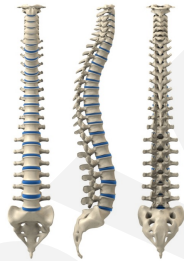


What You Need to Know About the Spine Part 1

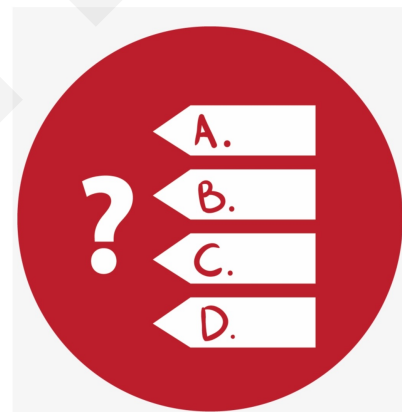
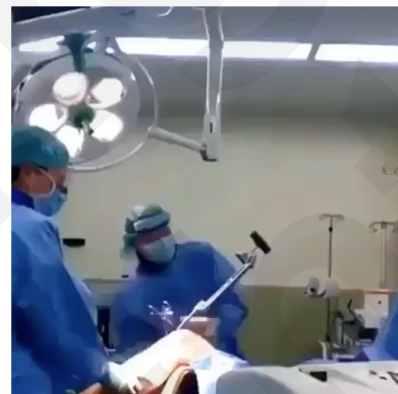
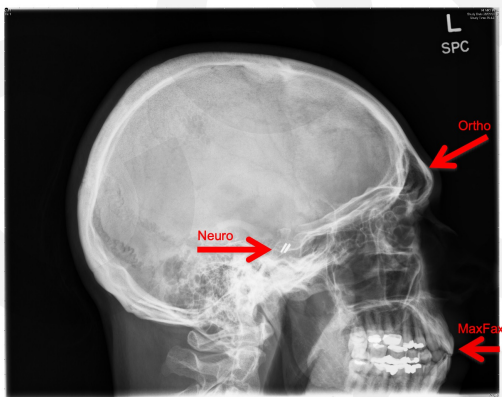


Mr M J H McCarthy
Consultant Spinal Surgeon



Everything in Case 14!

- SIT BACK AND LISTEN
- ACTIVELY ENGAGE
- USE THE CHAT FUNCTION AND ASK QUESTIONS



- A 20 year old female is involved in a high speed road traffic accident. She is brought straight into the resuscitation room of the emergency department by her partner and placed on a trolley. Her left lower limb is deformed and there is a lot of blood on her trousers. You are the junior doctor in the ED. Which of the following should you do next?
- Perform cardiopulmonary resuscitation
 - Assess her breathing
 - Attain intravenous access and give fluid resuscitation
 - Immediately straighten her lower limb and put pressure on the point of bleeding
 - Assess her airway whilst providing cervical spine control

- A 35 year old man attends the emergency department of a district general hospital complaining of lower cervical neck pain having fallen off his mountain bike at low velocity. He has a normal neurological examination and a slightly restricted range of movement in his neck which is slightly tender in the midline. The doctor arranges an XR which reveals normal bony anatomy from the Occiput to C6. What is the next most appropriate investigation / management?
- CT Cervical Spine
 - MRI Cervical Spine
 - XR Cervical Spine with facet views
 - Discharge to GP follow up
 - Cervical collar and fracture clinic follow up

- A 26-year-old man is reviewed on the spinal injuries unit. On examination he has an asymmetric spastic paraparesis and has a urinary catheter in situ. In his right leg there is loss of joint position sense below the anterior superior iliac spine and in his left leg there is loss of pain and temperature below T8. What is the most likely site of the lesion?
- Anterior horn cell
 - Anterior spinal cord
 - Dorso-lateral spinal cord
 - Cauda equina
 - Lumbosacral plexus

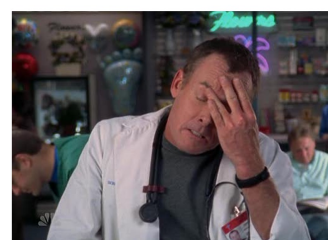
- A 68 year old diabetic male presents to his General Practitioner with a 3 month history of worsening thoracic pain and a 1 week history of altered sensation in his feet, difficulty walking and passing urine. What is the most likely diagnosis?
- Cauda equina syndrome
 - Cervical epidural abscess
 - Diabetic ketoacidosis
 - Metastatic Spinal Cord Compression
 - Multiple sclerosis

What do I need to know...

Everything in Case 14...

- A 30 year old diabetic male presents to his General Practitioner with a 2 day history of severe neck pain, fever, altered sensation in his hands and difficulty with coordination and dexterity. Which condition needs to be ruled out urgently?
- Diabetic peripheral neuropathy
 - Diabetic ketoacidosis
 - Cervical epidural abscess
 - Cervical myelopathy
 - Transverse myelitis

- Anatomy / Physiology / History / Examination
- **Trauma / Tumour / Infection**
- Cauda Equina Syndrome
- Myelopathy
- DDD / Disc Prolapse
- Stenosis / Spondylolisthesis
- **Scoliosis** / Kyphosis
- Inflammatory Conditions
- Low Back Pain - Adult
- Low Back Pain - Child
- And more...



General Rule:

Paraparesis = sPine
Hemiparesis = Head

CARDIFF
UNIVERSITY
PRIFYSGOL
CAERDYDD



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Don't Forget This Slide...



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Goals of Spine Trauma

- Protection
- Detection
- Optimize conditions for neuro recovery
- Maintain / restore spinal alignment
- Minimize loss of spinal mobility
- Obtain healed and stable spinal column
- Rehabilitation

• #s = Manage the ass soft tissue injury

Real Purpose of Surgery?



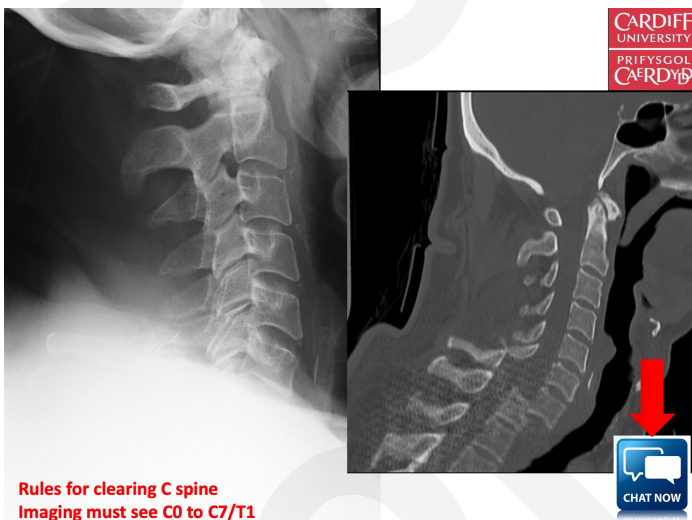
Management Spinal Injury

- ABCDE / ATLS Approach (not typical H&Ex)
- Protection - **THINK SPINAL CORD INJURY**
 - Maintain airway with spine control
 - Always aim to have a team of 6 for transfers (min 4 for log rolls)
- Detection
 - Level of injury
 - Complete or Incomplete cord injury
 - Spinal or Neurogenic shock
 - Hx / Exam / XR / CT / MRI
- Management
 - Conservative or Surgical treatment

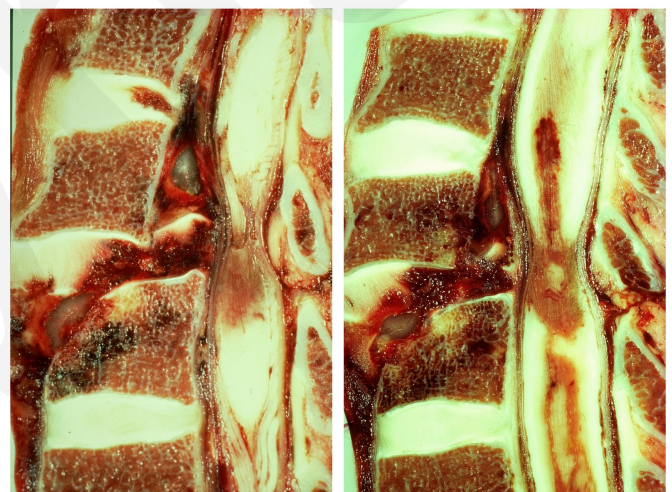
Clinical Instability

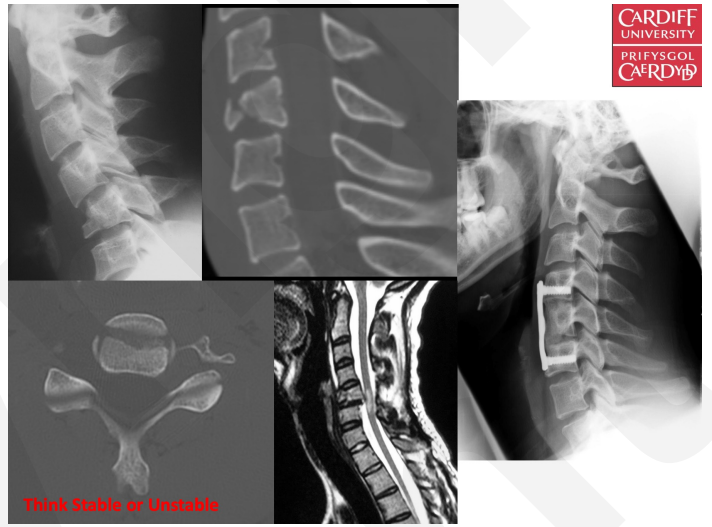
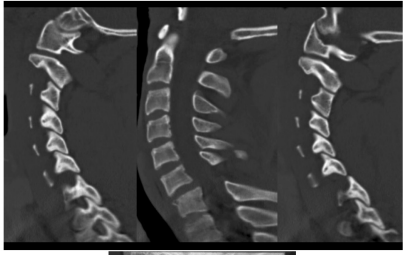
- The loss of the ability of the spine under **normal physiological loads** to maintain its pattern of displacement so that there is no initial or additional **neurological deficit**, no major **deformity** and no incapacitating **pain**

Stable $\longleftrightarrow$ Unstable



Rules for clearing C spine
Imaging must see C0 to C7/T1

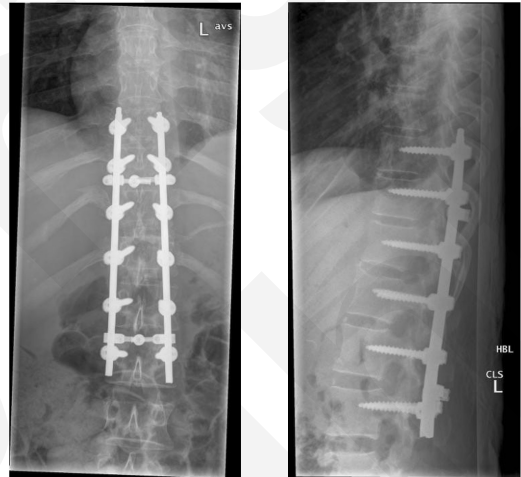




Think Stable or Unstable



Think Stable or Unstable



Think Stable or Unstable

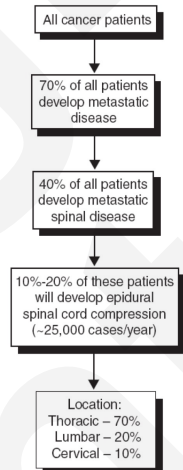


Red Flags

- <16yrs or >50yrs with NEW onset pain
- Unwell / unexplained weight loss / unexplained fevers
- Past history of cancer, recent serious illness, recent significant infection, previous long standing steroid use, HIV / AIDS, end stage renal disease, osteoporosis, Paget's disease, alcohol or drug abuse
- Widespread neurological deficits
- Pain is non-mechanical
- Thoracic pain
- Spinal deformity
- History of significant trauma / injury
- Fails to improve with treatment



Metastatic Spinal Cord Compression



Mets

Patient Presentation

- Pain – 95% presenting feature
 - Expansion of cortex of vertebral body
 - Not relieved by rest
 - Intensifies night – venous engorgement
 - Pathological fracture / Spinal instability
 - Breast / prostate – twelve month history
- Neurological compression – 5%
 - Nerve roots or spinal cord
 - Weakness symmetrical in 60-85%
 - Bladder / bowel loss is a late feature
- Incidental finding whilst Ix primary tumour

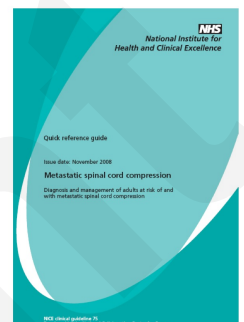
First Symptoms	
Pain	95%
Weakness	5%
Ataxia	1%
Sensory loss	1%

Duration of symptoms before diagnosis	
2-5 months median	

Mets

NICE MSCC Guidelines

- Suspected MSCC with neurological signs and symptoms = urgent MRI of whole spine **within 24 hours**
- Suspected Spinal Mets (normal neurology) = MRI whole spine within a week of suspected diagnosis



Mets

Indications for Surgery

- Progressive / impending neurological deficit
- Spinal instability / collapse / deformity
- Paralysed <24hours
- Intractable pain (including paralysed >24 hours)
- Histological confirmation
- Growing tumour resistant to non-operative measures
- Relapse after / deterioration during radiotherapy
 - Spinal cord radiotherapy tolerance

Mets

Surgical Candidate

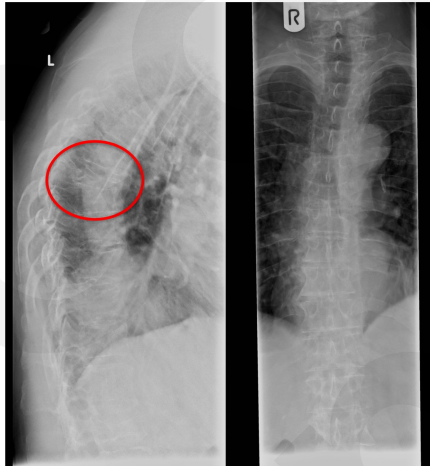
- Indication present
- Patient willing to have surgery
- Prognosis > 3-4 months
- Patient is fit enough to have surgery
- Surgery is technically possible (ask the surgeon!)

Mets

Steroids

- Works by reducing oedema (cf trauma don't give them)
- 16mg Dexamethasone daily
- Load then 8mg bd
- Reduce dose over 5-7/7 post intervention
 - Neurology deteriorates – increase dose temporarily
- Monitor blood glucose
- Proton pump inhibitor (gastric cover)

Mets



Thoracic pain
Raised Ca⁺⁺

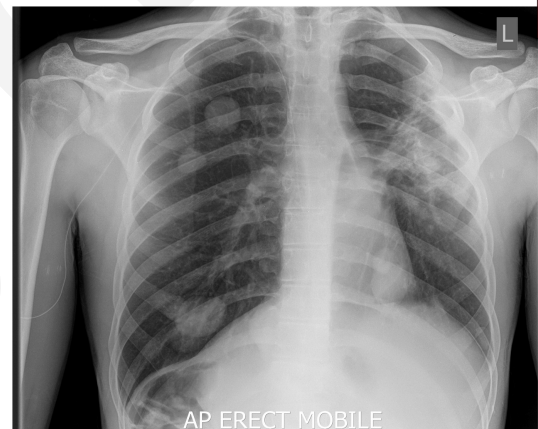
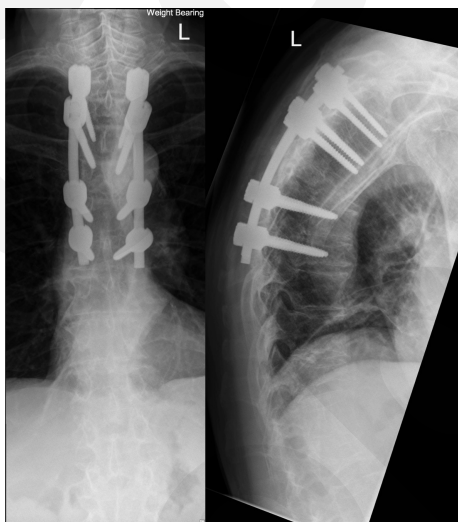
Prognosis

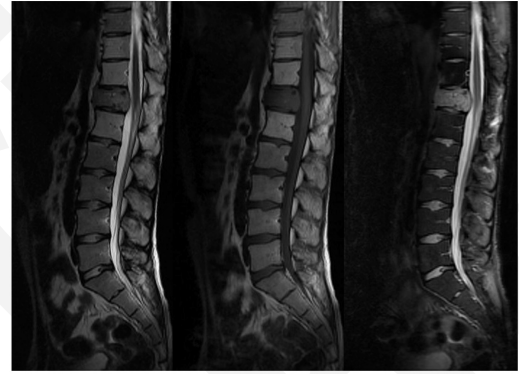
- Median survival MSCC – 6 months
- Ambulatory patients with radiosensitive tumours
 - Best prognosis
 - Likely to remain mobile
- It is better to keep somebody walking than to try and make them walk again (i.e. do something before they become paralysed)

Mets

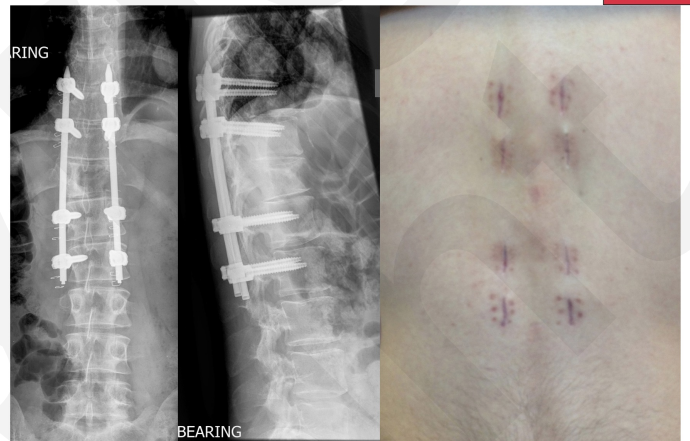
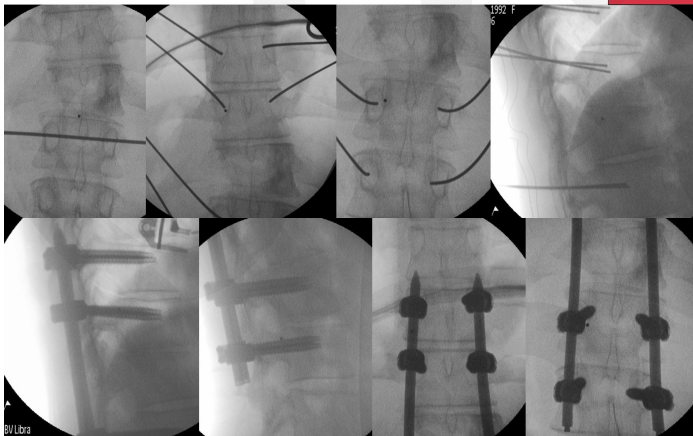


Diagnosis?





Ideas...



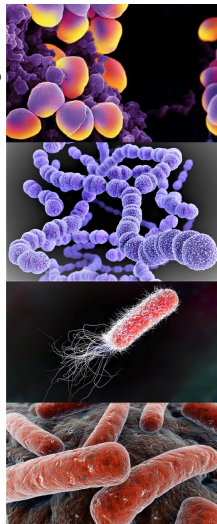
Spinal Infection

- Acute fever and pain
- More commonly:
 - Vague symptoms, chronic illness, low grade fever and back pain
 - 50% delayed $\Delta > 3/12$
- Back pain >90%
 - C 15% Th 35% L 50%
- Fever 50%
- Neurology 15%



Discitis / Osteomyelitis

- Spread:
 - Haematogenous
 - Contiguous
 - Direct Implantation
- Disc Involvement:
 - Pyogenic infection nearly always
 - Granulomatous do not typically involve the disc



Spinal Infection - Patient

- Diabetic / Drug abuse
- Immuno / Immigrant
- Steroids / Spinal Surg
- Genitourinary issues
- Renal F / Rheumatoid
- Adolescents
- Cardiac issues
- Elderly



Rule of 50%

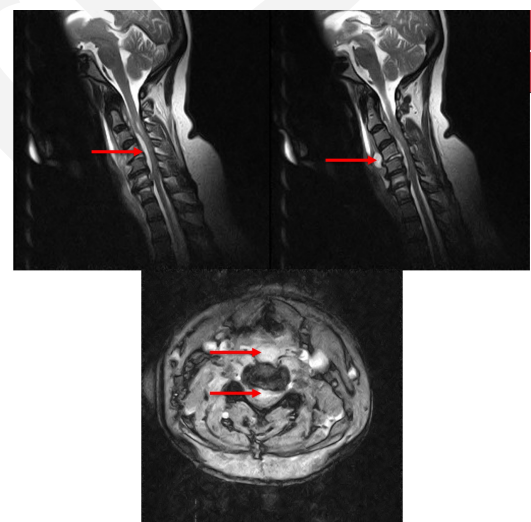
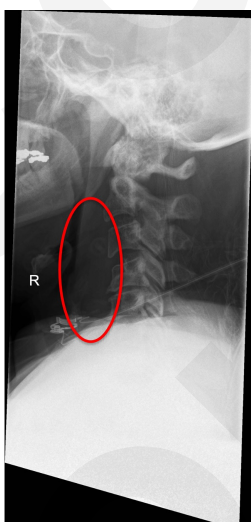
- 50% > 50 yrs old
- 50% have fever
- WCC normal in 50%
- Genitourinary tract source in 50%
- Staph aureus in >50%
- Lumbar spine in 50%
- No primary site found in 50%
- Symptoms > 3/12 in 50%

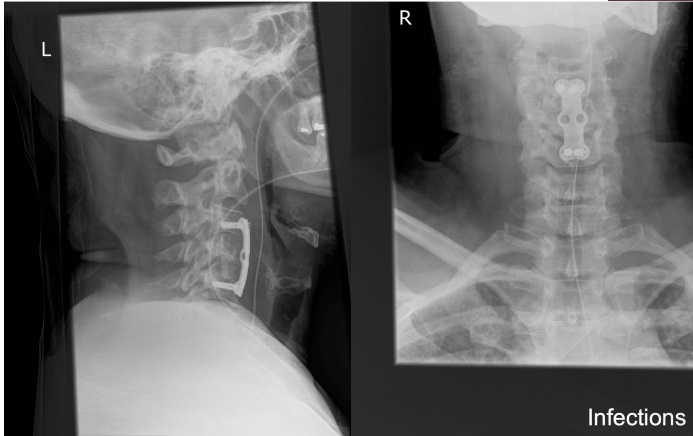
The Treatment

- Non-specialist in the majority of cases
- Rest / Brace
- Blood Cultures
- Massive and prolonged antibiotics
 - Talk to the bug doctors
 - Pref 2 agents with good bone penetration
- Watch for bone stock loss
 - Don't wait for the deformity to get worse
 - Get erect XRs during course of treatment
- “Complicated” cases – involve the spinal team



Pain
Fever
Neurology





Surgical Site Infections (SSI)

- Spinal SSI 0.7 – 12+%
- Increased morbidity, mortality and health care costs
- SSIs = 1/3 of Hospital Acquired Infections
- CDC Jan 2014 SSI:
 - 30 days after surgery without instrumentation
 - 1 year with instrumentation
 - Other classifications:
 - Acute (<3 weeks)
 - Subacute (3 weeks to 3 months)
 - Chronic (>3 months)

CDC Jan 2014

- All SSIs:

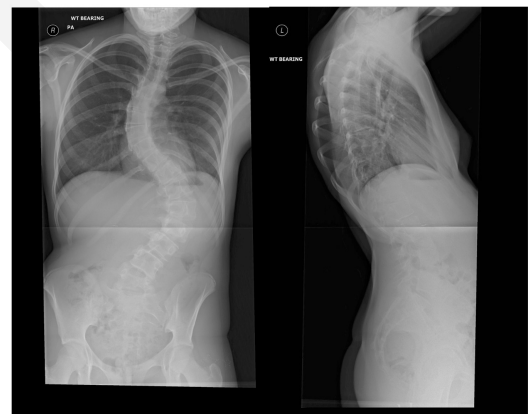
– Staph aureus	30%
– Coag neg staph	13.7%
– Enterococcus	11.2%
– E.coli	9.6%
– Pseudomonas	5.6%
- 1. Direct inoculation at surgery
- 2. Contamination early post op
- 3. Contamination haematogenous seeding

SSIs - Some Ps

- Patient
- Pathology (incl micro factors)
- Procedure
- Preoperative
- Perioperative
- Postoperative
- Proper
- Planning Preparation
- Prevents
- Piss
- Poor
- Performance



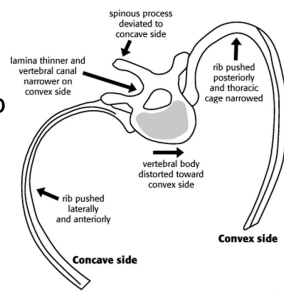
Scoliosis



Adams Test



Rib Hump



BOX 3-1 Etiologic Classification of Scoliosis

Idiopathic Early-onset Late-onset < 10yrs Adult	Neuromuscular—cont'd Spinocerebellar degeneration Cerebral palsy Lower motor neuron Poliomyelitis Myopathic Congenital hypotonia Duchenne muscular dystrophy
Congenital Osteogenic (vertebral anomaly) Anomalous formation Wedge vertebra Hemivertebra Anomalous segmentation Unilateral bar Fused ribs Fused vertebra Neuropathic (spinal dysraphism) Tethered cord Chiari malformations Syringomyelia Diastematomyelia Meningocele/myelomeningocele	Developmental Syndromes Skeletal dysostosis (e.g., neurofibromatosis) Skeletal dysplasias (e.g., osteogenesis imperfecta)
Neuromuscular Neuropathic Upper motor neuron	Tumor Associated Vertebral Osteoblastoma Osteoid osteoma Intraspinal Intradural (e.g., astrocytoma) Extradural (e.g., neurofibroma)

Congenital Scoliosis

- Failure Formation / Segmentation / Both

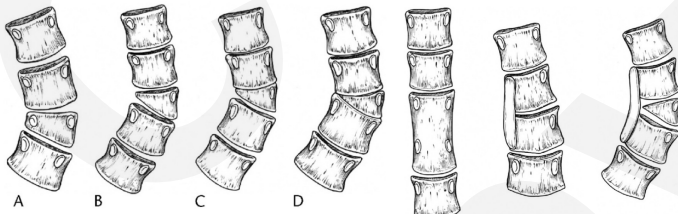


FIGURE 1. Schematic representation of formation failures. A, Wedge vertebra. B, Fully segmented hemivertebra. C, Partially segmented hemivertebra. D, Unsegmented hemivertebra. Reproduced with permission from Hedequist and Emans.¹⁴

FIGURE 2. Schematic representations of failures of segmentation. A, Block vertebra. B, Bar. C, Bar with contralateral hemivertebra. Reproduced with permission from Hedequist and Emans.¹⁴

Ass Congenital Anomalies

- V - Vertebral
- A - Anorectal
- C - Cardiac
- T - Tracheo
- E - Esophageal
- R - Renal
- L - Limbs

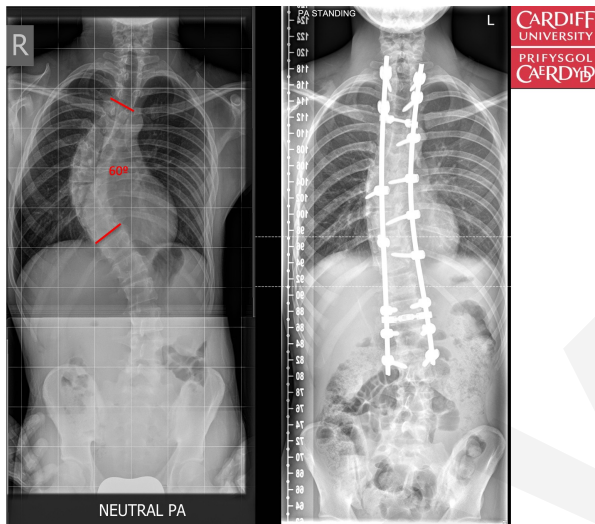


Scoliosis

- Refer
- Non-surgical: possible bracing
- Indications for surgery:
 - Curve > 40° skeletally immature
 - Curve > 50° skeletally mature
 - Relentless curve progression
 - Cardiopulmonary complications
 - Function
 - Prevent neurological deterioration

Objectives of Treatment

- Prevent curve progression
- Permit longitudinal growth
- Avoid cardio-pulmonary complications
 - Alveoli develop up to 9yrs age
 - Spinal (chest) deformity limits lung formation
- Facilitate sitting and handling (large curves)
 - Level shoulders and pelvis
 - Centre of Gravity over sacrum
- Cosmesis



- A 20 year old female is involved in a high speed road traffic accident. She is brought straight into the resuscitation room of the emergency department by her partner and placed on a trolley. Her left lower limb is deformed and there is a lot of blood on her trousers. You are the junior doctor in the ED. Which of the following should you do next?
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 - Assess her breathing
 - Attain intravenous access and give fluid resuscitation
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- CT Cervical Spine**
- MRI Cervical Spine
- XR Cervical Spine with facet views
- Discharge to GP follow up
- Cervical collar and fracture clinic follow up

A 26-year-old man is reviewed on the spinal injuries unit. On examination he has an asymmetric spastic paraparesis and has a urinary catheter in situ. In his right leg there is loss of joint position sense below the anterior superior iliac spine and in his left leg there is loss of pain and temperature below T8. What is the most likely site of the lesion?

- Anterior horn cell
- Anterior spinal cord
- Dorso-lateral spinal cord**
- Cauda equina
- Lumbosacral plexus

- A 68 year old diabetic male presents to his General Practitioner with a 3 month history of worsening thoracic pain and a 1 week history of altered sensation in his feet, difficulty walking and passing urine. What is the most likely diagnosis?
- Cauda equina syndrome
 - Cervical epidural abscess
 - Diabetic peripheral neuropathy
 - Metastatic Spinal Cord Compression**
 - Multiple sclerosis

- A 30 year old diabetic male presents to his General Practitioner with a 2 day history of severe neck pain, fever, altered sensation in his hands and difficulty with coordination and dexterity. Which condition needs to be ruled out urgently?
- A. Diabetic peripheral neuropathy
- B. Diabetic ketoacidosis
- C. Cervical epidural abscess**
- D. Cervical myelopathy
- E. Transverse myelitis

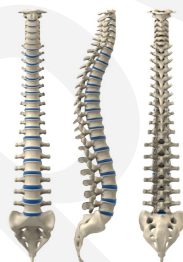


CRASH COURSE IN ORTHOPAEDICS: THE SPINE

What You Need to Know About the Spine Part 2



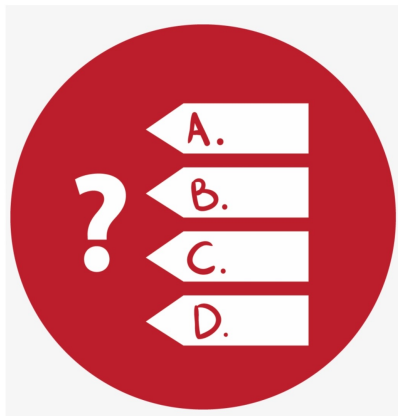
Mr M J H McCarthy
Consultant Spinal Surgeon



Everything in Case 14!

- SIT BACK AND LISTEN
- ACTIVELY ENGAGE
- USE THE CHAT FUNCTION AND ASK QUESTIONS





- A 26 year old female wakes up with severe pain in her right leg, numbness in her right buttock and outer aspect of her right foot. She notices difficulty walking up the stairs. What is the most likely diagnosis?
- Cauda equina syndrome
 - L5/S1 lytic spondylolisthesis
 - Left L4/5 disc prolapse
 - Right L4/5 disc prolapse
 - Right L5/S1 disc prolapse

- A 26 year old female wakes up with severe pain in her right leg, numbness in both buttocks and outer aspect of her right foot. She notices difficulty walking up the stairs. When she goes to the toilet she has no control of her bladder. What is the most likely diagnosis?
- Cauda equina syndrome
 - Central L4/5 disc prolapse
 - L5/S1 lytic spondylolisthesis
 - Right L4/5 disc prolapse
 - Right L5/S1 disc prolapse

- A 70 year old male presents to his General Practitioner with neck pain, bilateral heaviness in the arms and poor dexterity. He feels increasingly unsteady and has nocturia and terminal dribbling when passing urine. The most likely diagnosis is:
- Cauda equina syndrome
 - Cervical myelopathy
 - Epidural abscess
 - L4/5 degenerative spondylolisthesis
 - Prostate cancer metastases

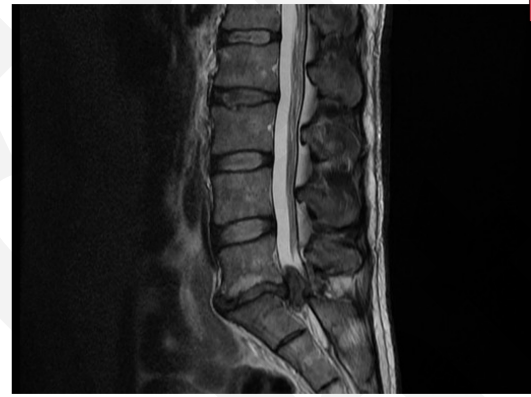
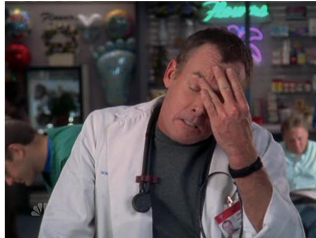
- A 30 year old male presents to his General Practitioner with a 2 week history of low back pain. It started after he lifted up a heavy box at work. There are no red flags. Examination is normal. The most likely diagnosis is:
- Cauda equina syndrome
 - Degenerative disc disease
 - Facet joint arthrosis
 - L5/S1 disc prolapse
 - Muscular mechanical low back pain

- A 70 year old male presents to his General Practitioner with low back pain, bilateral leg heaviness when standing for 10 minutes, severe left leg pain in an L5 distribution when walking for 5 minutes, nocturia and terminal dribbling when passing urine. The most likely diagnosis is:
- L4/5 degenerative spondylolisthesis
 - L5/S1 lytic spondylolisthesis
 - Cauda equina syndrome
 - Prostate cancer metastases
 - Epidural abscess

What do I need to know?...

Everything in Case 14...

- Anatomy / Physiology / History / Examination
- Trauma / Tumour / Infection
- **Cauda Equina Syndrome**
- **Myelopathy**
- **Disc Prolapse**
- **Stenosis / Spondylolisthesis**
- Scoliosis / Kyphosis
- Inflammatory Conditions
- Low Back Pain - Adult
- Low Back Pain - Child
- And more...

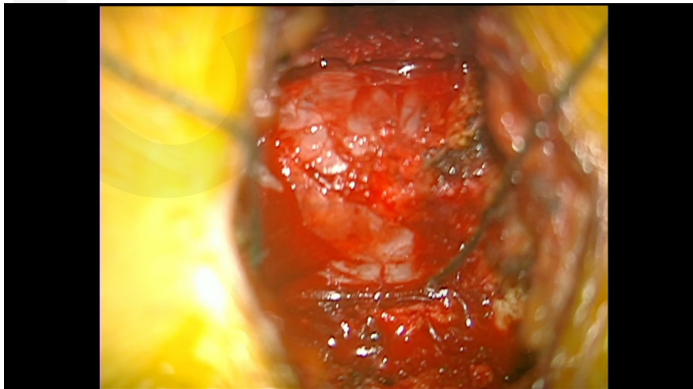


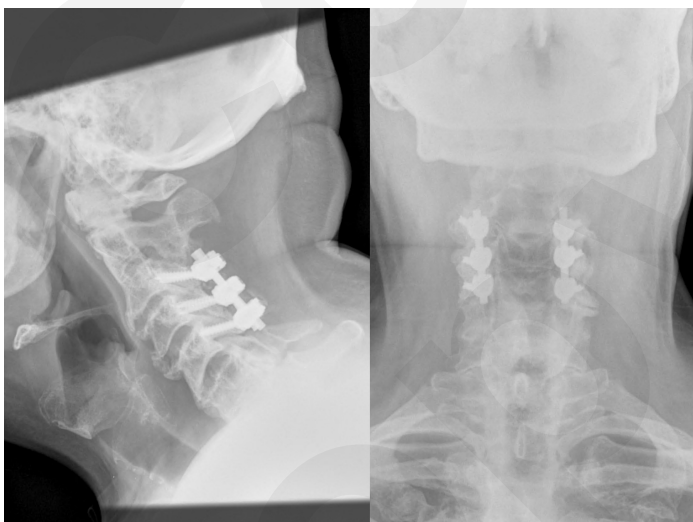
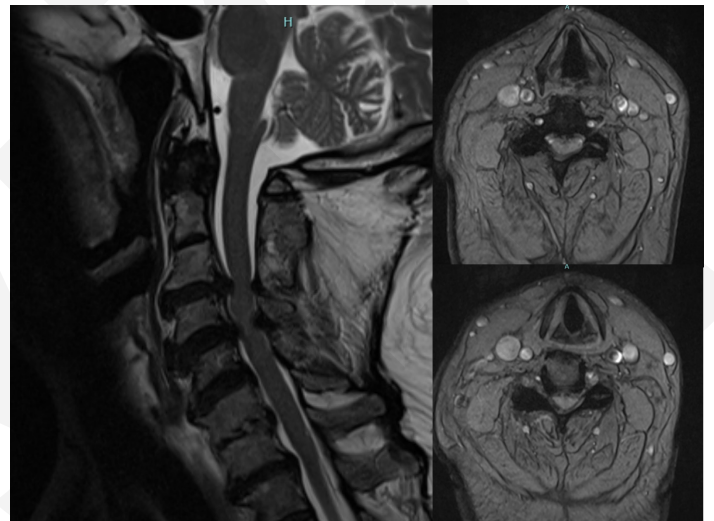
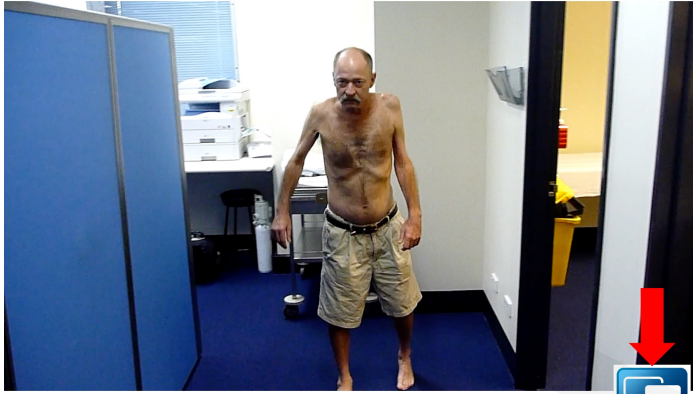
Cauda Equina Syndrome

- A spectrum of low back pain, uni / bilateral radiculopathy, saddle anaesthesia and motor weakness in the lower extremities with variable rectal and urinary symptoms
 - Usually due to a canal filling disc compressing the entire cauda equina
 - Others - Tumour Infection Trauma
- 1 / 100,000
- Disproportionately high medicolegal profile
 - Missed diagnosis >>£500,000

Cauda Equina Syndrome

- SPHINCTERIC DISTURBANCE
- **DO A RECTAL EXAM**
 - "Patient has no anus or surgeon has no fingers"
 - "If you don't put your finger in it you put your foot in it"
- **BLADDER SCAN (>200ml)**
- **GET AN MRI SCAN**
- ONLY MODIFIABLE FACTOR IS TIME TO DIAGNOSIS AND SURGERY





Myelopathy Radiculopathy

	Myelopathy = CORD	Radiculopathy = ROOT
Levels affected	>1	Usually 1
Bilateral Symptoms	Common	Rare
Sensation	Variable	Decreased in Dermatome
Motor	Weakness	Weakness in Myotome
Tone	Spastic	Flaccid
Reflexes	Hyperreflexic	Hyporeflexic
Gait	Broad based Poor balance	Depends on level (e.g. foot drop with L4)
Findings	Babinski Clonus	Pain Dysaesthesia

UMN

LMN

Symptoms - Myelopathy

- Subtle / varied presentation
- Pins & needles / numbness in hands
- Stiff hands and reduced dexterity
- Balance problems / recurrent falls
- Stiff legs that tire easily
- Shooting sensations through body
- Spontaneous twitching / jerking limbs
- Bowel or bladder disturbance (uncommon)
- Pain is not a common symptom

Signs - Myelopathy

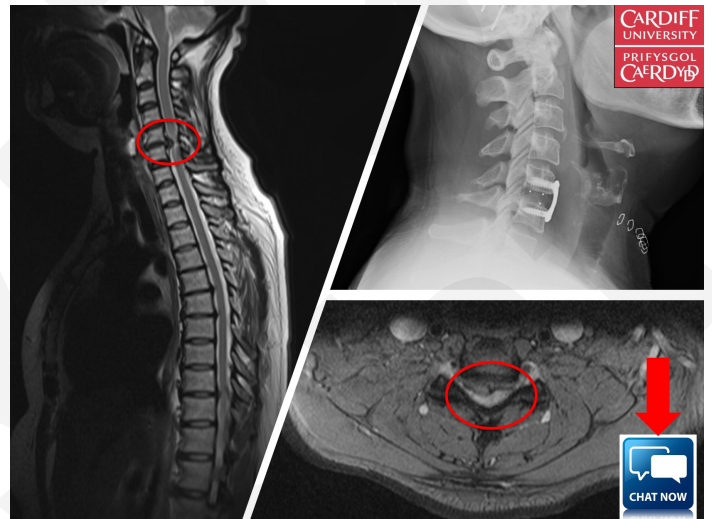
- Unsteady wide based gait
- Romberg / Walking Romberg
- Unable heel toe gait
- Triangle step test
- L'Hermittes sign
- Hoffman's sign
- Hyperreflexia
 - Ankle Clonus / Inverted Radial Reflex
- Extensor Plantar Response (Babinski)
- Increased Tone
- Grip release test
- Finger escape sign

Coordination requires

**2 of
Visual
Vestibular
Cerebellar**

Myelopathy = Surgery (most of the time)

- "Operation prevents progression"
- "Surgical treatment is better than no treatment"
- Irreversible vascular insult / change to cord may explain why some patients fail to improve post operatively
- Despite presenting with mild symptoms it is not possible to predict which patients will deteriorate
- **Surgical intervention is the most predictable way to prevent neurological deterioration**

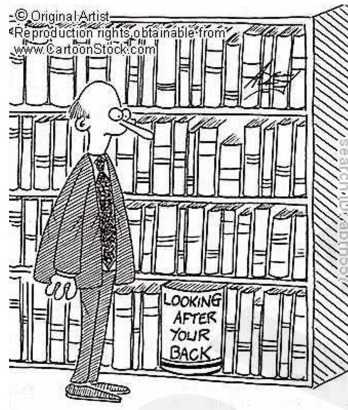


LBP Sciatica

- LBP Statistics
 - During 1 year up to 50% population will have LBP
 - 80% adults experience LBP during their life
 - 85% LBP no clear pathology identified
 - 90% acute LBP recover within 6/52
 - 7% develop chronic LBP
 - Most common cause disability in adults <45yrs
- Sciatica Statistics
 - 1.6% lifetime prevalence of radicular leg pain lasting >2 weeks
 - 60% settle in 6/52
 - 90% settle in 3/12
 - Remaining 10% - half settle by 1 year

Where does the pain come from?

- Nerves / Cord
- Muscles
- Ligaments
- Disc
- Bones / Joints

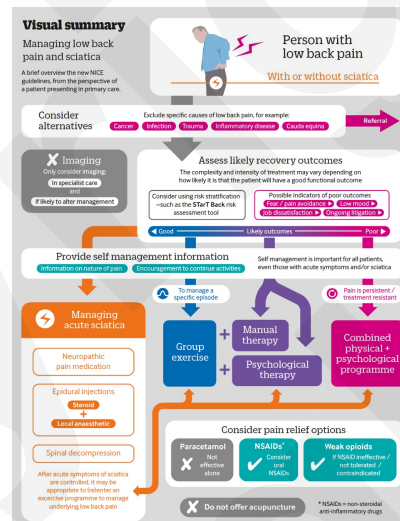
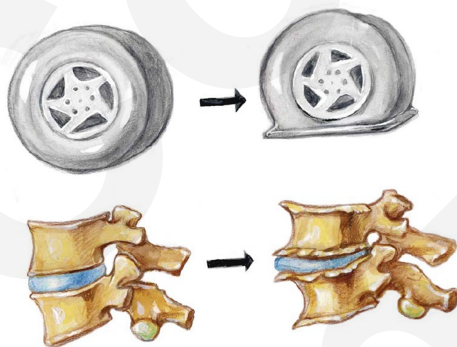


Main Causes of LBP

- Non-specific LBP / Mechanical / Muscular
- Degenerative Disc Disease / Discogenic
- Facet Joint Arthrosis
- Spondylolisthesis / Spondylolysis
- Degenerative Scoliosis / Kyphosis
- Inflammatory Conditions
- Sacroiliac Joint Pain
- **ATIT**



The Pathology



Low back pain and sciatica in over 16s: assessment and management

NICE guideline
Published: 30 November 2016
nice.org.uk/guidance/ing52

Don't be **ATIT**

- Exclude the serious:-
 - **Abdominal** / Retroperitoneal Causes
 - AAA, Pancreatitis, Malignancy
 - Spinal **Trauma**
 - Spinal **Infection**
 - Spinal **Tumour** - Primary / Mets

How do you "Identify" cause?

- VERY DIFFICULT – SKILL / ART / EXPERIENCE
 - Muscular - commonest
 - Disc – worse forward bend and sitting
 - Facet – worse extension and sit to stand
 - SIJ – not above, provocative tests
 - Radicular pain due to:
 - Disc – worse forward bend (root gets stretched over disc)
 - Stenosis – worse extension (canal gets narrower)

- You often don't have to – most acute LBP / sciatica settles down especially if early intervention

- ### Adult patient consultation with LBP

Presenting symptoms

Pain history and physical examination

Duration of symptoms

Anting (tender) to palpation

Symptoms and signs of radicular syndromes

Psychosocial factors

Exclude non-spinal causes

Any clinically significant

Any significant past leg, paravertebral, systemic, or systemic

Any significant past leg, paravertebral, systemic, or systemic

Any significant past leg, paravertebral, systemic, or systemic

Diagnosing things

Think about things

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Imaging Finding	Age (yr)						
	20	30	40	50	60	70	80
Disk degeneration	37%	52%	68%	80%	88%	93%	96%
Disk signal loss	17%	33%	54%	73%	86%	94%	97%
Disk height loss	24%	34%	45%	56%	67%	76%	84%
Disk bulge	30%	40%	50%	60%	69%	77%	84%
Disk protrusion	29%	31%	33%	36%	38%	40%	43%
Annular fissure	19%	20%	22%	23%	25%	27%	29%
Facet degeneration	4%	9%	18%	32%	50%	69%	83%
Spondylolisthesis	3%	5%	8%	14%	23%	35%	50%

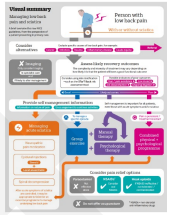


Alerting features	Diagnosis and prevalence	Image type	Timing
- Older age (>65 years for men, >75 years for women) - Prolonged corticosteroid use - Severe trauma - Presence of contusion or abrasion	Vertebral Fracture 0.7% - 4.5%	X ray possible CT scan	- Major risk: immediate - Minor risk: 1 month "watch and wait"
- History of malignancy - Strong clinical suspicion - Unexplained weight loss, >50 years	Malignancy 0.2%	X ray and MRI	- Major risk: immediate - Minor risk: delay
- Fever or chills - Immune compromised patient - Pain at rest or at night - Intravenous drug user - Recent injury, dental or spine procedure	Spinal Infection 0.01%	X ray and MRI	Immediate
- New bowel or bladder dysfunction - Perineal numbness or saddle anaesthesia - Persistent or progressive lower motor neuron changes	Cauda equina syndrome 0.04%	MRI	Immediate
- Progressive lower limb motor weakness - Motor deficits at multiple levels	Severe neurologic deficits	MRI	Immediate
- Chronic back pain (>3 months' duration), with back pain onset before 45 years of age and one or more of the following: - Inflammatory back pain with at least 4 of: - Age of onset 40 years or younger - Insidious onset - Improvement with exercise - No improvement with rest - Pain at night - with improvement when getting up - Peripheral manifestations (synovitis, peripheral arthritis, enthesitis, or dactylitis) - Extra-articular manifestation (psoriasis, inflammatory bowel disease, or uveitis) - Positive family history of spondyloarthritis - Good response to NSAIDs	Axial spondyloarthritis 0.1% - 1.4%	Refer to rheumatologist if strong suspicion of axial spondyloarthritis	



LBP Management

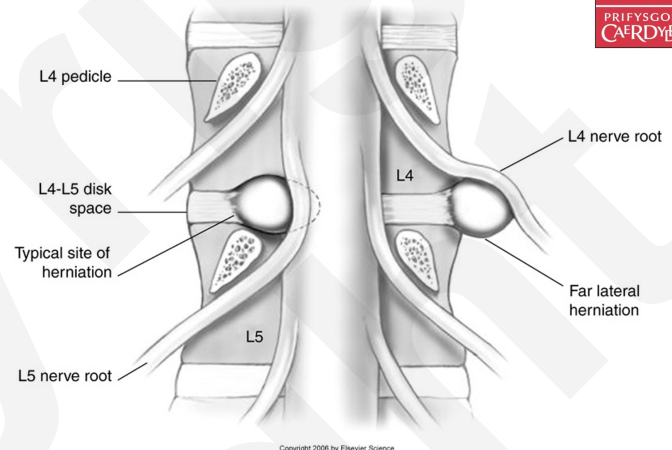
Alerting features	Diagnosis and prevalence	Image type	Timing
Back pain with leg pain in an L4, L5, or S1 nerve root distribution Positive result on straight leg raise or crossed straight leg raise test	Radicular pain or radiculopathy	Consider MRI in patients who are candidates for surgery	Defer work up until a trial of therapy has been completed
Bilateral buttock, thigh, or leg pain Older age Pseudoclaudication	Spinal canal stenosis	Consider MRI in patients who are candidates for surgery	Defer work up until a trial of therapy has been completed



- Red flags - refer
- In the absence of an identifiable pain source the mainstay of treatment for low back pain is conservative
- In short spinal surgery is high risk and surgery for low back pain is unpredictable

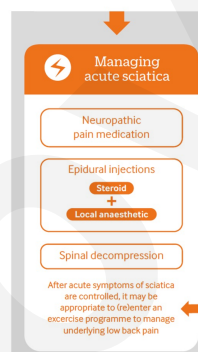
"Sciatica"

- Disc Herniation
- Radicular leg pain
 - Often far worse pain than a LBP episode
- Symptoms in distribution of nerve root
 - Most occur at L4/5 and L5/S1
 - Sensory changes
 - Motor changes
 - Rarely CES



Sciatica Management

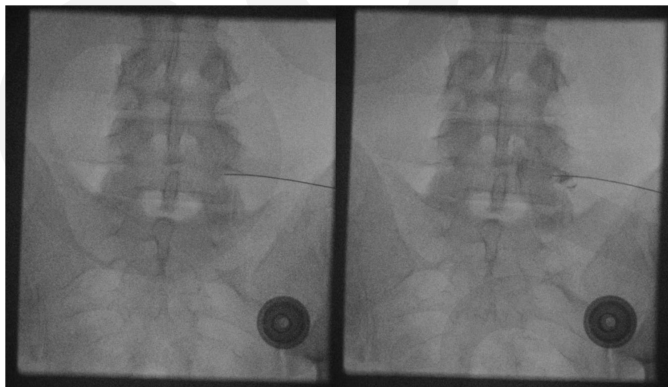
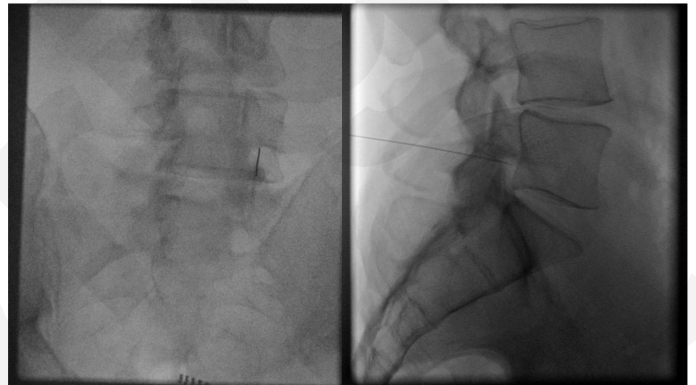
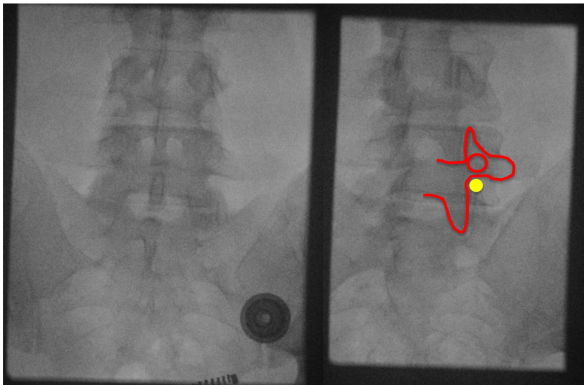
- Red flags - refer
- Doesn't settle down – refer
- Spinal surgical interventions for leg pain are generally successful



Pharmacological Options

- **NSAIDs** / COX2 (and **Paracetamol** / Nefopam)
- **Opioids**
 - Oxycodone, tramadol, fentanyl, morphine etc
- Antidepressants
 - TCAs – **amitriptyline**, nortriptyline etc.
 - SNRIs – duloxetine, venlafaxine etc.
- Anticonvulsants
 - Gabapentin, pregabalin, carbamazepine, valproate, lamotrigine, topiramate etc.
- Topical Agents
 - Lignocaine patch, capsaicin
- **Epidural**
 - Steroid, antiTNFα, clonidine, ketamine
- Intrathecal
 - Ziconotide, opioids

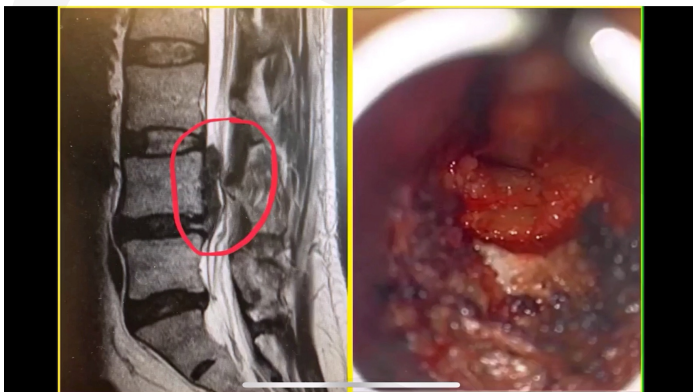
Foraminal Epidural / Root Block



Indications for Surgery

1. Cauda equina syndrome
2. Neurological deterioration
3. Persistent pain + signs

NB - STABLE radicular weakness (>3/5 power) resolves equally as well with conservative management



Lumbar Disc Prolapse Outcome

- Most improve spontaneously - leg pain settles
 - The disc prolapse resorbs – mechanical compression and chemical inflammation settles
- Those with persistent leg pain:
 - Operation better outcome than non operation:-
 - For all outcome measures at 4 to 8 years
 - Overall 85% satisfaction vs 65% (SPORT Trial)
 - But, 15% reoperation rate (85% for recurrent disc) and 3% dural tear rate (risks of surgery)



Definitions

- Stenosis:
 - “Narrowing of the spinal canal, nerve root canals or tunnels of the intervertebral foramina producing symptoms of claudication or radiculopathy” Arnolli 1976
 - Central, lateral recess and foraminal types
 - Describes the area where the narrowing occurs

Definitions

- Spondylolisthesis:
 - “Spine slipping” - forward backward or lateral of one vertebra relative to an adjacent vertebra
 - Various types and classifications
 - Commonest in young is lytic L5/1
 - Commonest in elderly is degenerative L4/5
- Claudication:
 - Limping
 - A condition in which cramping pain in the leg is induced by exercise

Spinal Claudication

- Standing
 - Lumbar lordosis increases - ↑ canal narrowing
 - Slippage may increase - ↑ canal narrowing
- Subarachnoid obstruction
- Increased endoneurial pressure
 - Compartment Syndrome in the nerve roots
 - Conduction disturbances
- Pain, numbness, weakness
- Unsteadiness
- Rarely CES type symptoms

Stenosis - Symptoms

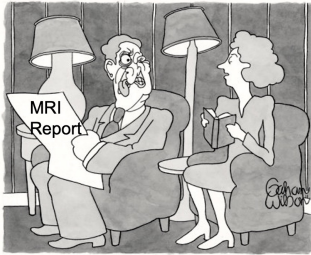
- Often asymptomatic at rest
- LBP with walking
- Early leg pain, paresthesia and numbness
- Increases with distance
- Sitting / crouching / leaning forwards decreases pain

- | | |
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| <ul style="list-style-type: none"> • Spinal Claudication <ul style="list-style-type: none"> – Ppt stand and walk – Relief lean and sit – Prox to distal – Worse down hill – Better up hill – Unlimited cycling – Weakness on exertion – Shopping trolley + – May have poor pulses | <ul style="list-style-type: none"> • Vascular Claudication <ul style="list-style-type: none"> – Ppt walk – Relief stand – Distal to proximal – Worse up hill – Better down hill – Cycling - pain – Not normally weak – Trophic skin changes – Poor pulses... |
|---|--|

Have your finger on the Pulse!



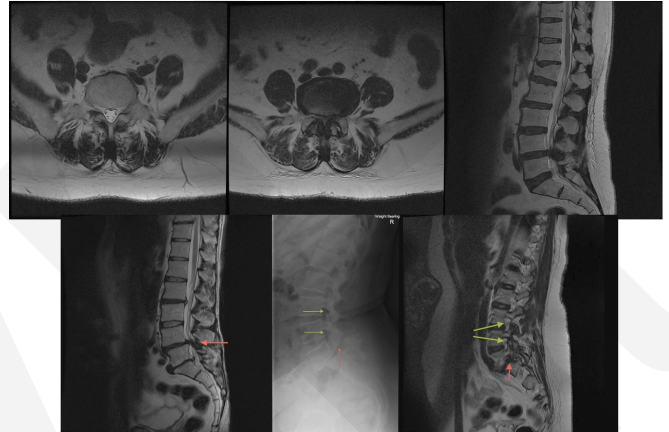
Stenosis - Investigations



- MRI – look at nerves
- Erect XR – look at slip
- +/- CT – bony anatomy
- +/- CT Myelogram
- +/- Duplex Ultrasound
- +/- NCS EMG

But remember - treat the man not the scan!

Investigations



Spondylolisthesis

- Asymptomatic – stenotic symptoms
- LBP, buttock, thigh, groin pain
- +/- radicular pain
- +/- numbness weakness L5-S1
- +/- urinary / bowel
- O/E – nil, restricted motion, hyperlordosis, palpable step, kyphosis above, trunk short, rib on crests, tight hamstrings, L5-S1 neuro findings

Spondylolisthesis

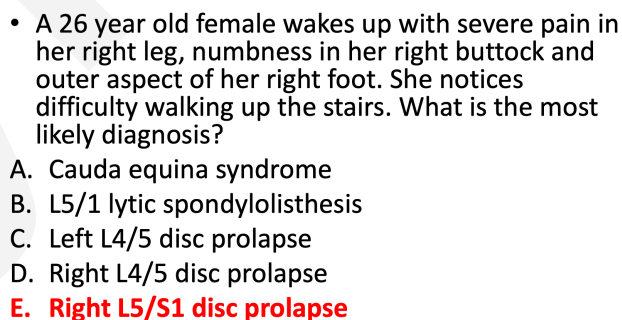
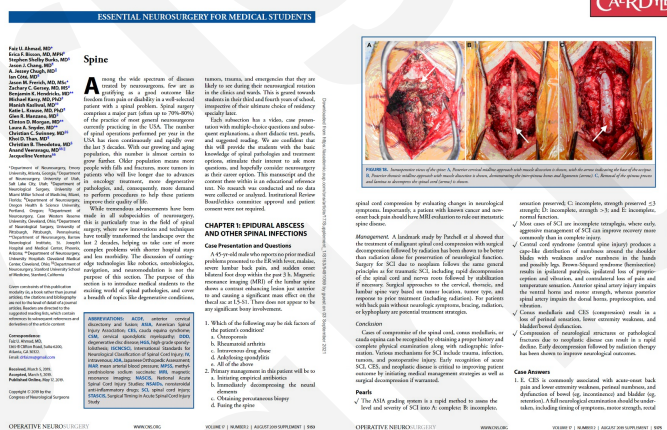
- Refer to a specialist
- Indications for surgery:
 - Failed conservative management
 - High grade slip immature patient (will progress)
 - Neurological compromise

Spondylolisthesis



Operations

- Indications:
 - Failed conservative treatment
 - Intractable leg pain > other leg symptoms
 - Progressive neurological deterioration
 - NOT LBP unless associated neurological signs
 - Proven stenosis on imaging
- Type of Operation:
 - Varies depending on pathology



- A 26 year old female wakes up with severe pain in her right leg, numbness in both buttocks and outer aspect of her right foot. She notices difficulty walking up the stairs. When she goes to the toilet she has no control of her bladder. What is the most likely diagnosis?

- A. Cauda equina syndrome**
- B. Central L4/5 disc prolapse
- C. L5/S1 lytic spondylolisthesis
- D. Right L4/5 disc prolapse
- E. Right L5/S1 disc prolapse

- A 70 year old male presents to his General Practitioner with neck pain, bilateral heaviness in the arms and poor dexterity. He feels increasingly unsteady and has nocturia and terminal dribbling when passing urine. The most likely diagnosis is:

- A. Cauda equina syndrome
- B. Cervical myelopathy**
- C. Epidural abscess
- D. L4/5 degenerative spondylolisthesis
- E. Upper thoracic prostate cancer metastases

- A 30 year old male presents to his General Practitioner with a 2 week history of low back pain. It started after he lifted up a heavy box at work. There are no red flags. Examination is normal. The most likely diagnosis is:

- A. Cauda equina syndrome
- B. Degenerative disc disease
- C. Facet joint arthrosis
- D. L5/S1 disc prolapse
- E. Muscular mechanical low back pain**

- A 70 year old male presents to his General Practitioner with low back pain, bilateral leg heaviness when standing for 10 minutes, severe left leg pain in an L5 distribution when walking for 5 minutes, nocturia and terminal dribbling when passing urine. The most likely diagnosis is:

- A. Cauda equina syndrome
- B. Epidural abscess
- C. L4/5 degenerative spondylolisthesis**
- D. L5/S1 lytic spondylolisthesis
- E. Thoracic prostate cancer metastases



Real Purpose of Surgery?

