



Prof M J H McCarthy
Consultant Spinal Surgeon



Start a talk with a story...



come back to it later...



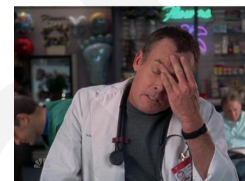
It's like removing your bendy spine..

and replacing it with a metal pole!



What do I need to know?...

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



- **DEMAND CAPACITY MISMATCH**

- IS THERE A SURGICAL TARGET?



- CAN YOU SEE THIS PATIENT AGAIN?

- YES AND NO!...

- BUT THE PT WANTS TO SEE YOU AGAIN / ARE THERE NEW TREATMENTS...

[illegible][illegible][illegible]

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- 
- Noah's Ark**
Children's Hospital Charity
Elusen Ysbyty Plant

**spine?...
GIG CYMRU NHS WALES** | Bwrdd Iechyd Prifysgol
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Don't Forget This Slide...

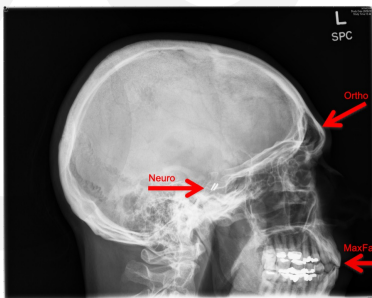


Spine Trauma as a GP

- Call 999
- Most will be post secondary / tertiary care
 - Plan and FU in place (incl SCI) Spine # Clinic
- Fractures tend to heal
 - Watch out for deformity and neurological def.
 - Surgery - watch out - wound infections – tell us!
- Osteoporosis management...



Whilst we are talking about trauma...



Spinal Infection

- Acute fever and pain
- More commonly:
 - Vague symptoms, chronic illness, low grade fever and back pain
 - 50% delayed Δ > 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%

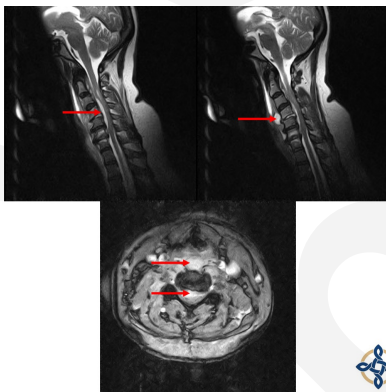


The Treatment

- 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



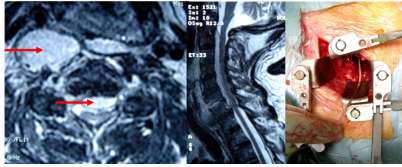
Pain
Fever
Neurology





Epidural Abscess

- TRIAD: Pain Fever Neurology
- Thoracic spine commonest
- Significant neurological deficits / paralysis can develop - reversible if op < 24-36 hrs
- Death rate upto 10%



The Little People

- Back pain
- Refusal to weight bear
- Flexed spine
- Hip pain
- Non specific abdominal pain
- <50% have fever
- Blood cultures usually negative



The Red God / White Plague

- Risk factors
 - Asia, S America, Russia
 - Confinement – homeless shelters, prisons
 - Elderly, alcoholics, AIDS, contacts
- Variable presentation
 - Cutaneous sinuses
 - Neurological deficit up to 40%
 - Kyphotic deformities
- TB = Always get a biopsy



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





The Complications

- Mortality rate up to 20%
 - Comorbidities
- Ongoing infection and sepsis
- Paralysis
 - Abscess / Deformity / Fracture / Thrombosis
- Deformity
- Pain
- Instability

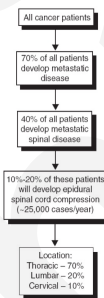
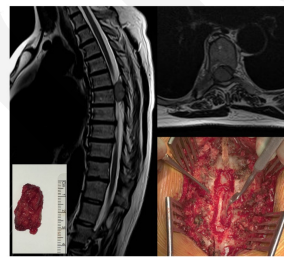


Red Flags

- <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



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%

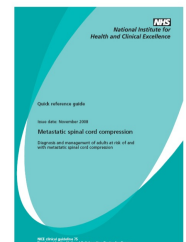
Duration of symptoms before diagnosis

2-5 months median



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





Indications for Surgery

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



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 everywhere in spine = surgery UNLIKELY
 - Spinal MDT Fri am includes Oncologists and MSCC coord



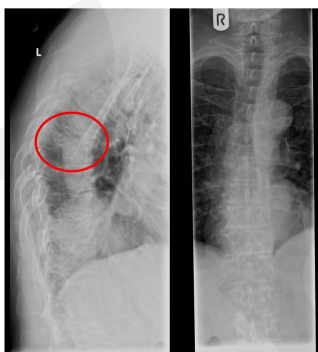
Steroids

- 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)



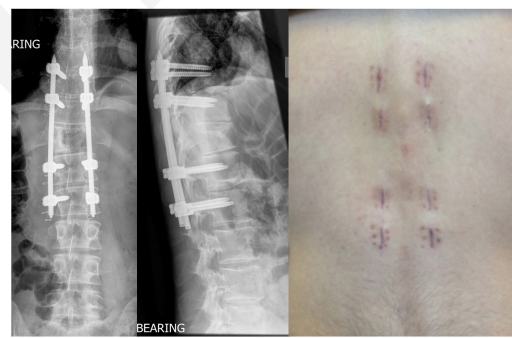
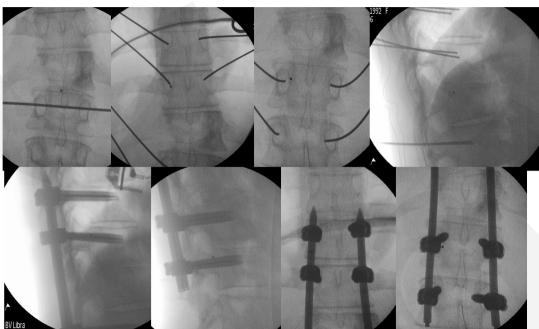
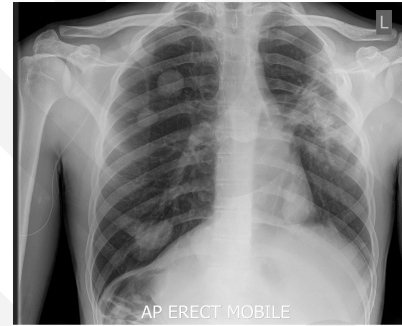
Prognosis

- 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)



Thoracic pain
Raised Ca⁺⁺





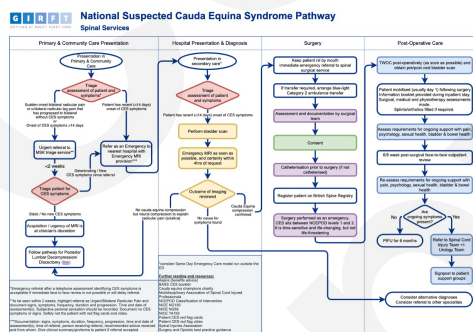


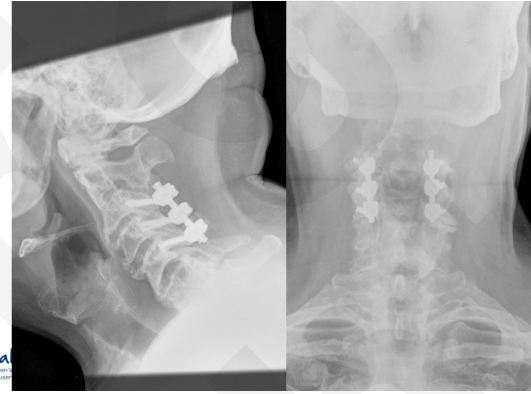
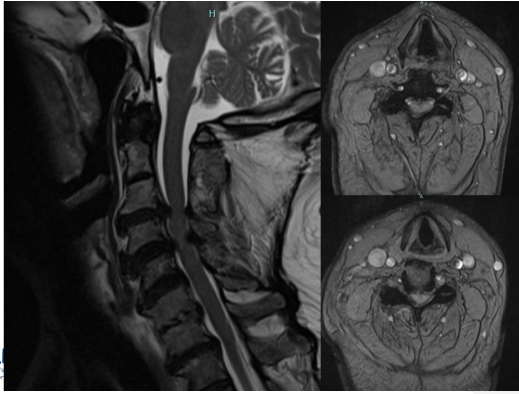
Cauda Equina Syndrome

- 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"
- **Post void 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

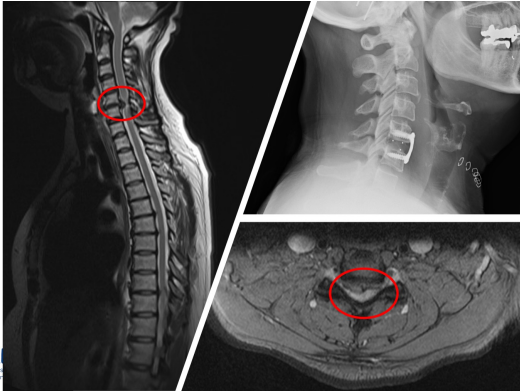
- Unsteady wide based gait
- Romberg / Walking Romberg
- Unable heel toe gait
- Triangle step test
- L'Hermittes sign
- Hoffman's sign
- Hyperreflexia
 - Ankle Clonus / Inverted Radial Reflex
- Extensor Plantar Response (Babinski)
- Increased Tone
- Grip release test
- Finger escape sign

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**



'IT'S ONE WORD GEORGE!'



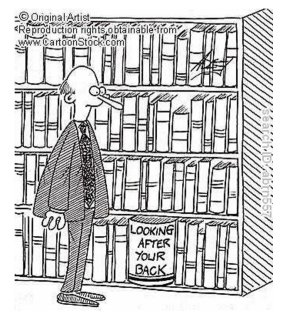
LBP Sciatica

- 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?

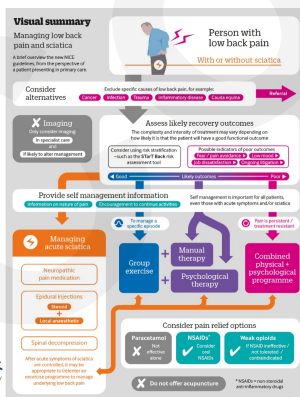
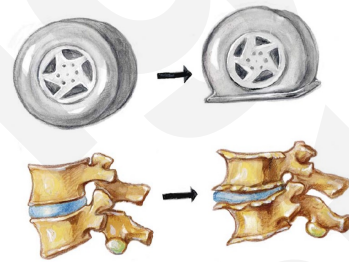
- Nerves / Cord
- Muscles
- Ligaments
- Disc
- Bones / Joints



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/ng59](https://www.nice.org.uk/guidance/ng59)

Don't Assume

- If you “assume” you make an **ass** of **u** and **me**
- Leg or back pain / neurological problems always originate from the spine
- A patient with a chronic back problem can't have a new diagnosis e.g. cauda equina syndrome
- What's on the MRI report is the cause of the symptoms (MRI is very sensitive)
 - “Treat the man not the scan!”
 - Asymptomatic population MRI studies

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)

How do you “Identify” cause?

- You often don't have to – most acute LBP / sciatica settles down especially if early intervention
- History, examination, red flags
- BUT, a % don't settle
- A % do develop chronic LBP



Do not routinely offer imaging for uncomplicated low back pain

Amanda M Hall, Kate Ashby-Saunders, Bradley Thomas, Chris G Maher

What you need to know

- Low back pain is a common condition that can be a source of significant personal and social distress.
- The majority of people have a self-limiting condition that improves within 6 weeks.
- Imaging is not routinely indicated for uncomplicated low back pain.
- Imaging should be reserved for cases with red flags, neurological signs, or failure to improve with conservative treatment.
- Imaging should be reserved for cases where the results will influence management.

The clinical problem

Low back pain is a common condition that can be a source of significant personal and social distress. The majority of people have a self-limiting condition that improves within 6 weeks. Imaging is not routinely indicated for uncomplicated low back pain. Imaging should be reserved for cases with red flags, neurological signs, or failure to improve with conservative treatment. Imaging should be reserved for cases where the results will influence management.

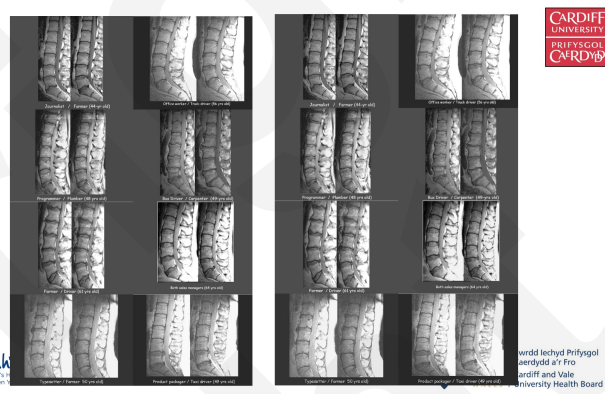


Table 2: Age-specific prevalence estimates of degenerative spine imaging findings in asymptomatic patients*

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%	

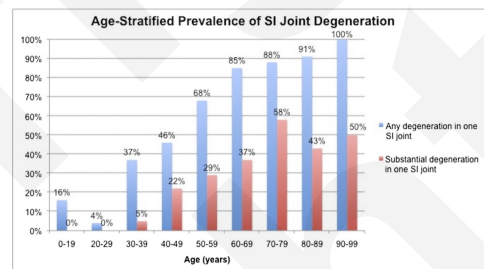


Fig. 4. Prevalence of sacroiliac (SI) joint degeneration per decade of life.



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 infection or abscess History of malignancy Ongoing clinical suspicion Unexplained weight loss, >10 years Fever or chills Immunocompromised patient Corticosteroid use at night Elevated inflammatory markers Recent injury, dental or spine procedure New bowel or bladder dysfunction Perineal numbness or saddle anaesthesia Persistent or progressive lower motor neuron changes Progressive lower limb motor weakness Motor deficits at multiple levels 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 - No improvement with exercise - No improvement with rest - Pain at night, with improvement when getting up - Peripheral manifestations (psoriasis, arthritis, enthesitis, or dactylitis) - Extra-articular manifestations (spondylitis, inflammatory bowel disease, or uveitis) - Positive family history of spondyloarthritis Good response to NSAIDs	Vertebral fracture 0.7% - 4.5% Malignancy 0.2% Spinal infection 0.01% Cauda equina syndrome 0.04% Severe neurologic deficits Acute spondylitis 0.1% - 1.4%	X-ray possible CT scan X-ray and MRI X-ray and MRI MRI MRI Refer to rheumatologist if strong suspicion of acute spondylitis	Major risk: immediate Minor risk: 1 month "watch and wait" Major risk: immediate Minor risk: delay Immediate Immediate Immediate

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-leg raise test Bilateral buttock, thigh, or leg pain Cauda equina Pseudotumour	Radiculopathy or radiculopathy Spinal canal stenosis	Consider MRI in patients who are candidates for surgery Consider MRI in patients who are candidates for surgery	Defer work up until a trial of therapy has been completed Defer work up until a trial of therapy has been completed

REPORTS CAN CAUSE HARM



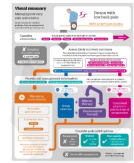
Non Verbal Communication



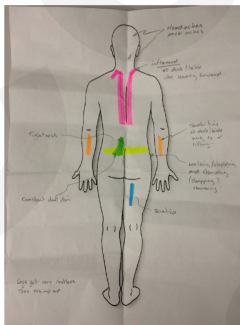
"And just exactly what is that expression intended to convey?"

LBP Management

- 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

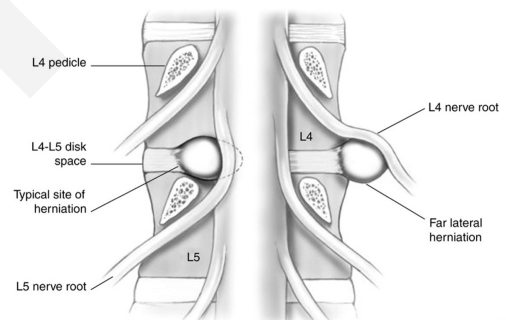


For Some Things There May Be No Cure



"Sciatica"

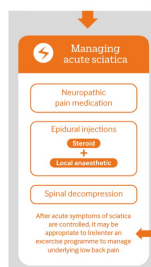
- Disc Herniation
- Radicular leg pain
 - Often far worse pain than a LBP episode
- Symptoms in distribution of nerve root
 - Most occur at L4/5 and L5/S1
 - Sensory changes
 - Motor changes
 - Rarely CES





Sciatica Management

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

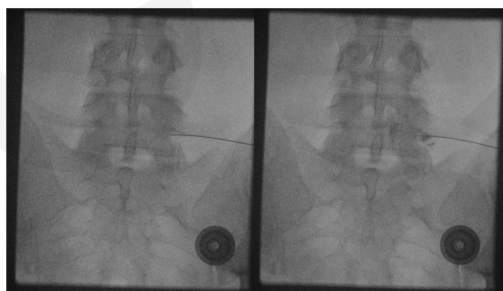
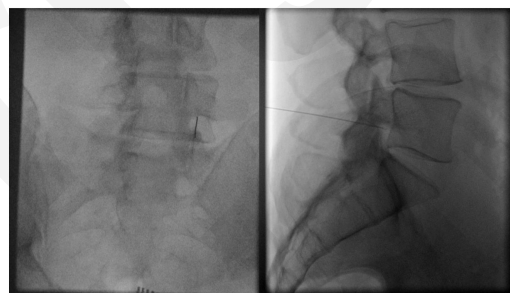
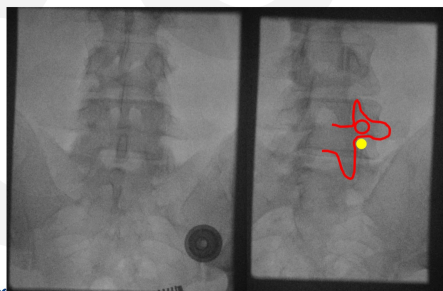


Pharmacological Options

- **NSAIDs** / COX2 (and **Paracetamol** / Nefopam)
- **Opioids**
 - Oxycodone, tramadol, fentanyl, morphine etc
- Antidepressants
 - TCAs – **amitriptyline**, nortriptyline etc.
 - SNRIs – duloxetine, venlafaxine etc.
- Anticonvulsants
 - Gabapentin, pregaba, carbamazepine, valproate, lamotrigine, topiramate etc.
- Topical Agents
 - Lignocaine patch, capsaicin
- **Epidural**
 - Steroid, antiTNF α , 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" Arnoldi 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





Stenosis - Signs

- Vague in all forms
- Examination often normal:
 - Gait
 - Long tract signs
 - 10-15% concurrent cervical stenosis
 - Hips
 - Osteoarthritis often present
 - Distal pulses
 - Is it vascular claudication?



Stenosis - Signs

- Neurological Exam:
 - Straight Leg Raise usually Normal
 - Back usually non-tender +/- loss lordosis
 - Palpable bony step if Spondylolisthesis
 - Good flexion limited extension - symptoms - prompt relief by leaning forward
 - Stoop test - keep walking - leans
 - Possible neurological signs on exertion
 - Occ "hard" neurological signs
 - weakness, numbness, loss reflexes etc



- | | |
|---|--|
| <ul style="list-style-type: none"> • Spinal Claudication • 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 • Ppt walk • Relief stand • Distal to proximal • Worse up hill • Better down hill • Cycling - pain • Not normally weak • Trophic skin changes • Poor pulses... |
|---|--|



Stenosis - Investigations



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

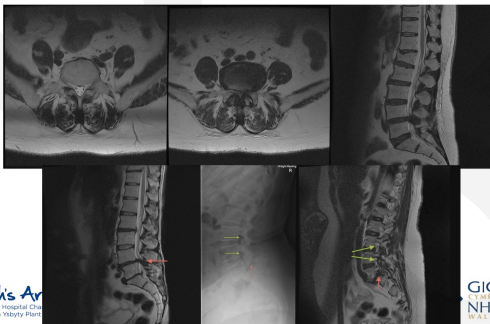


Have your finger on the Pulse!

But remember - treat the man not the scan!



Investigations



Pars Defect - Spondylolysis



- Most common cause of significant LBP in child
- Think certain sports as a cause
- Mainstay of treatment remains non-operative





Spondylolisthesis (SPL)

- Developmental
- Acquired
- High Grade
- Low Grade



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 if Sx
- 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



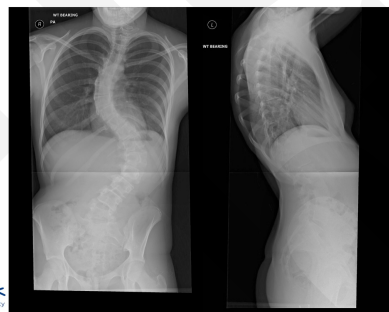
Pragmatic Approach

- No significant neurological problems / CES:
 - Patient managing
 - Observe
 - Lifestyle modifications and exercise
- Not managing
 - Lifestyle modifications and exercise
 - Injection first (safe and low risk - ? predictive)
 - Operation





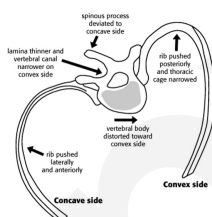
Scoliosis



Adams Test



Rib Hump



BOX 3-1 Etiologic Classification of Scoliosis		
Idiopathic		Neuromuscular—cont'd
Early-onset	<10yrs>	Spinocerebellar degeneration
Late-onset		Cerebral palsy
Adult		Lower motor neuron
		Poliomyelitis
Congenital		Myopathic
Osteogenic (vertebral anomaly)		Congenital hypotonia
Anomalous formation		Duchenne muscular dystrophy
Wedge vertebra		
Hemivertebra		Developmental Syndromes
Anomalous segmentation		Skeletal dysostosis (e.g.,
Unilateral bar		neurofibromatosis)
Fused ribs		Skeletal dysplasias (e.g., osteogenesis
Fused vertebra		imperfecta)
Neuropathic (spinal dysraphism)		
Tethered cord		Tumor Associated
Chiari malformations		Vertebral
Siringomyelia		Osteosarcoma
Diastematomyelia		Osteoid osteoma
Meningocele/meningocele		Intraspinial
		Intradural (e.g.,
		astrocytoma)
Neuromuscular		Extradural (e.g.,
Neuropathic		neurofibroma)
Upper motor neuron		



Congenital Scoliosis

- Failure Formation / Segmentation / Both

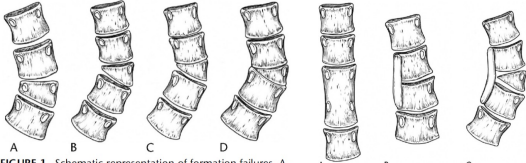


FIGURE 1. Schematic representation of formation failures. A, Wedge vertebra. B, Fully segmented hemivertebra. C, Partially segmented hemivertebra. D, Unsegmented hemivertebra. Reproduced with permission from Hedegquist and Emans.¹⁴

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



Ass Congenital Anomalies

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



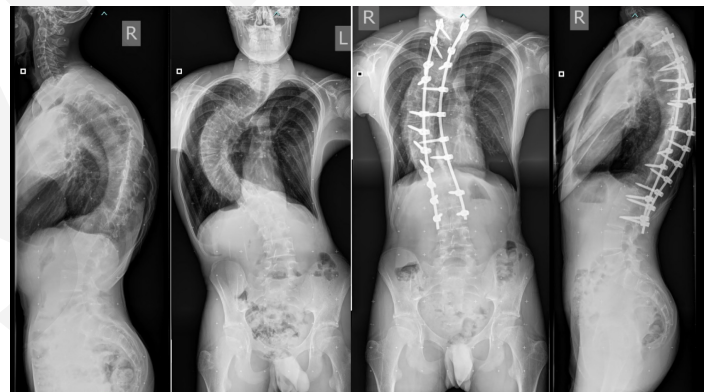
Scoliosis

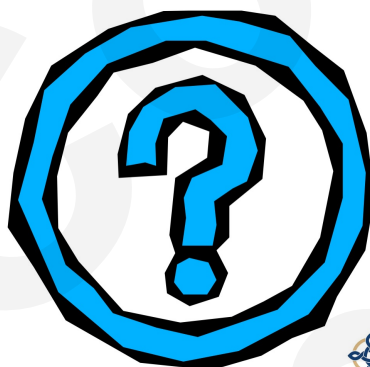
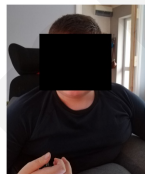
- Refer
- Non-surgical: possible bracing
- Indications for surgery:
 - Curve > 40° skeletally immature
 - Curve > 50° skeletally mature
 - Relentless curve progression
 - Cardiopulmonary complications
 - Function
 - Prevent neurological deterioration



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





Inflammatory Conditions

- Spondyloarthropathies
 - Generally systemic – other joints / systems
 - Ankylosing spondylitis, Rheumatoid, Psoriatic Arthropathy, Reactive arthropathy (Reiter's syndrome), Enteropathic arthritis (Crohns / Ulcerative colitis)
 - LBP / Hip girdle pain and stiffness
 - Pain and swelling shoulders, hips, knees, ankles and hands
 - Uveitis / Iritis, dactylitis, enthesitis, skin rashes, GI / GU upset, fatigue, anaemia chronic disease
 - Ankylosing spondylitis - stiffness, SIJ pain, kyphotic deformity, chalk stick fractures, osteoporosis
 - Rheumatoid - spinal instability – lumbar spondylolisthesis, C1/2 problems, osteoporosis



ASAS classification criteria for axial spondyloarthritis (SpA) in patients with >3 months back pain and age at onset <45 years	
Sacroiliitis on imaging* plus >1 SpA feature†	or
HLA-B27 plus >2 other SpA features†	
*Sacroiliitis on imaging • active (acute) inflammation on MRI highly suggestive of sacroiliitis associated with SpA • definite radiographic sacroiliitis according to modified New York criteria	†SpA features • inflammatory back pain • arthritis • enthesitis (heel) • uveitis • dactylitis • psoriasis • Crohn/colitis • good response to NSAIDs • family history for SpA • HLA-B27 • elevated CRP





ESSENTIAL NEUROSURGERY FOR MEDICAL STUDENTS

Spine

A spinal cord injury (SCI) is a permanent or temporary loss of function of the spinal cord. It can result in a wide range of physical, sensory, and cognitive impairments. The most common cause of SCI is trauma, such as a fall, car accident, or sports injury. Other causes include degenerative diseases, infections, and tumors.

CHAPTER 1: EPIDURAL ABSCESS AND OTHER SPINAL INFECTIONS

Case Presentation and Questions

1. What are the signs and symptoms of an epidural abscess?

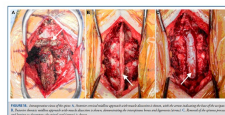
2. What are the risk factors for an epidural abscess?

3. How is an epidural abscess diagnosed?

4. What are the treatment options for an epidural abscess?

5. What are the potential complications of an epidural abscess?

6. How can an epidural abscess be prevented?



spinal cord compression by expanding abscess in intervertebral foramen, epidural space and dorsal root entry zone. This is a surgical emergency. If left untreated, it can lead to permanent neurological damage.

CHAPTER 2: SPINAL STENOSIS

Case Presentation and Questions

1. What are the signs and symptoms of spinal stenosis?

2. What are the risk factors for spinal stenosis?

3. How is spinal stenosis diagnosed?

4. What are the treatment options for spinal stenosis?

5. What are the potential complications of spinal stenosis?

6. How can spinal stenosis be prevented?



South Wales Spinal Network
Serving the Population of South Wales, West Wales & South Powys

The network of five specialist spine centres provides a comprehensive service for patients with suspected or confirmed spinal pathology. For further information, please contact your local spine centre.

Spine Centre	Specialist	Address	Phone	Email
Cardiff Spine Centre	Dr. [Name]	Cardiff Bay	[Phone]	[Email]
Swansea Spine Centre	Dr. [Name]	Swansea	[Phone]	[Email]
Neath Port Talbot Spine Centre	Dr. [Name]	Neath Port Talbot	[Phone]	[Email]
Cardiff Spine Centre	Dr. [Name]	Cardiff Bay	[Phone]	[Email]
Cardiff Spine Centre	Dr. [Name]	Cardiff Bay	[Phone]	[Email]



Referral Summary

- Low Back Pain / Sciatica
- Cauda Equina Syndrome
- Stenosis / Spondylolisthesis
- Spinal Tumours and Metastases
- Spinal Trauma
- Discitis / Osteomyelitis / Epidural Abscess
- Osteoporosis
- Inflammatory / Axial Spondyloarthropathy
- Scoliosis / Kyphosis
- Low Back Pain in Child
- Adult Spinal Deformity
- Thoracic Pain
- Neck Pain / Cervical Radiculopathy
- Cervical Myelopathy
- Whiplash

Sure send to a spinal surgeon
Rheumatology / Medics
Physiotherapists / Pain Clinic /
Others (assess red flags)
Oncologists 1st if known disease

Unless patient not fit for surgery!



Be Positive

- Use positive transference to your advantage
- Prime yourself for the returning chronic LBP patient
- Avoid being sucked down by the patients negative transference
- Address Ideas Expectations and Concerns
- The main predictor of outcome for LBP is - Psychological



Expectations & Concerns

- Pain relief
- Cause
- I just want to get back to normal
- 1. I'm afraid it will get worse
- 2. I'm afraid I'll end up in a wheelchair
- 3. I'm unable to work / lose my job / finances
- 4. I'm unable to do the things I used to
- 5. I'm unable to play with my children / grandchildren
- 6. I'm unable to sleep and I'm irritable all the time
- 7. I'm worried there's something serious going on





The List

- Aerobics
- Alexander Technique
- Aqua-aerobics
- Chiropracter
- CPP / FRP
- Cycling
- Diet / Lose Weight
- Gym Program
- Hydrotherapy
- Massage
- McKenzie Exercises
- Medication
- Osteopath
- Patches
- Physiotherapy
- Pilates
- Reflexology
- Stop Smoking
- Tai Chi
- Yoga



The Resources

- NICE Guidelines
- The Internet
 - patient.co.uk, gnotebook.co.uk, nhs.co.uk, backcare.org.uk, spinesurgeons.ac.uk, spine-health.com, spineuniverse.com, understandingspinesurgery.com etc. etc.
- The Back Book and Others
- Physiotherapy / Chiro / Osteo
- Gym / Fitness Program
- FRP / CPP - Back in Action Program
- Expert Patient Program
- The Pain Clinic
- The Surgeon



EXERCISE!



What not to say

- "Your back is so bad you need to see a surgeon"
- "Be careful your spine is like glass it could shatter at any moment (referring to osteoporosis)"
- "You have a crumbling spine"
- "If you don't have an operation on your spine you will end up in a wheelchair, if you do have one then you might not"
- "Your back pain is due to the bulging discs and you need to see a surgeon urgently before you become paralysed"



What not to say

- "You have degenerative back pain" – patients think this means it will get worse with age
- Annular "tear" – implies trauma – use "fissure"
- Until you have proof (MRI) do not label LBP as arthritis, rheumatism, a slipped disc, spondylosis, spondylitis
- "I'm going to leave you to talk to yourself because you've obviously got a lot to talk about"
- "A sack of potatoes..."



Reassure Explain Advise

- I know what's going on
- It's non-specific mechanical low back pain
- We often don't know exactly where the pain is coming from but what we do know is that it is not serious
- Hurt does not mean harm / Pain does not mean damage
- It will get better but sometimes it takes time



Reassure Explain Advise

- Use it or lose it / motion is the lotion
- Rest can be harmful – it delays recovery
- We need to strengthen your back and stomach muscles and this will help your pain
- The less you use your back muscles the more they will hurt when you come to use them
- Do what you normally do





Reassure Explain Advise



- We need to help you lose weight / stop smoking
- It will be hard work and its not going to be easy
- But, it will be worth it
- Diet is the best way to lose weight (probably the only way)
- This will take the load / strain off your back and also it will help to prevent conditions such as diabetes, high blood pressure, heart disease and even some cancers



Soothing Phrases



- Use the phrase "Normal ageing process"
- Degenerative changes are part of the normal ageing process / are a bit like getting grey hair / rusty hinges on a door
- Your back will hurt but you won't harm it
- Exercise will hurt as the muscles get fit
- Taking painkillers doesn't mean that you will hurt yourself without knowing it
- The aim of treatment is to reduce the severity, frequency and duration of your painful episodes



Real Purpose of Surgery?



