

Demystifying the Spine

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What are we going to cover?

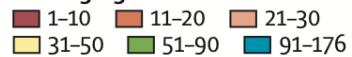
- Back pain
- Red flag conditions
- Lumbar and cervical
- Radiculopathy
- Myelopathy
- Scoliosis



The Burden!

Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010

Ranking legend



Cause	Global	High-income Asia Pacific	Western Europe	Australasia	High-income North America	Central Europe	Southern Latin America	Eastern Europe	East Asia	Tropical Latin America	Central Latin America	Southeast Asia	Central Asia	Andean Latin America	North Africa and Middle East	Caribbean	South Asia	Oceania	Southern sub-Saharan Africa	Eastern sub-Saharan Africa	Central sub-Saharan Africa	Western sub-Saharan Africa
Low back pain	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	4	1	2	4	3	3	2
Major depressive disorder	2	4	2	2	2	2	2	2	2	2	1	1	1	1	2	2	3	1	2	2	2	3
Iron-deficiency anaemia	3	26	48	22	88	14	11	10	15	6	6	3	3	3	3	3	2	3	3	1	1	1
Neck pain	4	3	4	3	4	4	3	3	3	3	3	6	5	5	6	8	7	8	6	6	7	5
Chronic obstructive pulmonary disease	5	21	9	10	6	10	8	11	8	12	18	4	8	10	8	16	4	9	5	5	5	7
Other musculoskeletal disorders	6	2	5	4	3	5	4	4	4	8	4	8	7	6	7	12	8	10	8	9	10	11
Anxiety disorders	7	8	6	6	5	6	5	12	12	4	5	7	4	4	4	6	6	7	7	4	6	9
Migraine	8	11	8	8	15	8	13	8	17	7	8	5	6	8	11	10	5	12	10	25	12	8
Diabetes mellitus	9	7	7	11	8	7	12	5	5	13	7	12	9	17	5	5	11	4	18	27	29	23
Falls	10	5	3	5	12	3	7	9	7	16	21	11	11	16	12	11	12	15	20	26	24	26
Osteoarthritis	11	6	13	15	10	9	14	7	6	11	10	17	12	12	10	14	19	14	17	19	26	20
Drug use disorders	12	12	11	9	7	16	6	17	18	9	11	10	14	11	9	13	9	16	12	16	21	21
Other hearing loss	13	13	18	19	20	12	15	14	11	15	15	9	15	14	17	18	10	19	14	10	18	13
Asthma	14	15	12	7	11	21	10	25	39	5	12	18	21	7	13	9	15	11	9	8	8	12
Alcohol use disorders	15	16	17	17	16	18	9	6	9	10	16	20	10	9	35	17	14	13	11	30	33	40
Schizophrenia	16	17	21	13	9	13	16	16	10	14	13	13	16	15	15	19	17	18	16	21	23	19
Road injury	17	19	14	14	27	11	19	15	13	22	22	15	13	19	14	15	13	17	21	24	22	25
Bipolar affective disorder	18	20	19	20	19	19	17	19	14	17	14	16	17	18	16	20	16	20	19	18	25	22
Dysthymia	19	22	20	21	21	20	20	20	16	20	19	19	19	22	19	22	20	23	22	20	31	27
Epilepsy	20	32	33	44	32	25	23	28	31	18	9	21	20	13	20	25	26	24	15	13	17	14
Ischaemic heart disease	21	18	15	18	17	15	22	13	19	21	25	28	18	31	22	27	31	29	34	41	48	37
Eczema	22	24	26	23	25	22	24	24	22	23	17	23	22	20	21	21	22	22	23	17	20	24
Diarrhoeal diseases	23	30	31	31	29	41	27	37	24	25	20	24	25	21	18	23	23	25	25	14	14	15
Alzheimer's disease and other dementias	24	10	10	12	14	17	18	18	26	28	31	40	30	33	41	30	50	69	48	64	67	64
Benign prostatic hyperplasia	25	9	16	16	13	23	25	29	20	31	36	34	42	36	29	36	45	51	47	61	56	57
Tuberculosis	26	38	83	93	102	56	56	34	42	42	56	14	24	27	24	24	18	6	13	22	16	32
Neonatal encephalopathy*	27	62	66	58	55	44	45	45	29	29	30	30	29	30	31	37	24	30	28	15	27	18
Other vision loss	28	27	22	25	26	27	26	27	33	19	24	26	26	23	26	26	34	26	26	34	39	45
Refraction and accommodation disorders	29	74	60	68	75	24	63	21	37	64	51	32	32	41	28	60	21	36	39	35	37	35
Conduct disorder	30	39	42	38	37	38	32	44	30	27	23	31	27	24	25	32	29	27	30	23	30	29
Periodontal disease	31	31	29	26	35	28	21	23	23	24	27	29	28	28	38	46	40	73	45	33	47	50

The Burden!

- Back pain leading cause of worldwide disability
- Neck pain is 4
- But it is all part of being human
- Many patients seek care
- Not all pain needs surgery, surgery cannot help all pain
- Most will be 'non-specific', most are benign, most will get better



Non-Specific Pain...



- Most patients will recover fully within three months
- Serious causes rare and can be excluded
- Managing patients beliefs, fear about pain
 - Activity doesn't worsen disease, analgesia is not a "band-aid"
- Reassurance and education
- Physiotherapy, alternative therapies
- Imaging if concerned

When to worry?

- Red flags

Tier 1

Cancer

Progressive Neurological Deficit

Systemic Symptoms (fever)



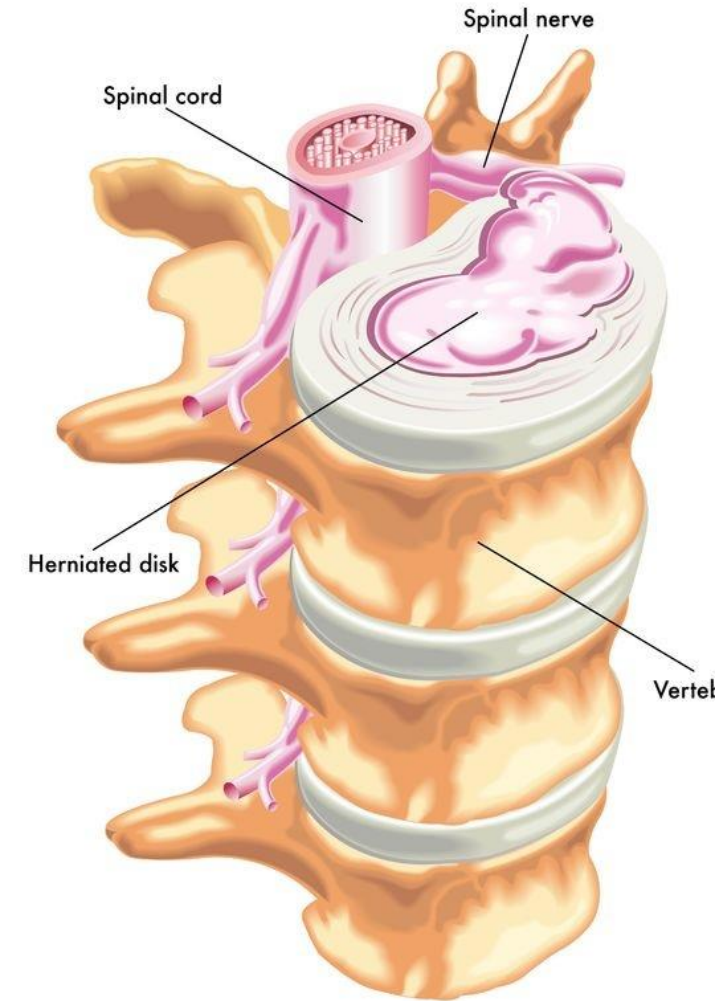
Everything Else...

- Cervical and lumbar
- Radiculopathy
- Spinal stenosis
- Myelopathy
- Scoliosis (adult and paediatric)
- Trial treatment or investigations – limited in primary care

Lumbar Radiculopathy

Radiculopathy

- Sciatica
- Pain in single nerve distribution
- “slipped disc” and spondylolisthesis “slipped vertebrae”
- Caution cauda equina syndrome!
- Most resolve with time
- Pain due to biology (sensitisation) and mechanical compressio



Radiculopathy - Management

- Simple Analgesics - avoid opioids
- Steroids
 - Improved function and pain
 - 15-day course of oral prednisone
 - (5 days each of 60 mg, 40 mg, and 20 mg; total cumulative dose = 600 mg)
- Gabapentinoids
 - Gabapentin is a prodrug, prefer pregabalin
 - 75mg BD for 1 week and if tolerated increase to 150mg BD

Research

JAMA May 19, 2015 Volume 313, Number 19

Original Investigation

Oral Steroids for Acute Radiculopathy Due to a Herniated Lumbar Disk A Randomized Clinical Trial

Harley Goldberg, DO; William Firtch, MD; Mark Tyburski, MD; Alice Pressman, PhD, MS; Lynn Ackerson, PhD; Luisa Hamilton, MD; Wayne Smith, MD; Ryan Carver, MD; Annu Maratukulam, MD; Lawrence A. Won, MD; Eugene Carragee, MD; Andrew L. Avins, MD, MPH

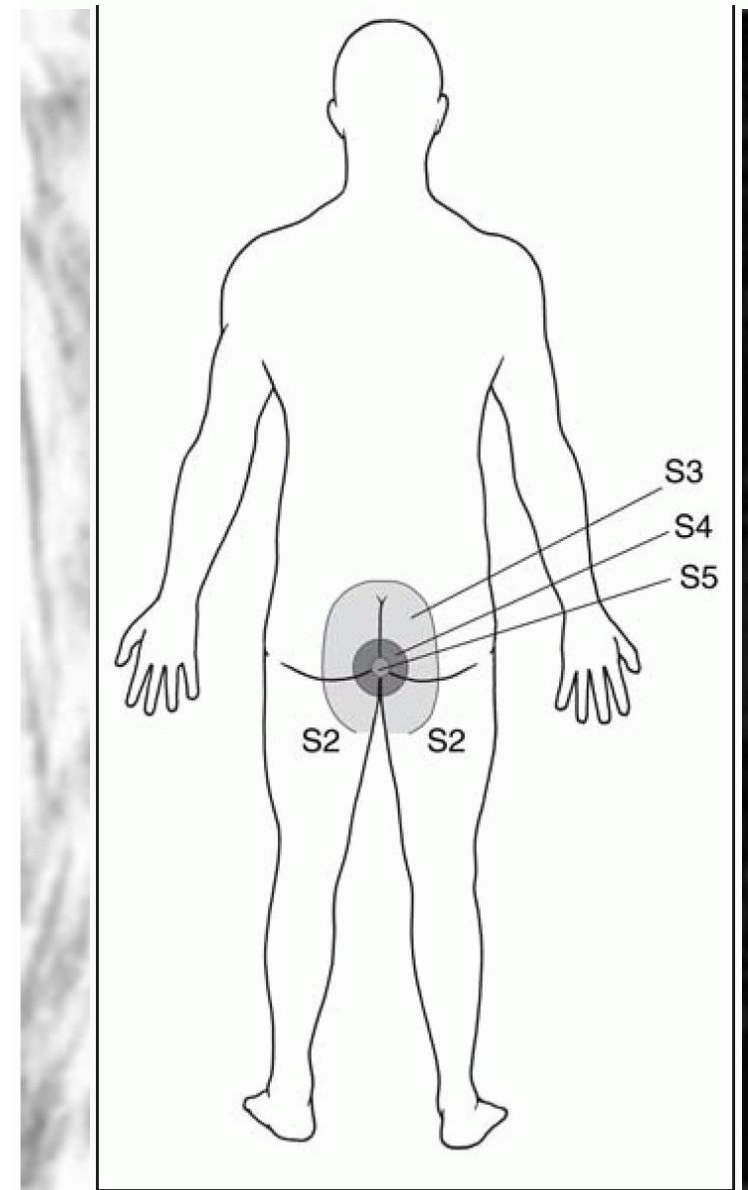
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Radiculopathy – When to Refer?

- Severe refractory pain significantly interfering with work/function
- **Weakness** - acute
- Failure of medical treatment
- Investigations – Standing X-rays
- Treatment – injections vs surgery (MLD)

Cauda Equina Syndrome

- Constellation of symptoms
- Large space occupying lesion in spinal canal
- Usually a disc herniation
- Back pain, sciatica (bilateral, perianal disturbance, bowel and bladder symptoms, lower limb neurology



Cauda Equina Syndrome

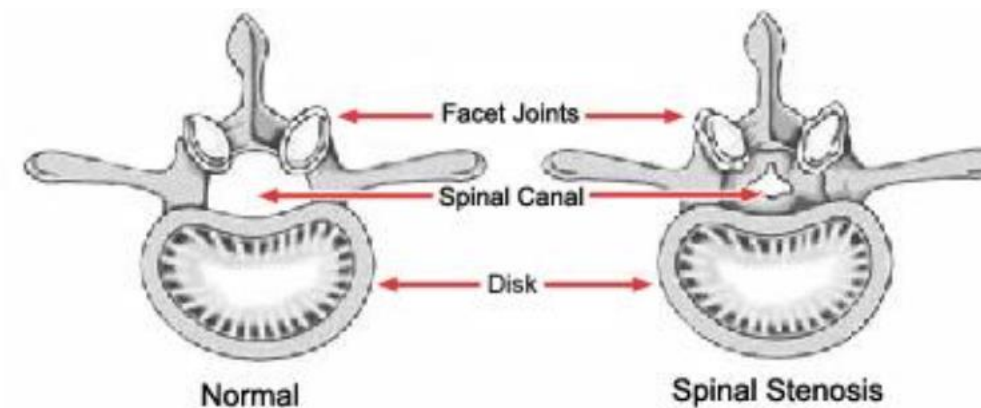
- Decrease rectal tone is late
- Diagnosis difficult, low index of suspicion
- You have to scan normal people...false negatives are ok!
- Damage to nerves - ?compression, ?venous congestion, ?ischemia
- Decompression within 24 hours of symptoms onset



Spinal Stenosis

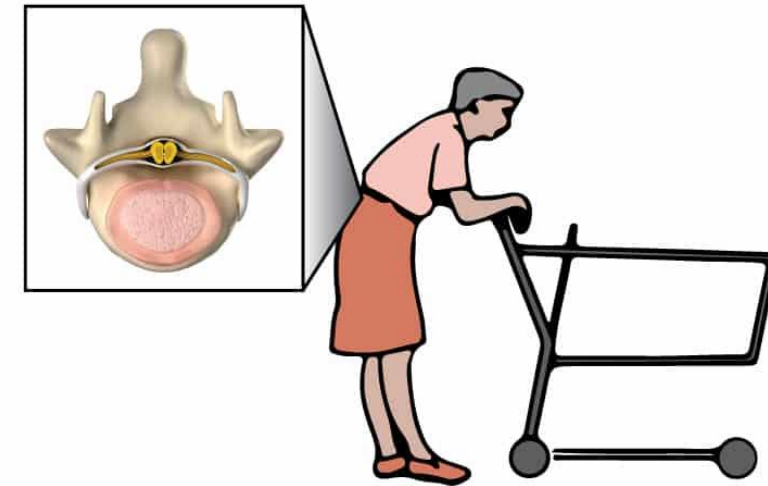
Spinal Stenosis and Neurogenic Claudication

- Neurogenic claudication is the clinical presentation
- Spinal stenosis is the imaging finding
- Pain etiology similar to that of CES



Spinal Stenosis and Neurogenic Claudication

- Diagnosis
 - Intermittent claudication – back, buttock, thighs
 - Worse when standing up, walking, leaning back
 - Improves when bending forward
 - Bilateral plantar numbness
 - Urinary symptoms – low sens, high specificity



Spinal Stenosis and Neurogenic Claudication

- Management

- Limited in primary care
- Oral analgesics and pregabalin avoid opioids
- Injections do not work
- Surgery for moderate and severe symptoms
 - Improve walking distance, improved walking tolerance, improved standing time

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A Randomized Trial of Epidural Glucocorticoid Injections
for Spinal Stenosis

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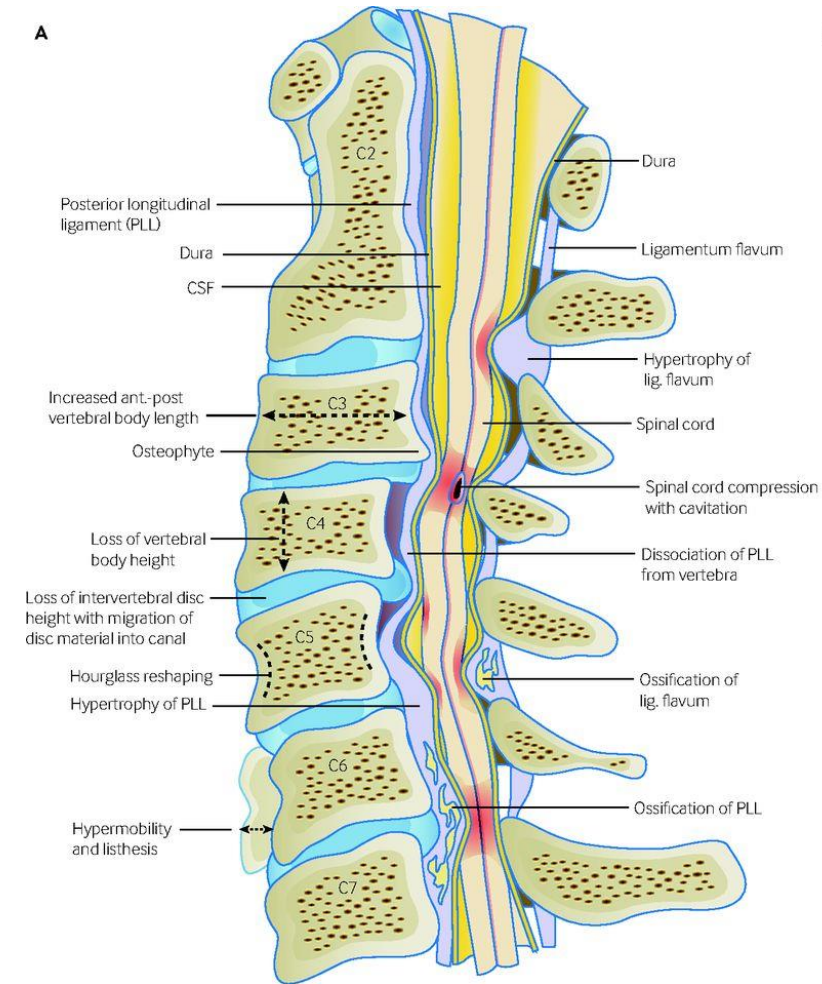
Spinal Stenosis and Neurogenic Claudication

- When to refer?
 - Functional limitation or impaired QoL
 - Weakness and numbness – important clinical sign but may not improve after surgery
 - >80 years is not too old
- Investigations?
 - Erect lumbar spine x-rays

Cervical Myelopathy

Cervical Myelopathy

- Spinal cord dysfunction
- Balance, gait, coordination, falls, urinary retention, hyperreflexia
- Stepwise decline



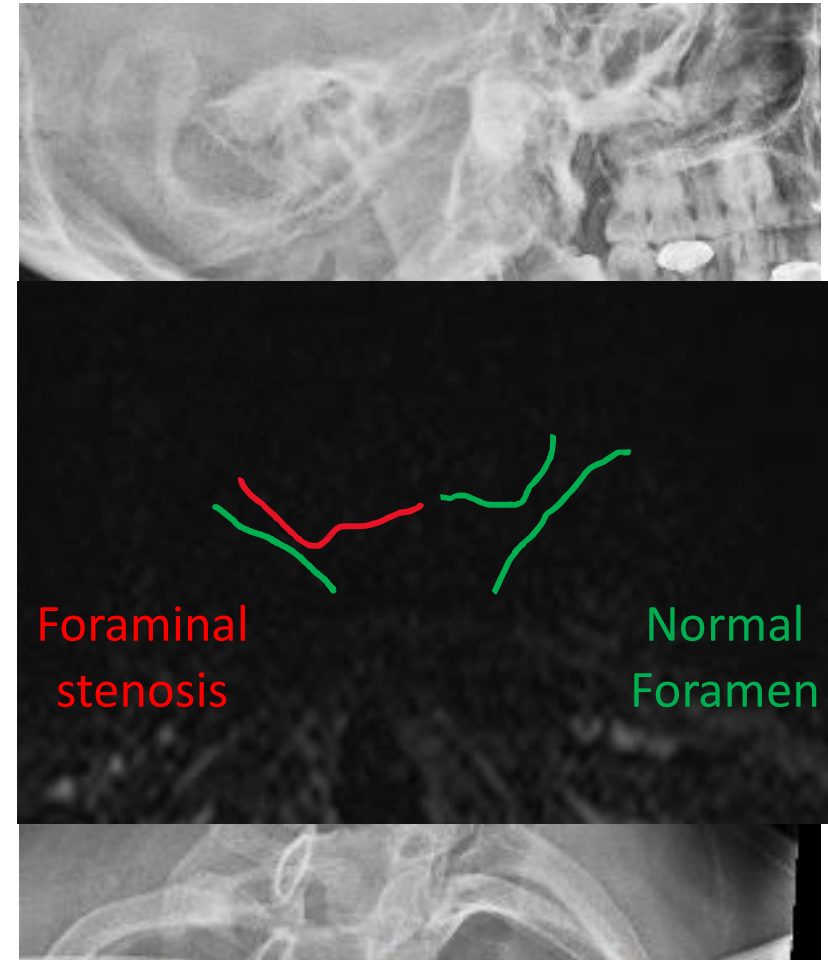
Degenerative Myelopathy

- When to refer:
 - Low threshold to intervene (spinal cord)
 - Stop progression – may get some recovery
 - Functional limitation
- Investigations - Erect lumbar spine x-rays
- Treatment – decompressive surgery

Cervical Radiculopathy

Cervical Radiculopathy

- Single or multiple nerve roots
- Disc herniation or osteophytes
- Symptoms
 - Neck and arm pain
 - Neurological symptoms - weakness
 - Pain worse with neck extension and lateral flexion



Nerve root signatures

- **C4** - lower neck and trapezius
- **C5** - lateral arm to elbow
- **C6** - lateral shoulder, lateral arm, radial forearm and thumb +/- **cervical angina (anterior chest wall)**
- **C7** - **posterior scapula spine**, dorsal arm and forearm, middle fingers
- **C8** - **inferior angle of scapula**, medial arm and forearm, little fingers
- **T1** - axilla

Is it the shoulder?

	Neck	Shoulder
History	Pain below elbow	Pain worse at night
Exam	Neurology abnormal Tests - Spurling's test, arm squeeze test, Shoulder abduction relieves pain	Neurology normal Positive Drop arm test, impingement signs, Shoulder abduction worsens pain
Investigations	Cervical transforaminal injection	Injection of subacromial bursa, AC joint or biceps tunnel

Treatment

- Same as for lumbar radiculopathy
 - Simple analgesia
 - Prednisone, pregabalin
 - Avoid opioids
 - Physiotherapy
 - Most get better

Refer?

- Recurrent or recalcitrant pain
- Progressive or objective neurological signs
 - Improves after surgery (95%)
- Impairment on occupation or quality of life
- Presence of red flags or concerns of myelopathy.



Scoliosis

Paediatric Scoliosis

- Curvature of the spine
- Always refer – public vs private
- **Standing whole spine stitched x-rays (PA and lateral)**

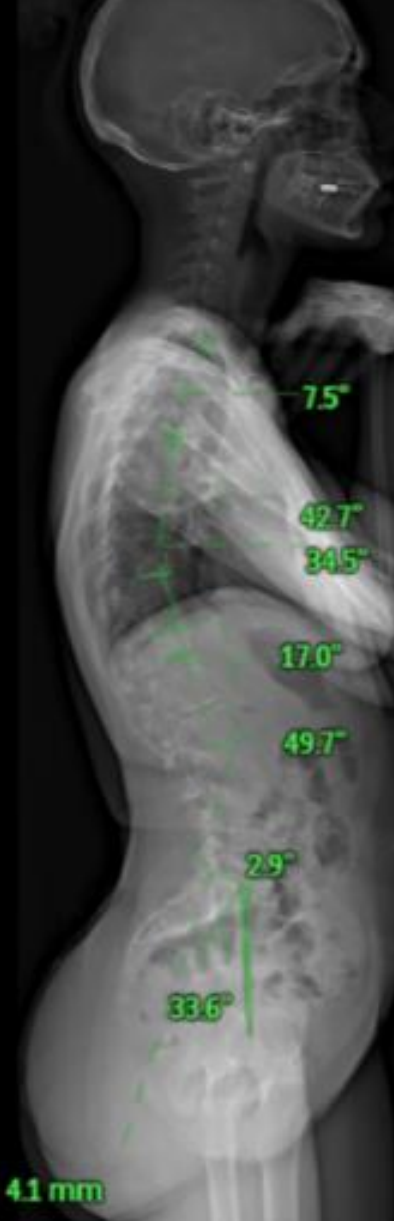
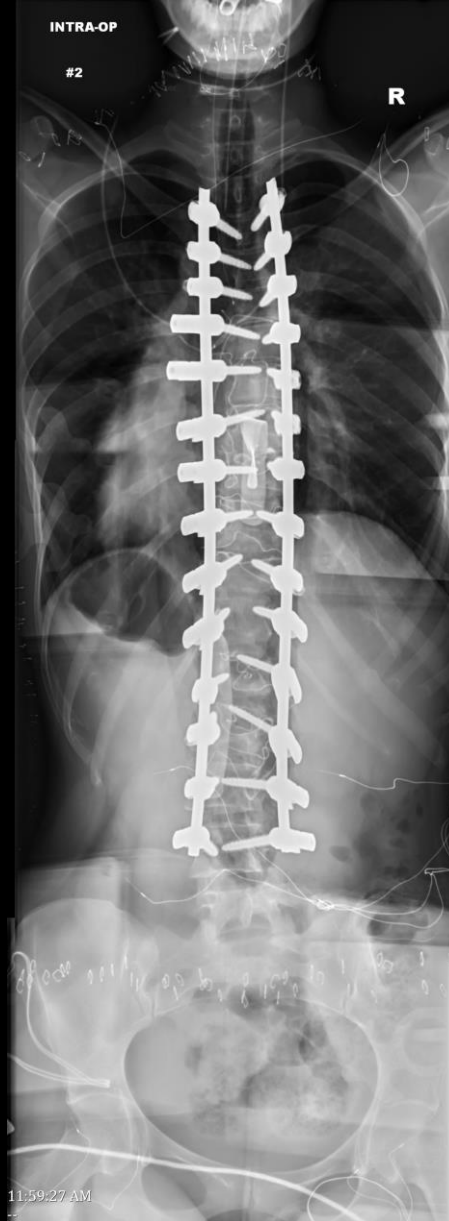
Normal spine



Deformity from scoliosis



 ADAM.



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Adult Spinal Deformity

- Untreated scoliosis, degenerative scoliosis, flat back
- Back pain, buttock pain (compensatory mechanisms)
- Claudication or radicular symptoms

Adult Spinal Deformity

- When to refer?
 - Pain, QoL, function
- Surgical intervention
 - Lots of counselling
 - Long term improvement in QoL and function despite magnitude of the intervention

Cases

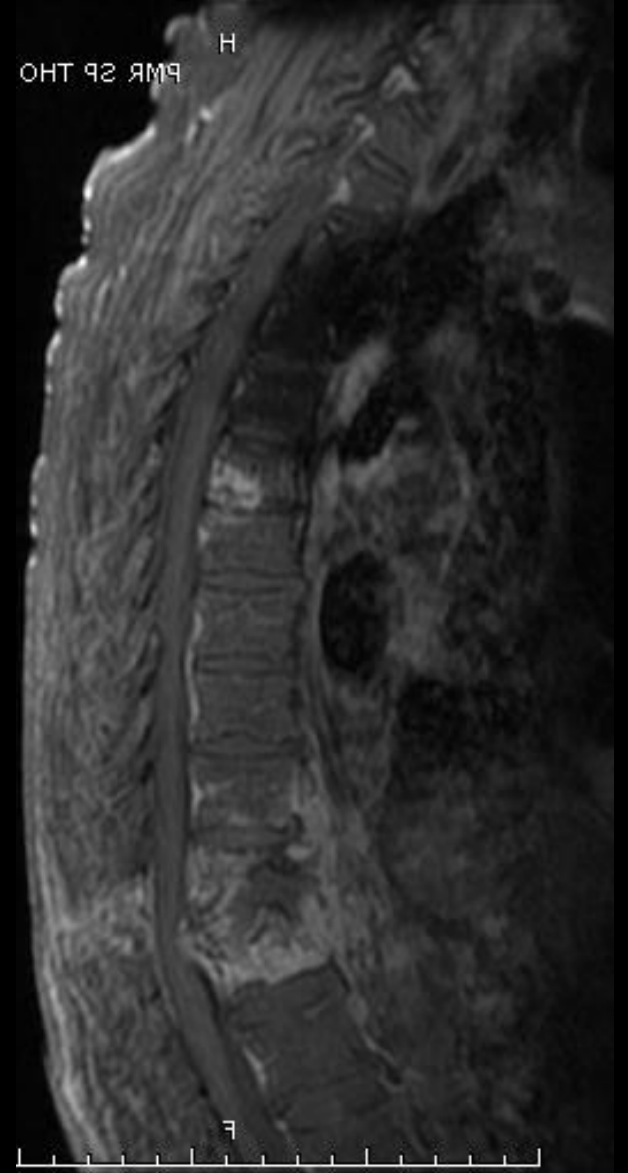
Case 1

- 77y/o female with two month h/o Mid/low back pain
- History of low energy fall
- Recent 5kg weight loss
- Cannot lay flat
- Night sweats
- Ex smoker

Case 1

- Bloods – CRP 42 ESR 60 WCC raised slightly anaemic

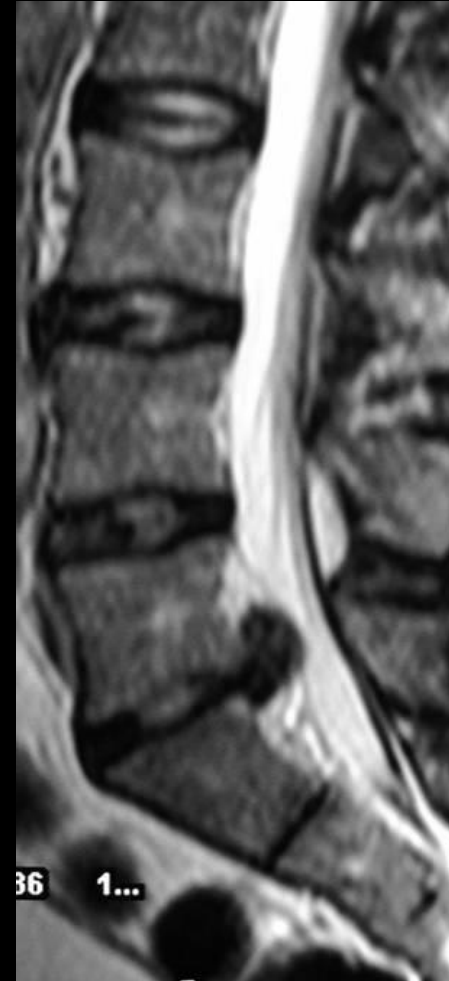
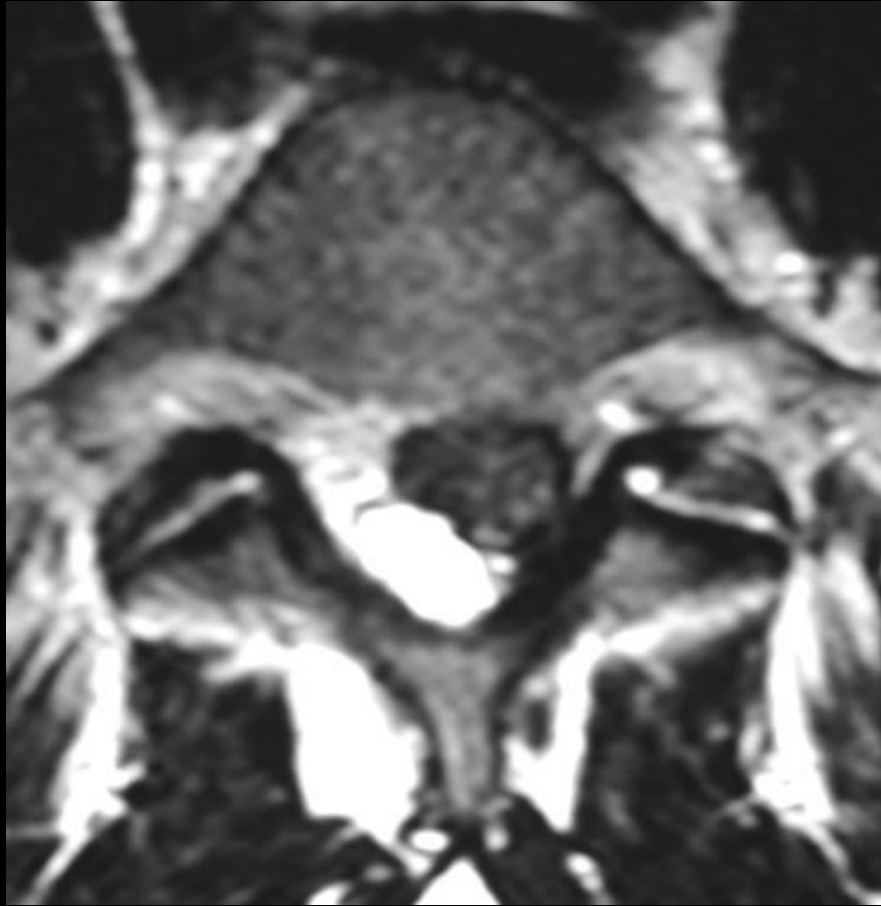
- What to do?



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Case 2

- 42 year old male
- Left posterior thigh and foot pain and tingling
- Started after lifting his child 7 weeks ago
- Not getting better
- Slightly weak to plantarflexion



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Case 3

- 54 year old construction worker
- Right posterior arm pain into dorsal middle finger
- Weakness with triceps extension
- Cannot work



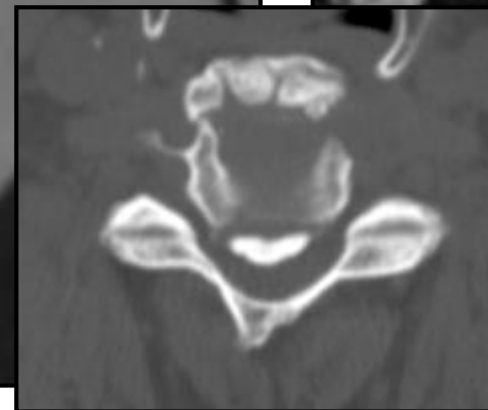
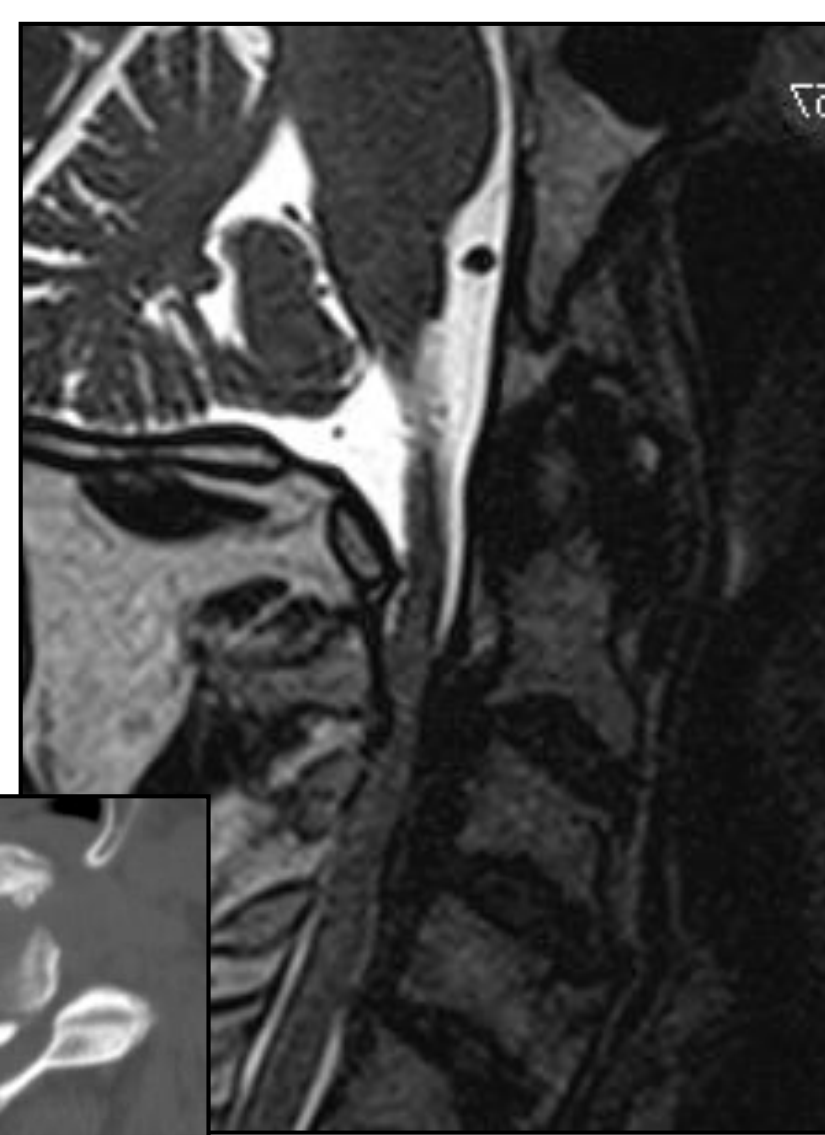
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Case 4

- 67 year old Polynesian female
- Cannot knit anymore, a couple of falls at night
- Cannot use her mobile phone and dropping items



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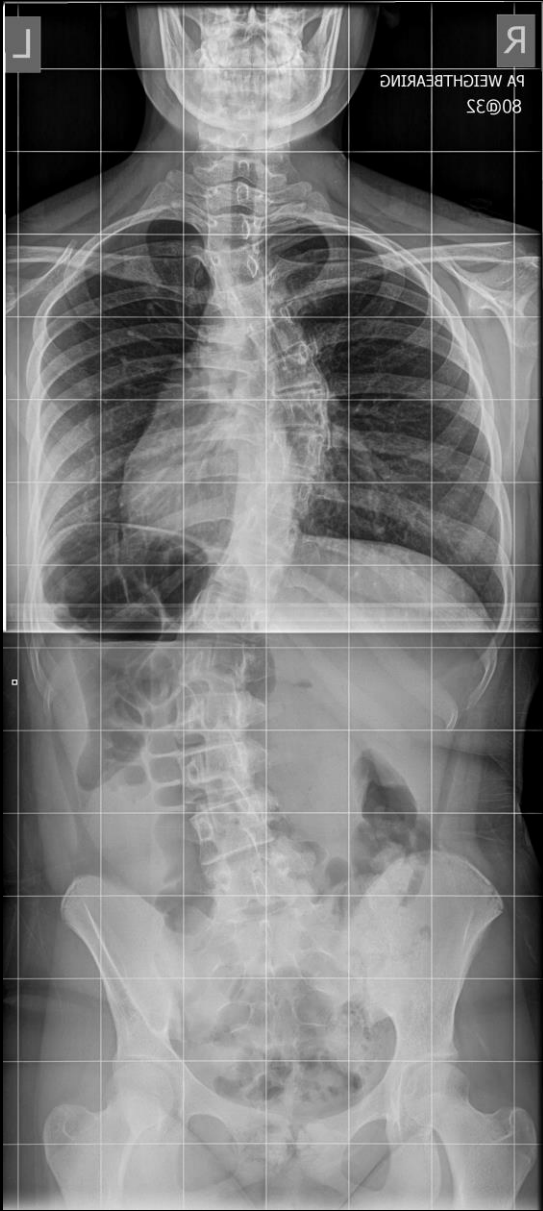


Case 6

- 14 year old female
- Complains of waist shoulder and scapular asymmetry
- No pain



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Thank you!

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