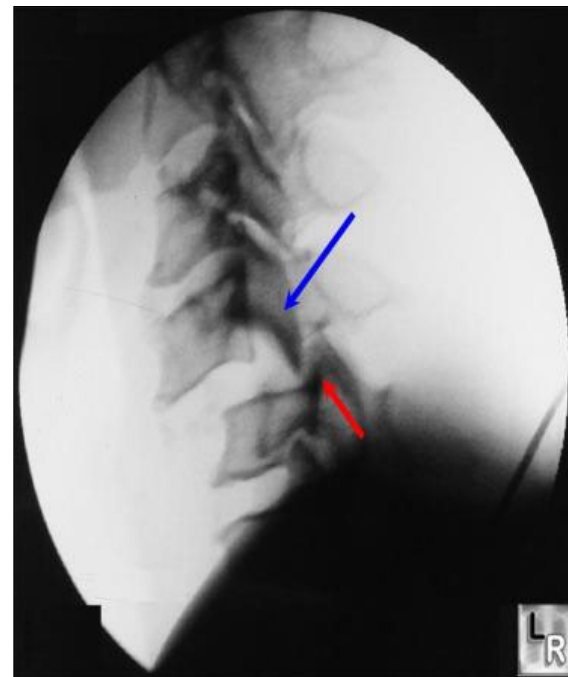


FIG. 6. (A) Lateral radiograph of an odontoid fracture. **(B)** Coronal CT of an odontoid fracture.



Spinal Cord Injuries

INCIDENCE=10000 USA/year-750/year UK

EPIDEMIOLOGY=male 15&35 years

Cervical spine and thoracolumbar junction

Cervical-40%,thoracic-10%,thoracolumbar-35%

Lumbar-3% rest of the spine-14%

Aetiology=RTA 55%

Occupational & Domestic 22%

Sports injuries 18%

Assault 5%

Spinal Infections

- Increased HIV
- Broad Spectrum antibiotics
- Steroids
- Immunosuppressive drugs
- IV Drug Abuse
- Malnutrition

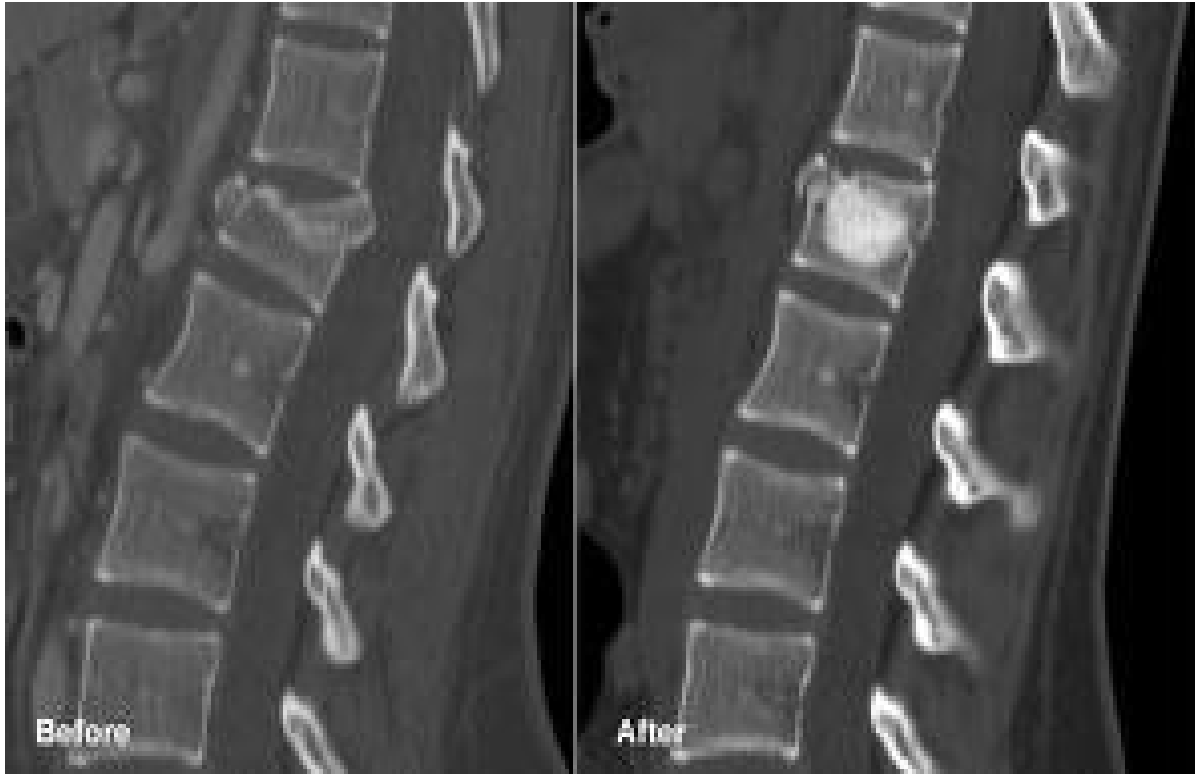
Red Flags for Infection

- Fever C38 C
- Use of corticosteroids or immunosuppressant therapy
- Intravenous drug abuse/drug addiction
- Immunodeficiency/AIDS
- Pain with recrudescence at night
- Intense night pain (and rest pain)
- Bone tenderness over the lumbar spinous process
- Previous back surgery
- Previous bacterial infections
- Penetrating wound
- Reduced appetite
- Rapid fatigue Impaired immune system

Osteoporosis

- 30% women and 20% men
- Fracture incidence 0 before age 50.
- Back pain and Postural issues
- Decline in physical performance
- One fracture quadruples the chances of second fracture

Osteoporosis



Cauda Equina Syndrome

- Saddle anaesthesia/perineal numbness.
- (Sudden onset) Bladder dysfunction (e.g. urinary retention, overflow incontinence)
- Sphincter disturbance/reduced tone, reduced wink
- Perianal sensory loss
- Progressive weakness in lower limbs/lower motor neuron weakness
(Wide) Spread sensory deficit (in lower limbs)
- Gait disturbance/abnormality
- Faecal incontinence
- Pain (radiating) in both legs

Diabetic Neuropathy

Diabetic neuropathy:

- Distal sensory neuropathy
- Proximal motor neuropathy
- Truncal neuropathy
- Compression neuropathy

- Chronic progressive radiculopathy or myelopathy
- Can present with haemorrhage
- Slow progression of gait symptoms
- Fiox-Alajouanine syndrome
- MRI and spinal angiography
- Endovascular or surgical treatment

Multiple Sclerosis

- CNS Dysfunction
- 2 or more sites of CNS involvement
- White matter involvement
- Chronic or relapsing/ remitting course
- Age of onset between 10 and 50
- No better explanation of symptoms

Transverse Myelitis

- Acute TM is Autoimmune or necrotising
- Viral prodrome with neurological deficit
- Necrotising TM is associated with paralysis and sphincter problems over hours or days
- EMG
- CSF studies

Motor Neuron Disease

- Weakness and atrophy of the hands
- Spasticity and hyperreflexia of the lower limbs
- Voluntary eye muscles and sphincters are spared
- Dysarthria and dysphagia
- Has to be differentiated from cervical myelopathy

Guillain Barre Syndrome

- Acute onset of peripheral nerve dysfunction with proximal muscle involvement
- History of toxin exposure

Thank you