Mr Dean Mistry FRACS
Spine Surgeon
Orthopaedic Surgeon

Screening for specialist referral in the cervical and lumbar spine

Introductions

- Mr Dean Mistry
  - BHB, MBChB (Auckland) 2000
  - FRACS (Ortho) 2009
  - Spine Fellowships in Sydney 2010, Vancouver 2012
  - www.spinesurgeon.co.nz

- Katy Street
  - BPhty, Cert. MDT, PGDip (Musculoskeletal), MHSc (current candidate)
  - Physiotherapist for Middlemore Hospital Spine Team

Workshop aims

- Review serious pathologies in the cervical and lumbar spine
- Clinical Prediction: sensitivity and specificity of clinical tests
- When to refer patients?
- Case presentations
- Examination skills

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AUCKLAND PHYSIOTHERAPY

Patient

- 43F
- Digging clay from under her house
- ‘It hurts….’

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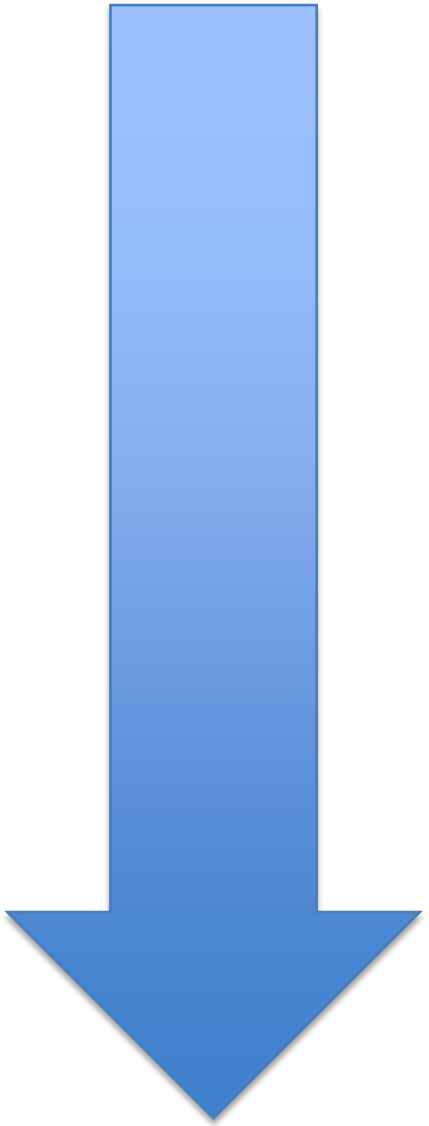
Now what?

Goals

- Categorise
  - Neurogenic
  - LBP

+/- RED FLAGS

- Urgently refer or arrange Ix for RF's
- Reassure appropriately
- Make them comfortable
- Keep them active
- Watch them get better….
- OR, if not getting better, Refer them on



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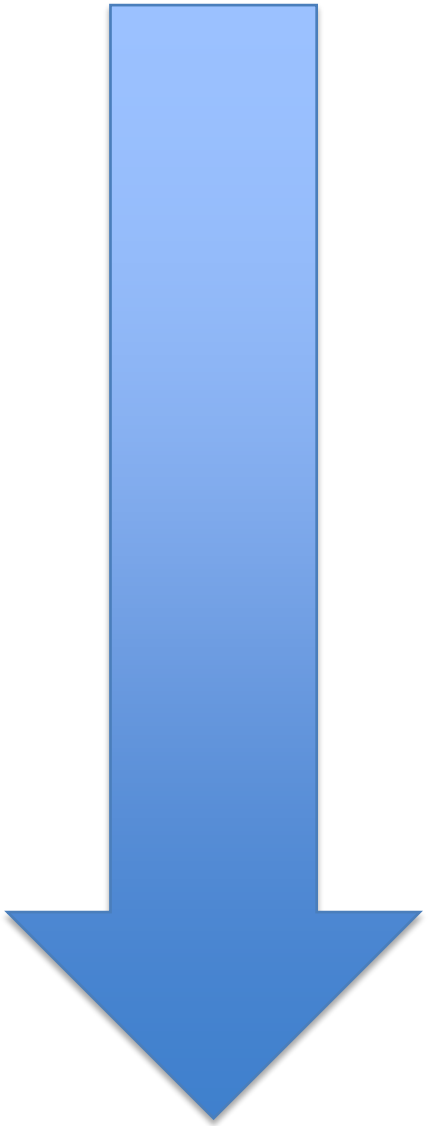

Low back pain

- 8th most common presentation to GP's ~2% case load
- For many, acute low back pain is the first reason to seek medical care as an adult.
- Most will be 'non-specific' = no defined pathoanatomical cause, benign course
- Some will not be benign….

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Non-specific LBP vs ????

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Non-specific LBP vs ????

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Red Flag Conditions

- Red Flags
  - Cauda Equina Syndrome
  - Tumour
  - Fracture
  - Infection

- Other serious pathologies
  - Cervical Myelopathy
  - Upper Cervical Instability
  - Adjacent/non-musculoskeletal pathology

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Red Flag Conditions

- 8th most common presentation to GP's ~2% case load
- Inflammatory Disease 5%
- Spinal Fracture 4%
- Spinal Tumour 0.5%
- Cauda Equina 0.04%
- Spinal Infection 0.01%

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Red Flag Conditions

- 8th most common presentation to GP's ~2% case load

• Inflammatory Disease	5%	1 in 20 pt's
• Spinal Fracture	4%	1 in 25 pt's
• Spinal Tumour	0.5%	1 in 200 pt's
• Cauda Equina	0.04%	1 in 2 500 pt's
• Spinal Infection	0.01%	1 in 10 000 pt's

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Red Flag Conditions

- Rare
- Suspected on the basis of HISTORY and EXAMINATION findings
- Some will be missed, or have delayed dx
- Many red flags have been proposed and tested
  - very few raise the post-test probability to greater than 1%.
  - The exceptions are previous history of cancer and unexplained weight loss.
- Combinations of positive results are more predictive but are rarely reported on in the literature

Diagnostics

- Specificity
  - The probability of a negative test result in someone without the pathology
  - Sp In (high specificity = rule in)

- Sensitivity
  - The probability of a positive test result in someone with the pathology
  - Sn Out (high sensitivity = rule out)

Diagnostics

- When screening for serious pathologies we are most interested in tests with high sensitivity so we can confidently rule out a condition. However, we must be aware of high false positive rates with red flags.

Likelihood ratios

- Positive likelihood ratio
  - The ratio of a +ve test result in people with the pathology to a +ve test result in people without the pathology

- Negative likelihood ratio
  - The ratio of a –ve test result in people with a pathology to a –ve test result in people without the pathology.

Likelihood ratios

LR		Change from Pre-Test Probability
>10		Large positive
10 to 5		Moderate positive change
5 to 2		Small positive change
1		No change
0.5 to 0.2		Small negative change
0.2 to 0.1		Moderate negative change
<0.1		Large negative change

Likelihood ratios

LR		Change from Pre-Test Probability
>10		Large positive (Rule it in)
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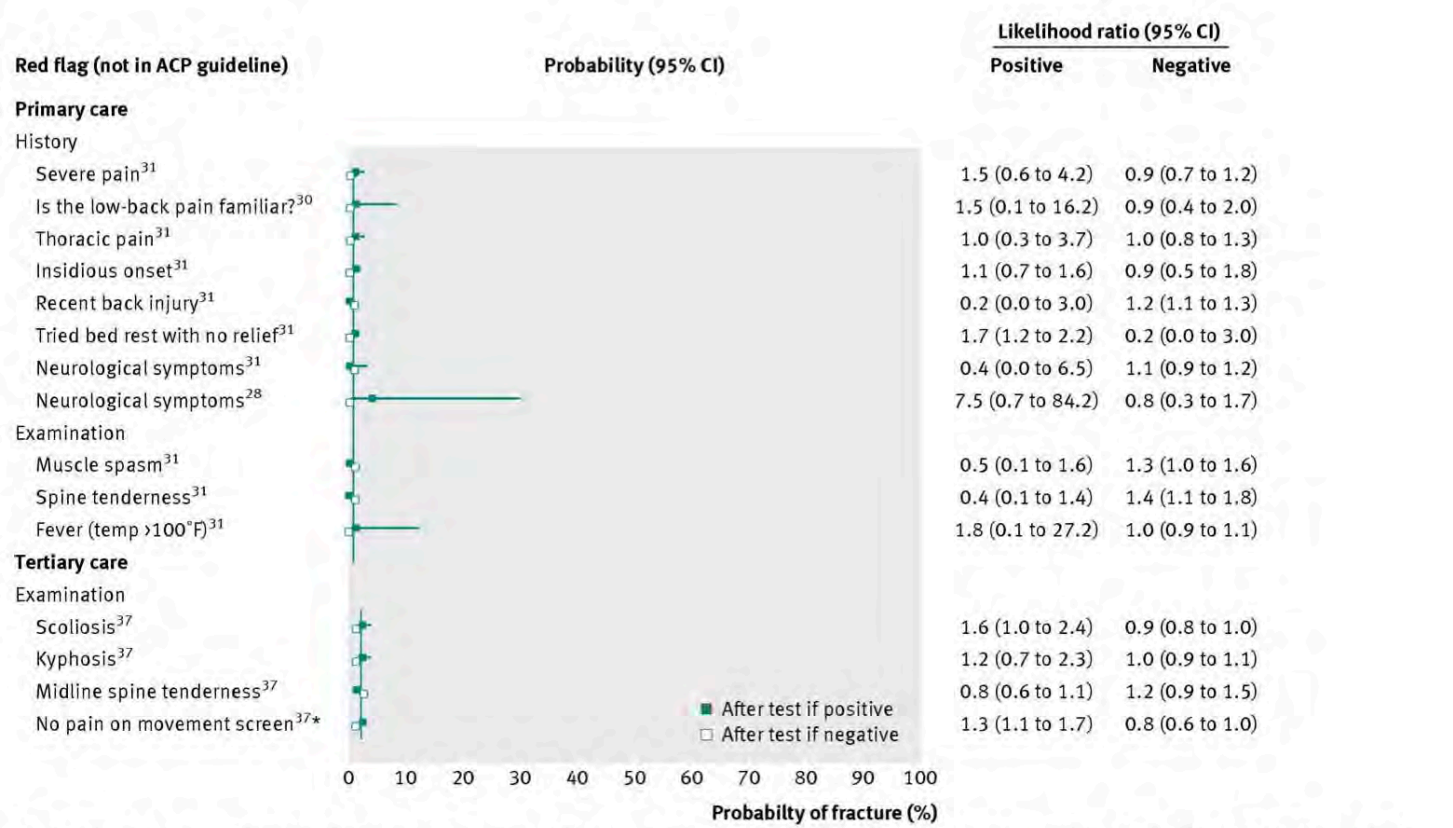
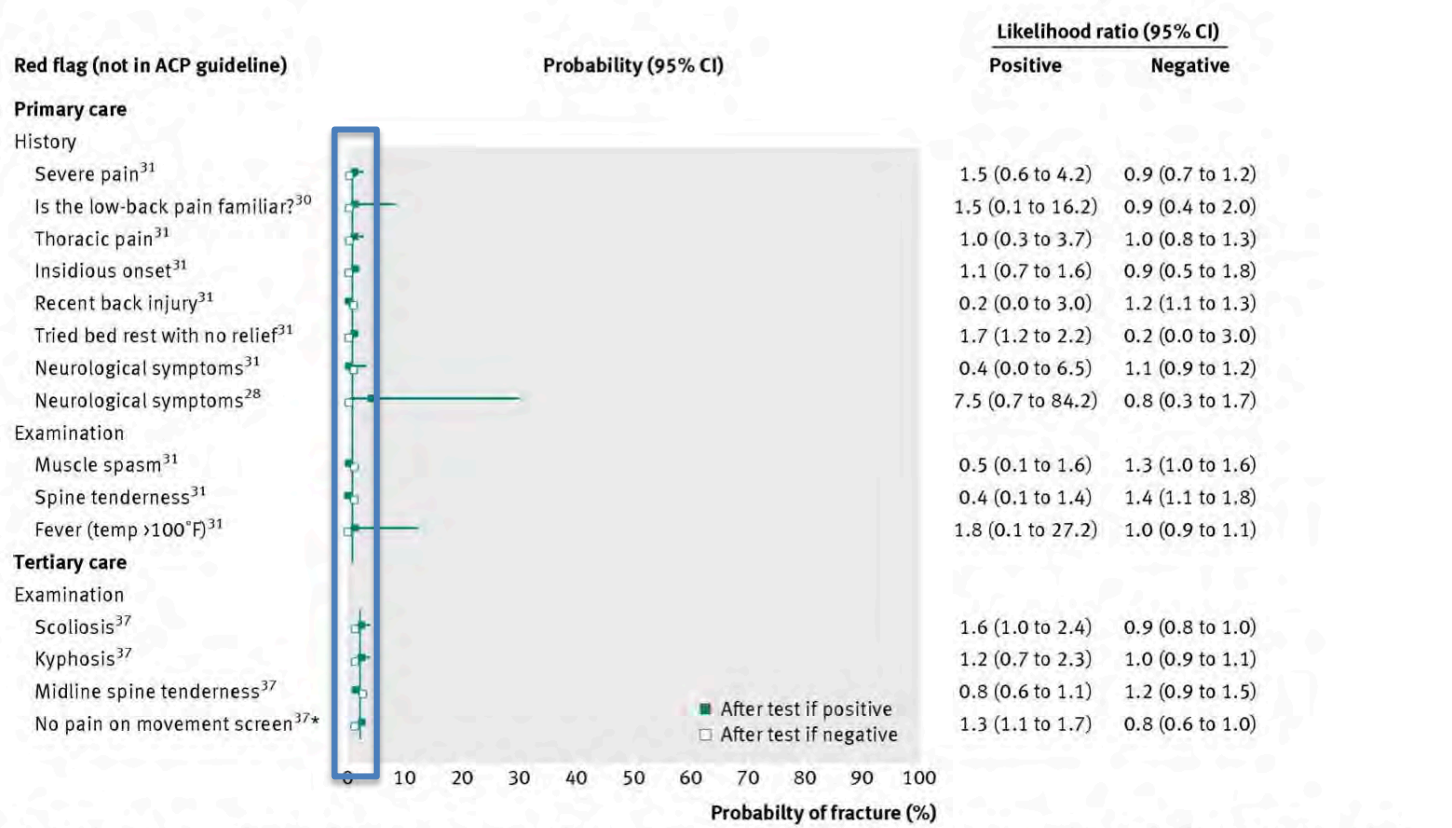
Likelihood ratios



Red flag (not in ACP guideline)	Likelihood ratio (95% CI) Positive	Negative
Primary care		
History		
Severe pain[31]	1.5 (0.6 to 4.2)	0.9 (0.7 to 1.2)
Is the low-back pain familiar?[30]	1.5 (0.1 to 16.2)	0.9 (0.4 to 2.0)
Thoracic pain[31]	1.0 (0.3 to 3.7)	1.0 (0.8 to 1.3)
Insidious onset[31]	1.1 (0.7 to 1.6)	0.9 (0.5 to 1.8)
Recent back injury[31]	0.2 (0.0 to 3.0)	1.2 (1.1 to 1.3)
Tried bed rest with no relief[31]	1.7 (1.2 to 2.2)	0.2 (0.0 to 3.0)
Neurological symptoms[31]	0.4 (0.0 to 6.5)	1.1 (0.9 to 1.2)
Neurological symptoms[28]	7.5 (0.7 to 84.2)	0.8 (0.3 to 1.7)
Examination		
Muscle spasm[31]	0.5 (0.1 to 1.6)	1.3 (1.0 to 1.6)
Spine tenderness[31]	0.4 (0.1 to 1.4)	1.4 (1.1 to 1.8)
Fever (temp >100°F)[31]	1.8 (0.1 to 27.2)	1.0 (0.9 to 1.1)
Tertiary care		
Examination		
Scoliosis[37]	1.6 (1.0 to 2.4)	0.9 (0.8 to 1.0)
Kyphosis[37]	1.2 (0.7 to 2.3)	1.0 (0.9 to 1.1)
Midline spine tenderness[37]	0.8 (0.6 to 1.1)	1.2 (0.9 to 1.5)
No pain on movement screen[37]*	1.3 (1.1 to 1.7)	0.8 (0.6 to 1.0)

Fig 5 Diagnostic accuracy of red flags for spinal malignancy excluded from American College of Physicians (ACP) guideline.

Likelihood ratios



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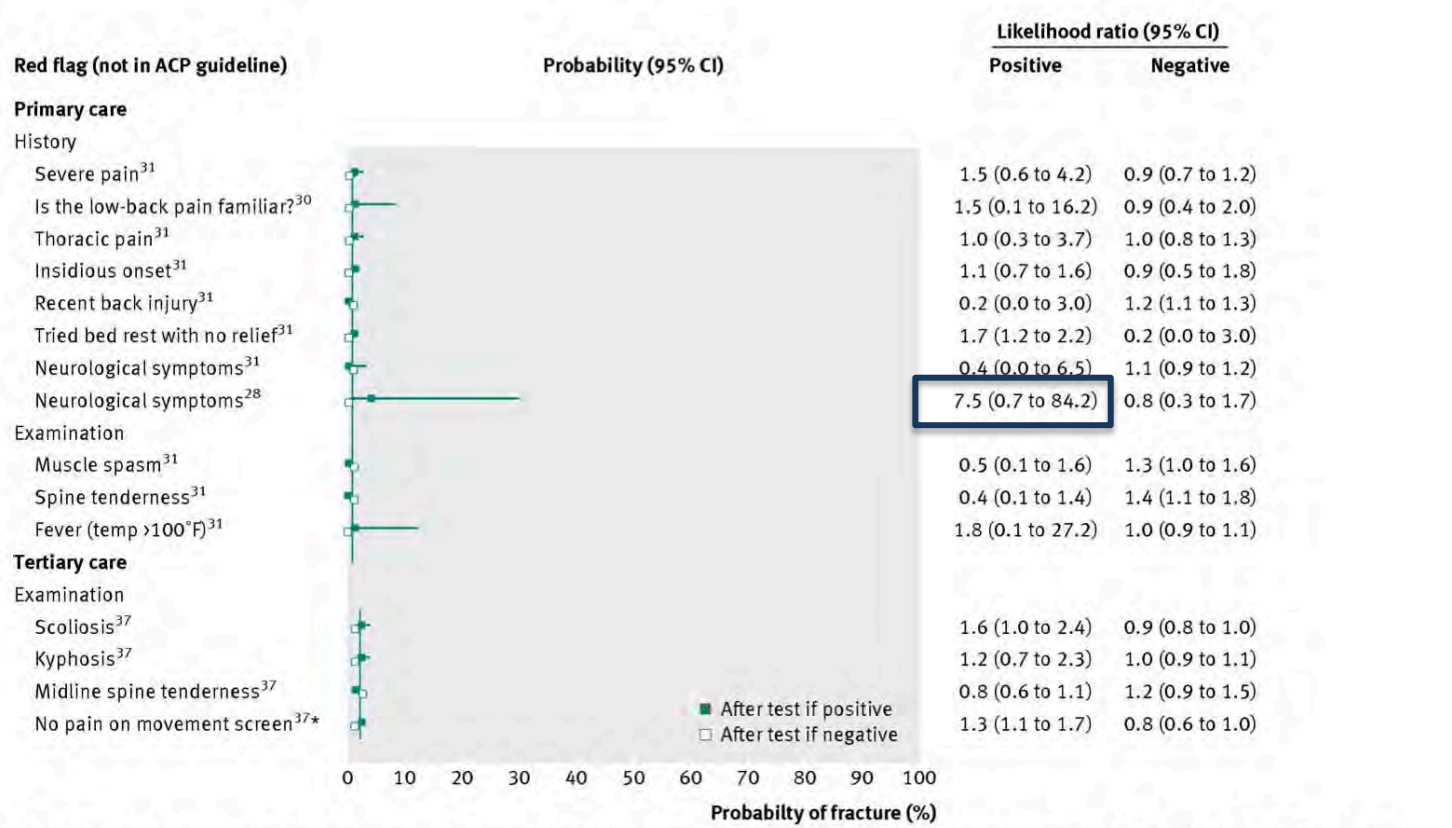

Fig 5 Diagnostic accuracy of red flags for spinal malignancy excluded from American College of Physicians (ACP) guideline.

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Likelihood ratios

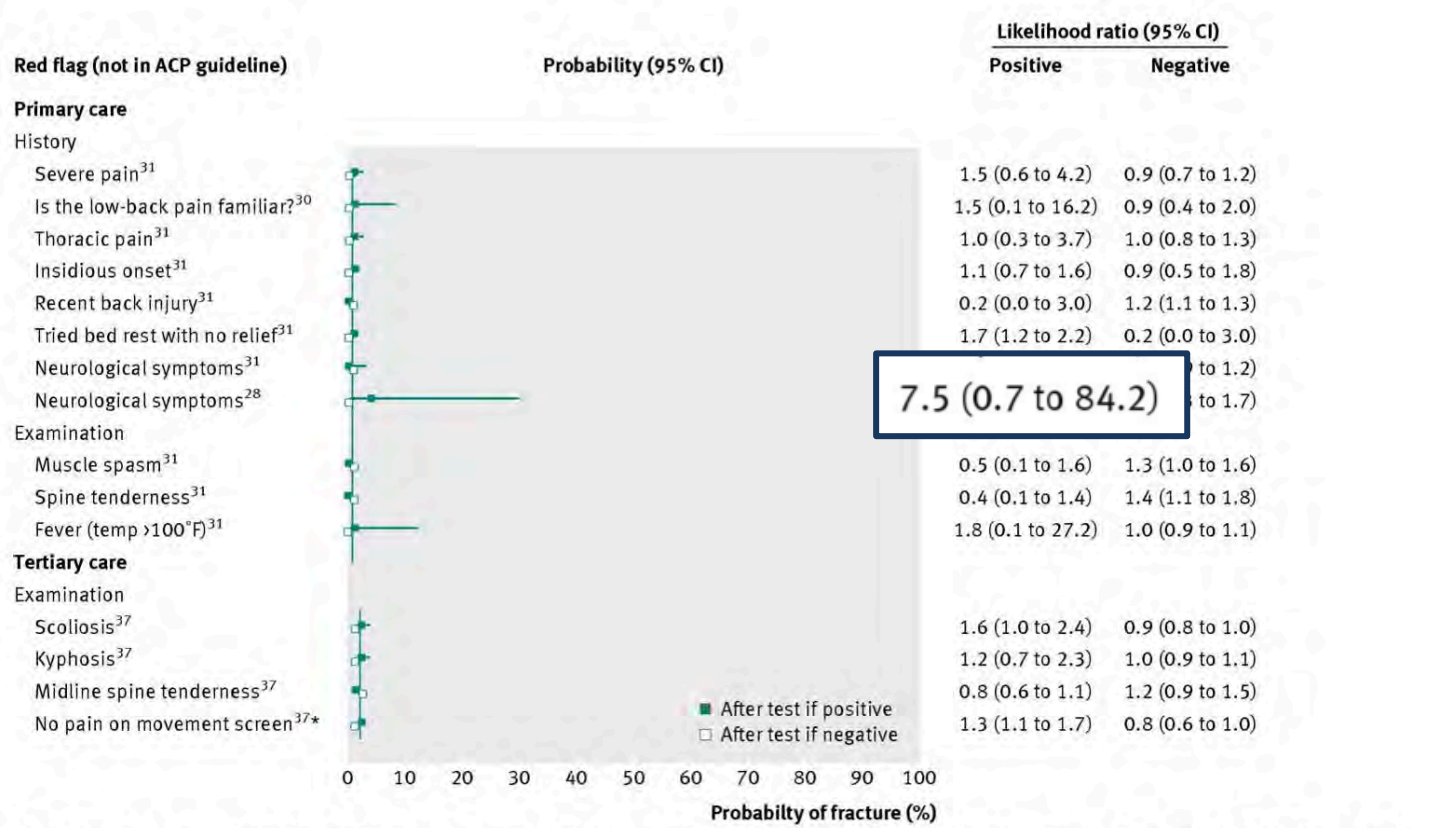

Fig 5 Diagnostic accuracy of red flags for spinal malignancy excluded from American College of Physicians (ACP) guideline.

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False positives

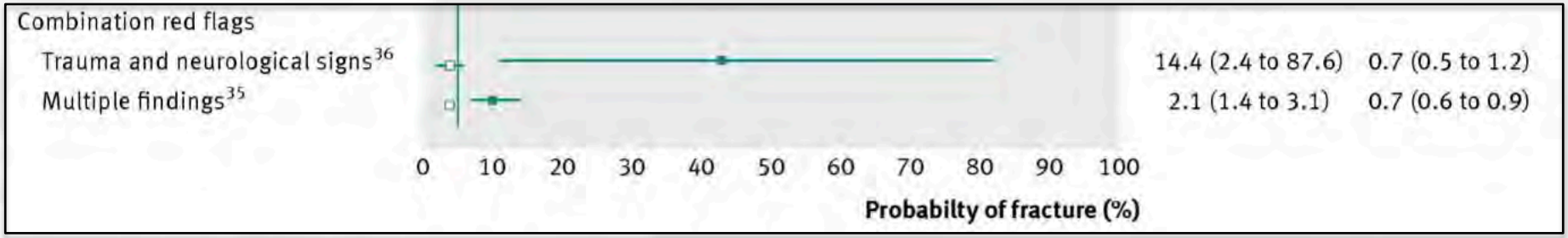
- Night pain
  - Harding et al, 2005 investigated 213 patients with night pain, none had serious pathologies
  - Patients with pain every night had increased VAS pain scores, anxiety, depression and Oswestry scores

- Age
  - age alone is not a useful predictor as females aged 40-80 years have the highest prevalence of back pain (Hoy et al, 2012)

- Positive red flags in isolation often have high false positive rates, therefore clusters of findings are more useful

Clusters

Positive red flags in isolation often have high false positive rates, therefore clusters of findings are more useful



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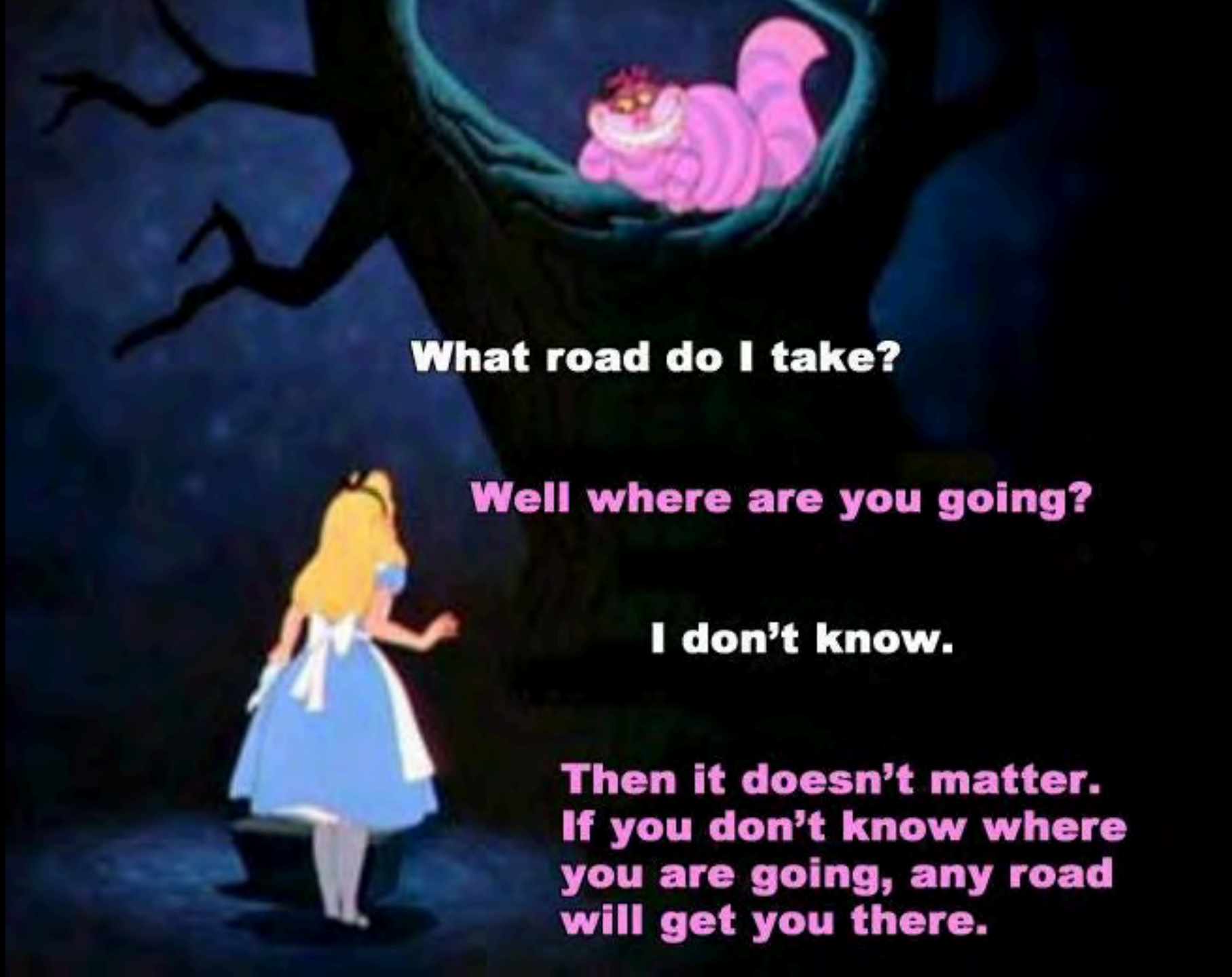
So, what do I DO?


What road do I take?
Well where are you going?
I don't know.
Then it doesn't matter. If you don't know where you are going, any road will get you there.

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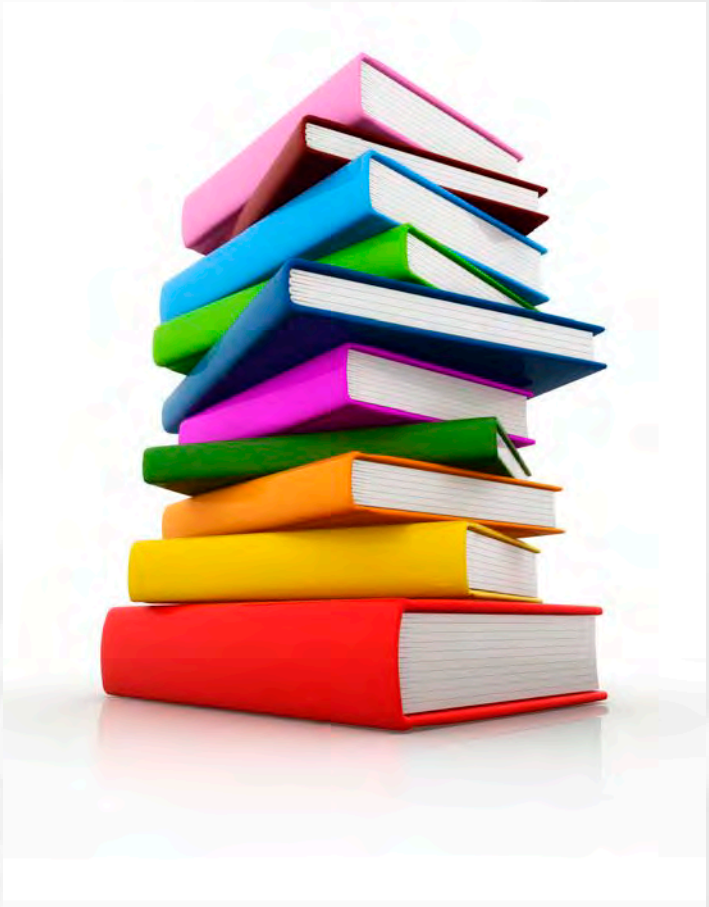

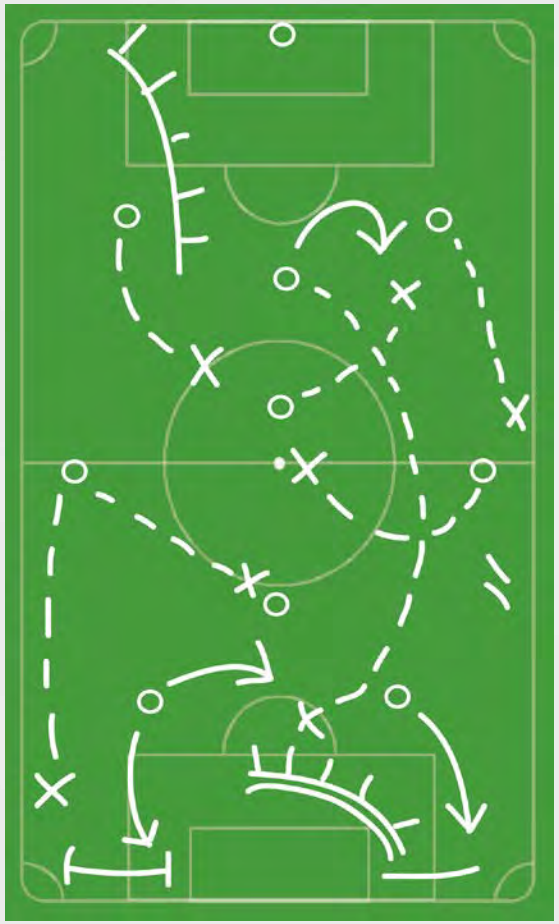

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GROUP 1:

REFER IMMEDIATELY

GROUP 2:
EXPIDITIOUS
SPECIALIST REFERRAL

GROUP 3: TRIAL OF
TREATMENT
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT

Red Flag Pathologies

- Lumbar Spine
  - Infection
  - Cauda Equina
  - Tumour
  - Fracture
- Cervical Spine
  - As above +
  - Myelopathy
  - Instability

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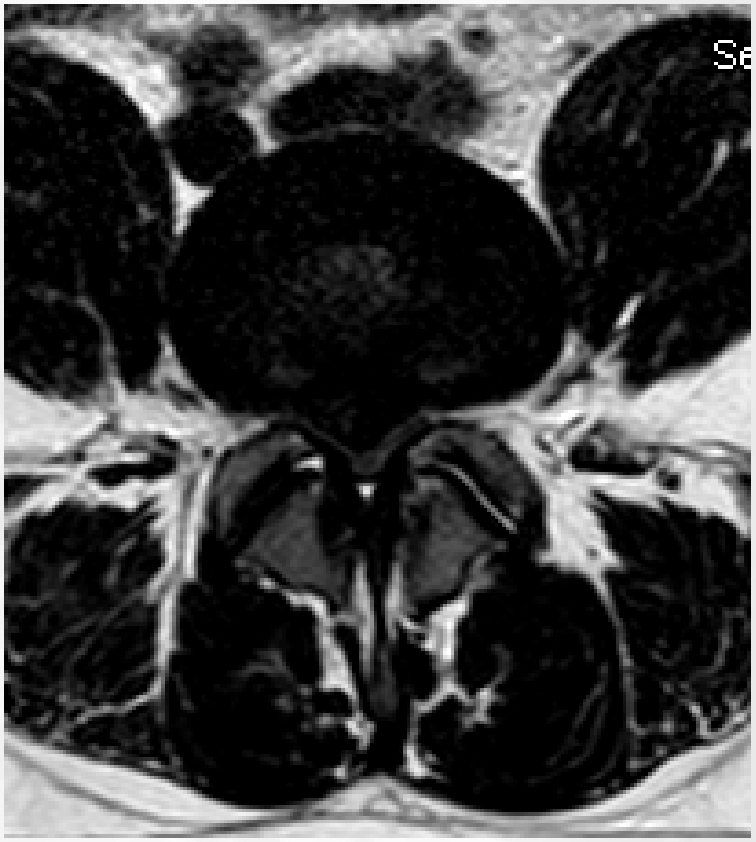
Cauda Equina Syndrome (CES)



- CES can be defined as the sudden loss of function of the lumbar and lumbosacral plexus below the conus medullaris due to a number of conditions
- Most common cause = disc herniation, followed by compression from tumour, infection, stenosis and haemotoma (Fraser et al, 2009)
- Early recognition and early decompression can stop progress of neurological deficits

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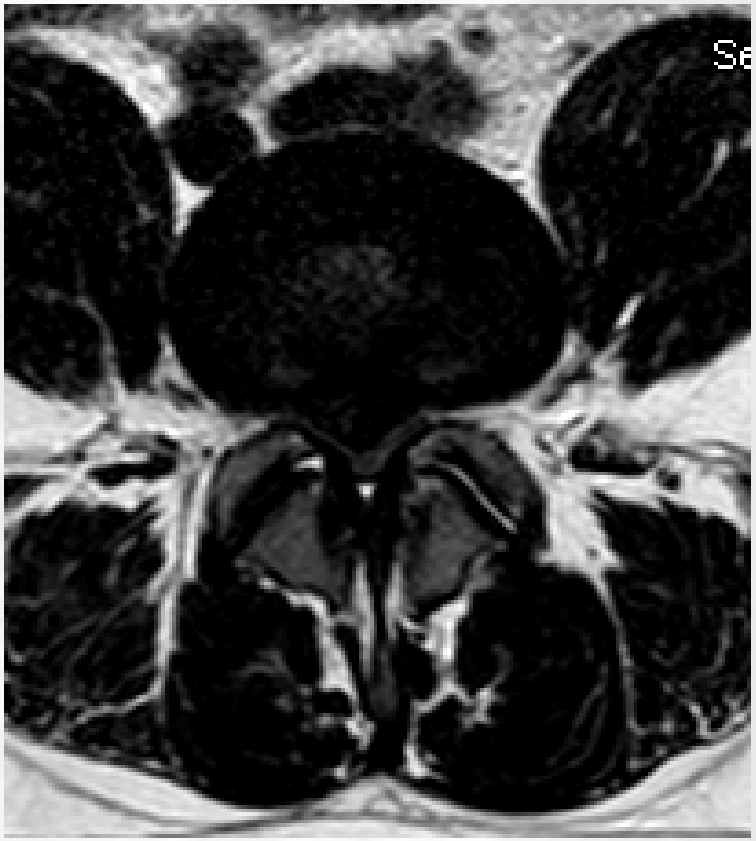
Cauda Equina Syndrome (CES)



- CES can be categorised into two group:
  - CES-I (incomplete) reduced urinary sensation, loss of desire to void or poor stream
  - CES-R (retention) established urinary retention +/- overflow
  - Both need urgent referral, CES-R less likely to be reversible

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Cauda Equina Syndrome (CES)

	SENSITIVITY	SPECIFICITY	LR
Back Pain	High	Low	Low
Bowel Incontinence	High	Low	Low
Bilateral Sciatica	Low	High	Low
Bladder Changes	Wide variation reported	Wide variation reported	Low
Saddle Anaesthesia	Wide variation reported	Wide variation reported	Low
Reduces Anal Tone	Low	High	Low

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Cauda Equina Syndrome (CES)

- Take home message
  - CES symptoms are varied in presentation
  - Patients may present with bladder and / or bowel symptoms.
  - Normal anal tone does not rule out CES.
  - Urodynamic studies may be useful for early Dx (>500ml post void)

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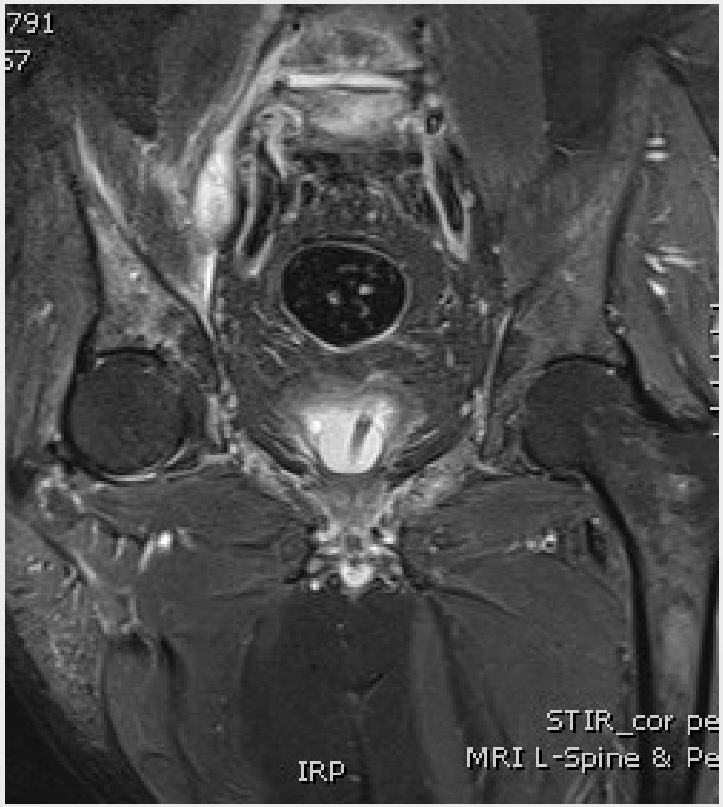
Infection

- Discitis / osteomyelitis
- Epidural abscess
- Psoas abscess

- Wide presentation , typical vs atypical bacteria

- Poor data for usefulness of red flags



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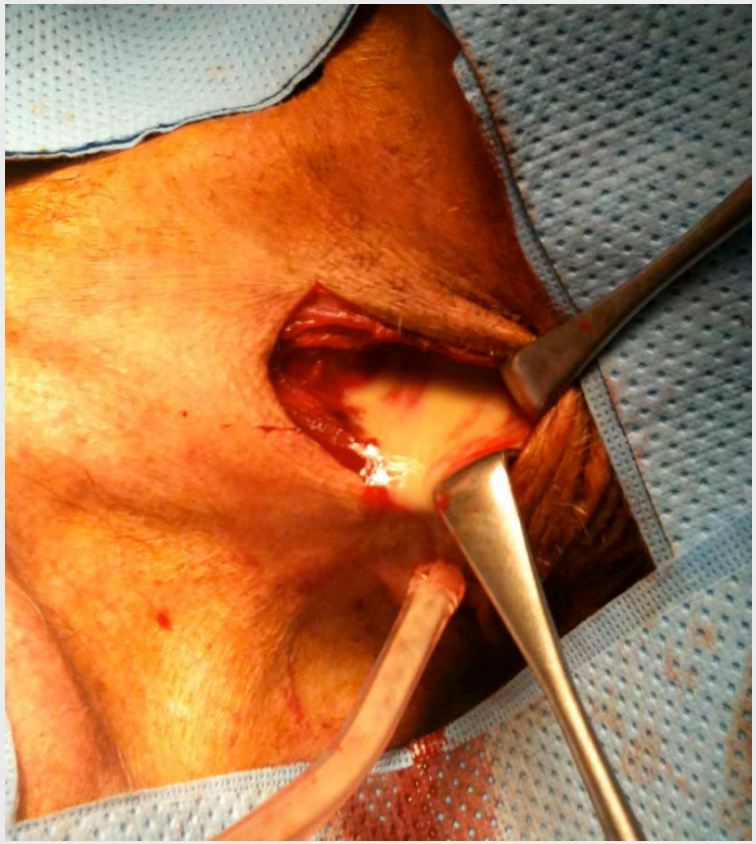
Infection

- Fever and back pain are cardinal symptoms
  - Night pain/Sweats/UWL/Fatigue
  - Hx of exposure – travel/immigration/procedures (dental)/infections/IV drug use
  - Immunocompromised
  - Blood tests (WCC, CRP, ESR)
  - CRP Sn 65%, Sp 70% for post procedure discitis.
- Afebrile + negative CRP/ESR/WCC then unlikely to have infection



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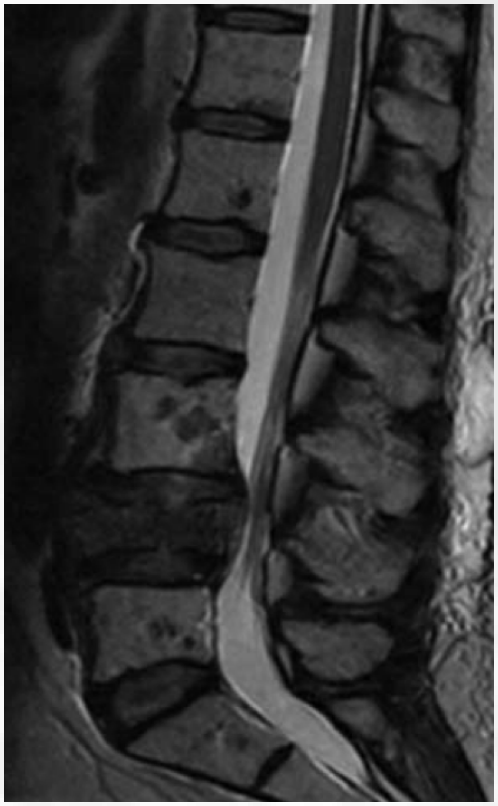
Tumour



- 0.5% of patients with back pain
- Most Spinal tumours in adults are metastases
  - The spine is the most common site for mets and may effect 30-70% of patients (Hatrick et al, 2000)
- Cluster – none of:
  1. age greater than 50 years
  2. history of cancer
  3. unexplained weight loss
  4. failure to improve with conservative therapy

Sens 100%, Spec 60%, LR 0 (Deyo &Diehl, 1988)

NB: If a patient has NONE of the above you can rule out cancer

Tumour

- Insidious onset of pain has the highest sensitivity of 94-100% (Deyo & Diehl 1986; 1988; Slipman et al, 2003)
- Pain may initially start as a mild diffuse intermittent ache and progress to an intense constant ache, then to severe incapacitating pain. Non-mechanical pain.
- Previous Hx Cancer has the highest positive likelihood ratio (14.7)
- No relief with bed rest was also a clinically useful question
- Midline tenderness Sp 46% Sn 45% (Cook et al, 2012)
- Night pain has poor sensitivity (48%) and a high false positive rate
  - Pain that wakes you from sleep may be more useful

Fracture

- 2 Groups
  1. Traumatic
  2. Osteoporotic (Abnormal Bone)

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Fracture

- 2 Groups
  1. Traumatic
     - High Energy
     - Neurological involvement
     - Contusion
     - Distracting injuries

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Be suspicious!

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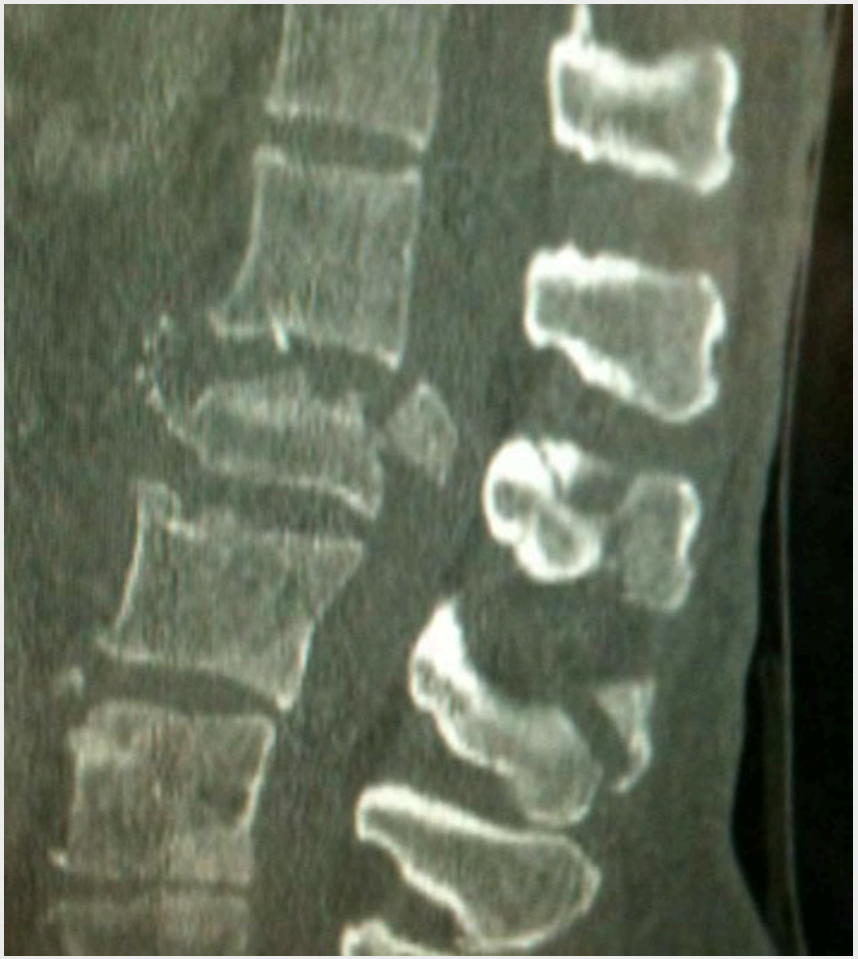
Fracture

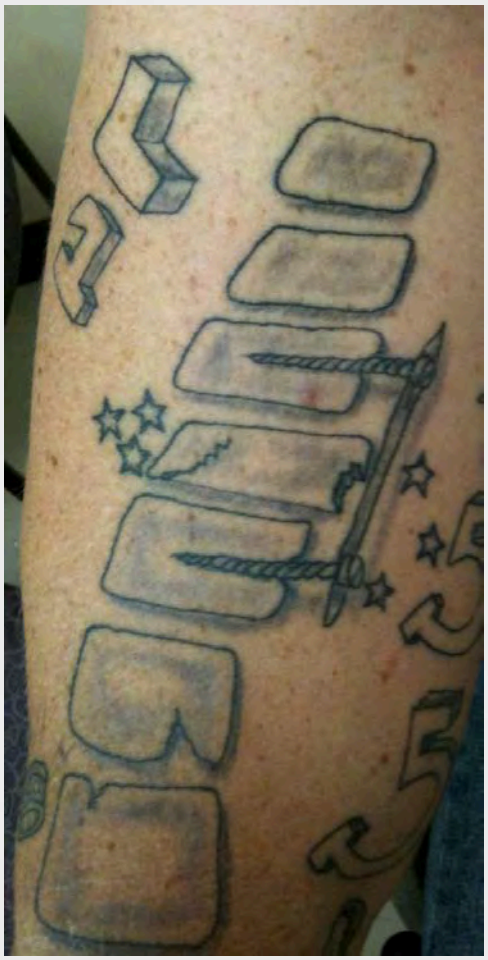
- 2 Groups
  1. Traumatic
     - High Energy
     - Neurological involvement
     - Contusion
     - Distracting injuries



Fracture

Beware fractures that involve

- The cervical spine
- The front and the back of the spine
- Have any associated neurology



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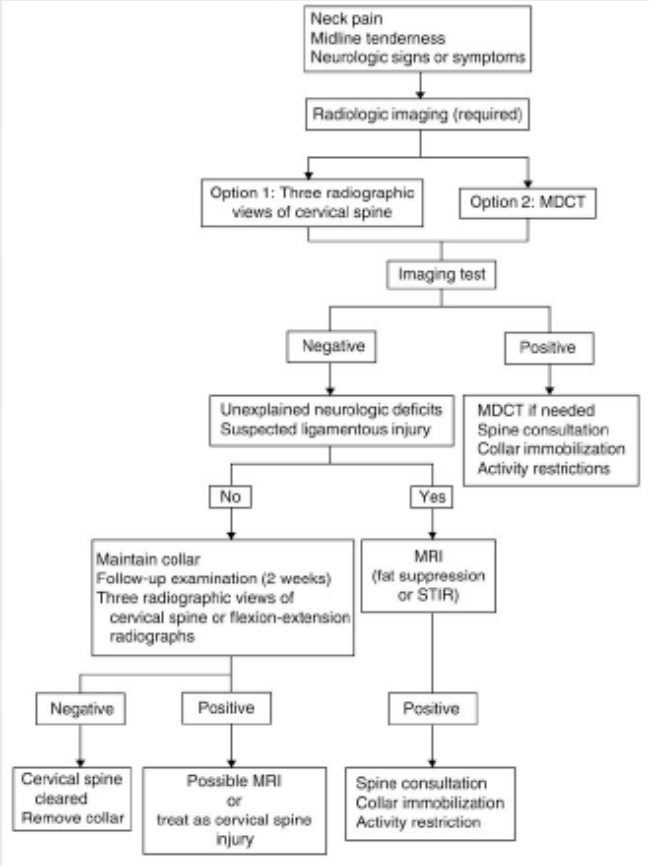
Fracture - Imaging

- Xrays are useful and indicated for trauma
- Sensitivity of a 3 shot C-Spine series (AP, lateral and open mouth views) is 80-95%
- Supplemented with flex/ext views in two weeks, in the absence of Ix abnormality/neurological sx



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Nexus C Spine Rules

For patients with Cervical Spine Trauma

1. Midline Tenderness
2. Neurological change
3. Abnormal Alertness/Intoxication/Distracting injuries

If any of above exist → 3 shot C Spine series

If XR normal + Neuro normal → Collar and re-XR in 10days – Flex/Ext views

If XR normal + Neuro Abnormal → Need referral for Hi-tech imaging

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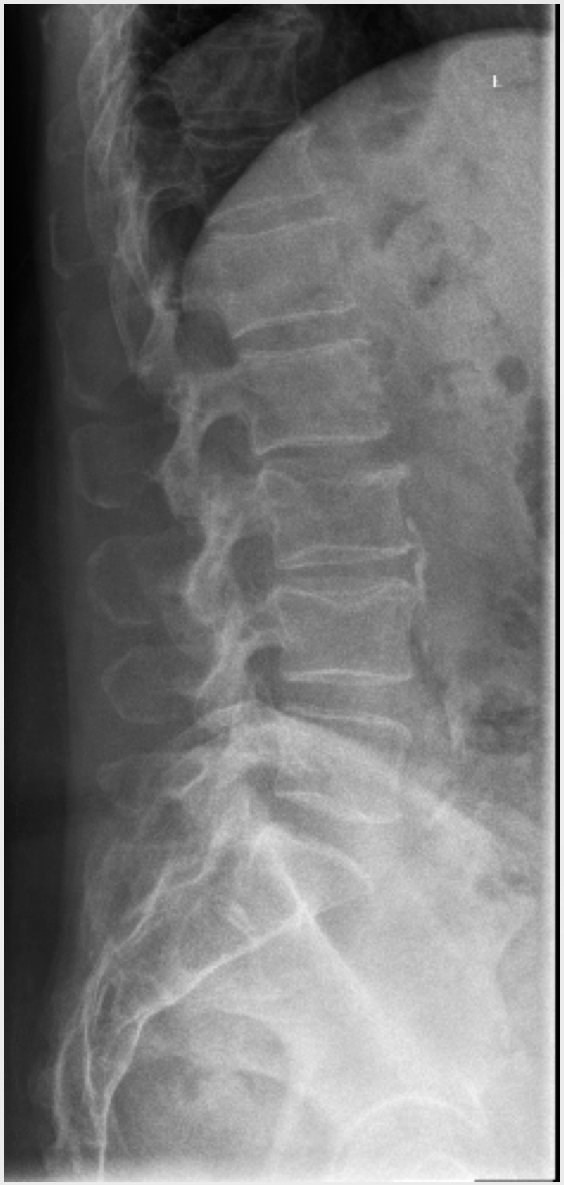
Fracture

- 2 Groups

2. Osteoporotic/Abnormal Bone
   i. Age >52yrs
   ii. No presence of leg pain
   iii. BMI < 22
   iv. Does not regularly exercise
   v. Female

- 1/5 Rule out:
  - Sn 95% -ve LR 0.16,
- >4/5 Rule in:
  - Sp 96% +ve LR 9.6



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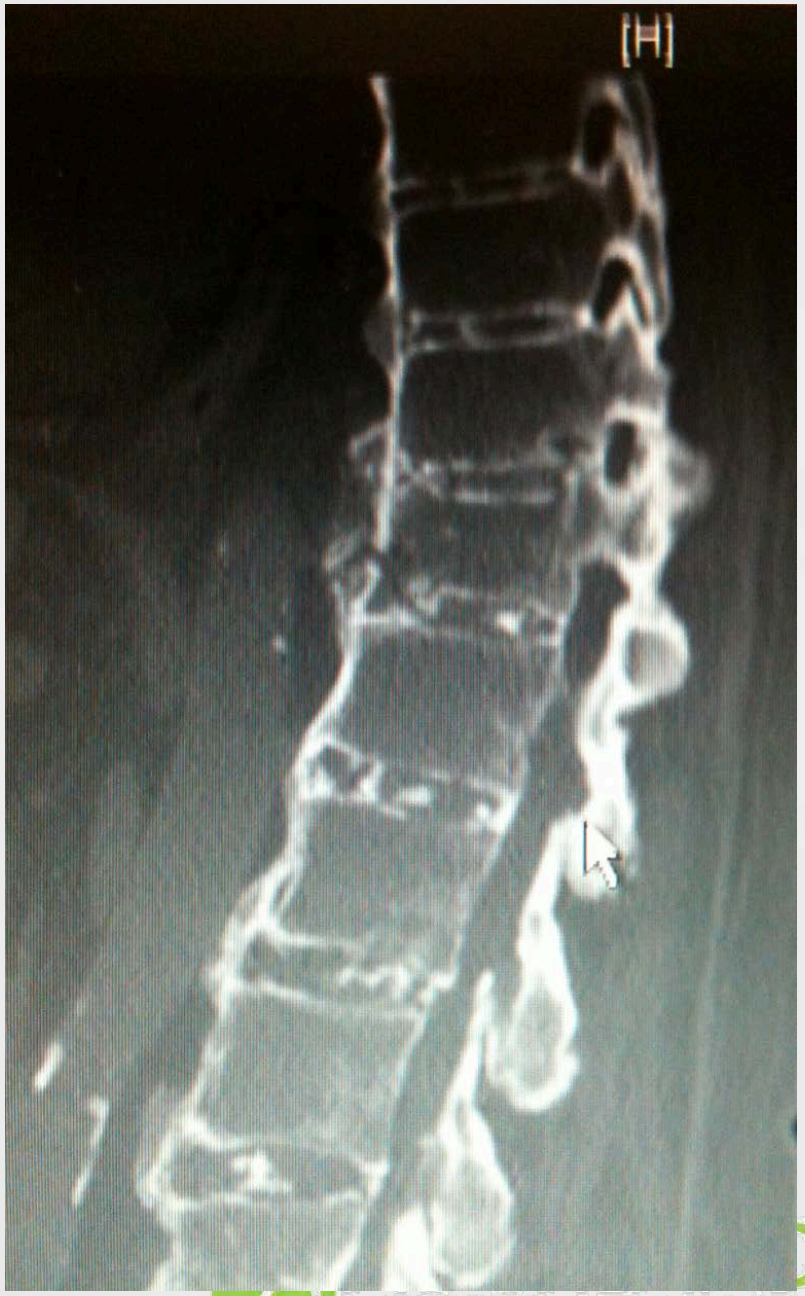
Fracture

- Abnormal Bone
  - Rheumatoid Arthritis
  - Ankylosing Spondylitis/DISH

- Fractures are easily missed, particularly in the C-Spine

RA/AS + Trauma + Pain

= Imaging Required



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PHYSIOTHERAPY

Cervical Myelopathy

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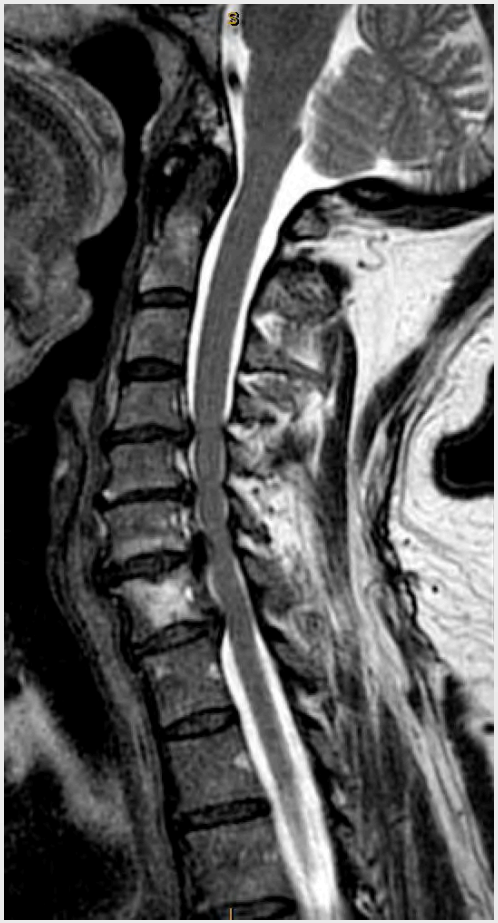
Cervical Myelopathy

- Narrowing of the cervical spinal canal, causing compression of the spinal cord with
  - Long Tract Signs
    - Pathologic Reflexes
    - Hyperreflexia
    - Gait disturbance
  - Often accompanied by radiculopathy also
- Usually degenerative in nature
- Common in NZ
  - Maori and PI populations have a tendency to congenital stenosis



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Cervical Myelopathy

- Progresses slowly in a step-wise fashion
  - Long periods of stability or even mild improvement
  - Punctuated by periods decline in a small proportion of patients

- Usually a ‘Pink Flag’ Pathology, but….

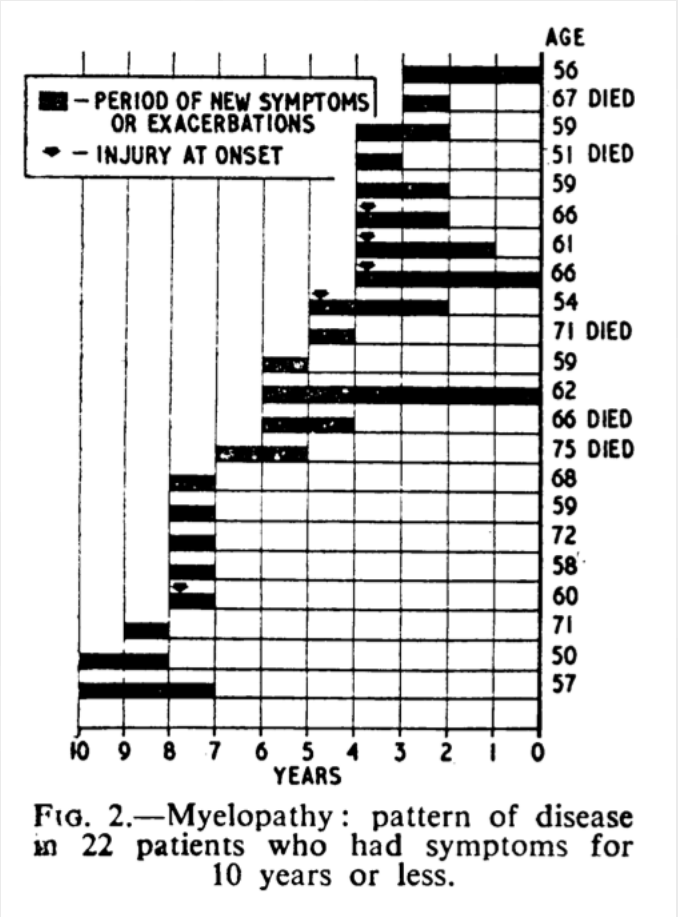

FIG. 2.—Myelopathy: pattern of disease in 22 patients who had symptoms for 10 years or less.

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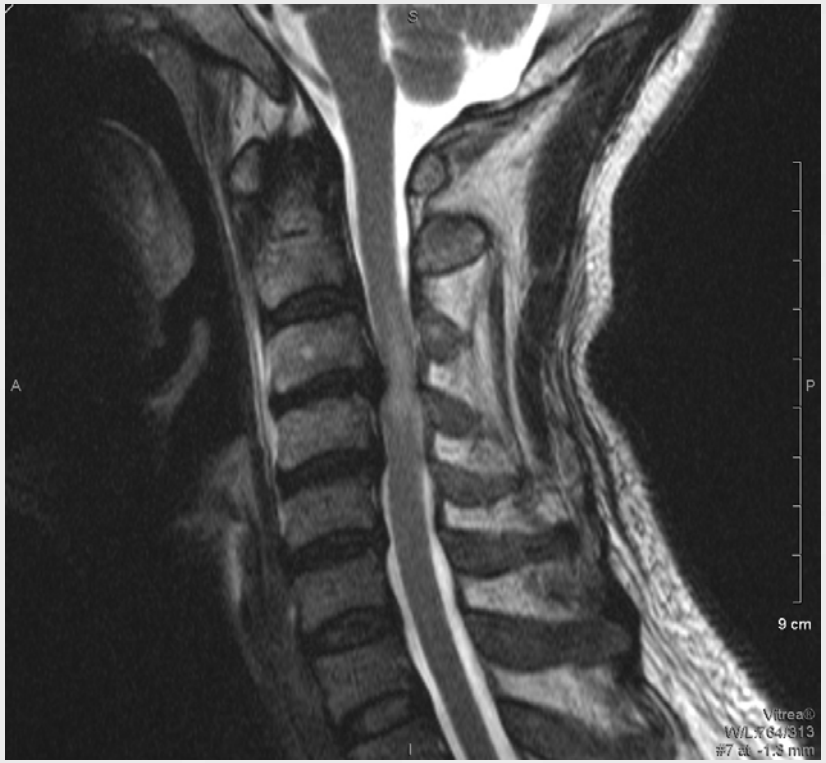
Cervical Myelopathy

- Please be aware of symptomatic patients
  - Older age group
  - Neck +/- radicular pain
  - Clumsiness in hands
    - Writing
    - Doing up buttons
  - Gait disturbance
    - Rough surfaces
    - Low light levels
    - Unfamiliar environments



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Orthopaedic Surgeon

AUCKLAND PHYSIOTHERAPY

Cervical myelopathy clinical prediction rule

Cook et al, 2009

1. Gait Deviation
2. Positive Hoffman's test
3. Inverted Radial Reflex
4. Positive Babinski test
5. Age >45 years

- 1 out of 5 Rule out — Sn 94%, -ve LR 0.18
- 2 out of 5 — Sp 88% +ve LR 3.3
- 3 out of 5 Rule in — Sp 99% +ve LR 30.9
- 4 out of 5 Rule in — Sp 100% +LR inf

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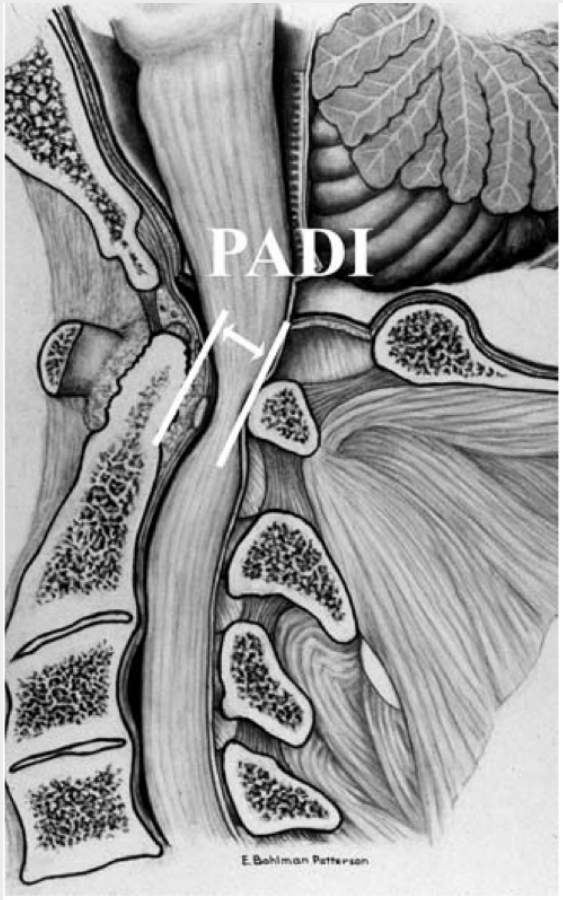
Cervical Myelopathy and Rheumatoid Arthritis

- RA pt's higher risk for cervical instability
- 20% of RA will develop some form of upper cervical instability in their lifetime (may be decreasing)
- Watch for deterioration in
  - Pain, particularly to the temporal/suboccipital regions
  - Myelopathic sx
  - Rapid deterioration in systemic RA
  - General deterioration in function



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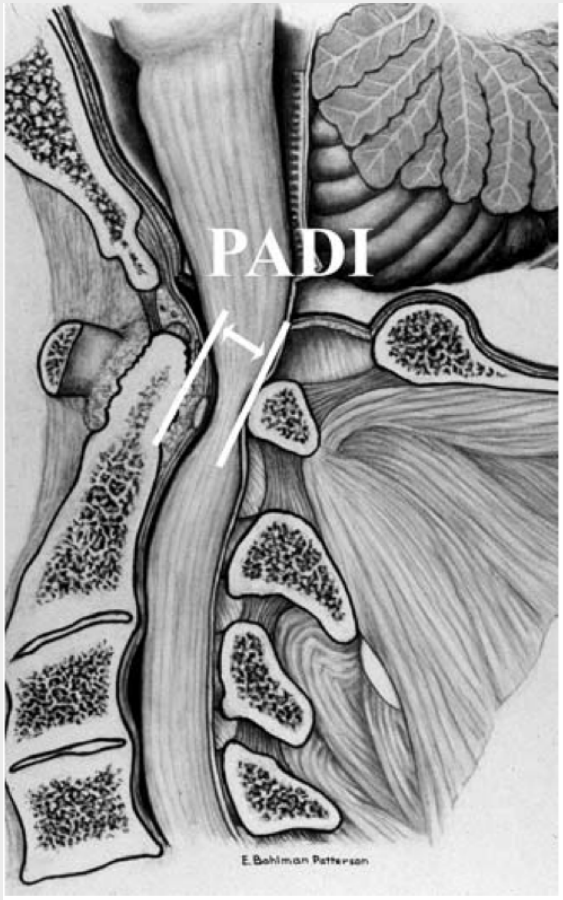
Orthopaedic Surgeon

AUCKLAND PHYSIOTHERAPY

Cervical Myelopathy and Rheumatoid Arthritis

- Indications for X Ray
  - Prolonged cervical symptoms >6 months
  - Neurologic signs or symptoms
  - Scheduled endotracheal intubation
  - Rapidly progressive carpal or tarsal bone destruction
  - Rapid overall functional deterioration



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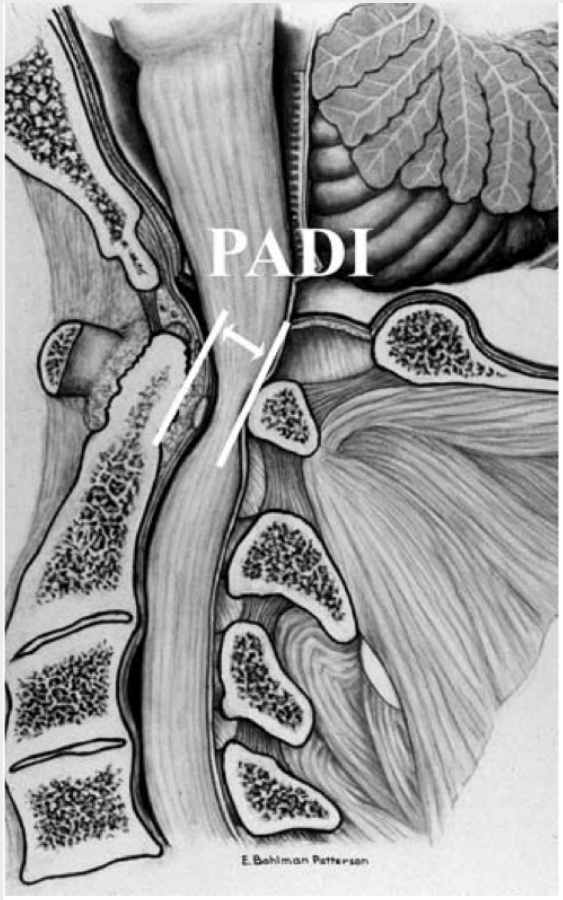
Orthopaedic Surgeon

AUCKLAND PHYSIOTHERAPY

Cervical Myelopathy and Rheumatoid Arthritis

- If mild pain and normal XR
  - Analgesia, Physical Therapy, Symptomatic soft collar and keep under review

- If myelopathic signs or abnormal xrays → SPECIALIST REFERRAL



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AUCKLAND PHYSIOTHERAPY

Non-musculoskeletal causes

- AAA
  - Pulsatile abdominal mass only detectable in 30-40% cases
    - Palpation has poor Sn/Sp 68%/75%
  - More common in males (4/5th of cases) but deaths more common in women they count for 1/3 of ruptures
  - Older patients (60+ M, 80+ F)
  - May complain of ache lower Tx or upper/mid Lx, may feel bloated after eating small amount, +/- nausea, +/- weight loss
  - Insidious onset or very sudden onset (dissection)
  - Non-mechanical pain – no change with positions / postures
  - Vascular risk factors – smoker history, PVD, IHD (HT, ⇧Chol), Vasculitis
  - May also present with dyspnea, dysphagia, oedma /central oedema or hoarseness

Non-musculoskeletal causes

- Kidney stones
  - Present with flank pain, referral into iliac crest, hip, groin
  - Males 4:1 to females, age 30-50years
  - Risk factors – hot, humid weather, excessive calcium, obesity
  - Increase urinary frequency, urgency, nausea, sweats
- Renal colic
  - Patients commonly present with acute, severe, restless pain with loin to groin radiation (and hematuria in 90%)
- Ectopic pregnancy
  - If suspected pregnancy perform blood test

Non-musculoskeletal causes

- Cervical
- Carotid artery dissection
  - “Pain like no other”
  - Unilateral neck pain / clavicle
  - Sudden onset
  - Vascular risk factors

GROUP 1:

REFER IMMEDIATELY

GROUP 2:
EXPIDITIOUS
SPECIALIST REFERRAL

GROUP 3: TRIAL OF
TREATMENT
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT

GROUP 1: REFER IMMEDIATELY

Risk Factors

- Severe, worsening pain
- Septicemia – febrile, back pain
- Catastrophic neurological changes
  - Sphincter loss
  - Saddle/perianal anaesthesia
  - Bilateral radicular symptoms
  - Progressive neurology
  - High energy trauma or trauma with neurological sx
  - Prior history of cancer (NOT as an isolated finding)

Pathologies

- Cauda equina
- Infection with systemic toxemia
- High likelihood of spinal tumour
- Unstable Fractures/Spinal Cord Injury

GROUP 1:

REFER IMMEDIATELY

GROUP 2:
EXPIDITIOUS
SPECIALIST REFERRAL

GROUP 3: TRIAL OF TREATMENT
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT

GROUP 2: EXPIDITIOUS SPECIALIST REFERRAL

Intermediate risk signs for

- Spinal Mets/Tumour
  - Age greater than 50 years, history of cancer, unexplained weight loss, failure to improve with conservative therapy, non-mechanical pain
- Fracture
  - Age>52y, no leg pain, BMI<22, does not regularly exercise, female, significant trauma, prolonged steroid use
  - Low energy trauma

Slowly progressive myelopathy

Radicular pain that does not settle

GROUP 2: EXPIDITIOUS SPECIALIST REFERRAL

When to add in Xrays?

- If you suspect fracture, tumour, or +/- infection
- NOT routinely
  - Highly unlikely to lead to diagnosis in the absence of FR
  - Number needed to treat (absent FR) = 2500
  - No benefit to patient

When to add in Blds?

- If you suspect infection, or tumour
- FBC/ESR/CRP
- ALP, LFT's, Ca/Phosphate

GROUP 1:

REFER IMMEDIATELY

GROUP 2:
EXPIDITIOUS
SPECIALIST REFERRAL

GROUP 3: TRIAL OF TREATMENT
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT

GROUP 3: TRIAL OF Tx + INVESTIGATIONS

TEMPORISING GROUP – FOLLOWING Ix or TOT SHOULD MOVE INTO Groups 1/2/4

Trial of Tx = 4 - 6 weeks of adequate conservative treatment

For

Acute Back Pain with weak risk factors

Xrays = fracture, tumour, or infection

Blds = infection, or tumour

FAILURE OF TRIAL OR INVESTIGATIONS +VE

→ REFER

GROUP 1:

REFER IMMEDIATELY

GROUP 2:
EXPIDITIOUS
SPECIALIST REFERRAL

GROUP 3: TRIAL OF TREATMENT
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT

GROUP 4: TRIAL OF TREATMENT

Trial of Tx = 4 - 6 weeks of adequate conservative treatment

Acute musculoskeletal back pain that is
- manageable with analgesia
- can mobilise
- with weak/no risk factors

Adequate non-operative therapy
- Education
- Physical Therapy
  - Manipulation
  - Tailored Exercises

IF FAILURE OF TRIAL (NO IMPROVEMENT) → REFER

GROUP 4: TRIAL OF TREATMENT

PLEASE DON'T REFER PEOPLE 'FOR AN MRI'

- Patient expectations are important
- In localised, mechanical LBP with no neurogenic features, no Red Flags, and only mild restriction of function MRI is unlikely to change the course of treatment
- Focusing on the imaging and potentially minor/age related findings can increase fear avoidance behaviours and impair improvement

Failed conservative management

Although there are many ways to treat LBP. Be aware that the type of conservative treatment does matter!

- Directional preference:
  - In general patients who are worse with flexion based activities such as bending or sitting improve with extension based exercises
  - Patients who are worse with extension based activities improve with flexion based exercises.
  - If they are given exercises in the wrong direction they are more likely to fail conservative Mx.
  - Most patients with mechanical back pain have a directional preference and around 80% of these respond to extension (McKenzie)

Failed conservative management

Study by Fritz et al (2005) grouped patients into stabilisation exercises vs manipulation. Failure rates increased from 24% to 79% if patients were put into the wrong group

Moderate evidence for mobilisation and manipulation

Poor evidence for therapeutic Ultrasound or massage

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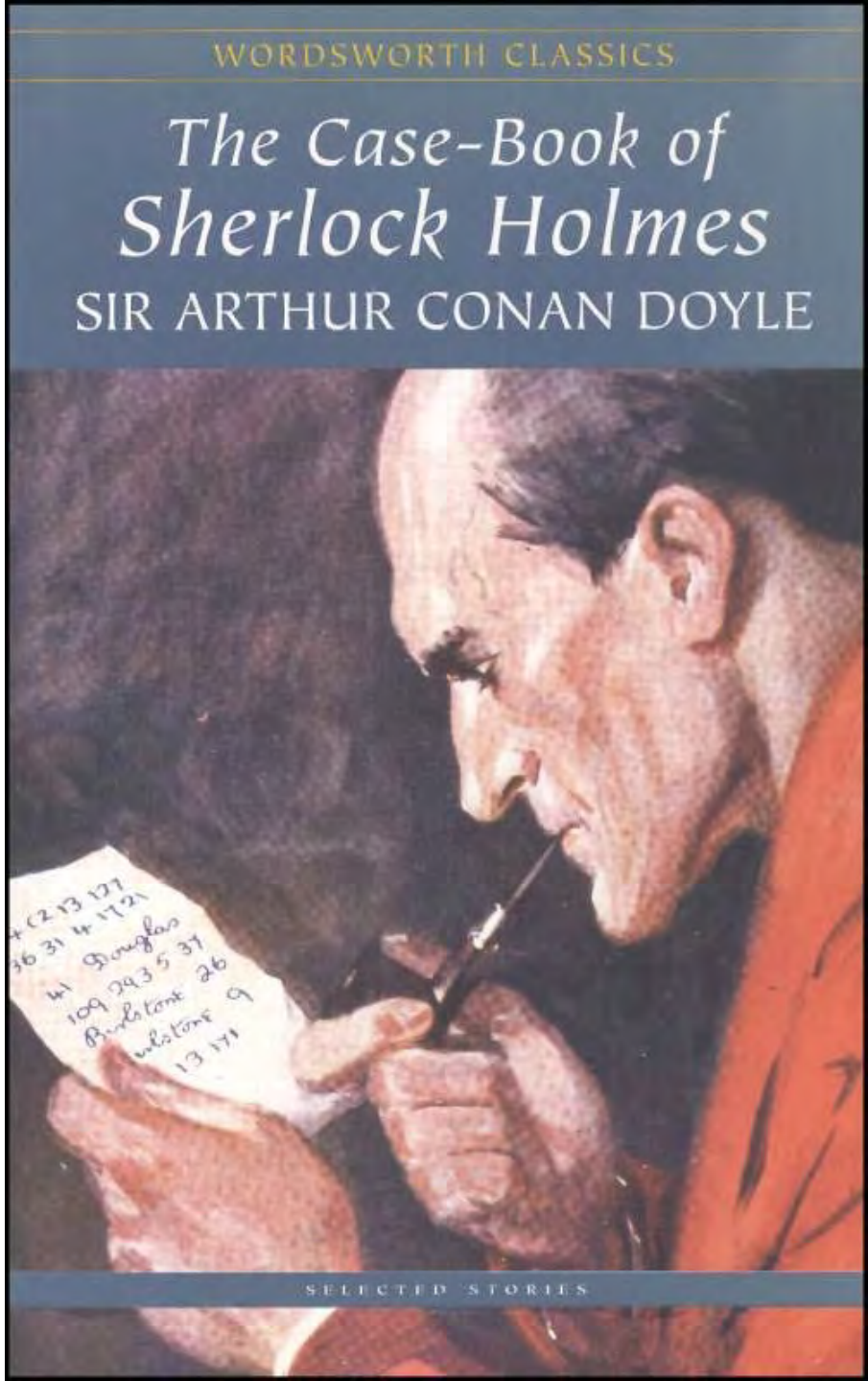
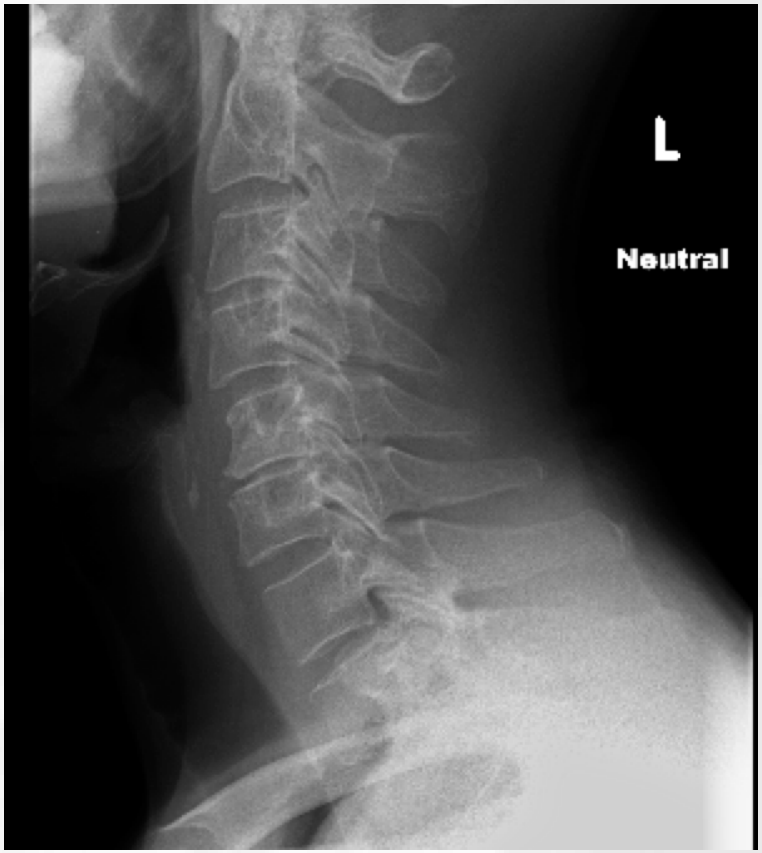
Orthopaedic Surgeon

CASES


WORDSWORTH CLASSICS
The Case-Book of
Sherlock Holmes
SIR ARTHUR CONAN DOYLE
SELECTED STORIES

Case 1

51m



- Fell head first off mountain bike
- Pain in neck and down left arm with paraesthesia in ulna border left hand

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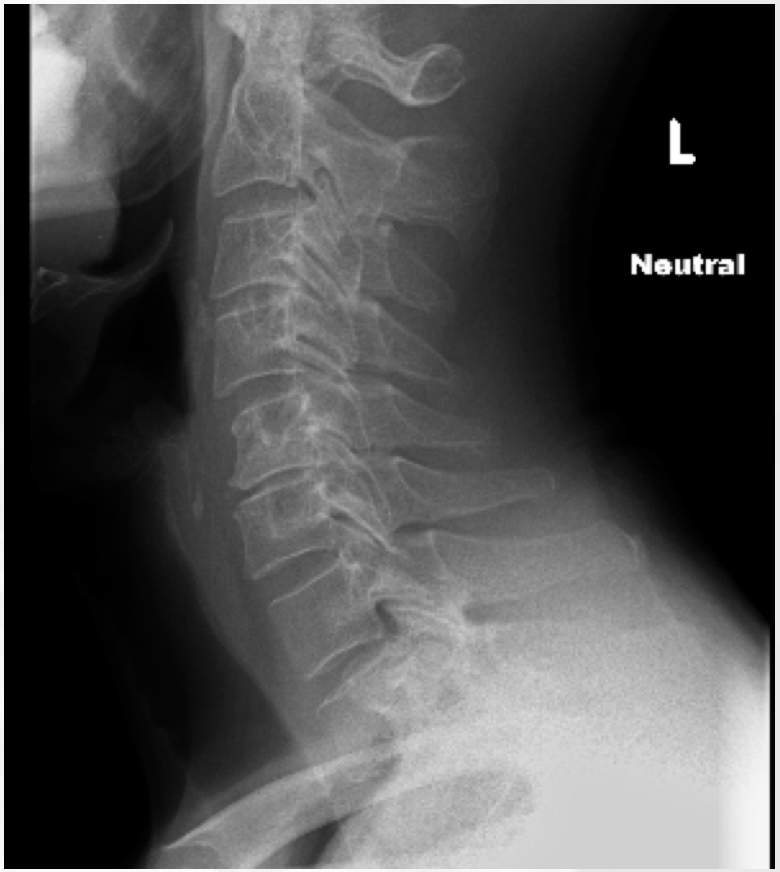
Orthopaedic Surgeon

AUCKLAND PHYSIOTHERAPY

51m



- Fell head first off mountain bike
- Pain in neck and down left arm with paraesthesia in ulna border left hand

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Orthopaedic Surgeon

AUCKLAND PHYSIOTHERAPY

GROUP 1:

REFER IMMEDIATELY

GROUP 2:
EXPIDITIOUS
SPECIALIST REFERRAL

GROUP 3: TRIAL OF
TREATMENT
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT

AUDIENCE QUESTION

In which group would you place this patient?

A. GROUP A – REFER IMMEDIATELY

B. GROUP B – EXPIDITIOUS SPECIALIST REFERRAL +/- INVESTIGATIONS

C. GROUP C – TRIAL OF TREATMENT +/- INVESTIGATIONS

D. TRIAL OF TREATMENT

GROUP 1:

REFER IMMEDIATELY

GROUP 2:
EXPIDITIOUS
SPECIALIST REFERRAL

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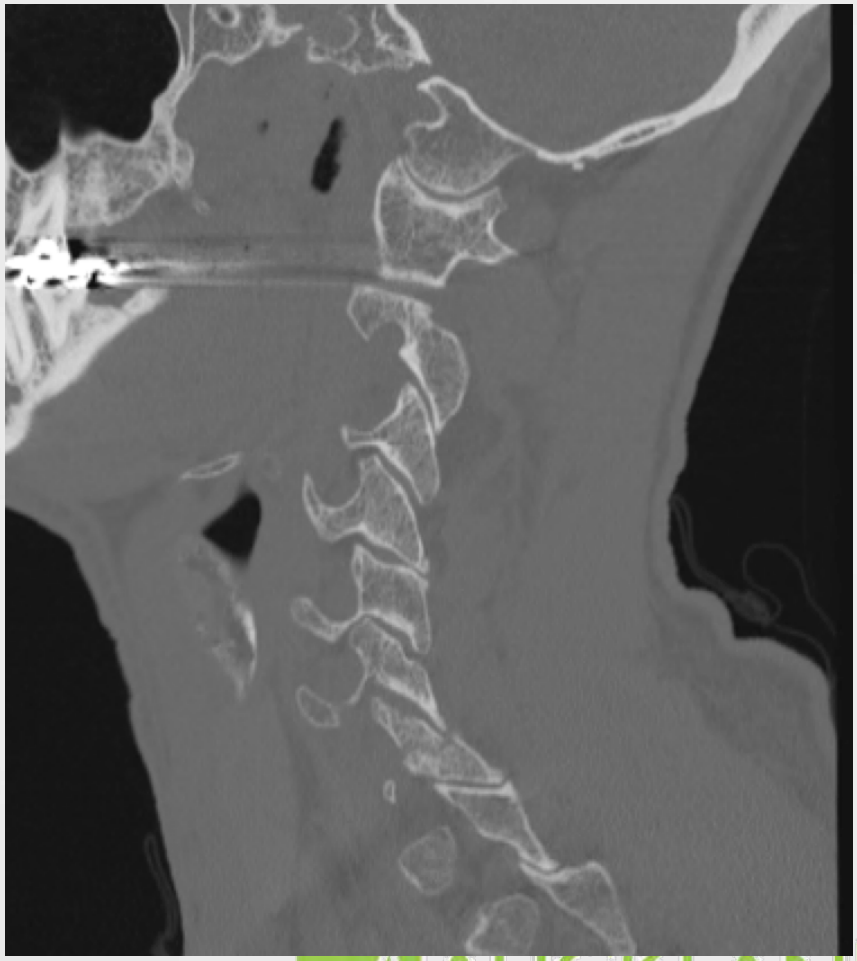
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT



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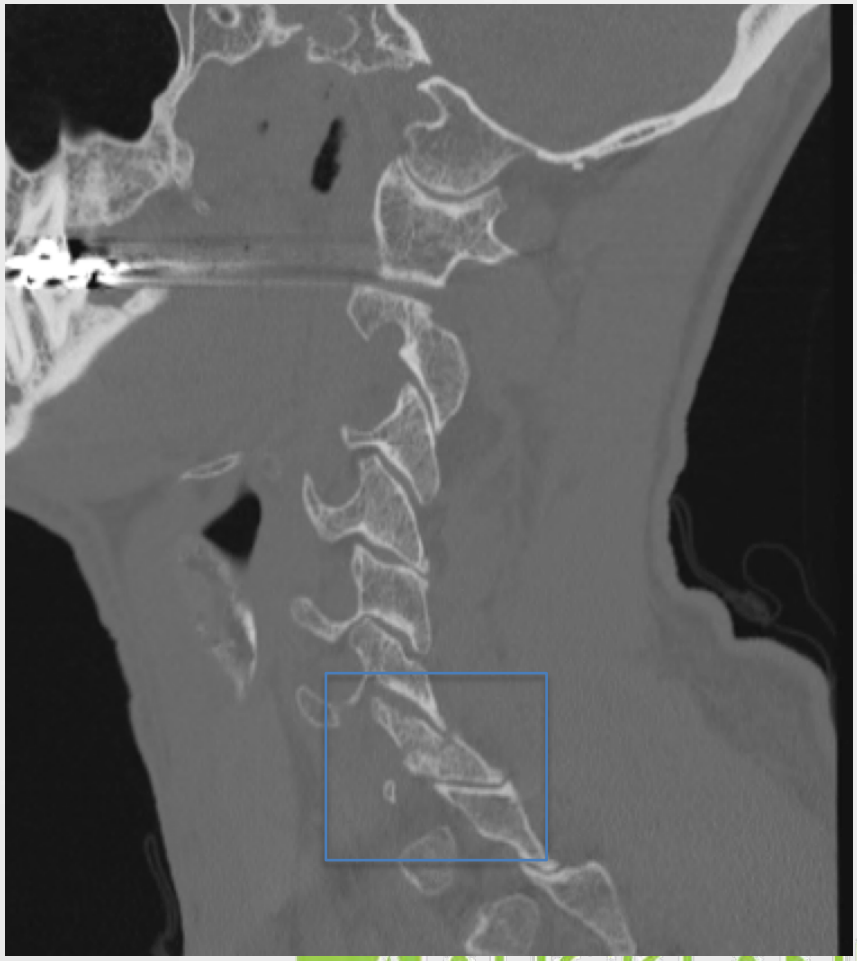
AUCKLAND PHYSIOTHERAPY



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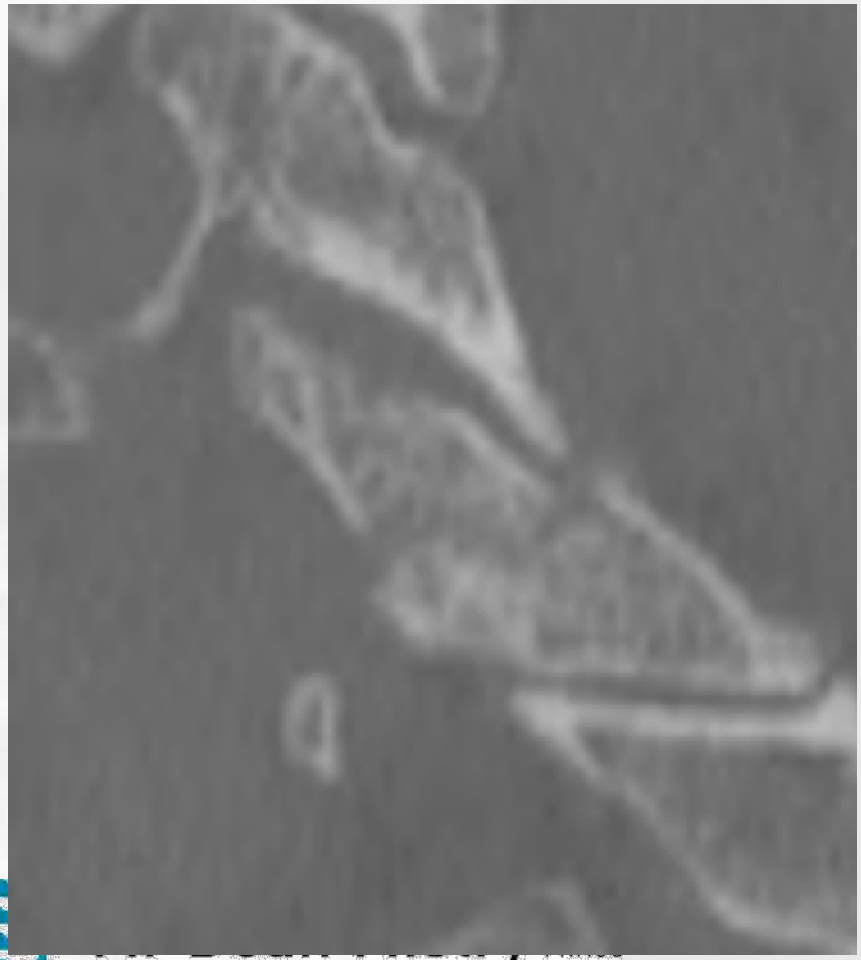
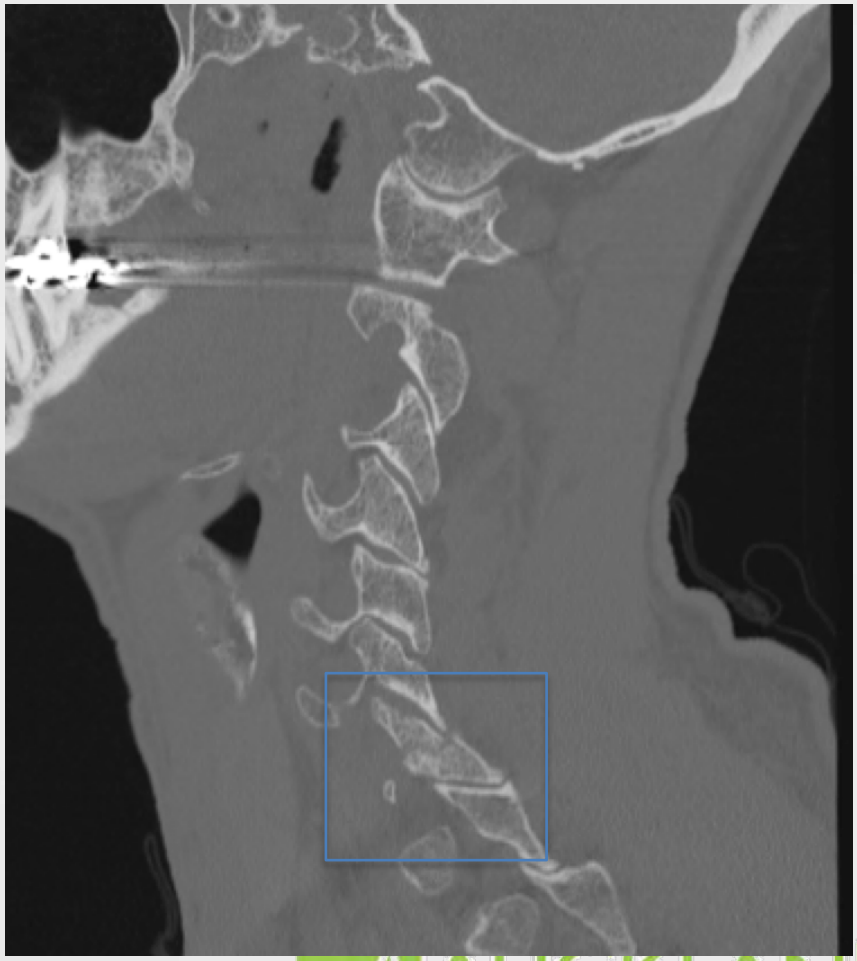
AUCKLAND PHYSIOTHERAPY





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AUCKLAND PHYSIOTHERAPY

Case 2

43m

- 4 week history of insidious onset low back pain
- Constant pain – prevents him from lying flat on his back, worse with standing and walking
- Lost 8kg over 3 weeks
- Pain worsening, wakes him from sleep and is worse with movement in every direction
- No easing factors
- Fevers and night sweats
- Ex-smoker 40 pack year history
- Fatigue

43m

- 4 week history of insidious onset low back pain
- Constant pain – prevents him from lying flat on his back, worse with standing and walking
- Lost 8kg over 3 weeks
- Pain worsening, wakes him from sleep and is worse with movement in every direction
- No easing factors
- Fevers and night sweats
- Ex-smoker 40 pack year history
- Fatigue

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AUDIENCE QUESTION

In which group would you place this patient?

A. GROUP A – REFER IMMEDIATELY

B. GROUP B – EXPIDITIOUS SPECIALIST REFERRAL +/- INVESTIGATIONS

C. GROUP C – TRIAL OF TREATMENT +/- INVESTIGATIONS

D. TRIAL OF TREATMENT

GROUP 1:

REFER IMMEDIATELY

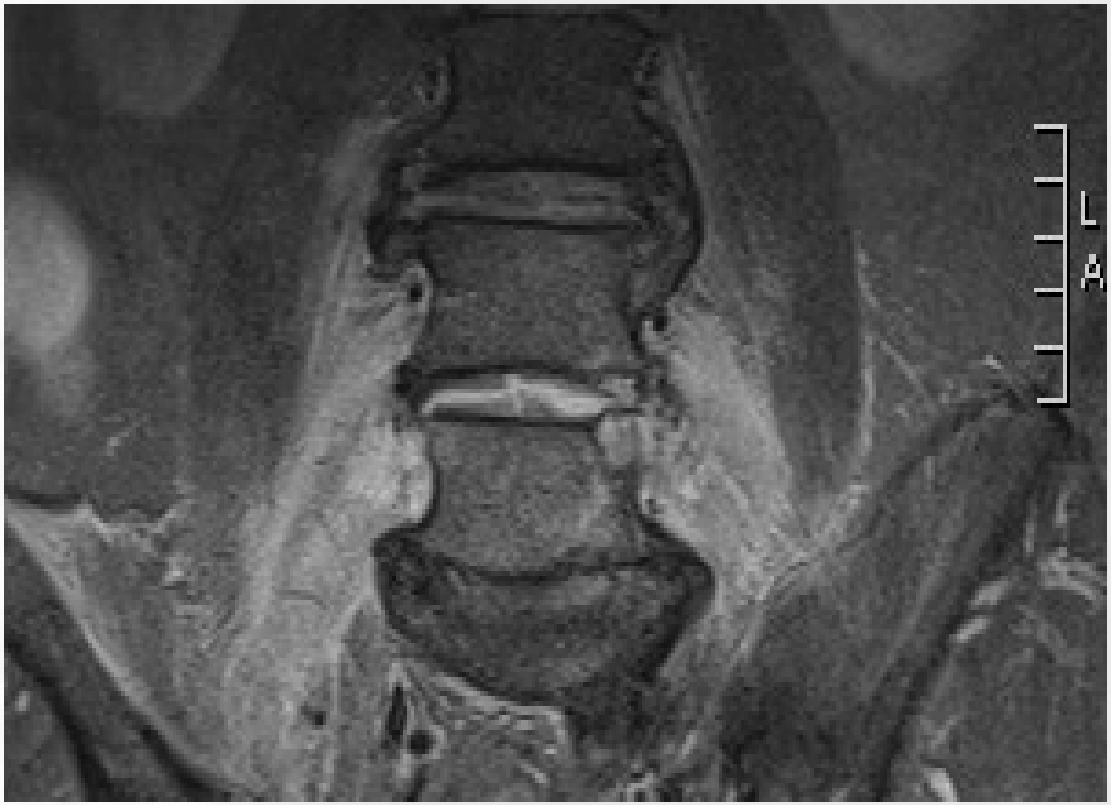
GROUP 2:
EXPIDITIOUS
SPECIALIST REFERRAL

GROUP 3: TRIAL OF TREATMENT
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT

43m



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Orthopaedic Surgeon

Case 3

61f

- 4 month history of insidious onset worsening constant low back pain / sciatica
- Aggravated by standing / walking
- Eased with lying down
- Also complains of pain across neck and shoulders
- 3 kg weight loss over the past 6 months
- Fatigue
- 40 pack year history of smoking
- Bladder/bowel normal
- No history of cancer

61f

- 4 month history of insidious onset worsening constant low back pain / sciatica
- Aggravated by standing / walking
- Eased with lying down
- Also complains of pain across neck and shoulders
- 3 kg weight loss over the past 6 months
- Fatigue
- 40 pack year history of smoking
- Bladder/bowel normal
- No history of cancer

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61f

- Neuro exam:
  - Sensation normal
  - Reflexes normal
  - Strength – Right hip flexion / extension 4/5 (limited by pain), Right knee flexion, DF, EHL 4/5, otherwise 5/5 strength
- Plantars downgoing
- Normal PR

- Provisional diagnosis ???

AUDIENCE QUESTION

In which group would you place this patient?

A. GROUP A – REFER IMMEDIATELY

B. GROUP B – EXPIDITIOUS SPECIALIST REFERRAL +/- INVESTIGATIONS

C. GROUP C – TRIAL OF TREATMENT +/- INVESTIGATIONS

D. TRIAL OF TREATMENT

GROUP 1:

REFER IMMEDIATELY

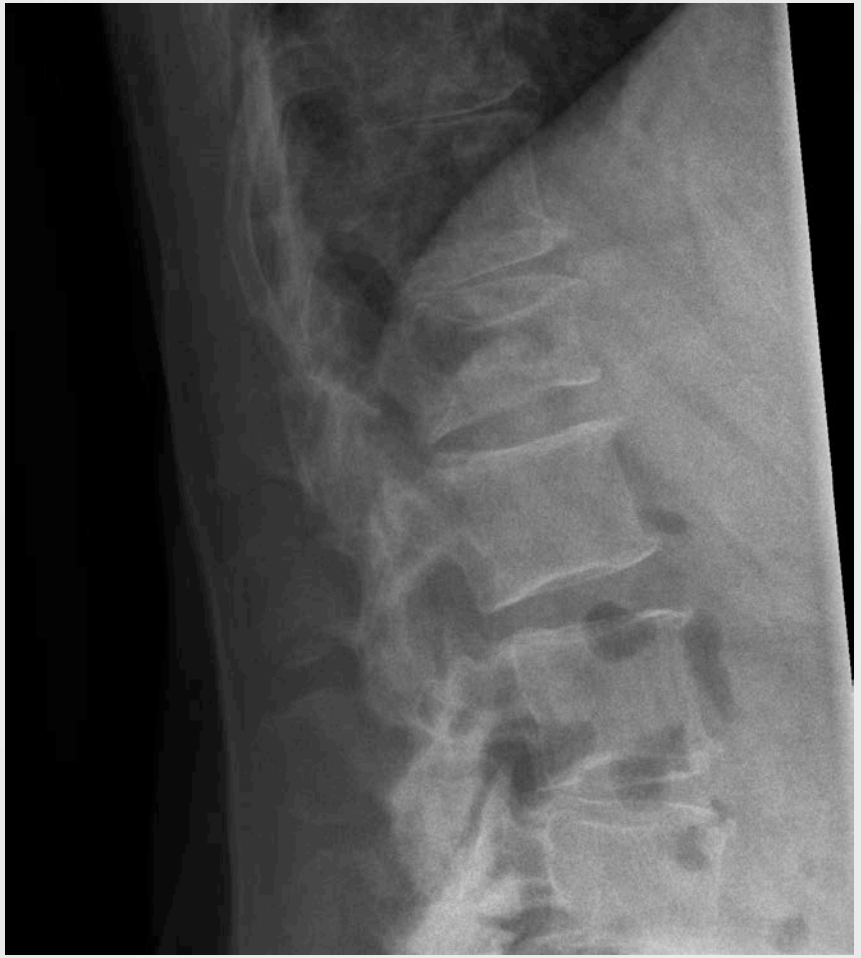
GROUP 2:
EXPIDITIOUS
SPECIALIST REFERRAL

GROUP 3: TRIAL OF
TREATMENT
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT

- ESR 66, CRP 16



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AUDIENCE QUESTION

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SPECIALIST REFERRAL

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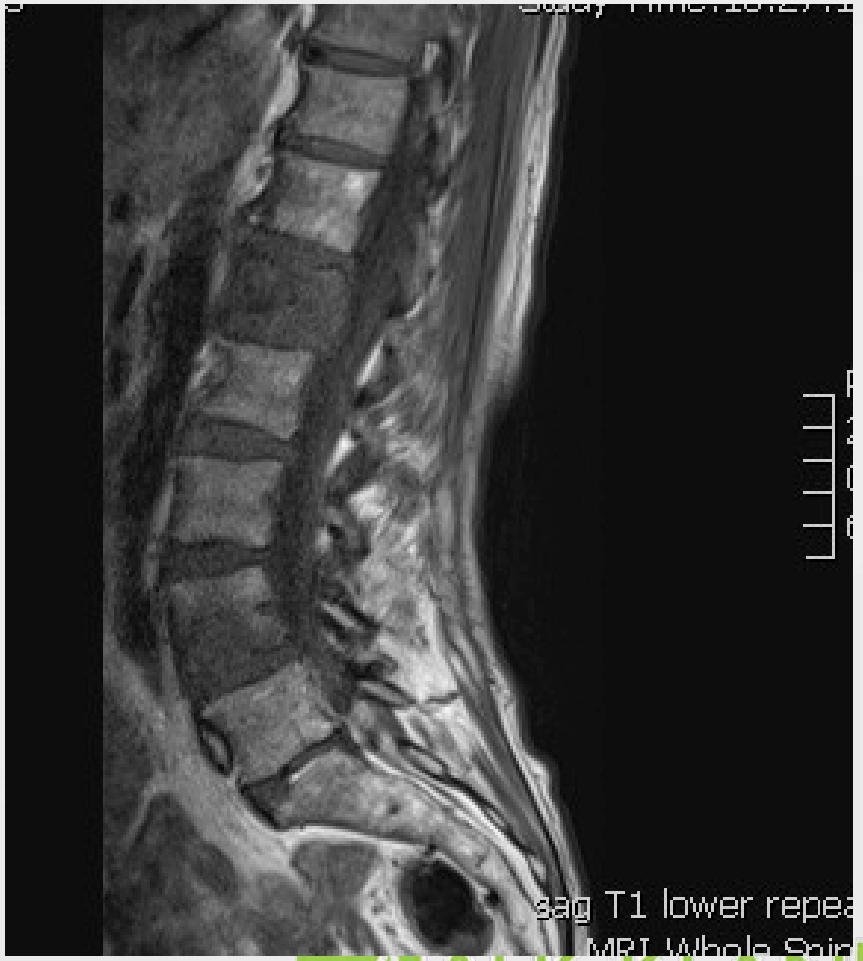
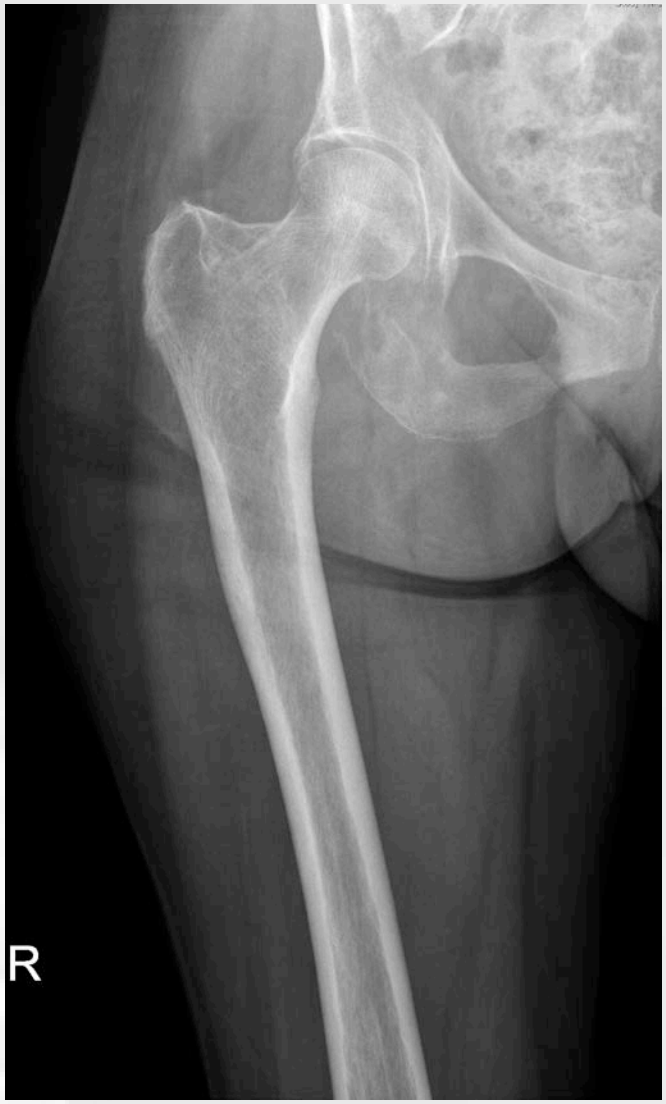
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT

61f





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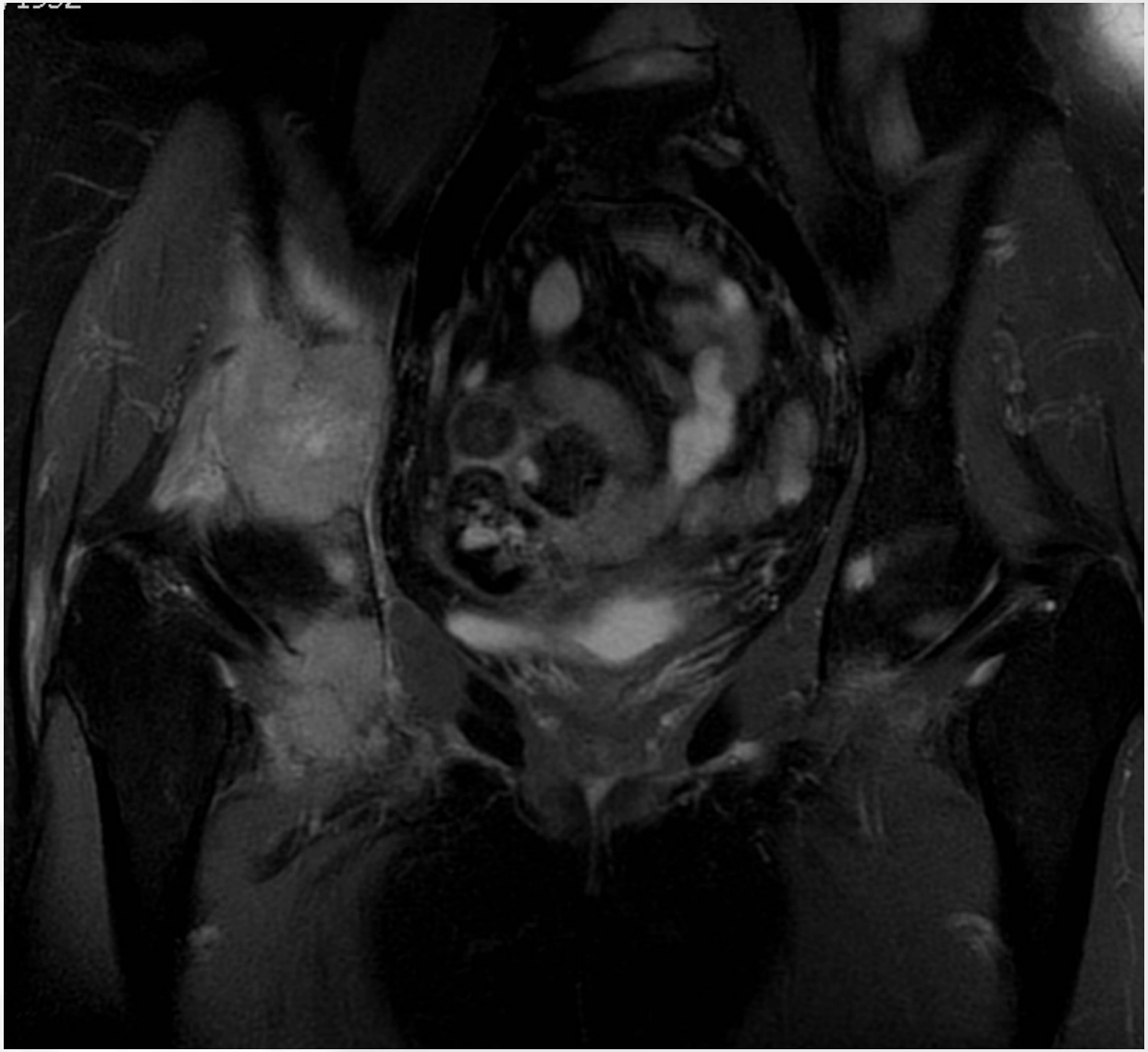

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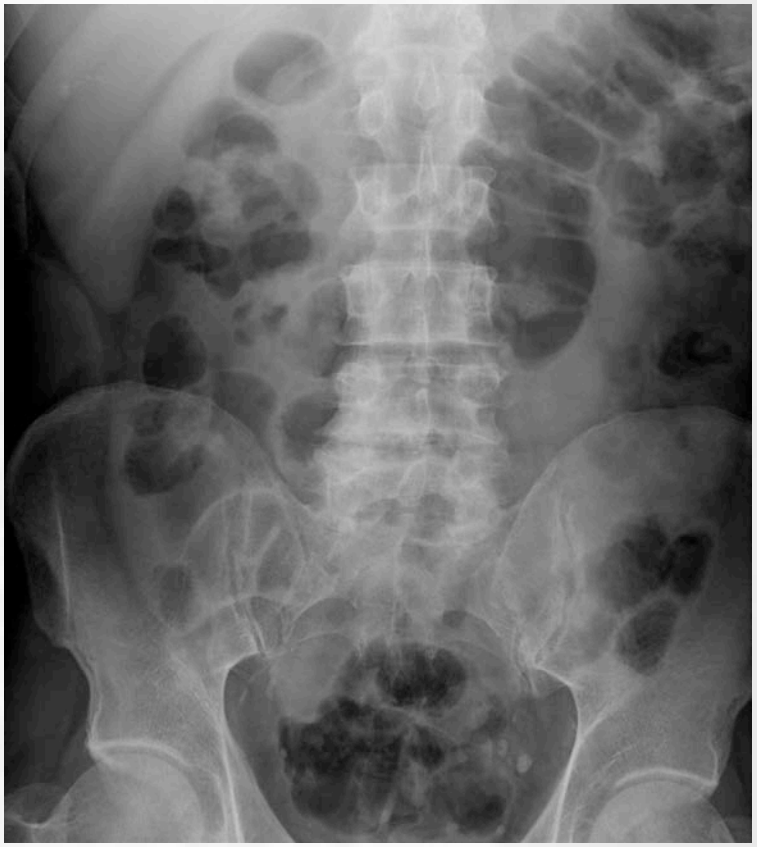
Case 4

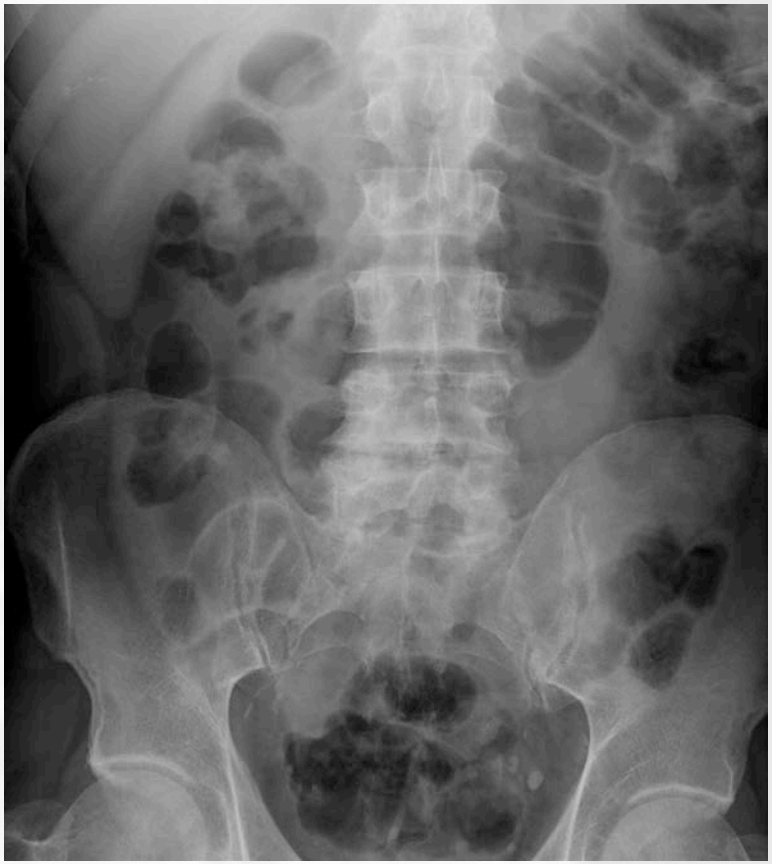
57m



- 3 day history of insidious onset right sided LBP with referral into right lower quadrant, no leg pain, normal neurology
- History of IV drug use (heroine), on Methodone, Hep C
- Otherwise well

- Afebrile
- Tender on percussion
- No neurology

57m



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- History of IV drug use (heroine), on Methodone, Hep C
- Otherwise well

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- Tender on percussion
- No neurology

AUDIENCE QUESTION

In which group would you place this patient?

A. GROUP A – REFER IMMEDIATELY

B. GROUP B – EXPIDITIOUS SPECIALIST REFERRAL +/- INVESTIGATIONS

C. GROUP C – TRIAL OF TREATMENT +/- INVESTIGATIONS

D. TRIAL OF TREATMENT

GROUP 1:

REFER IMMEDIATELY

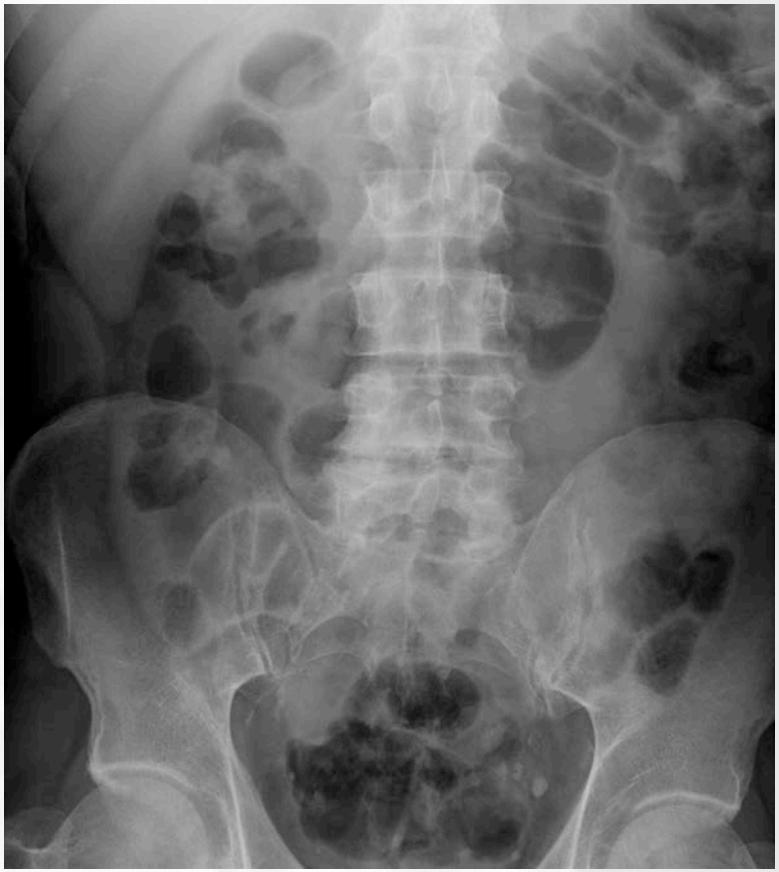
GROUP 2:
EXPIDITIOUS
SPECIALIST REFERRAL

GROUP 3: TRIAL OF TREATMENT
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT

57m



- CRP 100

AUDIENCE QUESTION

In which group would you place this patient?

A. GROUP A – REFER IMMEDIATELY

B. GROUP B – EXPIDITIOUS SPECIALIST REFERRAL +/- INVESTIGATIONS

C. GROUP C – TRIAL OF TREATMENT +/- INVESTIGATIONS

D. TRIAL OF TREATMENT

GROUP 1:

REFER IMMEDIATELY

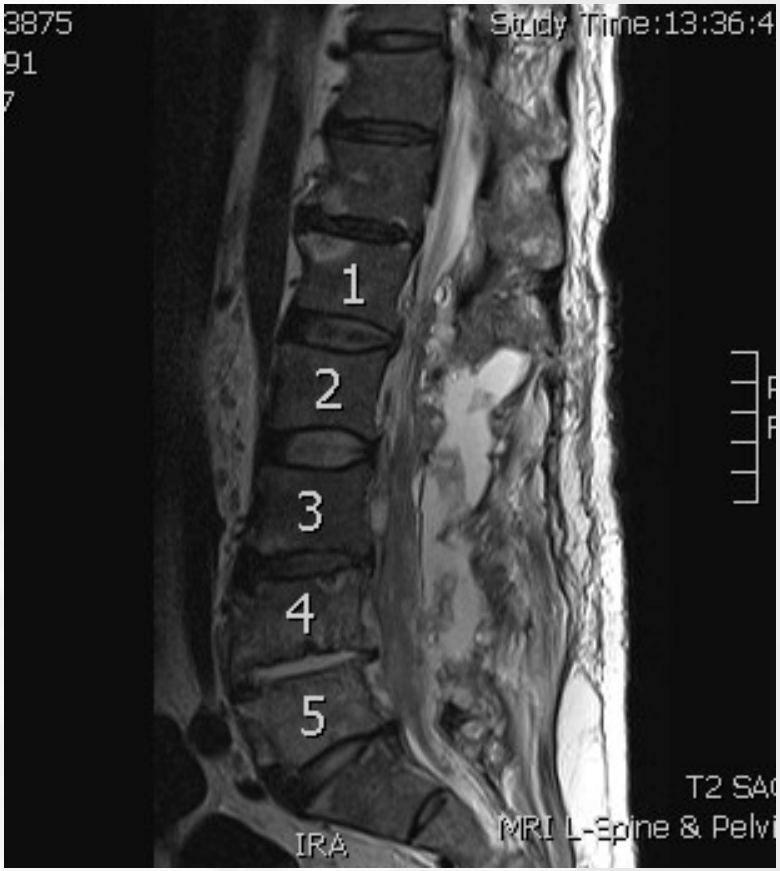
GROUP 2:
EXPIDITIOUS
SPECIALIST REFERRAL

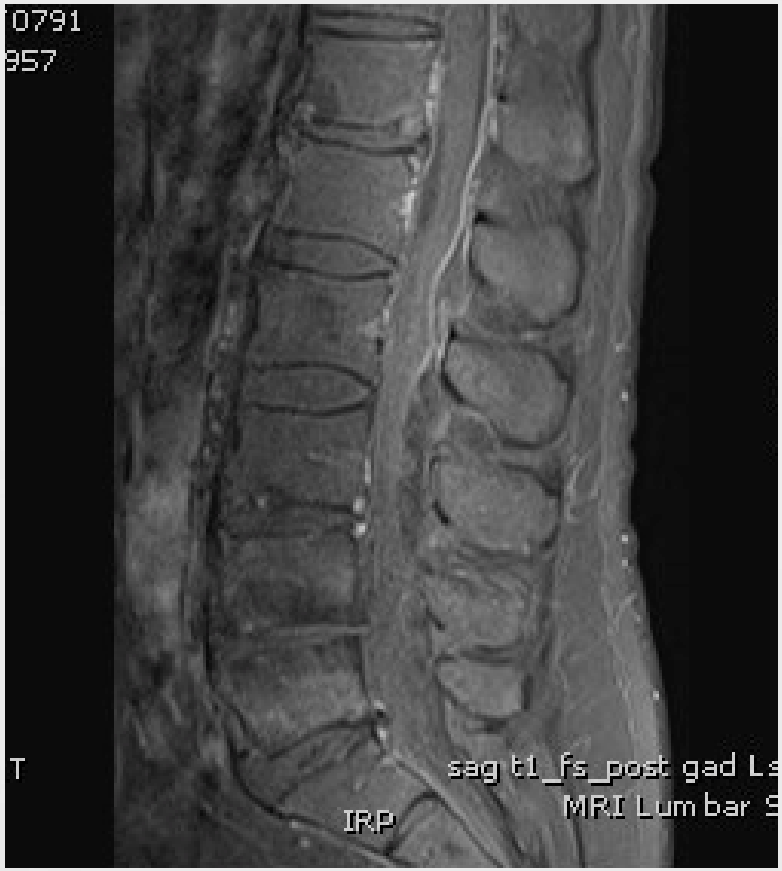
GROUP 3: TRIAL OF TREATMENT
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT

57m





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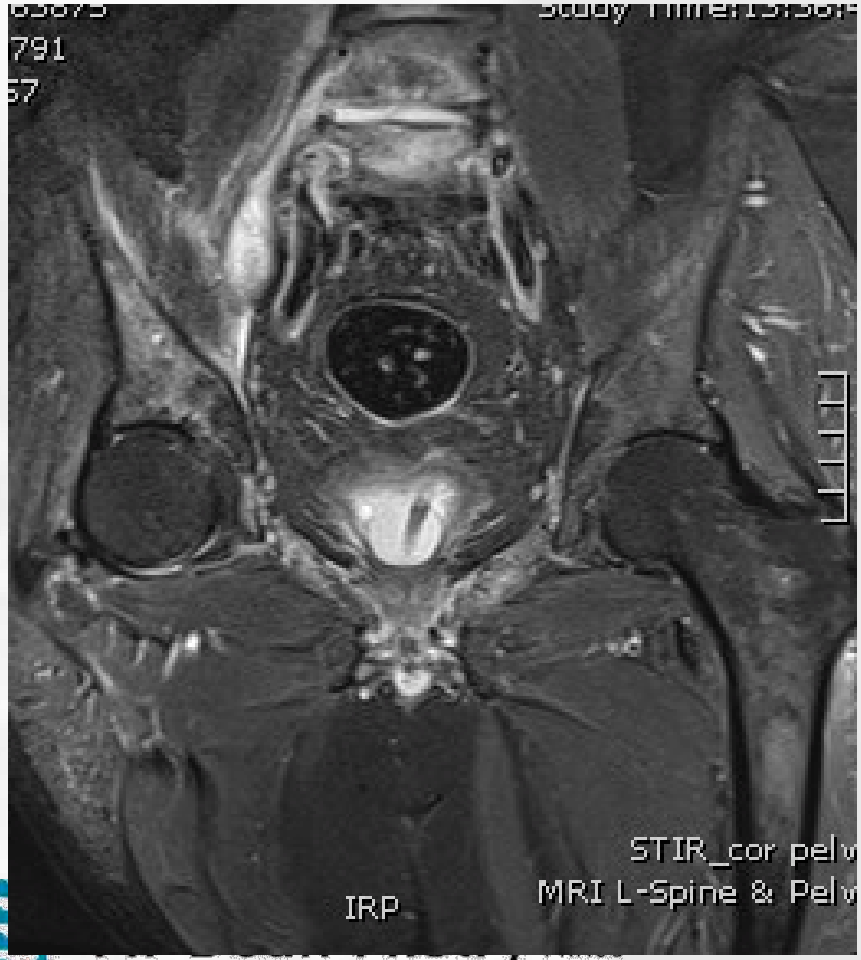
Orthopaedic Surgeon

57m

- Developed fevers and urinary retention
- Reduced anal tone
- Quickly deteriorated and desaturated
- CRP 65
- Admitted to ICU
- Discharged to the spinal unit after 60 days in hospital, then DC home 10 days later with significant distal lower limb weakness (L4-S1) and an indwelling catheter

57m



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AUCKLAND PHYSIOTHERAPY

Case 5

41m

- 4 month history of back pain following a fall
- Intermittent pain, worse with standing and walking, no pain sitting
- 2 week history of worsening pain and constant numbness in both legs (non-dermatomal), no pins and needles
- Legs feel weak and he has been fallen several times
- Normal bladder / bowel
- Normal sexual function
- No saddle anesthesia but peri-anal anesthesia

Mr Dean Mistry FRACS
Spine Surgeon
Orthopaedic Surgeon

41m

- 4 month history of back pain following a fall
- Intermittent pain, worse with standing and walking, no pain sitting
- 2 week history of worsening pain and constant numbness in both legs (non-dermatomal), no pins and needles
- Legs feel weak and he has fallen several times
- Normal bladder / bowel
- Normal sexual function
- No saddle anesthesia but peri-anal anesthesia

- ? Provisional diagnosis

Mr Dean Mistry FRACS
Spine Surgeon
Orthopaedic Surgeon

AUDIENCE QUESTION

In which group would you place this patient?

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B. GROUP B – EXPIDITIOUS SPECIALIST REFERRAL +/- INVESTIGATIONS

C. GROUP C – TRIAL OF TREATMENT +/- INVESTIGATIONS

D. TRIAL OF TREATMENT

GROUP 1:

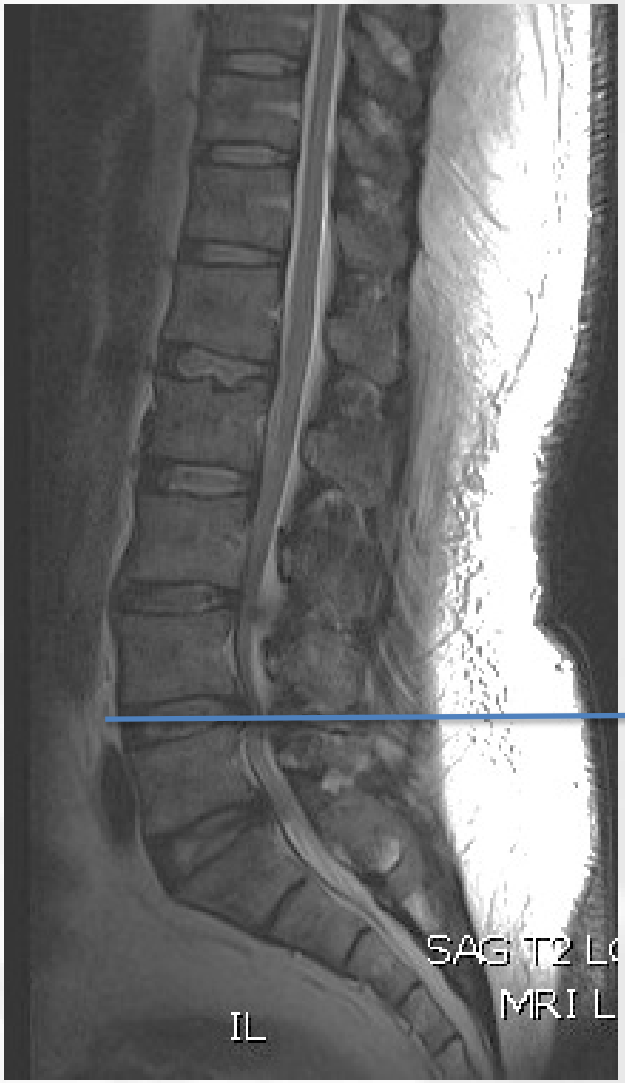
REFER IMMEDIATELY

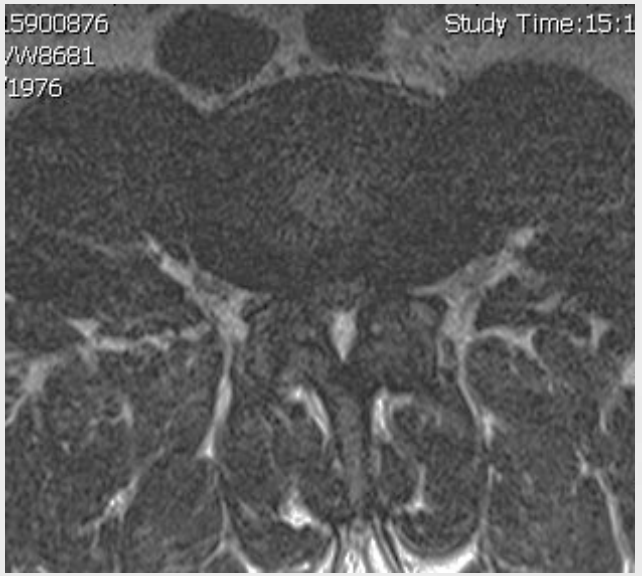
GROUP 2:
EXPIDITIOUS
SPECIALIST REFERRAL

GROUP 3: TRIAL OF TREATMENT
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT





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Spine Surgeon
Orthopaedic Surgeon

AUCKLAND PHYSIOTHERAPY

Case 6

21F

- 21F Gymnast
- Fell on her neck during a flip 1 day ago
- Forced flexion injury
- Pain in mid-cervical spine

- No radicular symptoms
- Tender in cervical spine

- Examination – Reduced ROM due to pain, Normal Neurology

21F

- 21F Gymnast
- Fell on her neck during a flip 1 day ago
- Forced flexion injury
- Pain in mid-cervical spine

- No radicular symptoms
- Tender in cervical spine

- Examination – Reduced ROM due to pain, Normal Neurology

AUDIENCE QUESTION

In which group would you place this patient?

A. GROUP A – REFER IMMEDIATELY

B. GROUP B – EXPIDITIOUS SPECIALIST REFERRAL +/- INVESTIGATIONS

C. GROUP C – TRIAL OF TREATMENT +/- INVESTIGATIONS

D. TRIAL OF TREATMENT

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GROUP 3: TRIAL OF TREATMENT
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT

Nexus C Spine Rules

For patients with Cervical Spine Trauma

1. Midline Tenderness
2. Neurological change
3. Abnormal Alertness/Intoxication/Distracting injuries

If any of above exist → 3 shot C Spine series

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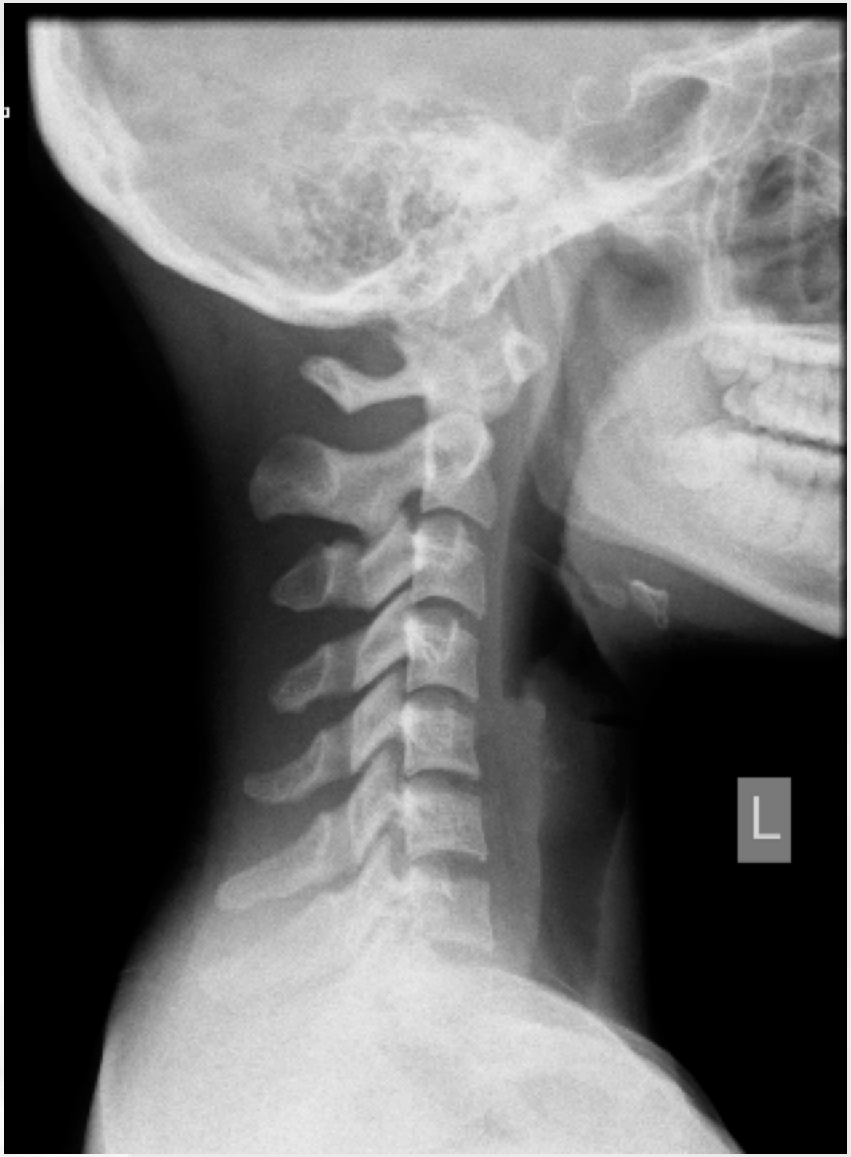
Spine Surgeon
Orthopaedic Surgeon


CE
TALL
Stiffneck Extrication Collar
Laerdal



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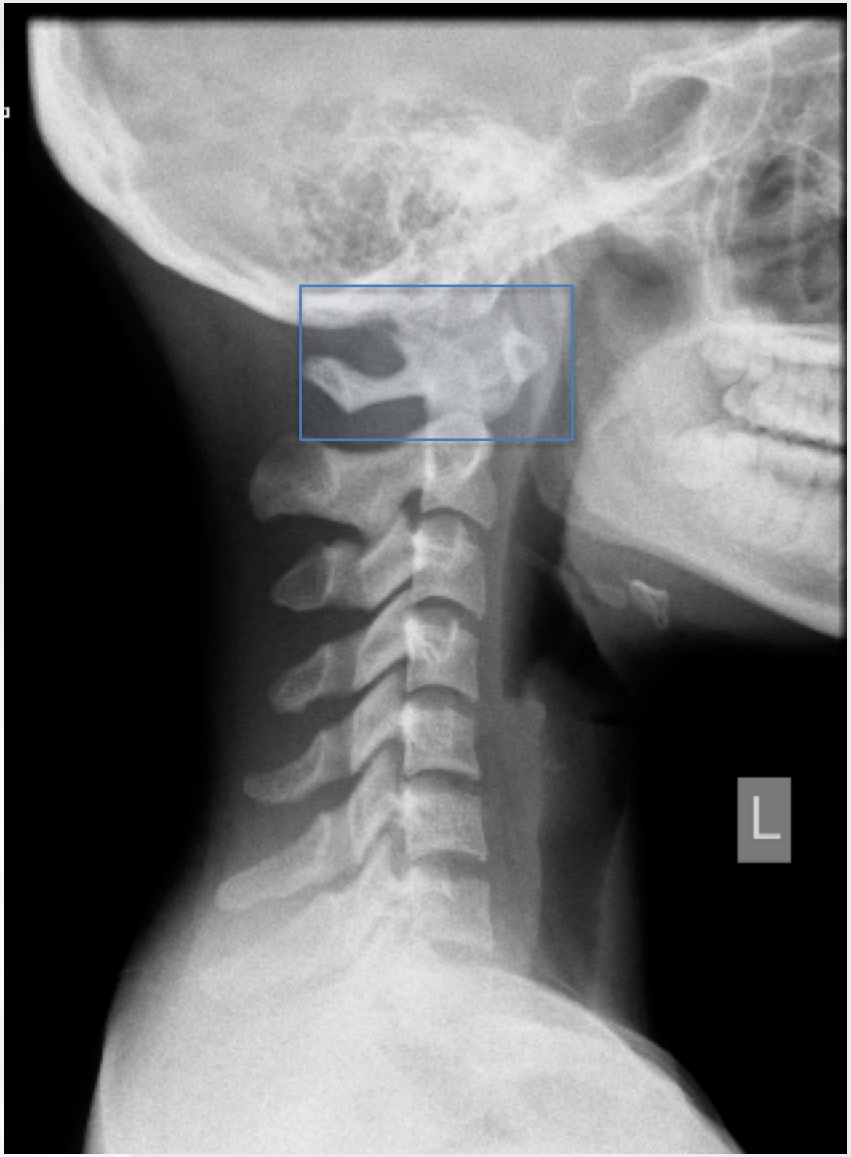
AUCKLAND PHYSIOTHERAPY



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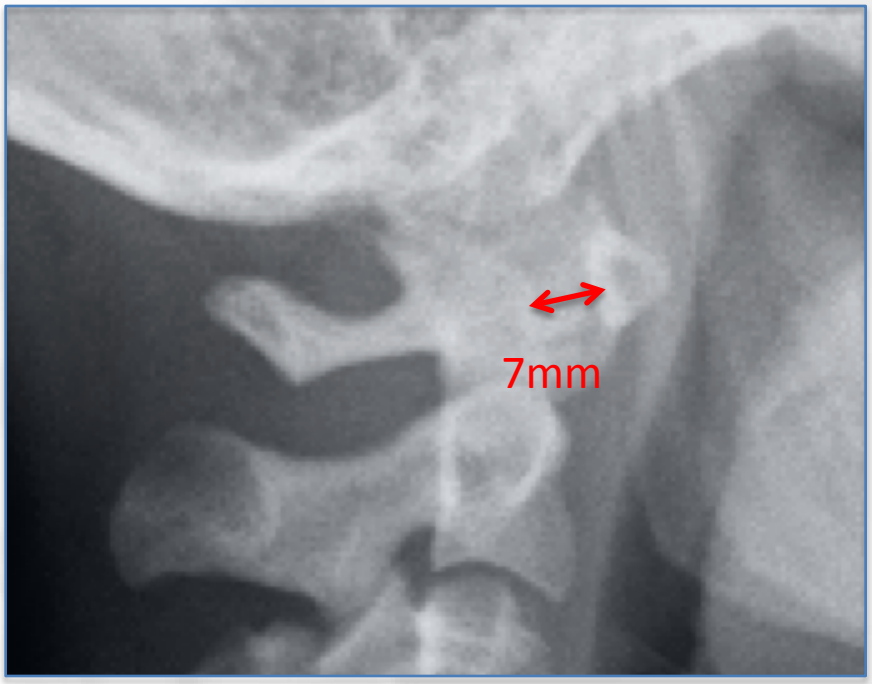

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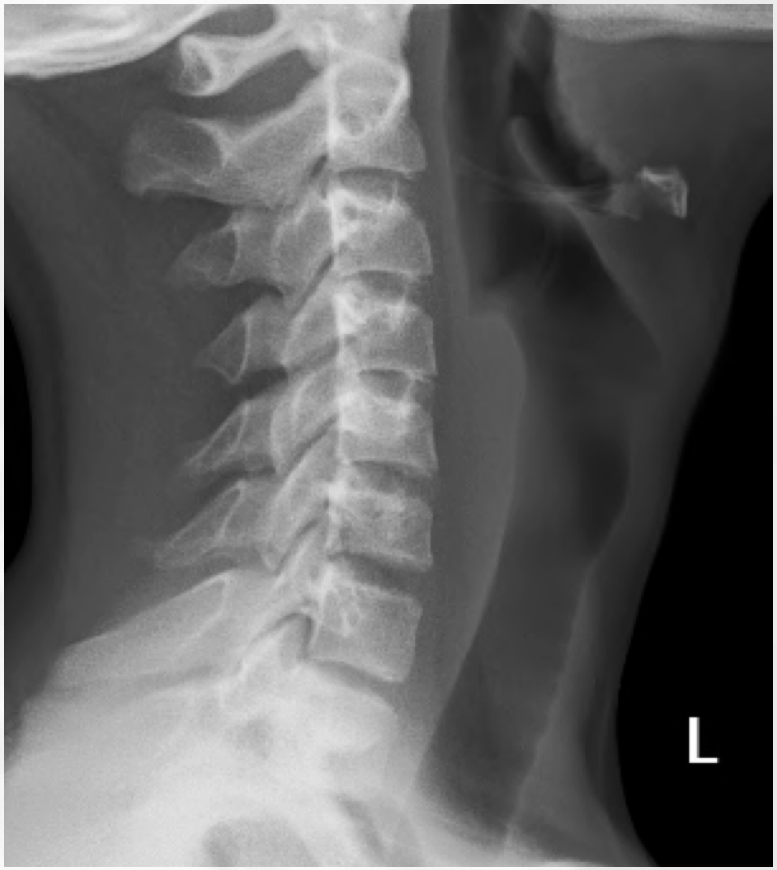
Case 7

16m



- 18 months of increasing cervical pain, no hx trauma
- Worse at night
- Pain and paraesthesia radiates down right arm

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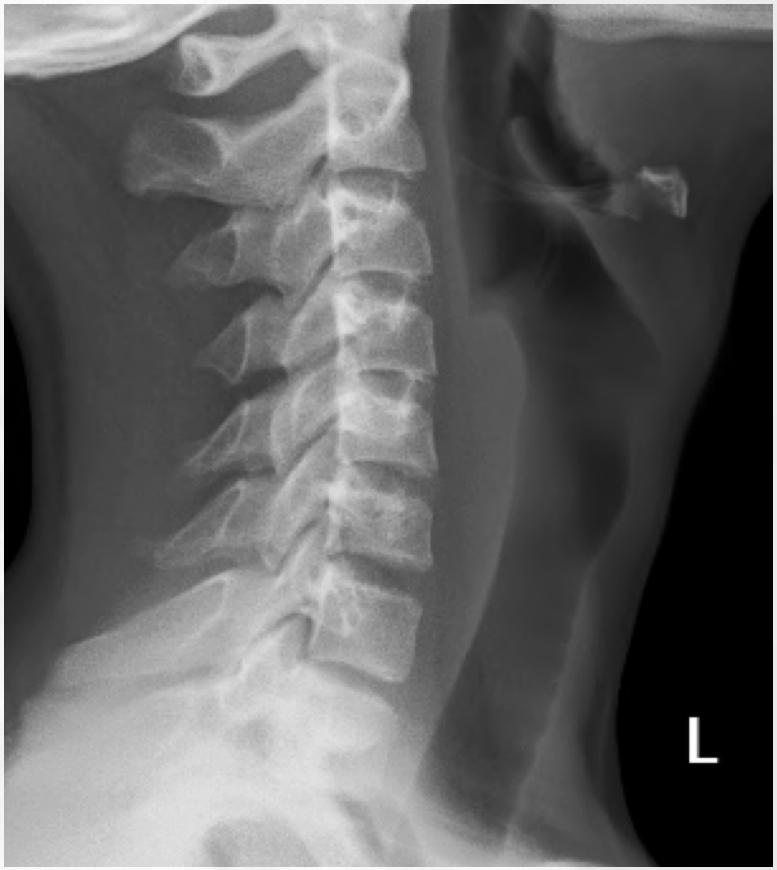
16m



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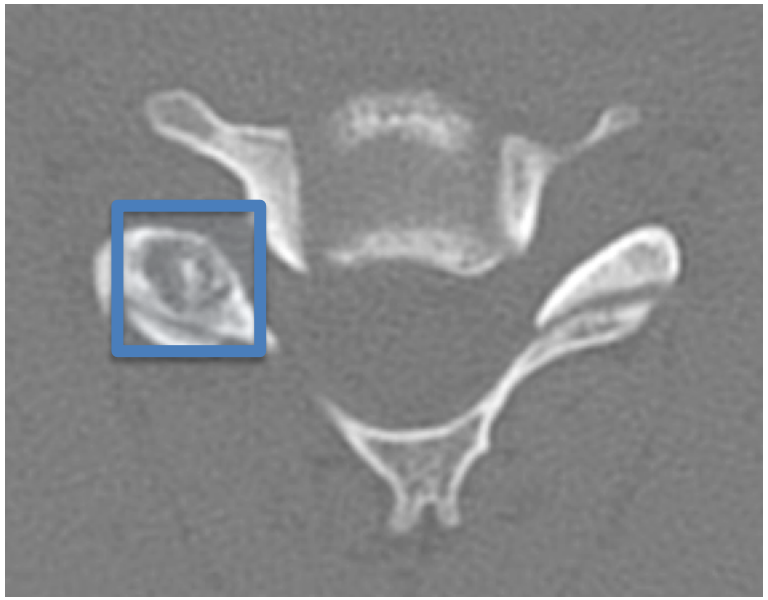

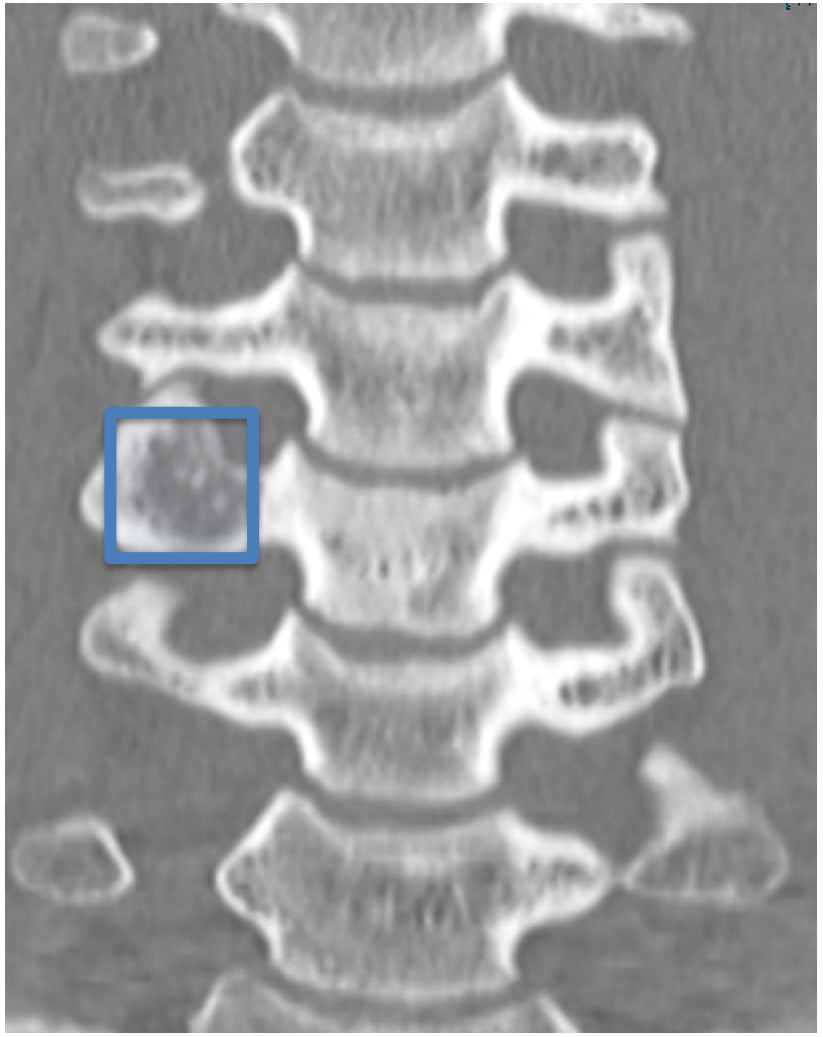

Case 7

65m

- Fell in bathroom 4 hours ago
- c/o severe pain in thoracolumbar region and ‘tingling’ in feet when mobilising
- Diabetic

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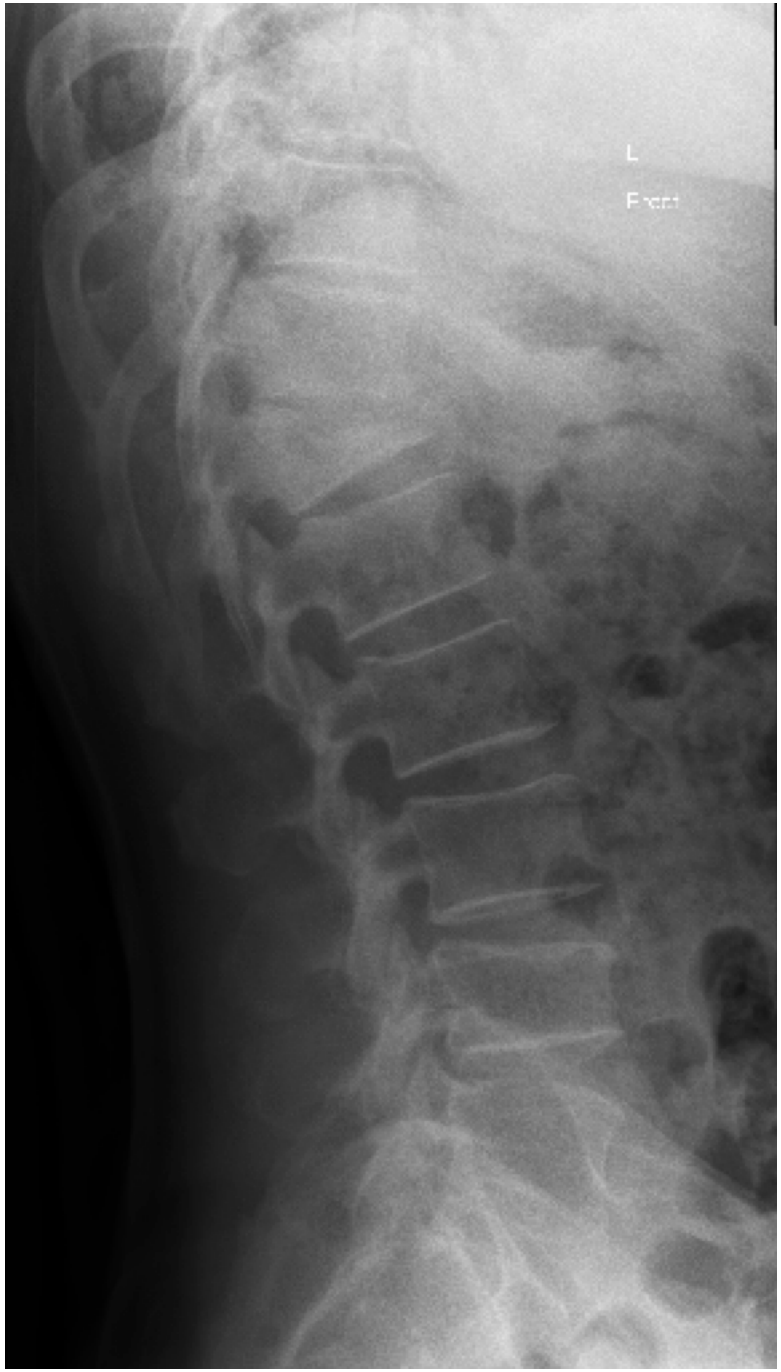
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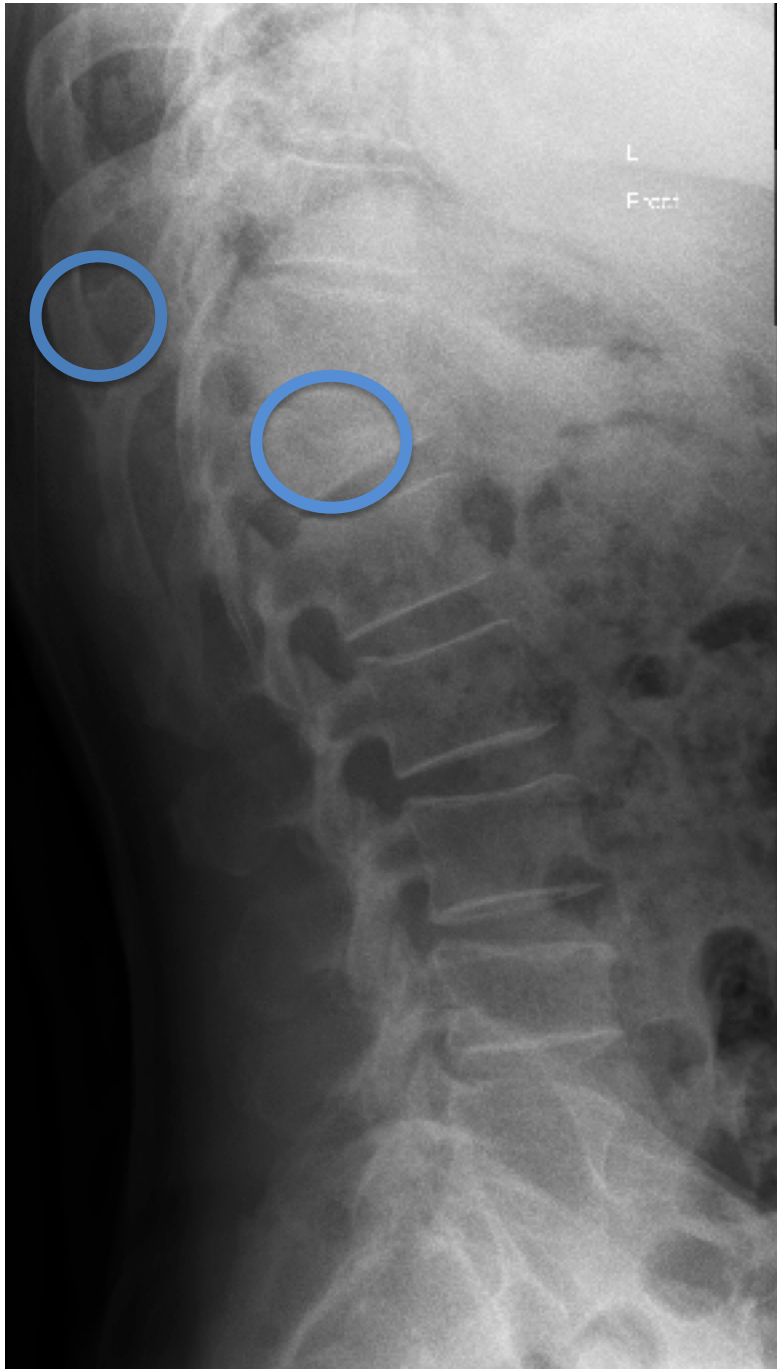
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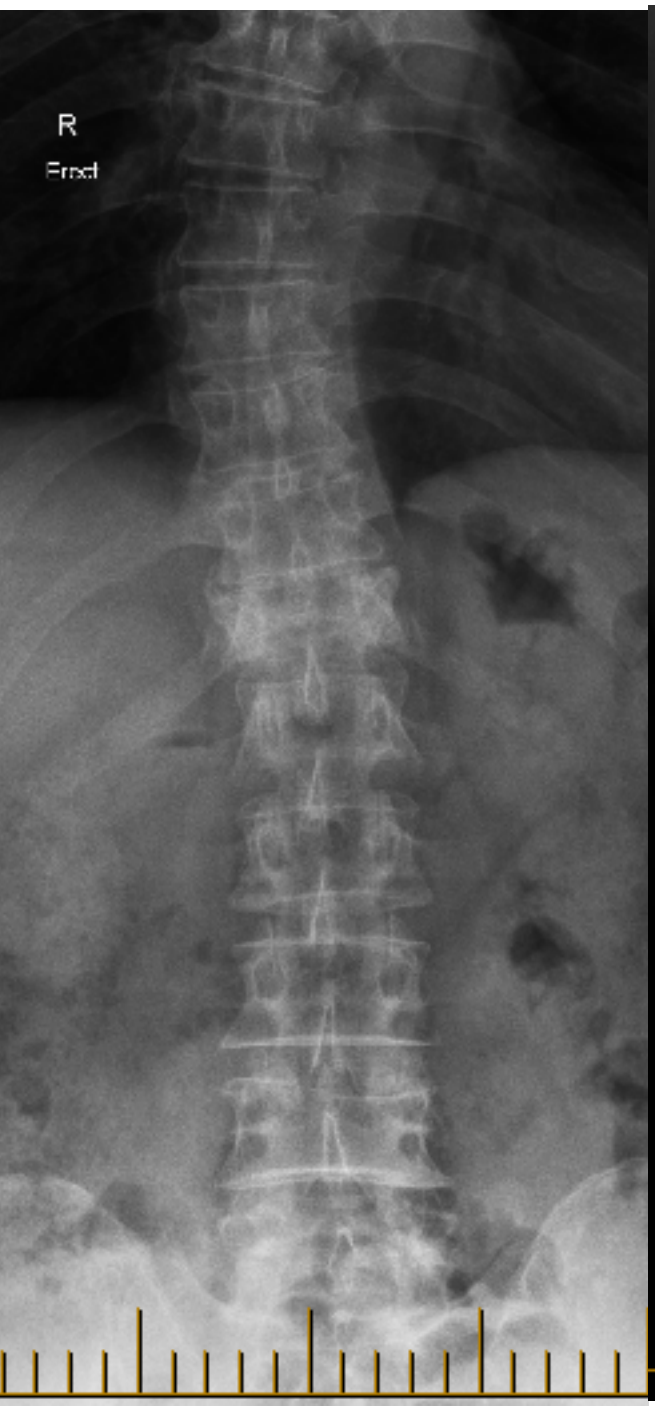
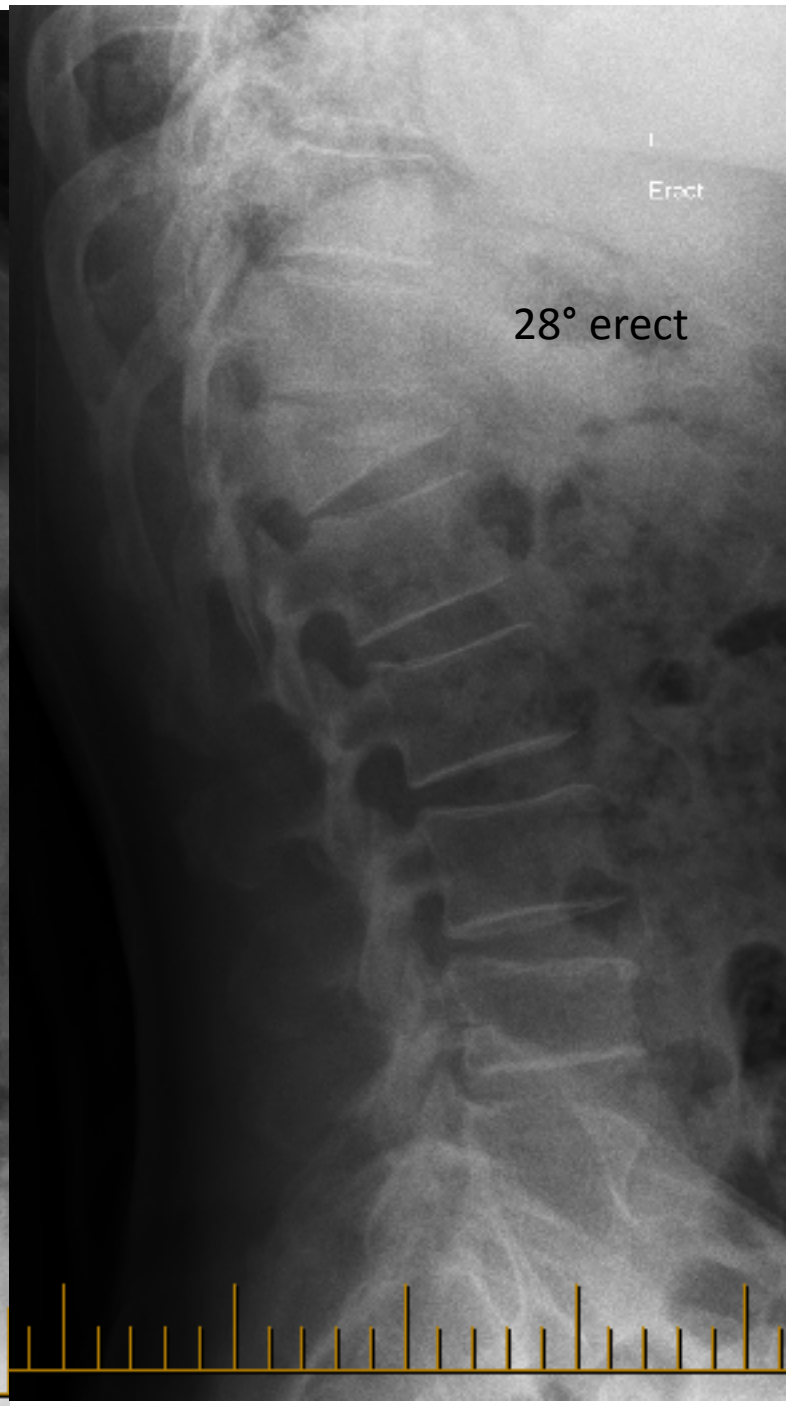
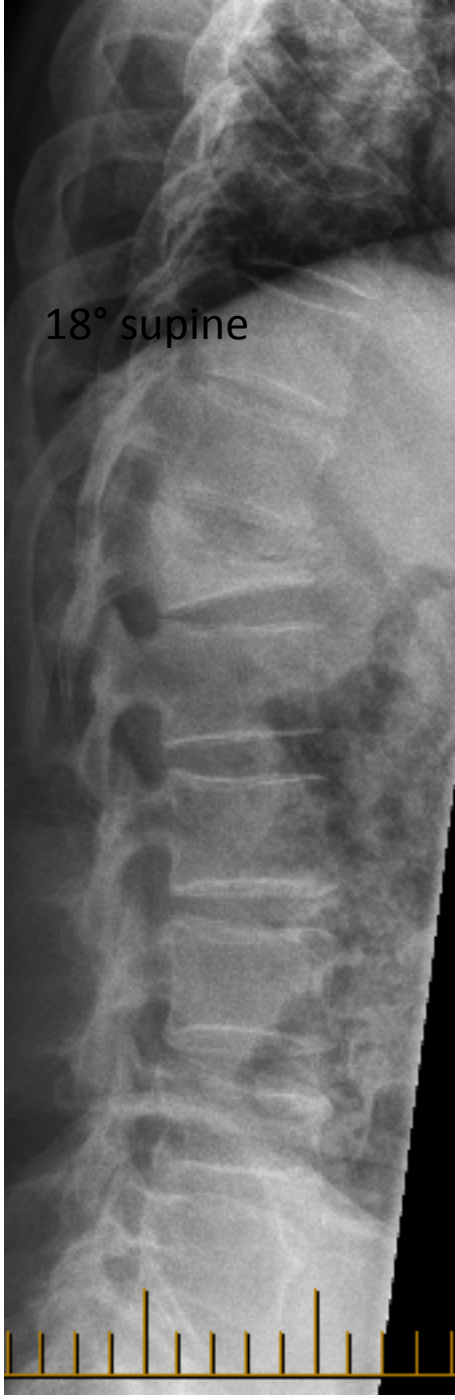
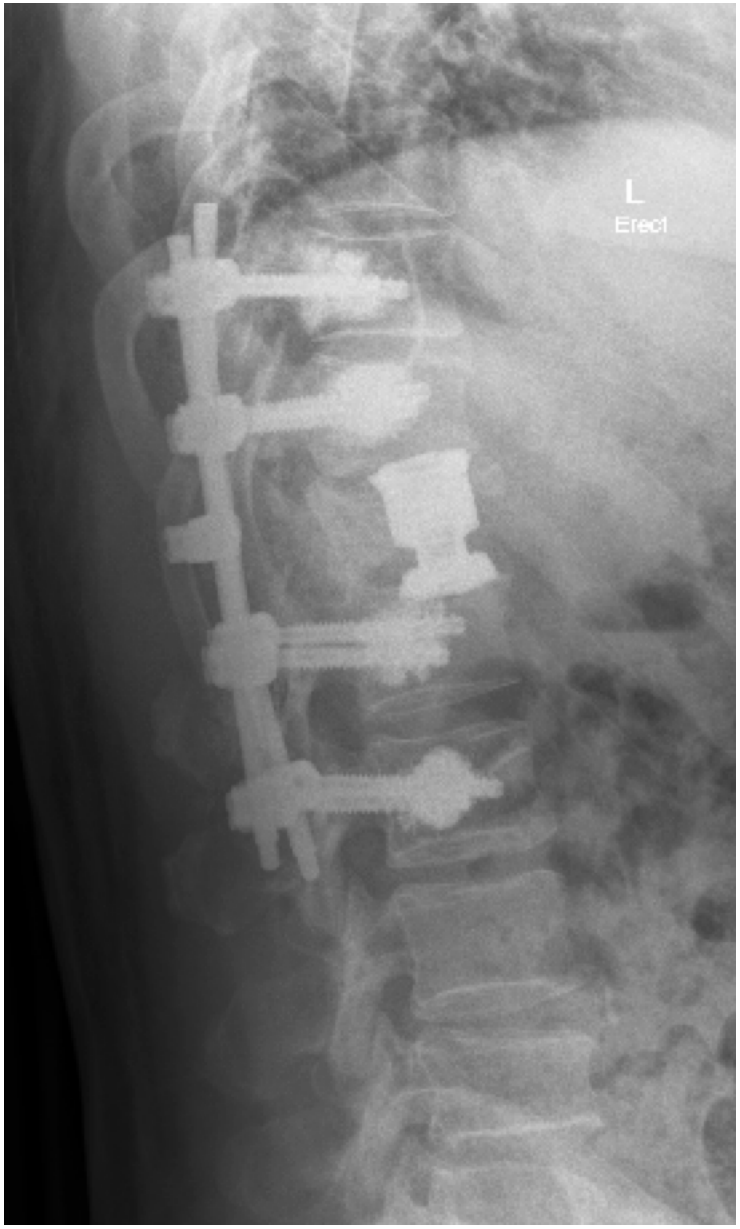




28° erect



18° supine


L
Erect

Case 8

55F

- Fell off horse 3 months ago
- C/o neck and left arm radicular pain (intermittent)
- Now left hand permanently numb
- Finding it difficult to perform tasks with left hand

- Long history of neck pain with multiple falls off horses

- Taking her husband's Tramadol, now run out.

- PMHx – nil. Non smoker.

- Examination
  - Numbness and weakness in a left C5/6 distribution
  - No sx of myelopathy

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AUCKLAND PHYSIOTHERAPY

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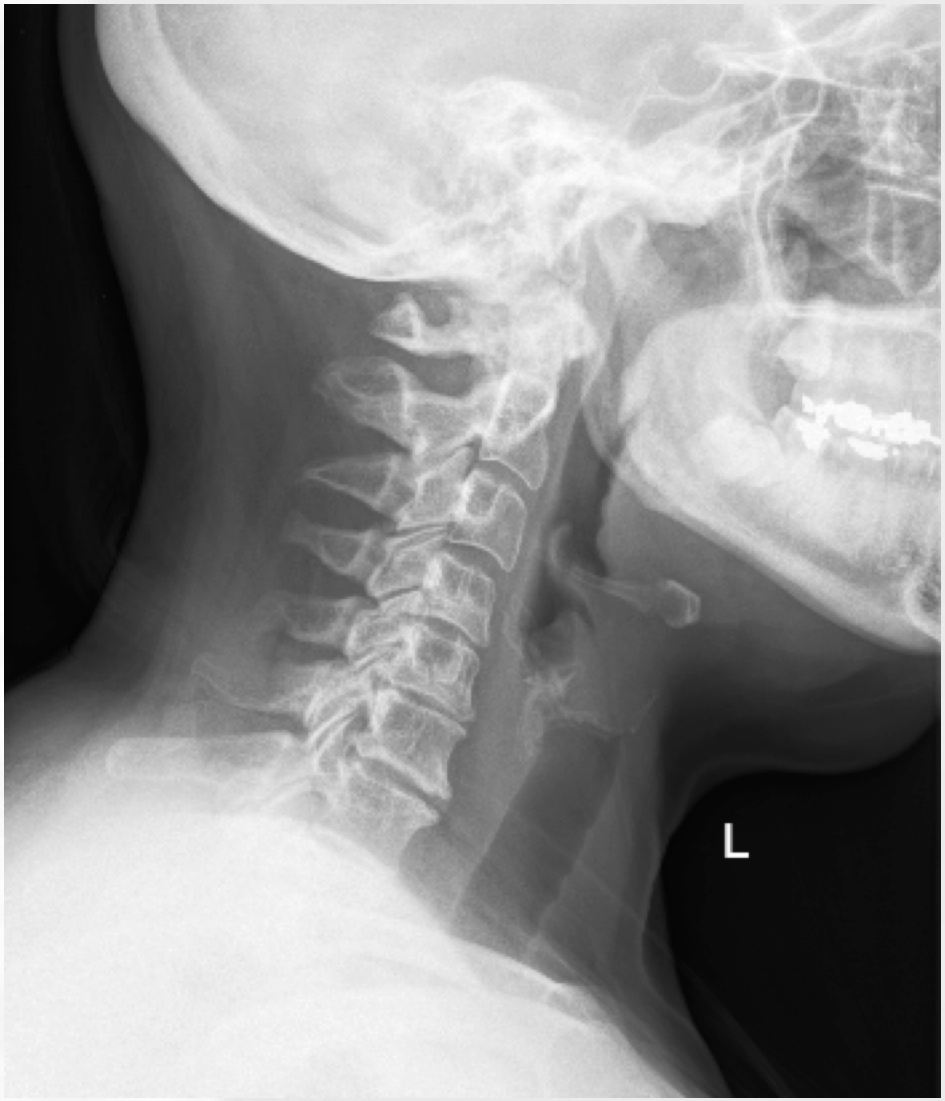

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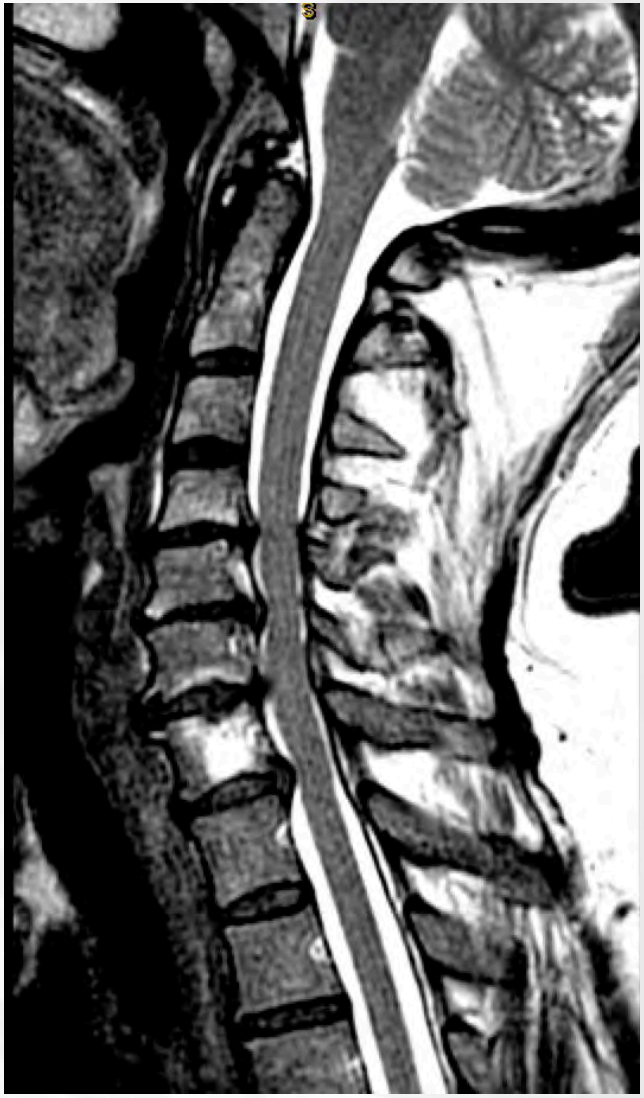
AUCKLAND PHYSIOTHERAPY



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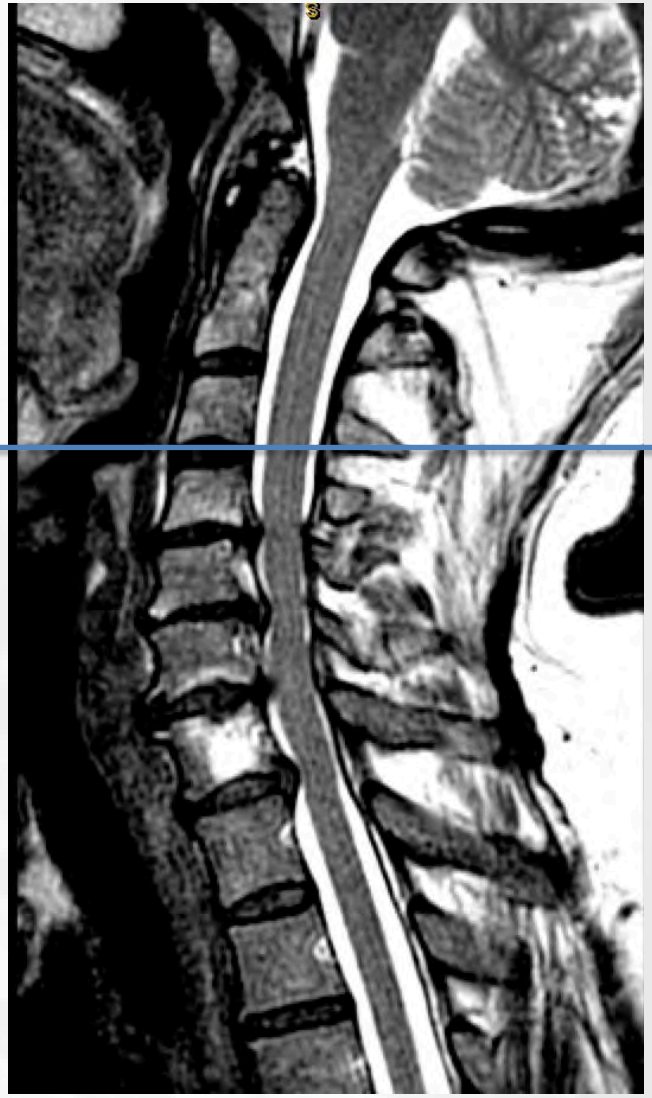

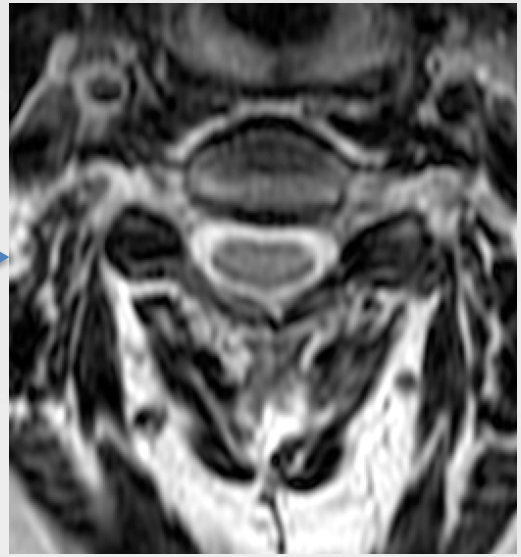

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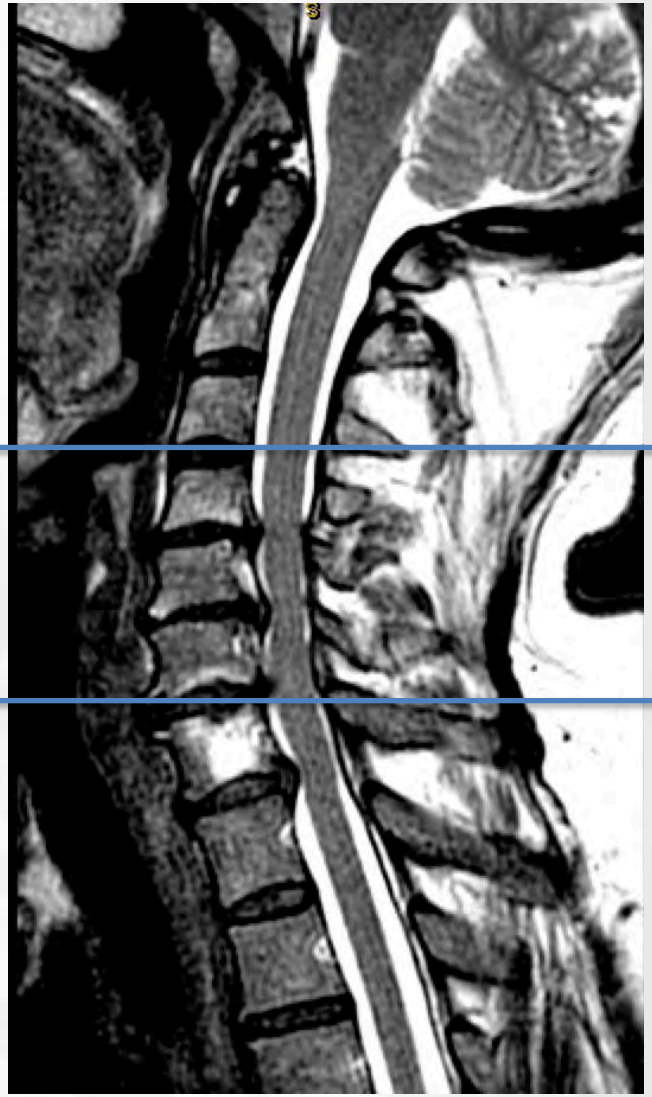

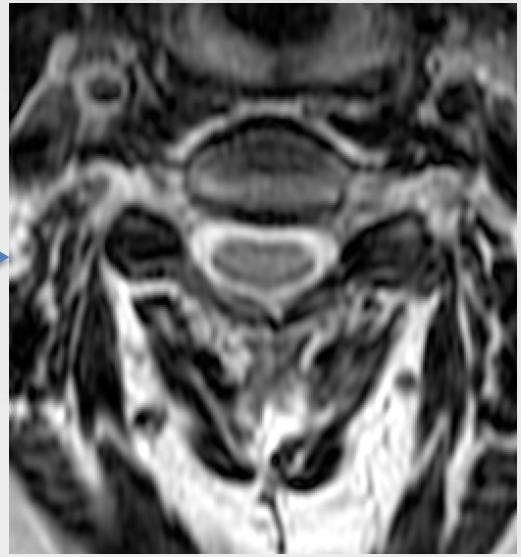

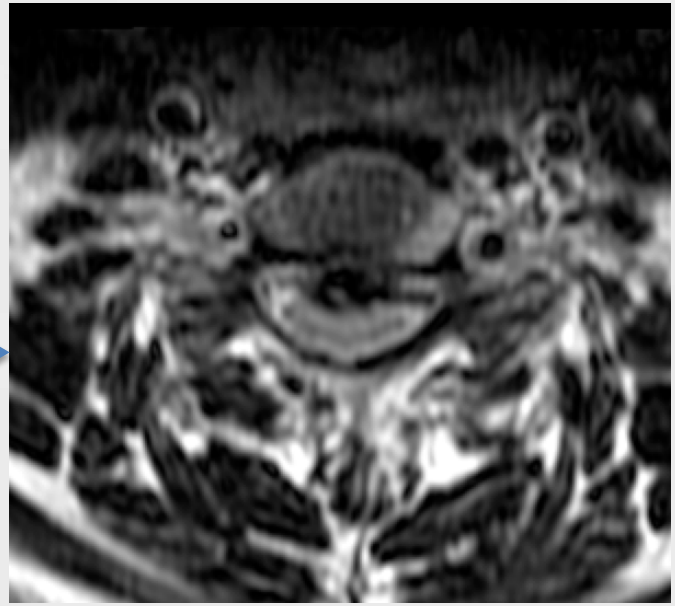

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AUCKLAND PHYSIOTHERAPY

Lower limb Neuro exam

- Quick myotome / dermatome testing
- Reflex testing
- Babinski
- Rhomberg
- Slump
- SLR variations

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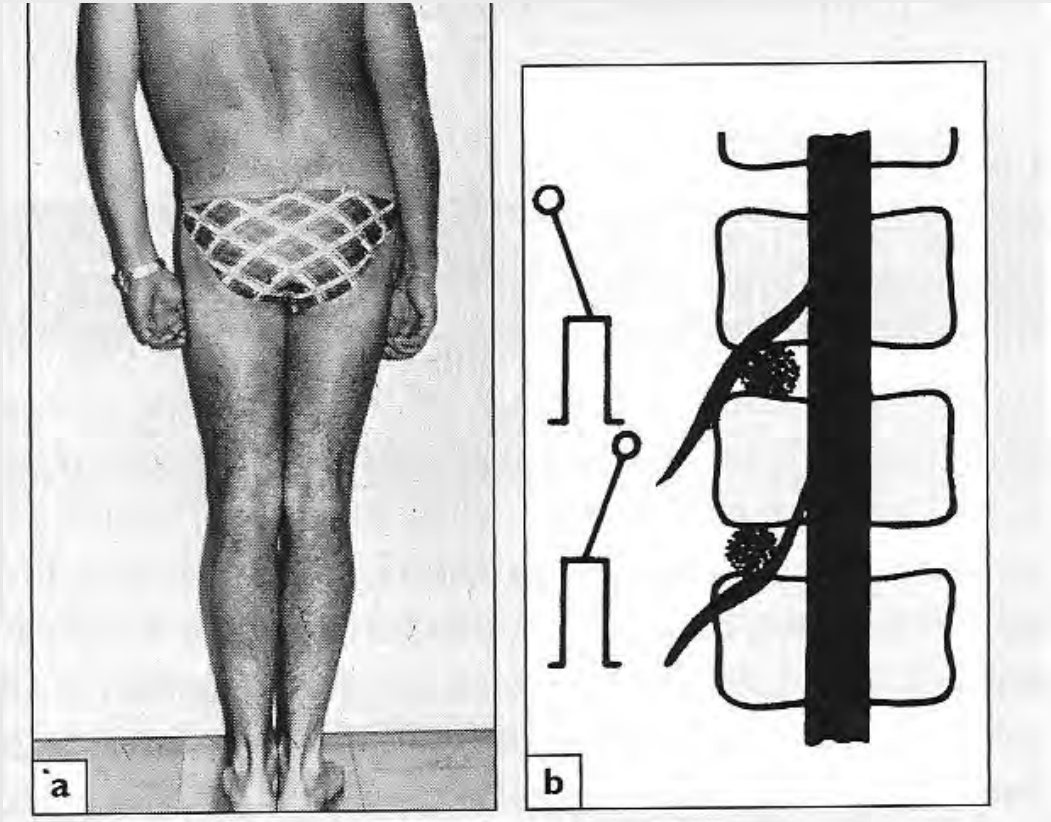
EXAMINATION

- Standing
  - Muscle wasting
  - Tilt
  - Stooping forward
  - Flexion/Extension
- Gait
  - Toe walking
  - Heel Walking
  - Heel-Toe (Ataxia)



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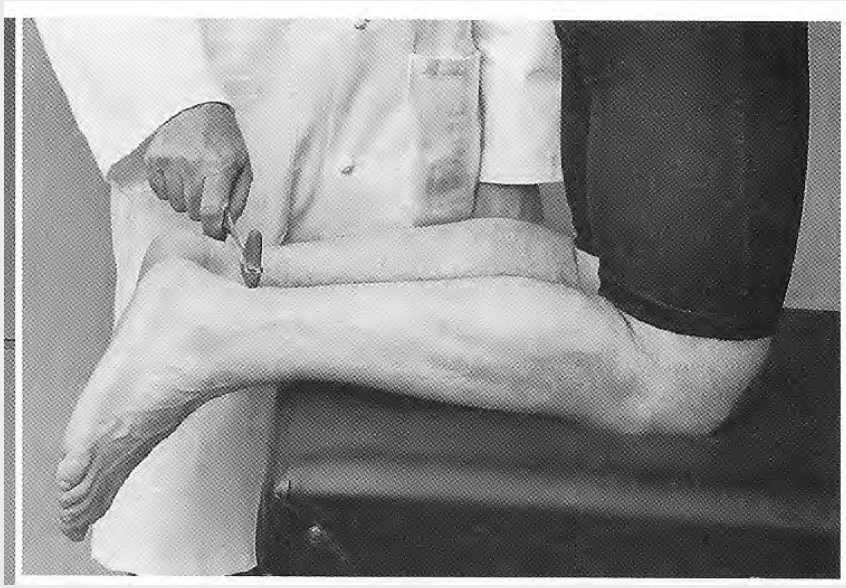
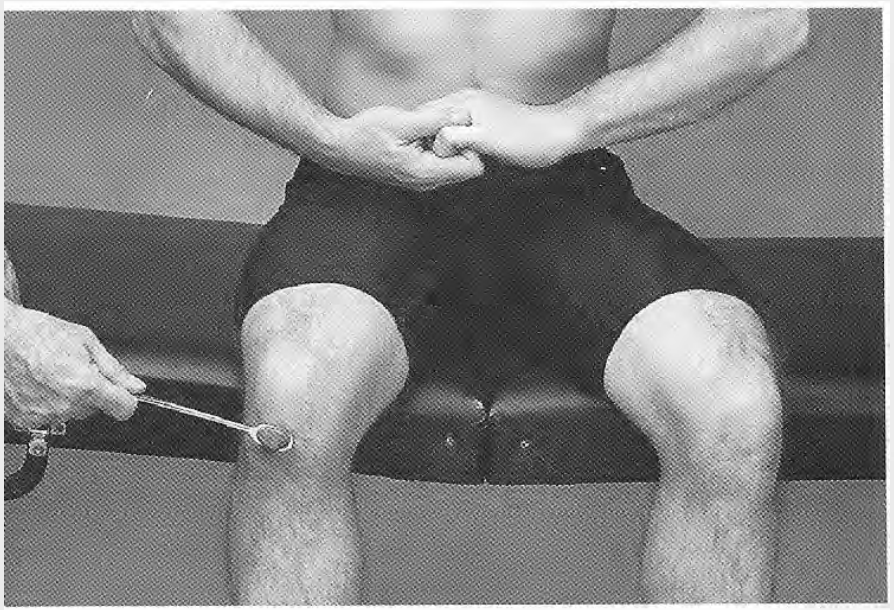
- Kneeling
  - Ankle Reflexes (S1)



- Sitting
  - Knee Jerks (L3/4)
  - Muscles
    - Hip Flexors
    - Quads
      - Bonus Slump Test!



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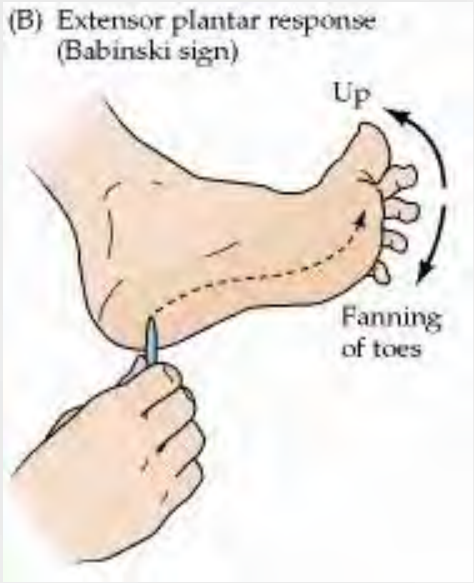
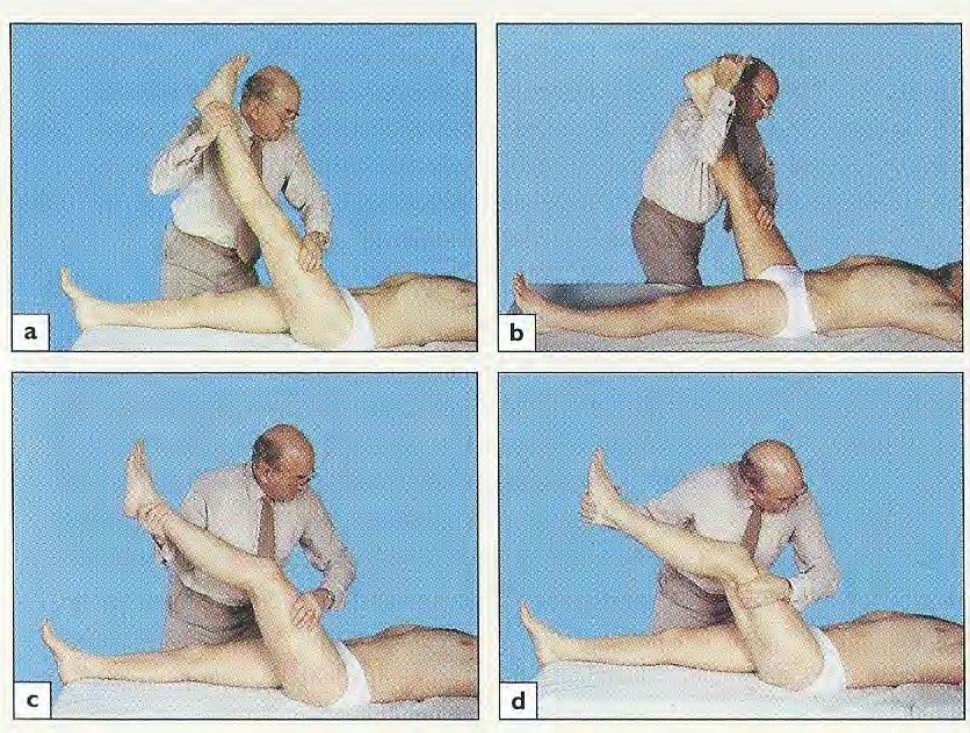
- Lying Supine
  - Babinski Sign
  - Clonus
  - Pulses
  - Sensation
  - Motor Power
  - Nerve Root Tension Signs



Nerve Root Tension Signs

- Average Excursion of Nerve Roots
  - L4 1.5mm
  - L5 3.0mm
  - S1 6.0mm



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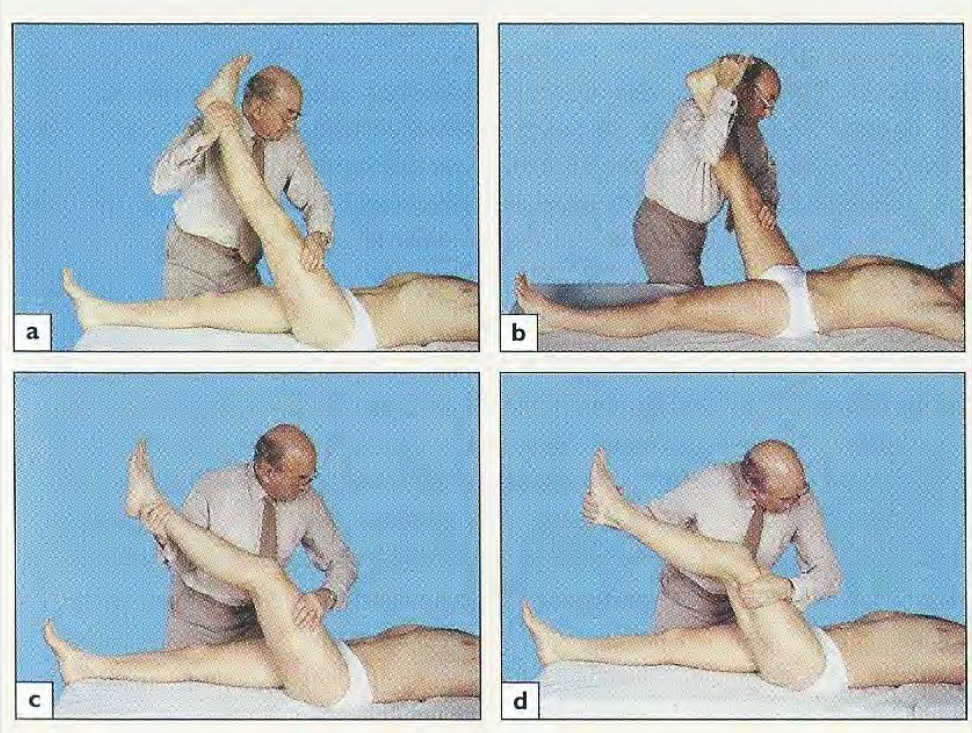
Nerve Root Tension Signs

- Straight Leg Raise
  - Reproduces pain below knee
  - Worse with dorsiflexion
  - Very sensitive for patients
  - Cross-over sign, very specific
- Hips
  - ROM/Pain



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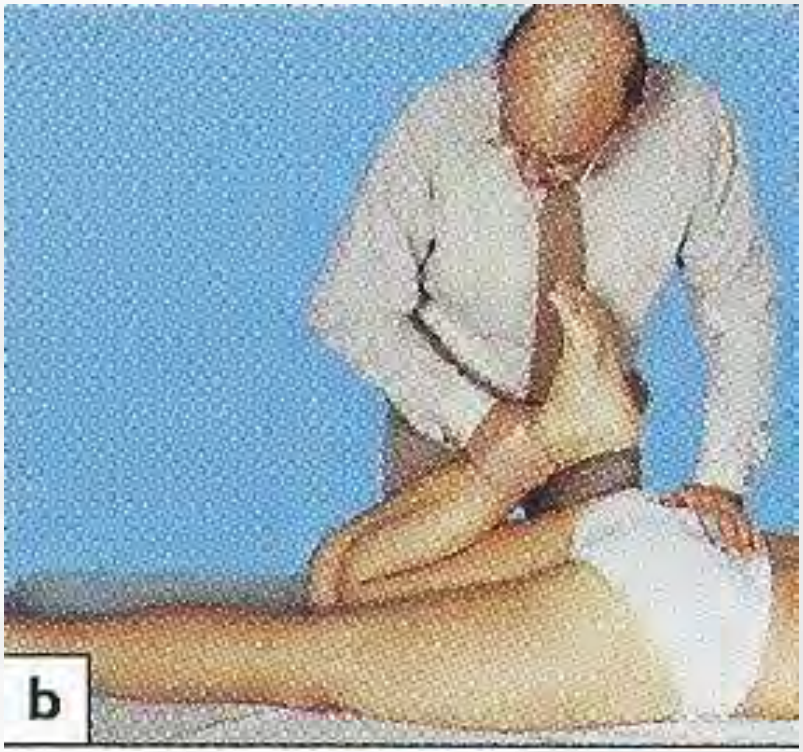
Nerve Root Tension Signs

- Femoral Nerve Stretch Test Sp 84% (Porchet et al, 1994 – QUADAS 5)



Cervical Spine Exam

Neuro

- Sensation
- Power
- Reflexes
- Test for Myelopathy
- Peripheral Neuro

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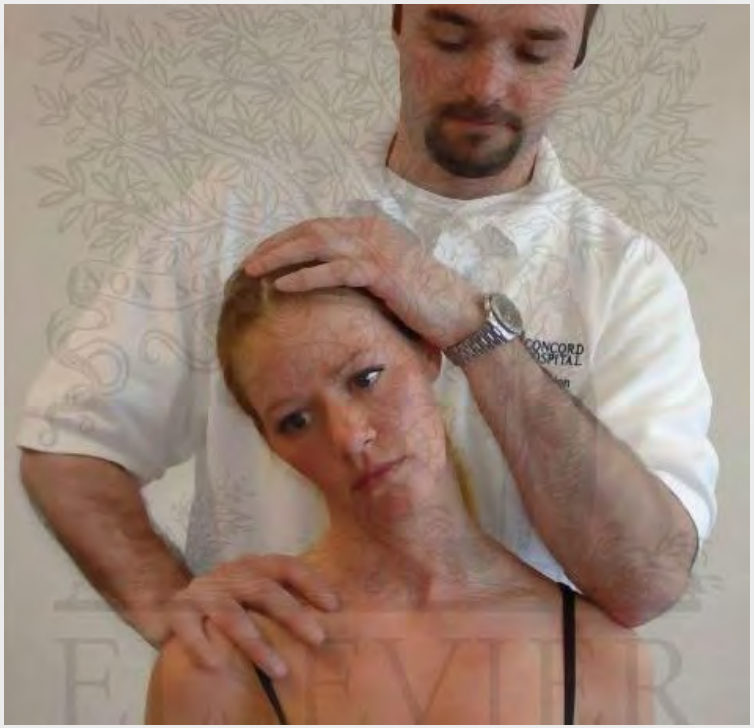
AUCKLAND PHYSIOTHERAPY

Look and Move

- Stand in <u>front</u> of the patient so you can <u>see</u> when it <u>hurts</u>

Patient moves under their OWN power

- Flexion (L'hermitte's)
- Lateral Rotation
- Extension
- Extension and rotation (Spurling's Test)



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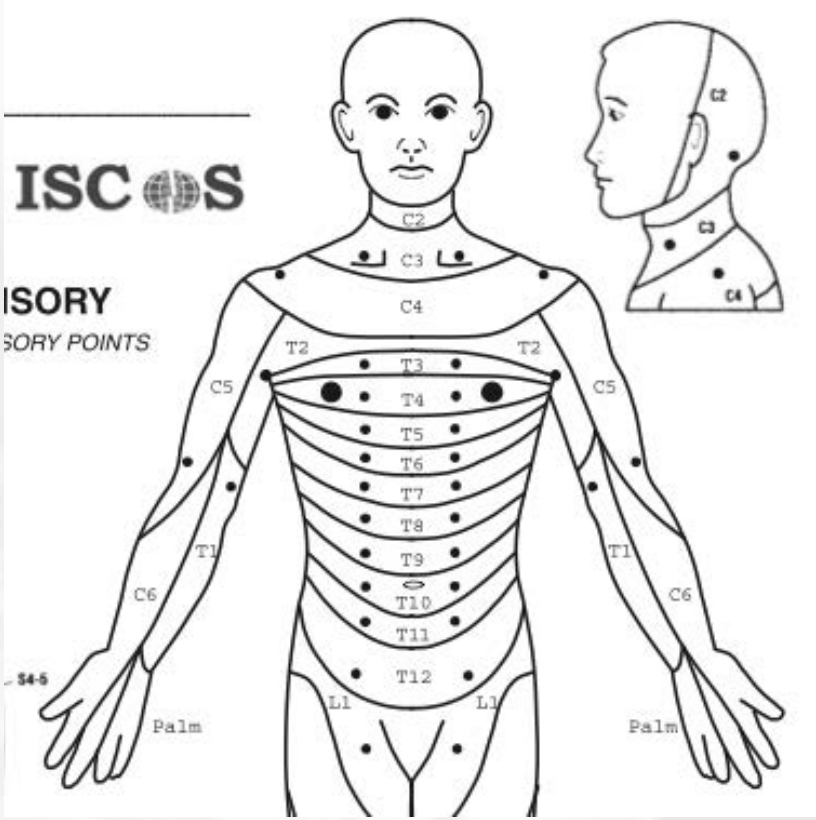
Neuro - Sensory



- C4 – Point of shoulder
- C5 – Lateral Elbow
- C6 – Thumb
- C7 – Middle Finger
- C8 – Little Finger
- T1 – Medial Elbow

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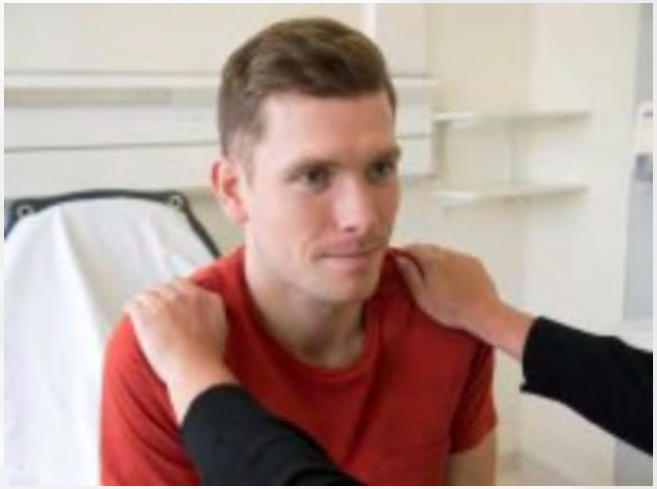
AUCKLAND PHYSIOTHERAPY

Neuro - Motor



- C4 – Shoulder Shrug
- C5 – Deltoid/Biceps
- C6 – Wrist Extension
- C7 – Triceps
- C8 – Finger Extension
- T1 – Finger ABduction

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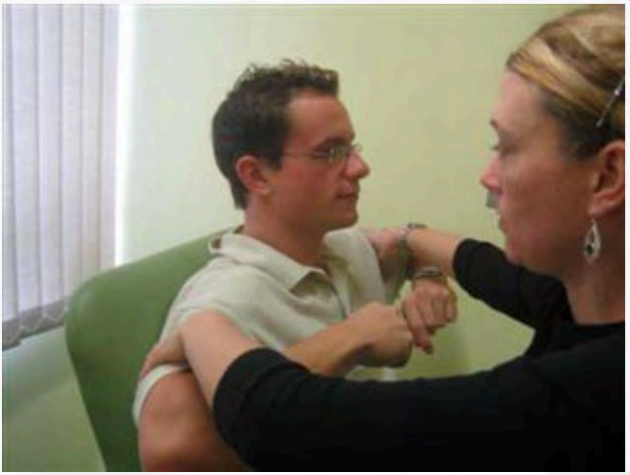
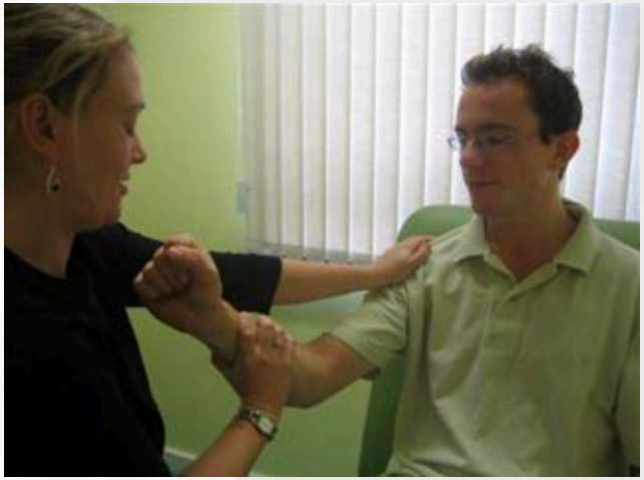
Neuro - Motor





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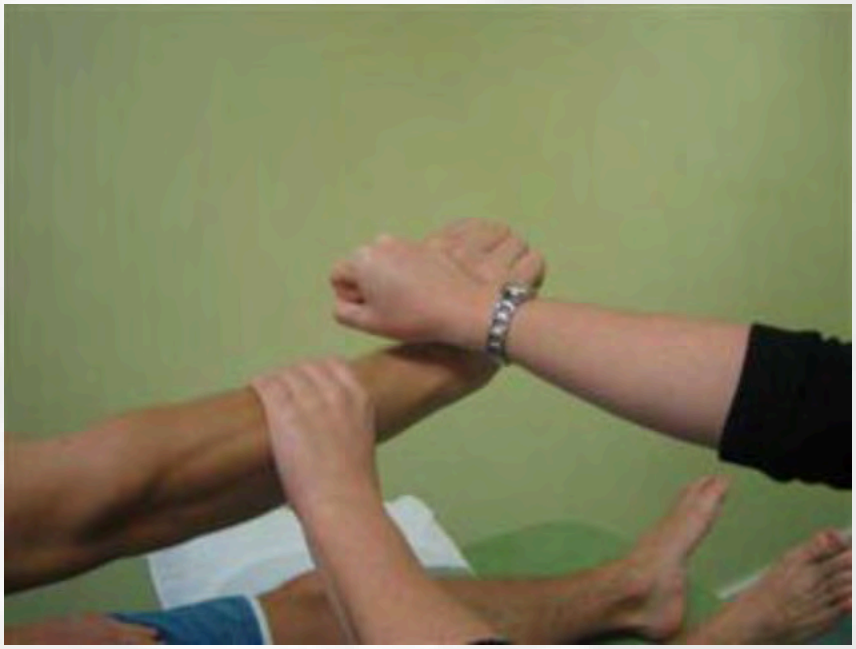
Neuro - Motor



- C4 – n/a
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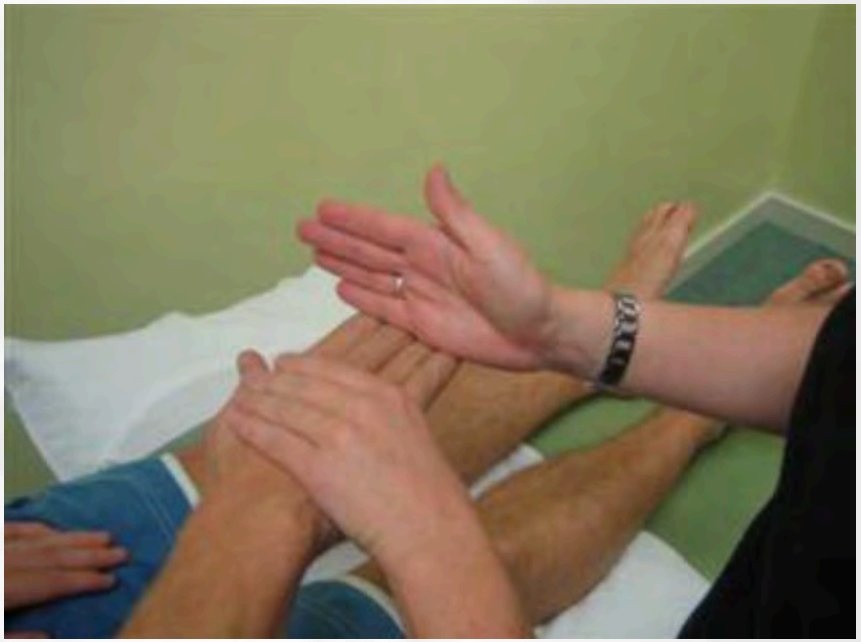

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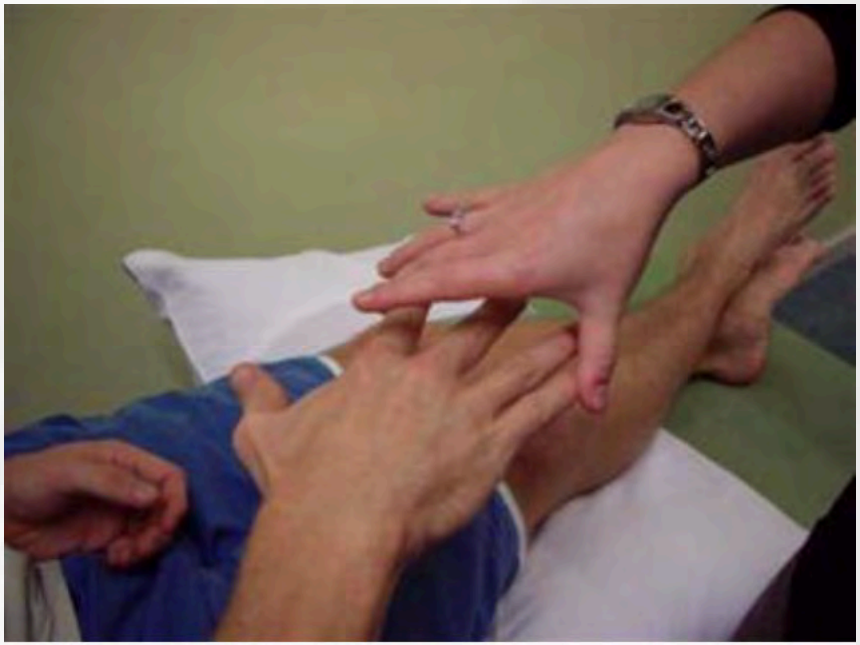

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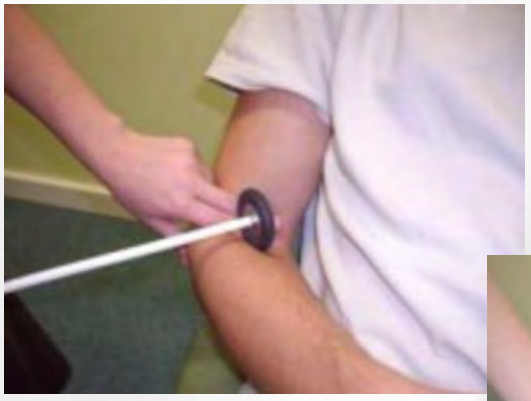
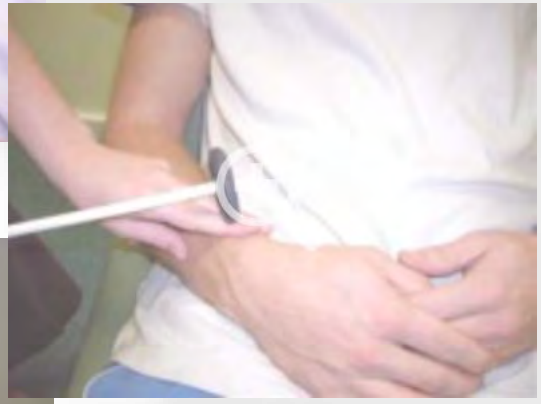
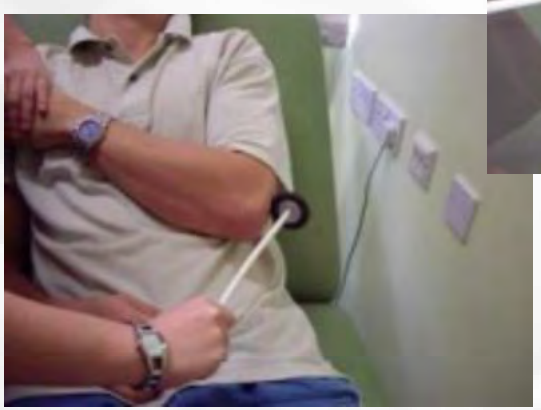
Neuro - Reflexes



C5 –Biceps



C6 – Brachoradialis



C7 – Triceps

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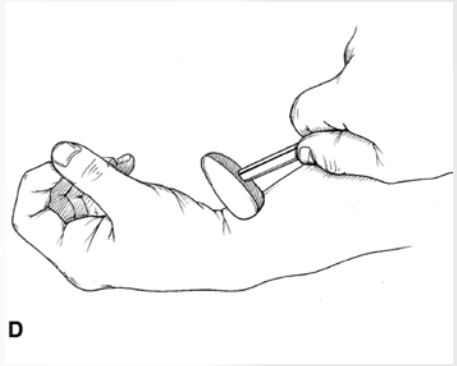
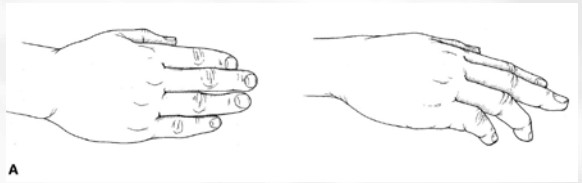
Neuro - Myelopathy

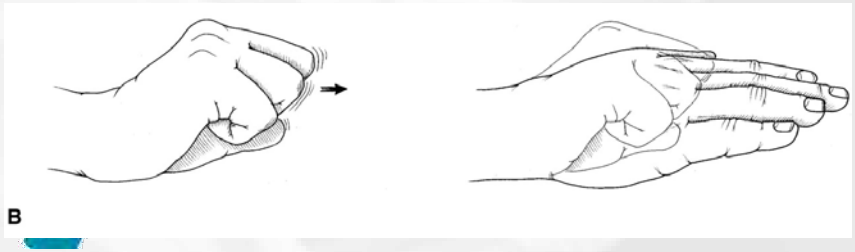


Inverted Radial (aka Inverted Supinator) Reflex

Hoffman's Sign



Finger Escape



Grip and Release Test

AUCKLAND PHYSIOTHERAPY

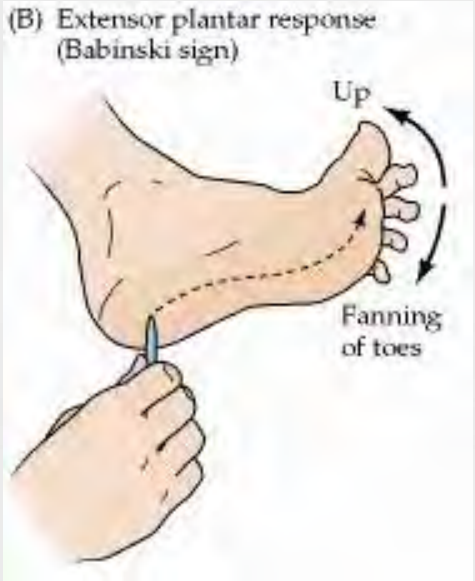
Neuro - Myelopathy

Gait - Ataxia

Rhomberg's Test

Babinski

Clonus



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Cervical myelopathy

• Positive Rhomberg	Sp 100%	Sn unknown
• Finger Escape sign	Sp 100%	Sn 55%
• L'hermittes	Sp 97%	Sn Poor
• Biceps hyper-reflexia	Sp 96%	Sn 18%
• Clonus	Sp 96%	Sn 11%
• Inverted supinator sign	Sp 78%	Sn 61%
• Hoffman test	Sp 75%	Sn 44 %

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Summary

- Red flag pathologies are uncommon, but you are likely to come across them in your practice at some point
- Individual red flags have poor diagnostic utility
- Clusters of findings are more useful
- Early diagnosis is important
- Suspicion of red flag pathology primarily from history and examination findings
- Using a system for screening is useful…

GROUP 1:

REFER IMMEDIATELY

GROUP 2:
EXPIDITIOUS
SPECIALIST REFERRAL

GROUP 3: TRIAL OF
TREATMENT
+ INVESTIGATIONS

GROUP 4:

TRIAL OF TREATMENT

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Questions

- To view the powerpoint online go to:
  - www.spinesurgeon.co.nz or
  - www.aucklandphysiotherapy.co.nz

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