- Back pain - largest single cause of disability in the UK

- Lower back pain alone - 11% of the total disability of the UK

Spine in a nutshell

GREG RUDOL

CONSULTANT SPINAL SURGEON

Spire Healthcare

Looking after you

Objectives

- Spinal examination - quick initial assessment
- Red flag signs
- When an MRI is abnormal
- Common conditions
  - Management in primary care
- Back pain guidelines
- Rationale for surgical treatment
- Referral pathways

- Back and neck pain are very common
- Pick up those with significant pathology and deal with early
- All in 5 mins…

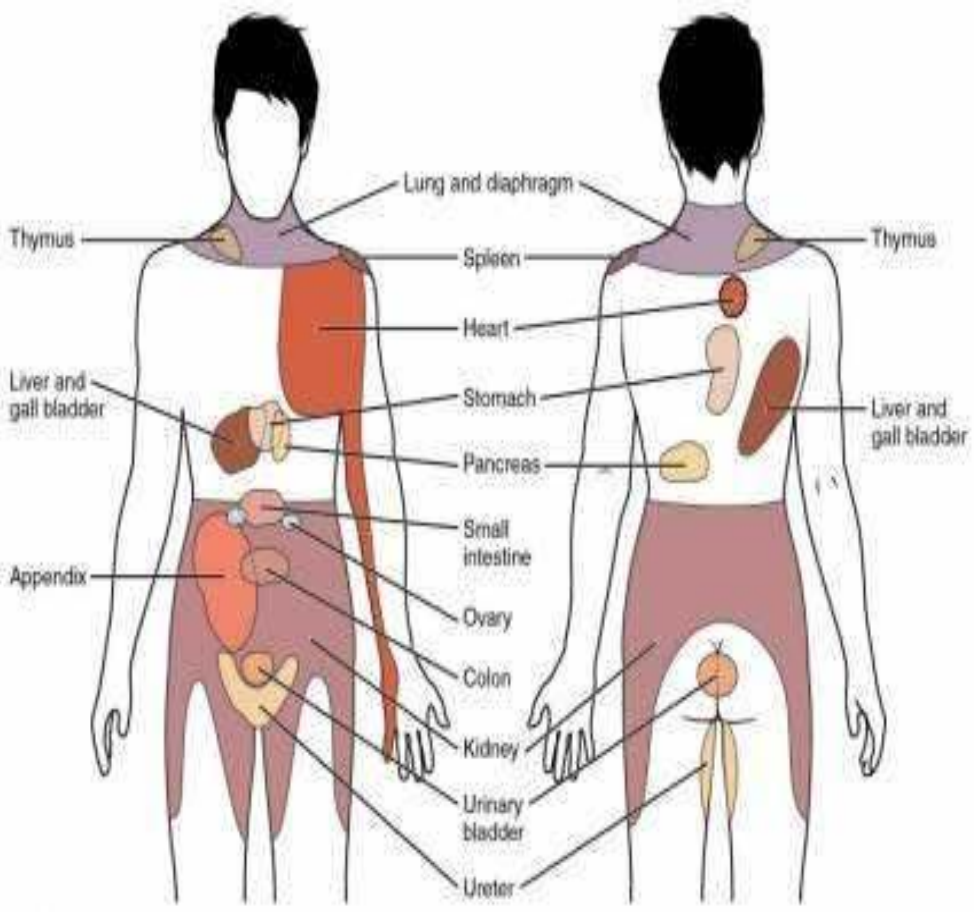
‘Back pain’ presentation

- 4% Symptomatic disc herniation
- 4% Compression fracture
- 3% Symptomatic spinal stenosis

0.3 Ankylosing spondylitis

- 0.7% Cancer
- 0.04% Cauda Equina Syndrome
- 0.01% Spinal infection

‘Back pain’ – Spinal Masquerades



Assessment

No gold standard to compare sensitivity or specificity of symptoms, questions or tests.

History:

- characteristics of the pain
  - site, onset, nature and radiation, preceding injury or surgery
- dizziness, especially on upward gaze, indicate vascular insufficiency

Assessment – Red flags (poor specificity)

- Significant preceding trauma or surgery
- Systemic upset (weight loss, night sweats, fevers)
- Intractable pain
- Nocturnal pain
- Relatively young (<20) or old (>55)
- Signs of spinal cord or cauda equina compression
- Significant tenderness in spinal area
- History of TB, HIV, cancer or inflammatory arthritis
- Immunosuppression
- Thoracic pain

‘Yellow’ flags

Factors that **increase** a patient’s **risk** for **developing long-term disability**

- ‘Pain is harmful or disabling’
- ‘Pain must be eliminated before returning to activity’
- Passive attitudes towards therapy
- Reduced activity level and withdrawal from daily activities
- Patient reports of extreme pain intensity
- High intake of alcohol or other substances

Physical Exam

Look

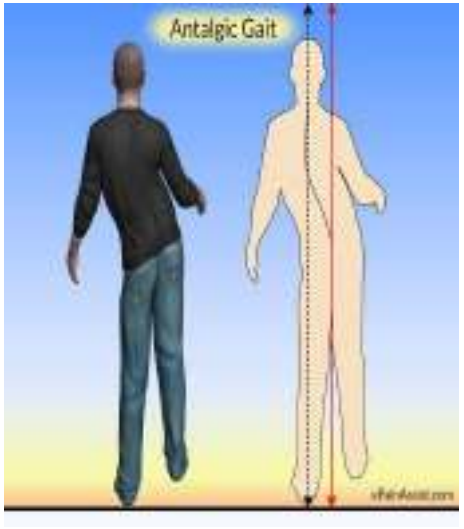
Feel

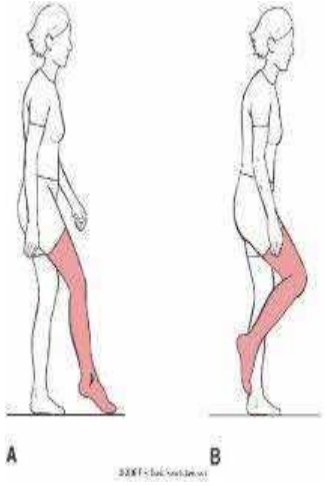
Move

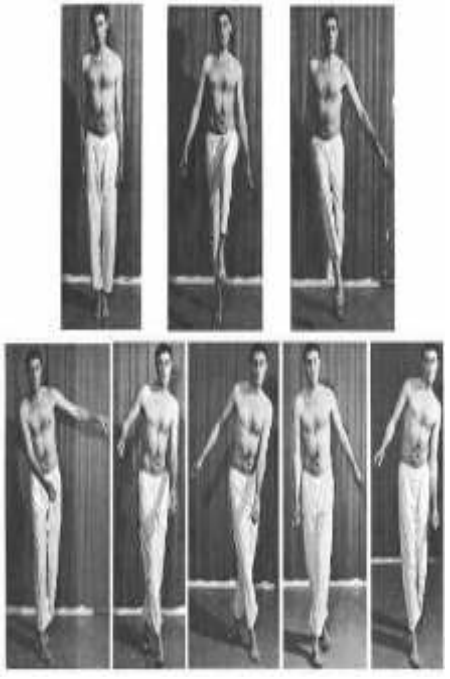
Neuro

Look

- Gait
- Spine
- Lower limb







Look

- Gait
- Spine
- Lower limb

Look

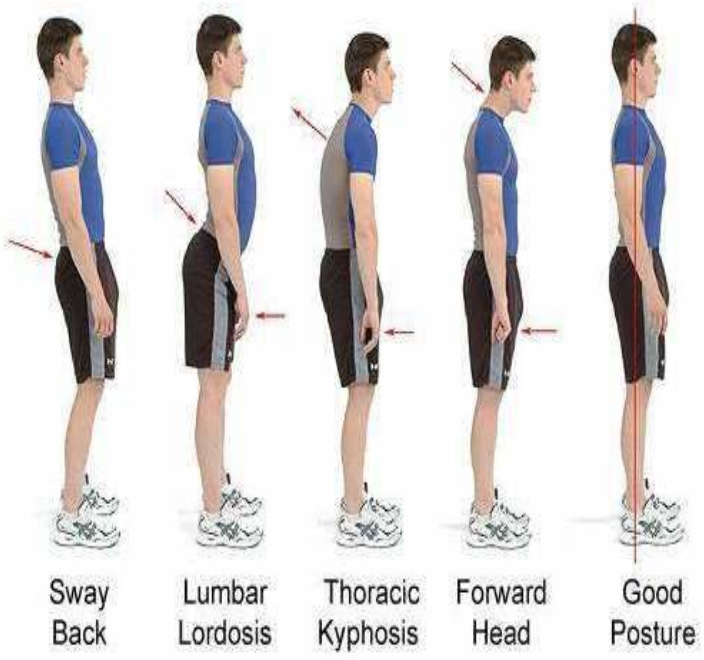
- Gait
- Spine
- Lower limb

Sway = makes others uncomfortable

Lordosis (chest out) = trying too hard

Kyphosis (slumping) = insecure

Forward Head = others feels personal space is being invaded

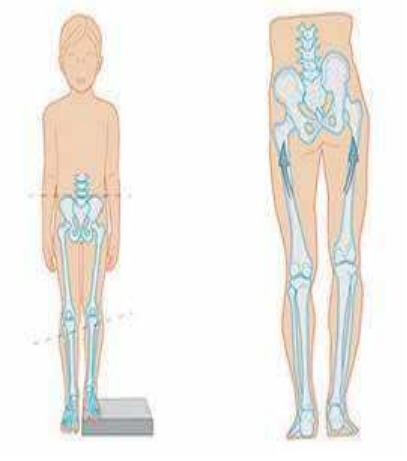


Look

- Gait
- Spine
- Lower limb

Look

- Gait
- Spine
- Lower limb

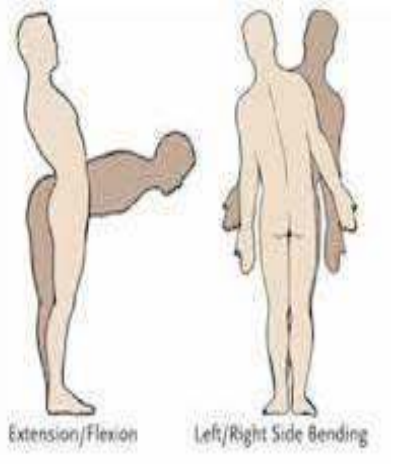


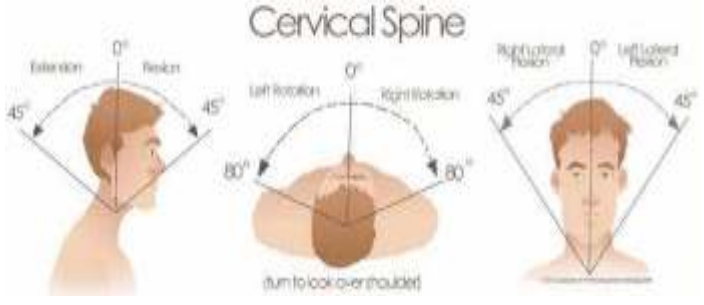
Feel

PALPATION
(Thoracic Spine)

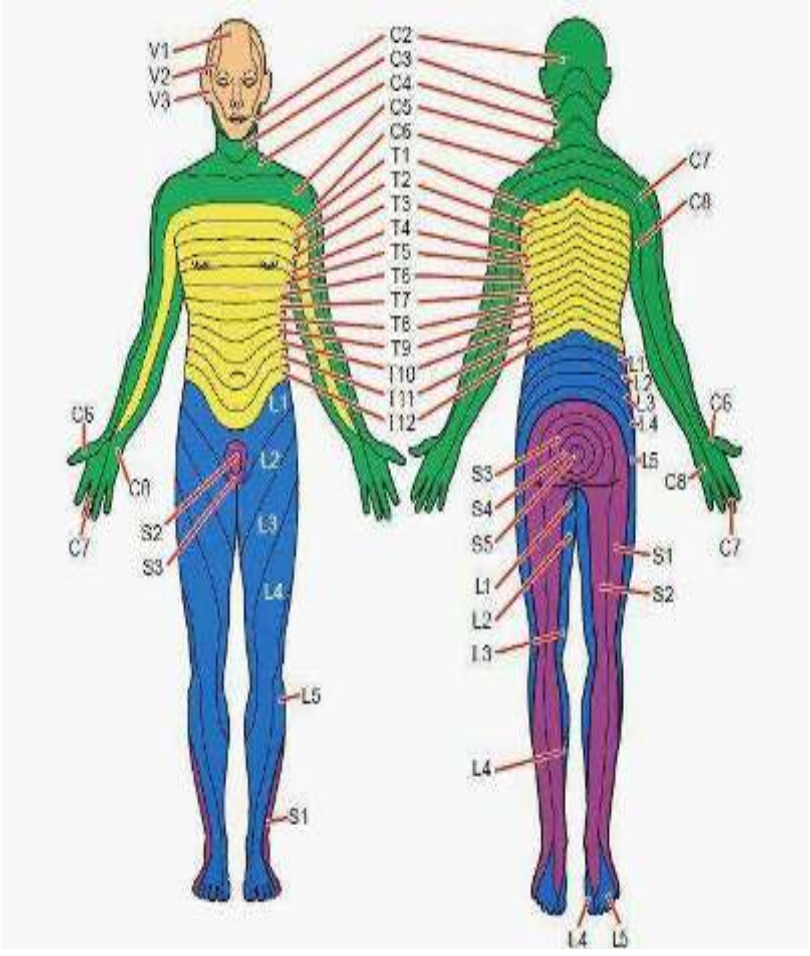
1. Spinous processes
2. Supraspinous ligament
3. Costovertebral junction
4. Trapezius
5. Paravertebral muscles
6. Scapular muscles

Move


Extension/Flexion
Left/Right Side Bending


Cervical Spine
0°
45°
45°
0°
80°
80°
0°
45°
45°

Assessment - neuro



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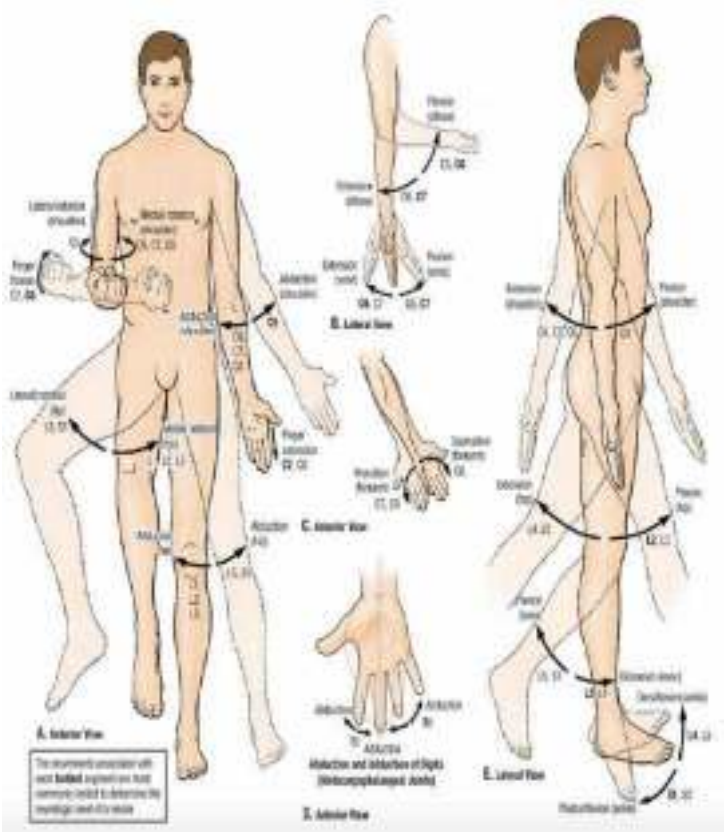
Looking after you

Assessment - neuro



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Assessment – Neuro screen

- squat to the floor and rise
- tip-toe and heel walking

MRI

- ‘Red flag’ signs
- ‘Sciatica’ - >6 weeks
- Neck pain and brachialgia - >6weeks
- Thoracic back pain

- Reports are increasingly protective
- Hard for anyone to get an idea on the severity of pathology from the report

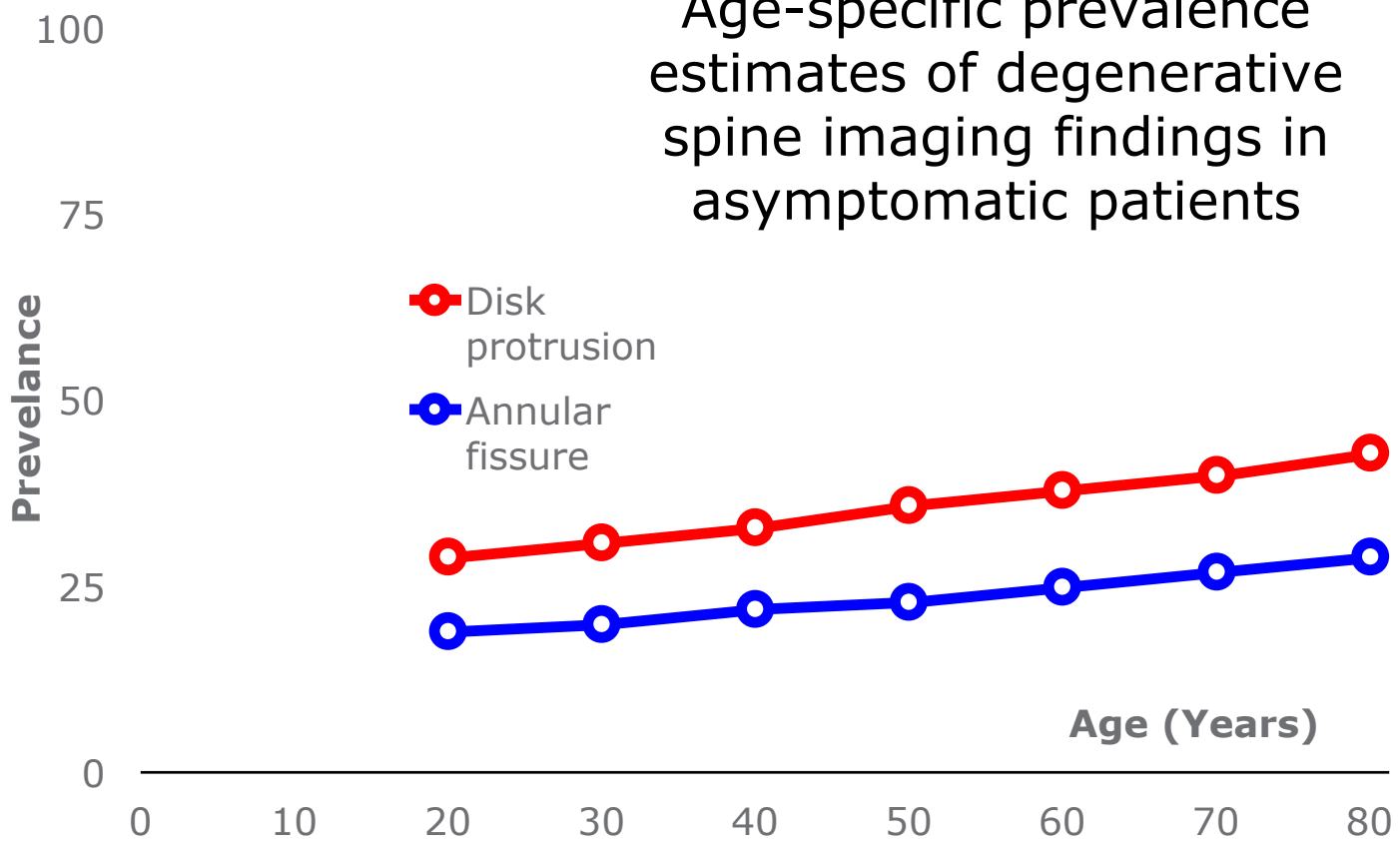
How often is the MRI abnormal?

Boden et al (1990) - JBJS (Am)

'Abnormal MRI' in asymptomatic individuals

- 30% at age 30
- 60% at age 50
- 98% at age 80

Annular fissure - disc protrusion



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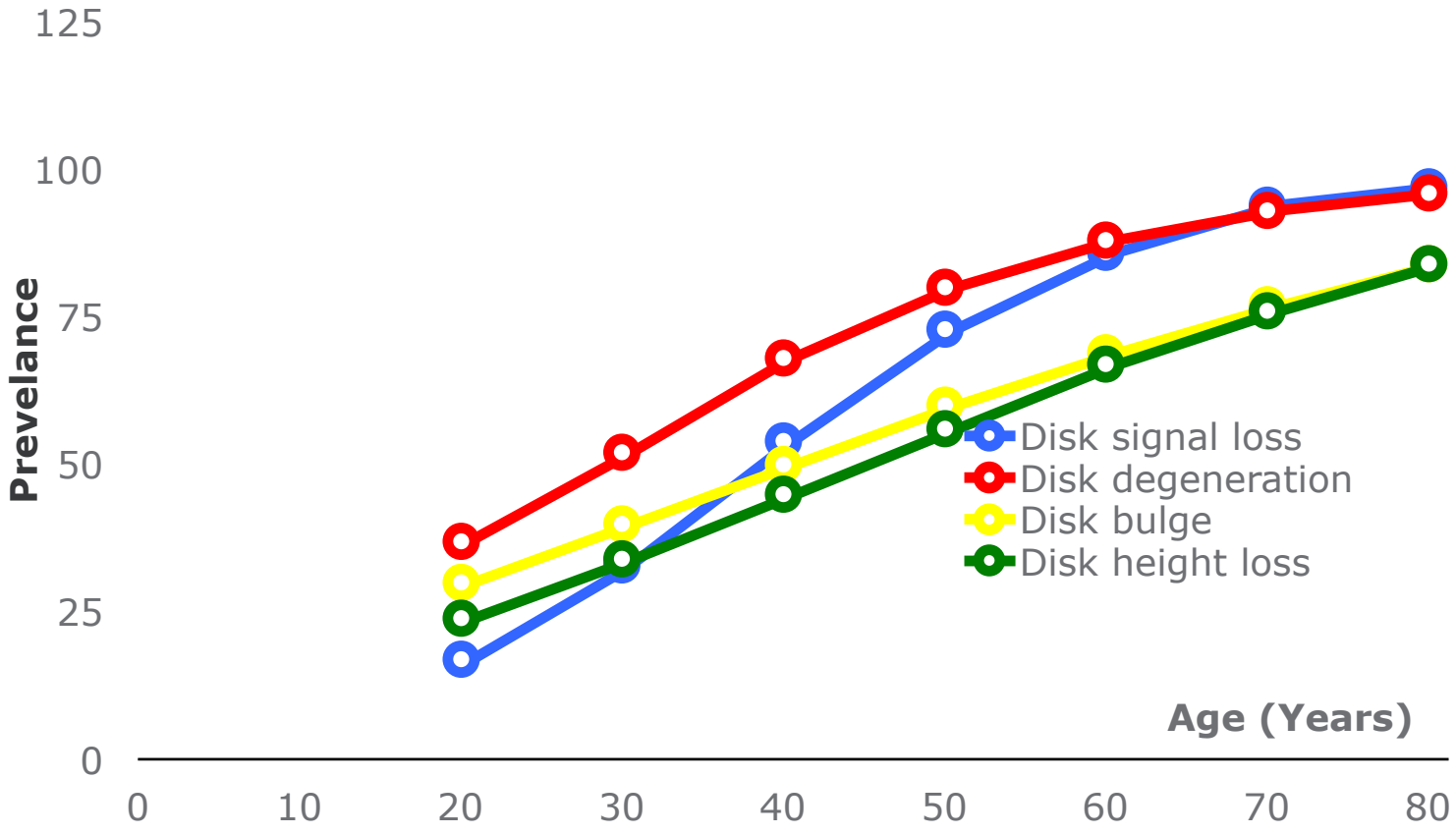
Brinjikji, W., Luetmer, P.H., Comstock, B., Bresnahan, B.W., Chen, L.E., Deyo, R.A., Halabi, S., Turner, J.A., Avins, A.L., James, K. and Wald, J.T., 2015. Systematic literature review of imaging features of spinal degeneration in asymptomatic populations. American Journal of Neuroradiology, 36(4), pp.811-816

Looking after you

Disc degeneration

Age-specific prevalence estimates of degenerative spine imaging findings in asymptomatic patients



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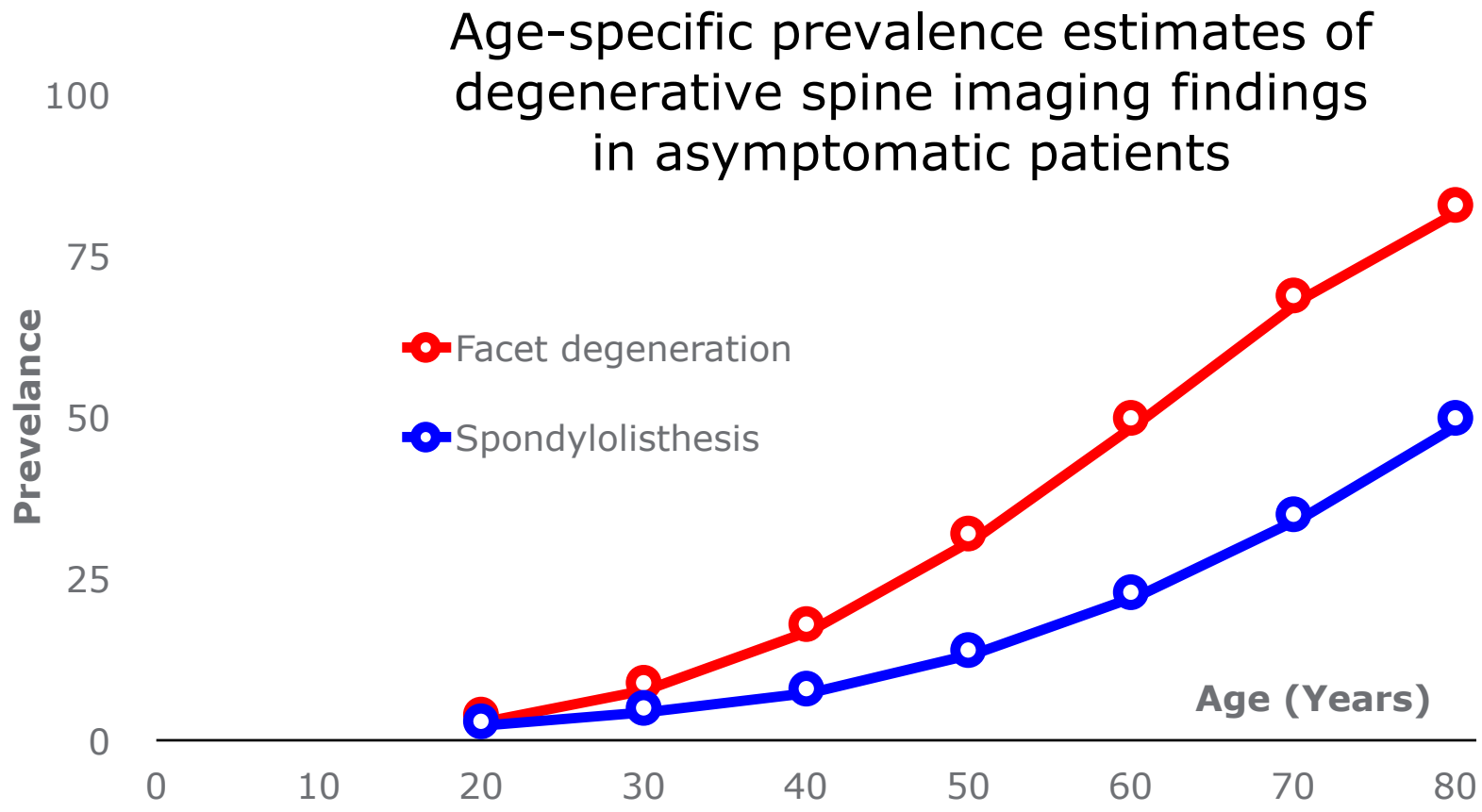
Facet degeneration / spondylolisthesis



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American Journal of Neuroradiology, 36(4), pp.811-816.

Disc problems

YOUNG

- Turgid healthy disc
- Annulus tear
- Reabsorbs in 3 months

OLD

- Reduced disc height
- Micro-fissures
- Unlikely to improve

Disc problems

YOUNG

- Turgid healthy disc
- Annulus tear
- Reabsorbs in 3 months

OLD

- Reduced disc height
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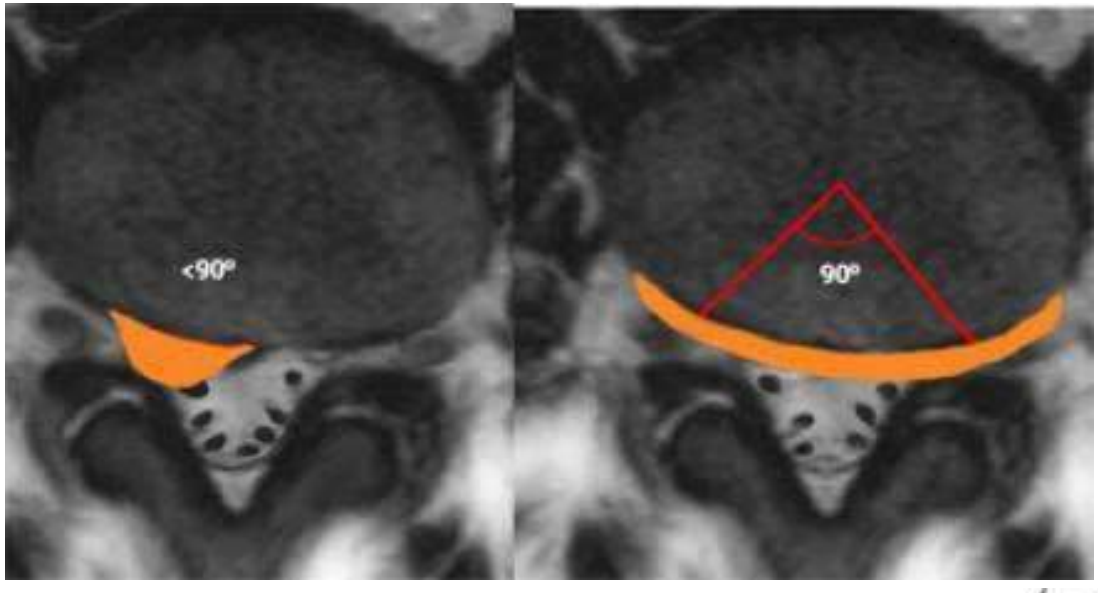
- Unlikely to improve



Spinal Conditions

Overview

- Cervical myelopathy
- Cervical radiculopathy
- Lumbar stenosis
- Lumbar radiculopathy
- Non - specific Low Back Pain (LBP)
- Spondylolisthesis
- Spinal emergencies
  - CES
  - MSCC
  - Epidural abscess

Myelopathy

- gait deviation
- +ve Hoffmann's test
- inverted supinator sign
- +ve Babinski test
- age 45 years or older

- post-test probability of the condition to 94–99%

Myelopathy - physiotherapy

- Improve posture
- Motor training programs
- Proprioception exercises
- Aerobic exercises
- Balance training
- Core stability exercises

Myelopathy - surgery

- Surgical treatment - no better than conservative over two years

- **More than 50% of patients progress over time with irreversible consequences**
  - **Rhee JM. 2013, Nonoperative management of cervical myelopathy: a systematic review**

- Better with surgery:
  - younger age
  - Positive Lhermitte's
  - Shorter duration of symptoms

Cervical radiculopathy

Natural History:

- Substantial improvement 4-6 months
- Time to complete recovery 24-36 months
- Small proportion residual pain and disability

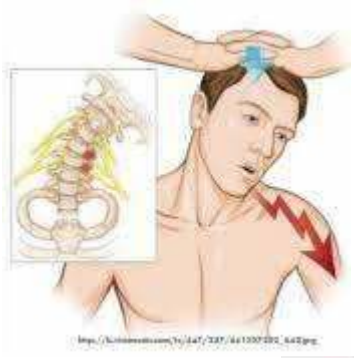
Cervical radiculopathy

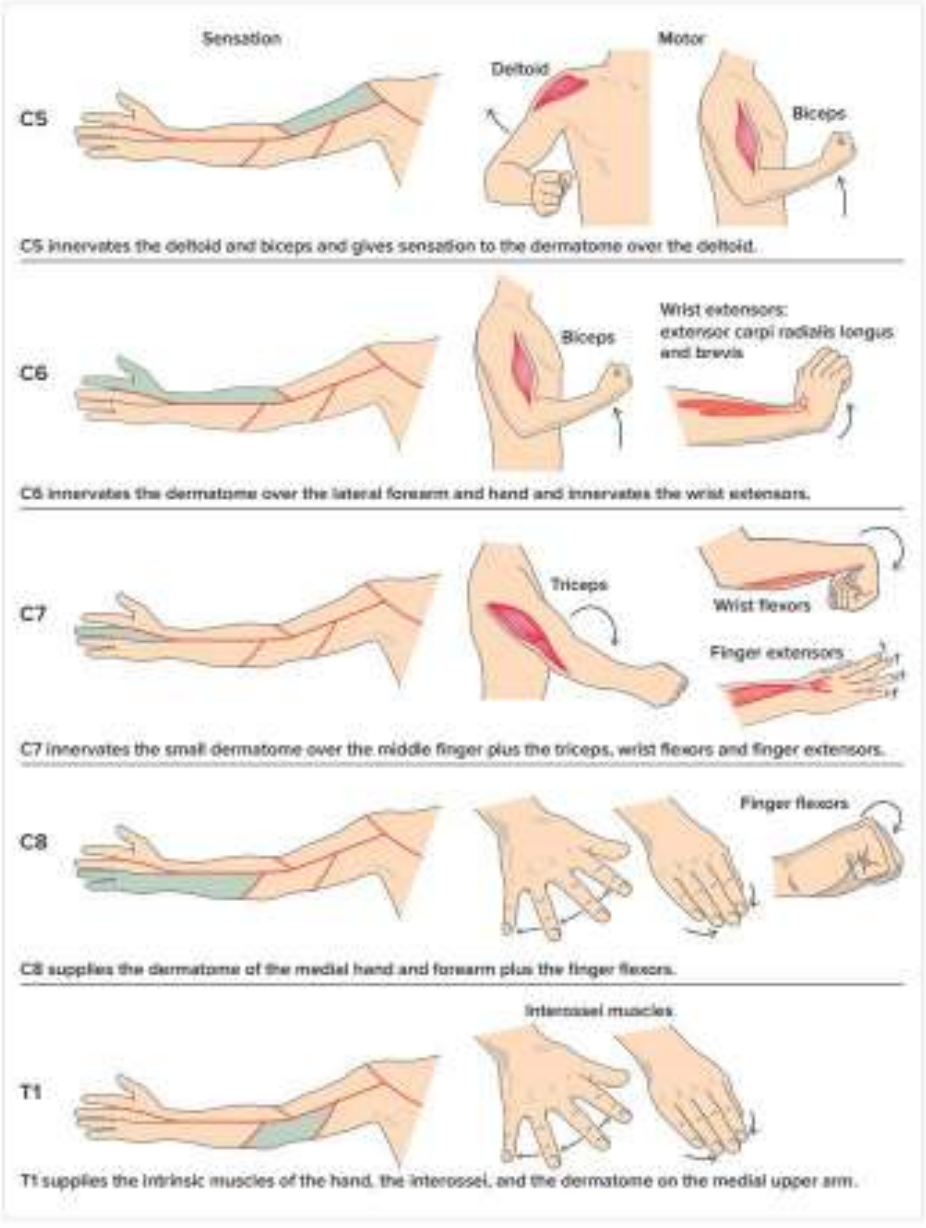
Diagnosis:

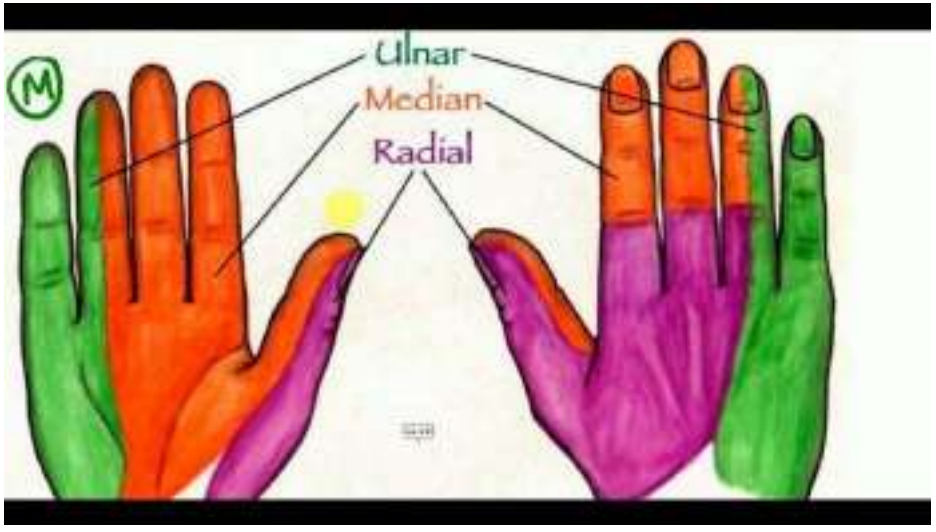
- Spurling's test
- Positive distraction test
- Cervical rotation

< 60deg

- (+) upper limb stretch test




Sensation
Motor
C5
Deltoid
Biceps
C5 innervates the deltoid and biceps and gives sensation to the dermatome over the deltoid.
C6
Biceps
Wrist extensors:
extensor carpi radialis longus
and brevis
C6 innervates the dermatome over the lateral forearm and hand and innervates the wrist extensors.
C7
Triceps
Wrist flexors
Finger extensors
C7 innervates the small dermatome over the middle finger plus the triceps, wrist flexors and finger extensors.
C8
Finger flexors
C8 supplies the dermatome of the medial hand and forearm plus the finger flexors.
T1
Interossei muscles
T1 supplies the intrinsic muscles of the hand, the interossei, and the dermatome on the medial upper arm.


Ulnar
Median
Radial

Cervical radiculopathy - management

- Exercise therapy has the most positive and lasting effects for the condition
- Contralateral rotation and side flexion
- Stretching

- Pain coping/stress management

- Multimodal approach more effective than manual therapy alone

Cervical radiculopathy - management

- **Surgery vs. Physiotherapy**
  - Engquist M. 2013. Surgery Versus Nonsurgical Treatment of Cervical Radiculopathy: A Prospective, Randomized Study Comparing Surgery Plus Physiotherapy With Physiotherapy Alone With a 2-Year Follow-up
- **Surgery with physio – faster improvement in first year**
- **Difference decreased 2 years after surgery**

- My indications:
  - intractable pain
  - neurological compromise
  - failure to improve 3 months

Spinal stenosis

- Calf pain, lower limb heaviness and foot numbness
- Reduced walking distance
- Shopping trolley sign
- Physiotherapy first
- Decompression when fails to respond to non-operative treatments

Spinal stenosis

- Bilateral symptoms
- Leg pain more than back pain
- Claudication
- Relief on sitting
- Age >48

Probability if (+)
1- 44%
2- 55%
3- 63%
4- 76%
5- 99%

Spire Healthcare

Looking after you

Spinal stenosis - treatment

- Rarely leads to a neurologcial injury
- Pain management first before surgery

- Lumbar isometric and stretching exercises
- Static and dynamic postural exercises
- Individualized muscle strengthening
- Stabilization of abdominal and back muscles to avoid excessive lumbar extension
- Postural and ergonomic advice
- An aquatic walking and jogging program
- Cycling exercises - aerobic fitness
- Endurance exercises
- Manual therapy
- Education (Back school) and counseling

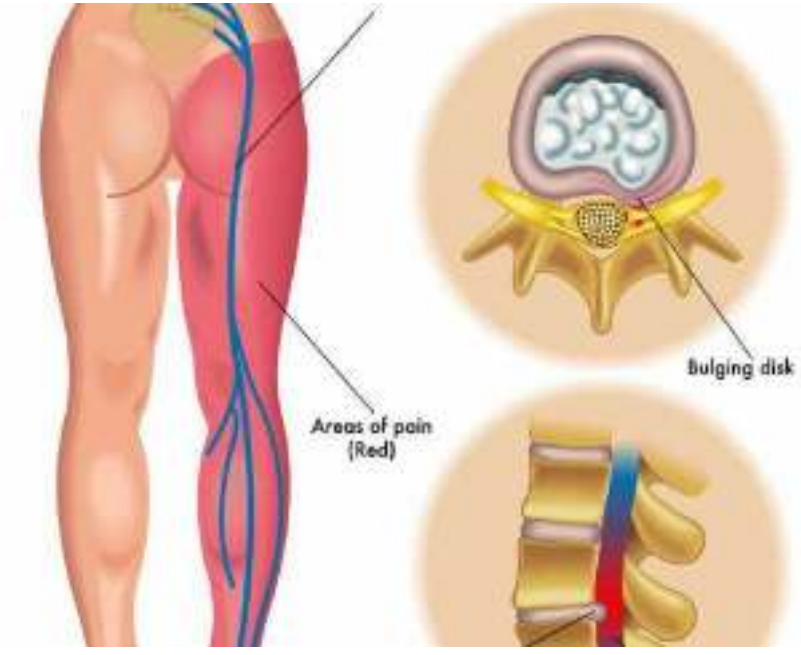
Spinal stenosis - treatment

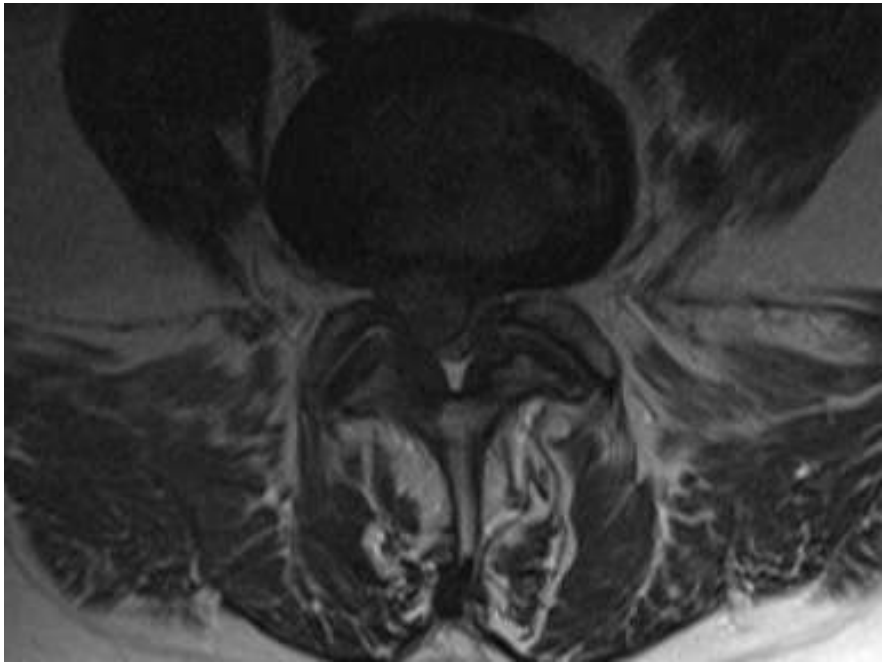
- Surgery reserved for failed conservative management
- Cochrane Database Syst Rev (2016) Surgical versus non-surgical treatment for lumbar spinal stenosis
  - Paucity of evidence on the efficacy of surgery for lumbar spinal stenosis
  - No trials have compared surgery with no treatment, placebo or sham surgery
  - Placebo-controlled trials in surgery are feasible and needed in the field of lumbar spinal stenosis

Lumbar radiculopathy

- Radiating pain in dermatomal distribution
- +ve SLR, saiatic stretch test, Bowstring test

- 90% improve within 3 months and 98% within one year
- Surgery for ongoing / debilitating symptoms





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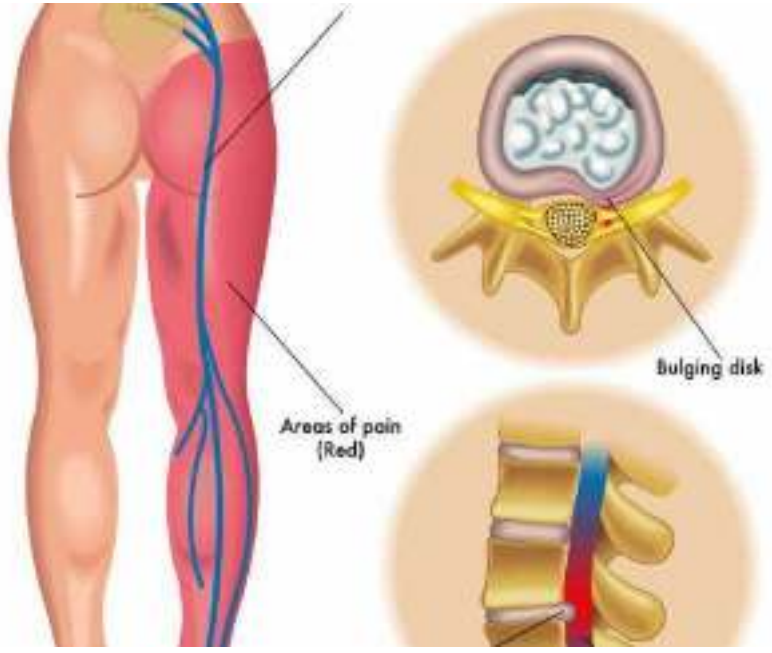
Looking after you

Lumbar radiculopathy - treatment

- Physiotherapy
- Analgesics
  - non-steroidal anti-inflammatory drugs
- Muscle relaxants

- Back schools
- Graduated core stabilisation exercises

- Surgery
  - Pain >3 months
  - Better pain relief than physiotherapy at all time points
  - 10% recurrence



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Looking after you

Lumbar surgery - results

SPORT - Spine Patient Outcome Research Trial (RCT and observational cohort) - Spine

- Adbu et al (2018) - Degenerative spondy at 8 years
  - Better outcomes for fusion
- Lurie et al (2015) - Decompression at 8 years
  - Better outcomes for surgery
- Lurie et al (2015) - Microdiscectomy at 8 years
  - Better outcomes for surgery

Forsth et al (2016) - NEJM

- Fusion equivalent to decompression for degenerative spondylisthesis (RCT)

NICE guidelines - Spines

- Low back pain and sciatica in over 16s: assessment and management - [NG59]

- Spinal injury: assessment and initial management - [NG41]
- Metastatic spinal cord compression in adults: risk assessment, diagnosis and management [CG75]

Non-specific LBP

- ✓ Risk stratification
  - ✓ STarT Back Tool
- ✓ Spine practitioner led
- ✓ Medication / CBT
- ✓ Median branch block
- ✓ Radiofrequency ablation

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

NICE guideline
Published: 30 November 2016
nice.org.uk/guidance/ng59

- **No nerve injections**
- **No caudal epidurals**
- **NO SURGERY (unless RCT)**

Spire Healthcare

STarT Back

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

NICE guideline
Published: 30 November 2016
nice.org.uk/guidance/ng59

- Likely to improve quickly and have a good outcome:
  - reassurance
  - advice to keep active
  - guidance on self-management
- Higher risk of a poor outcome
  - exercise programmes
  - with or without manual therapy
  - or using a psychological approach

Sciatica / spinal stenosis

✓Epidural nerve injections

- **No caudal epidurals**

✓Surgery 'okay'
  - Microdiscectomy
  - Lumbar decompression

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

NICE guideline
Published: 30 November 2016
nice.org.uk/guidance/ng59

MSCC

Metastatic spinal cord compression in adults: risk assessment, diagnosis and management

Clinical guideline
Published: 26 November 2008
nice.org.uk/guidance/cg75

- Early detection
- Early imaging
- Early consideration of spinal surgery
- Guidelines on supportive care

- Surgery plus radiotherapy - patients are ambulant for longer and maintain continence longer
  - Patchell et al (2005) Lancet

Referral pathways

NEUROSURGERY

- www.leedsneurosurgery.com

- Cervical pathology (C0-T1
- Suspected cauda equina syndrome (via ED)
- Intradural tumours
- Post-op neurosurgical patients

ORTHOPAEDICS

- Phone referral

- Thoracolumbar pathology (T2-sacrum)
- MSCC (via Oncology)
- Thoracolumbar fractures
- Post-op orthopaedic patients

Non spinal specialist referral

MSCC

- Oncology

Cauda equina syndrome

- Local ED for urgent MRI

Spinal Infection

- Medicine, CofE, Paediatrics, Infectious Diseases

Referral – SpineFit+

- **'Our team at SpineFit+ includes a variety of healthcare professionals who work together to ensure every patient receives a programme of care that is tailored to their individual needs'**

- Medication
- Sleep
- Fitness and Health
- Soothing the stress of pain
- Dealing with unhelpful thoughts
- Low mood and depression
- Pacing and flare ups
- Relationship and life issues
- Money worries

- https://www.leedscommunityhealthcare.nhs.uk/our-services-a-z/spinefit3/spinefit-meet-the-team/

Spire Healthcare

SpineFit+

Paintoolkit.org

Spire Healthcare

Looking after you

Summary

- Knowledge of red flags is essential to identify malignancy, infection, serious neurological pathology and fracture
- **Think 'gait first' when examining spinal patients**

- Neurological examination may include asking the patient to squat to the floor then rise or by testing tip-toe and heel walking

- Not all 'bad' MRI results are 'bad'
- Majority of back problems self managed
- Multidisciplinary approach – prerequisite to success

Objectives

- Spinal examination
- When is an MRI abnormal?
- Common conditions
- Back pain guidelines
- Rationale for surgical treatment
- Referral pathways