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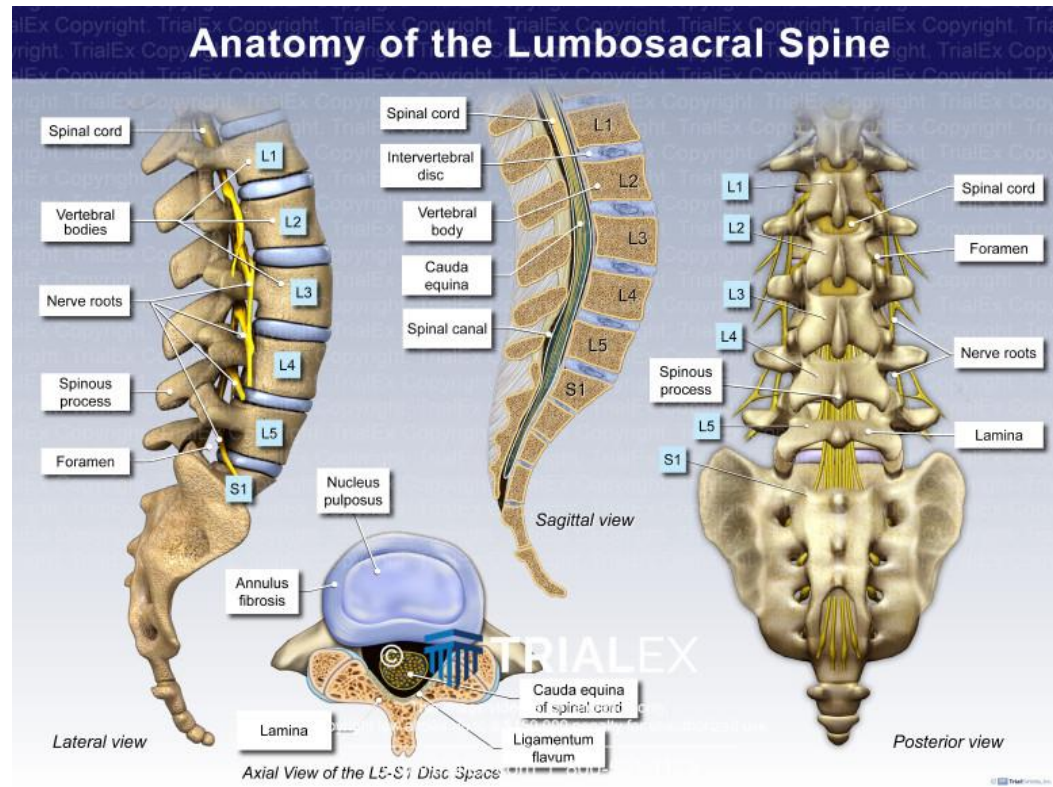
**WELLNESS & PAIN CARE**

OF LAS VEGAS

# MRI REVIEW – AN INTRODUCTION FOR PROCEDURAL PLANNING

BY KYLE WENTZ D.O.

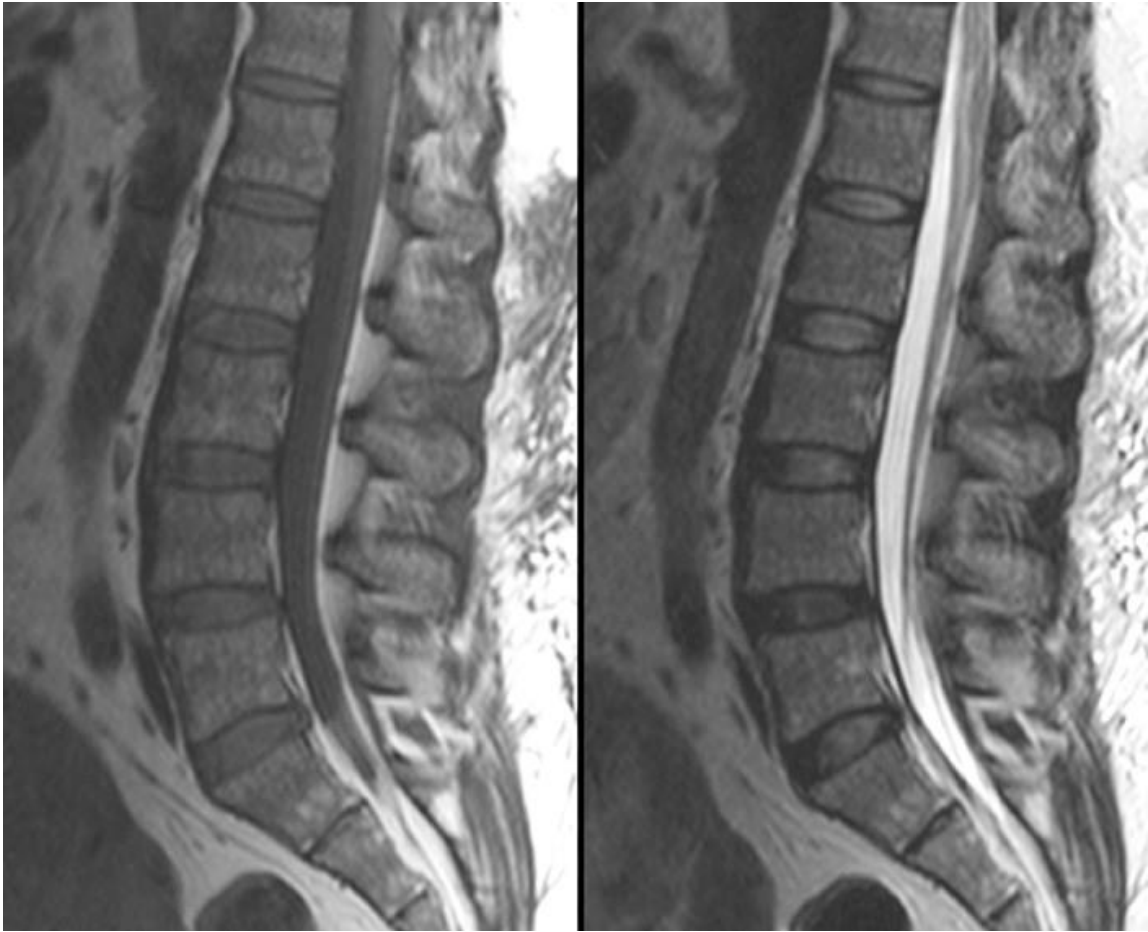
# Spine Anatomy





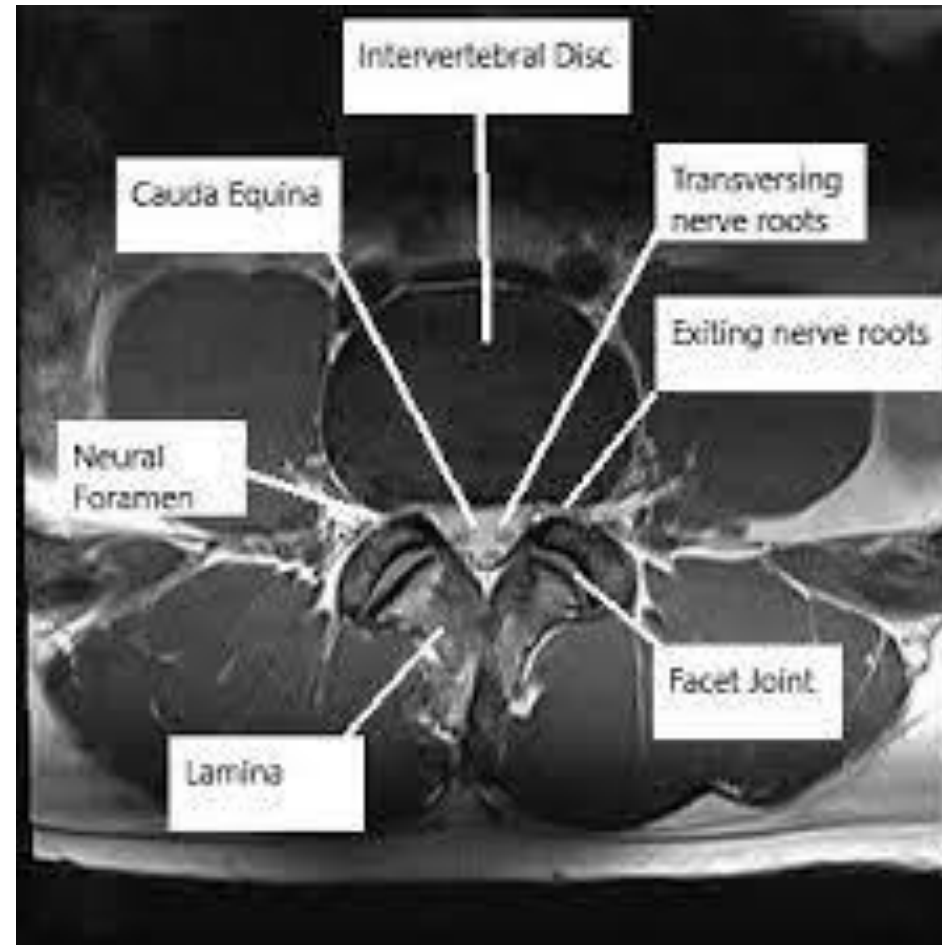
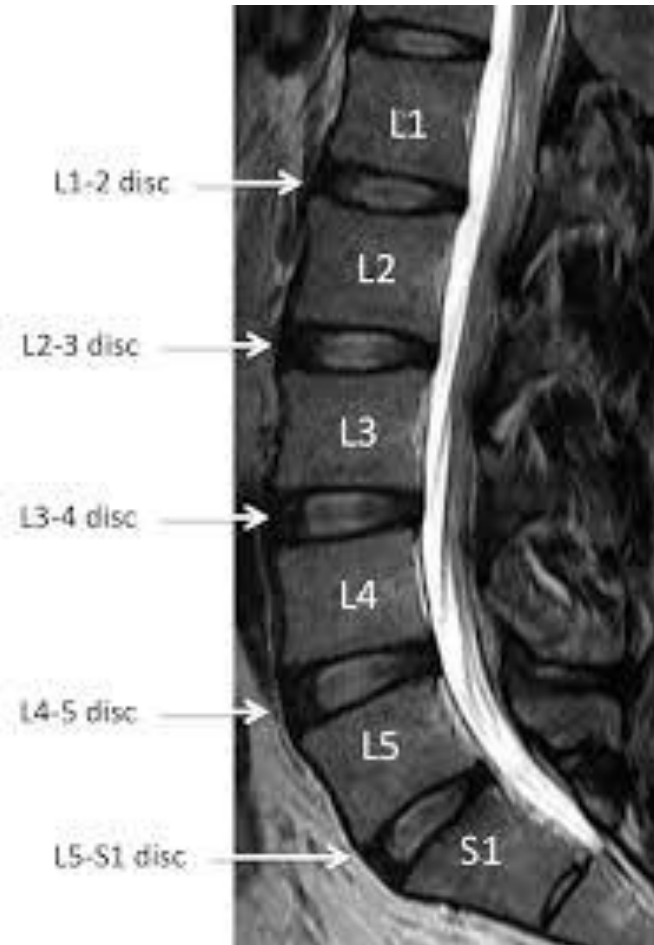
# MRI sequences, T1 or T2

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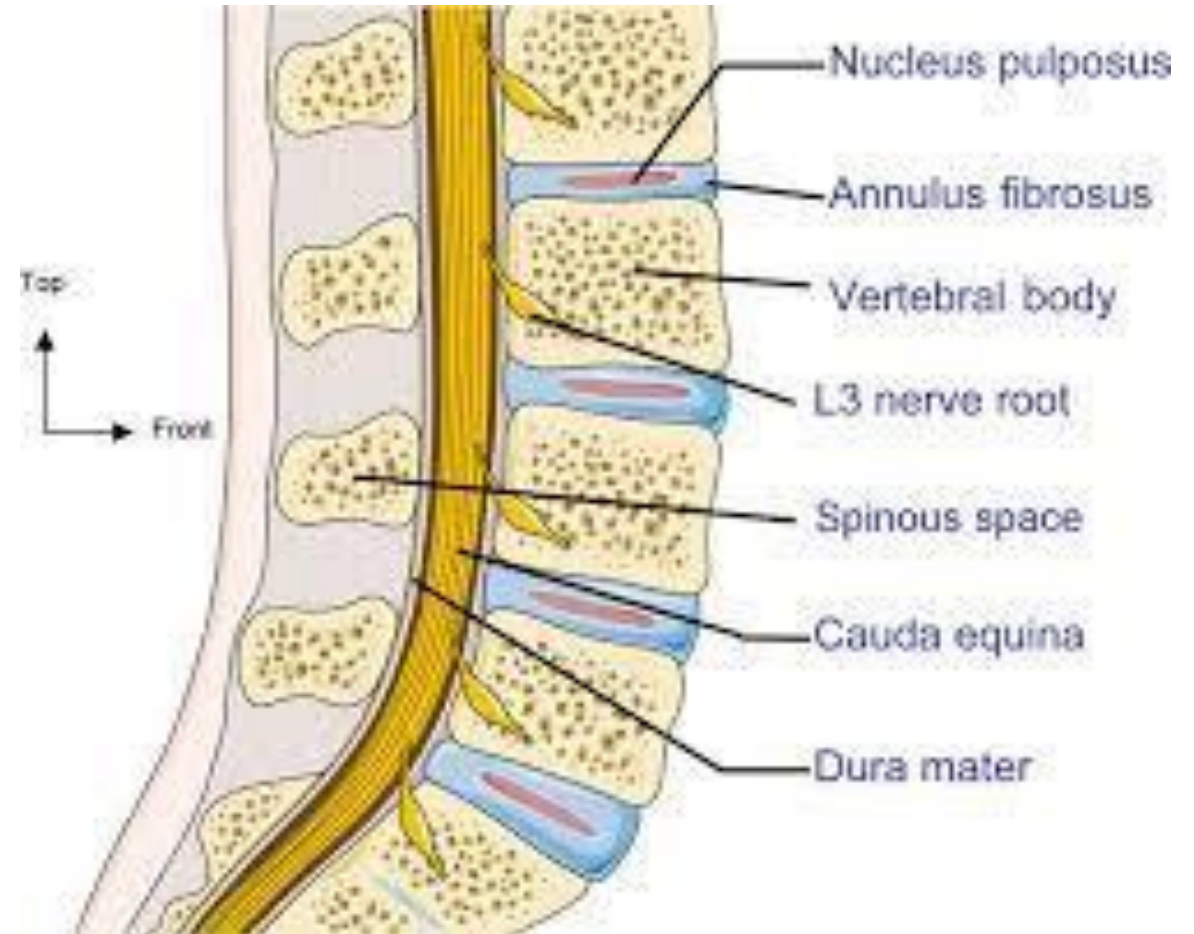
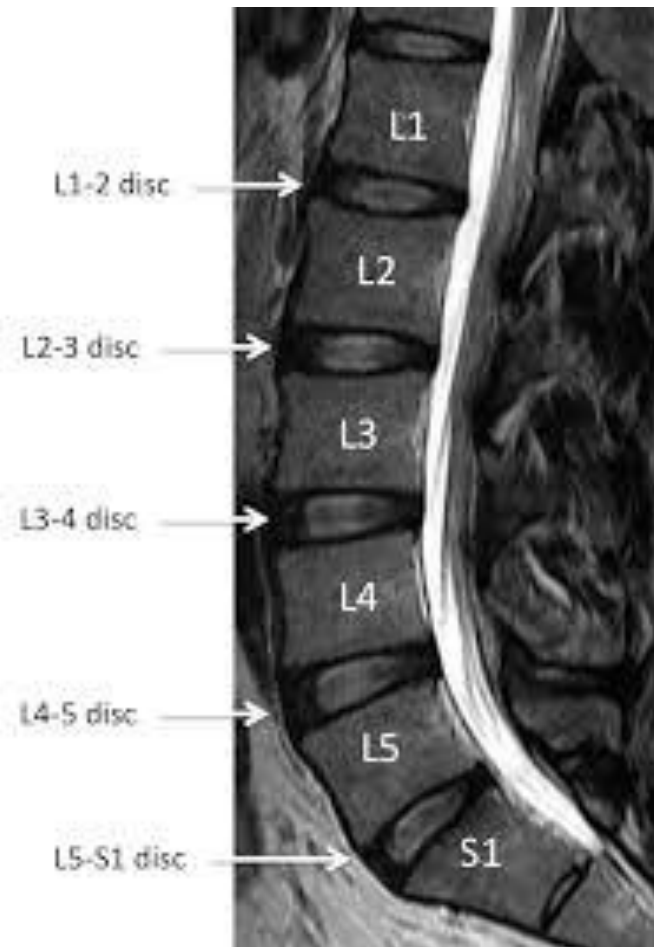
T1-weighted MRI enhances the signal of the fatty tissue and suppresses the signal of the water. T2-weighted MRI enhances the signal of the water.

# Sagittal and axial views





# Sagittal view –T2



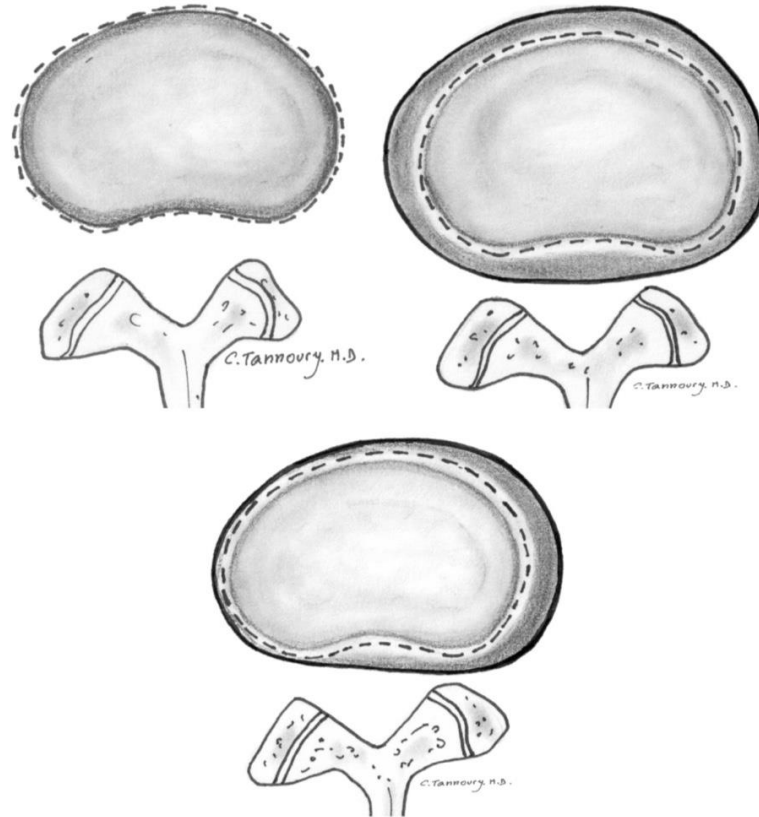
# Lumbar sagittal view – disc herniation

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# Disc bulge (over 25% of circumference)

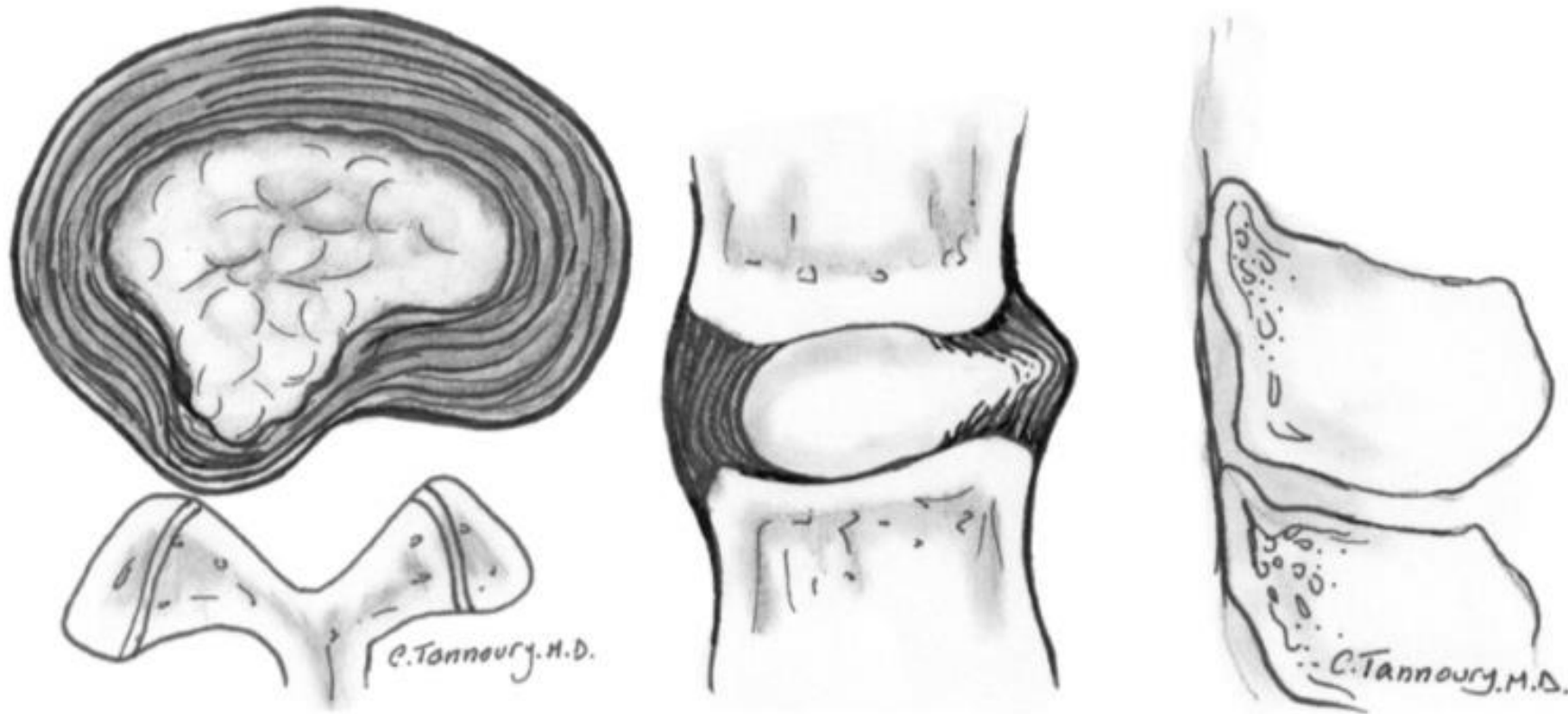
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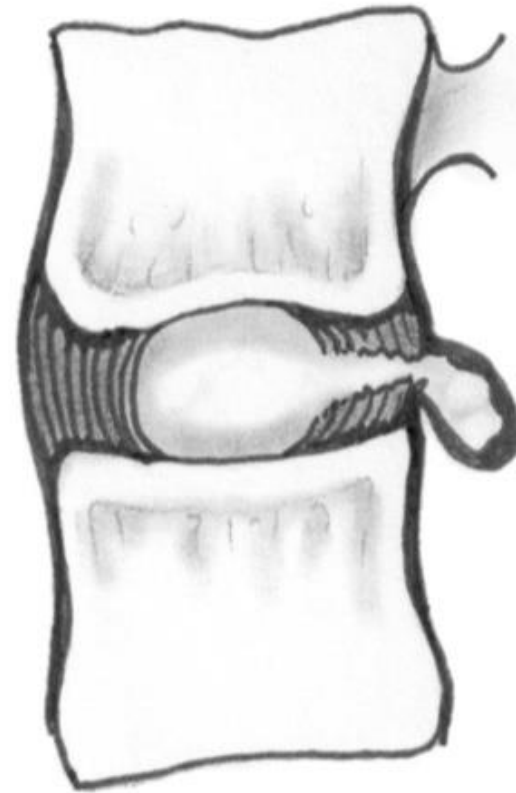
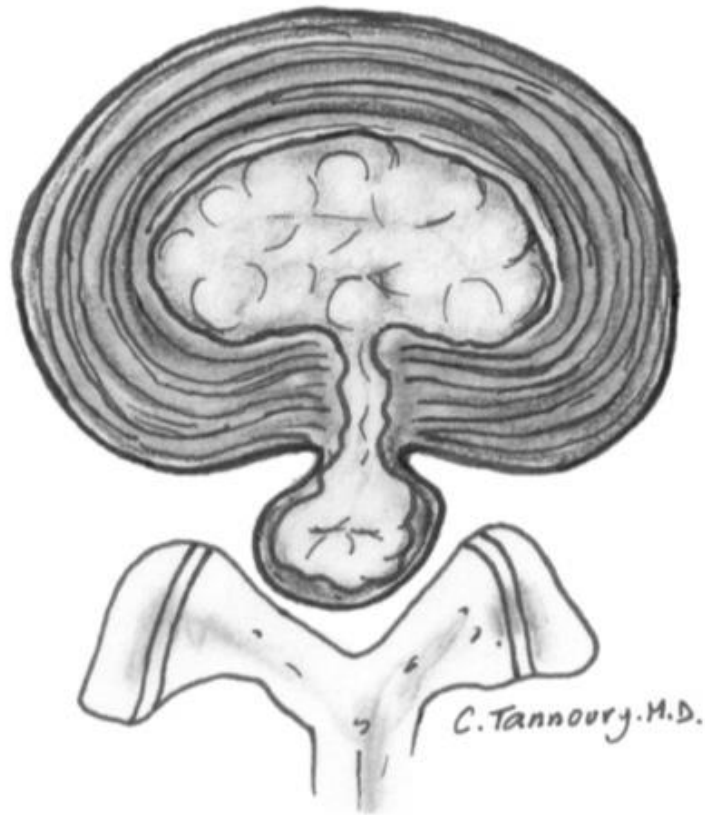
# Lumbar disc protrusion (base > height)

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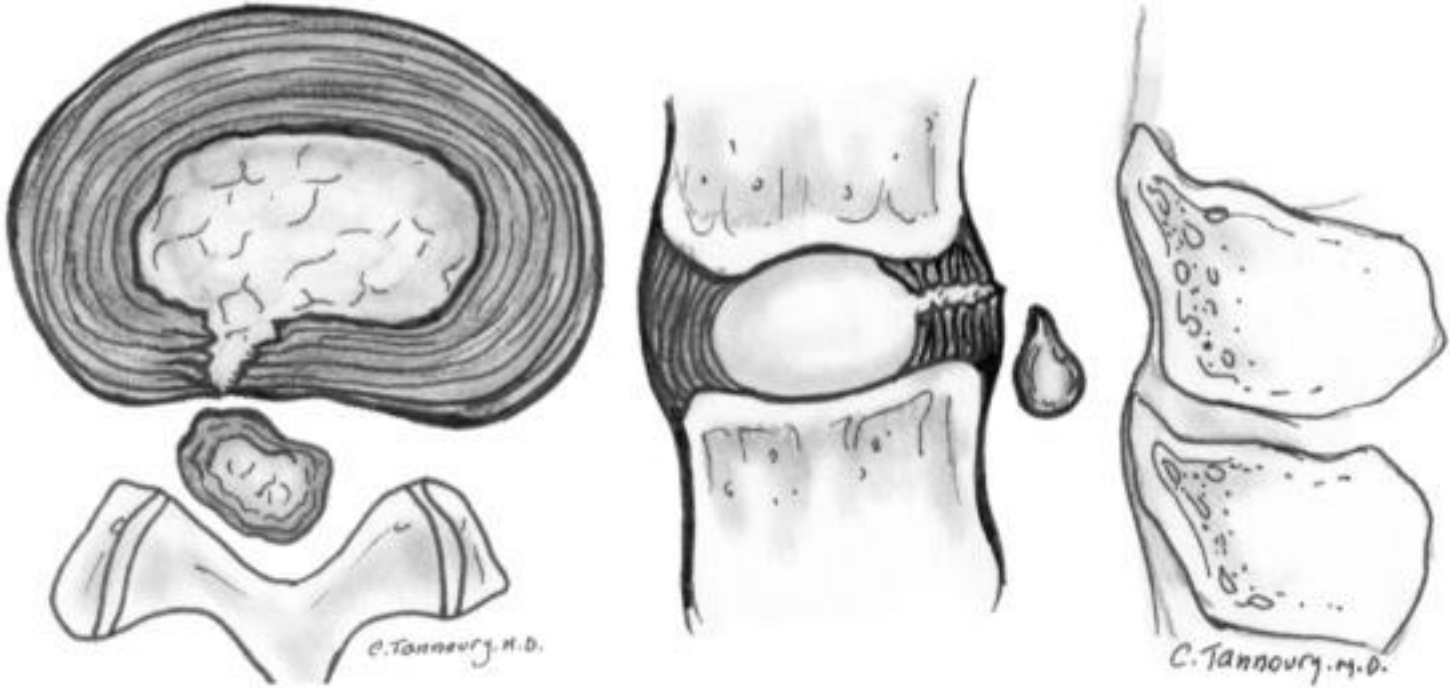
# Lumbar disc extrusion (height > base)

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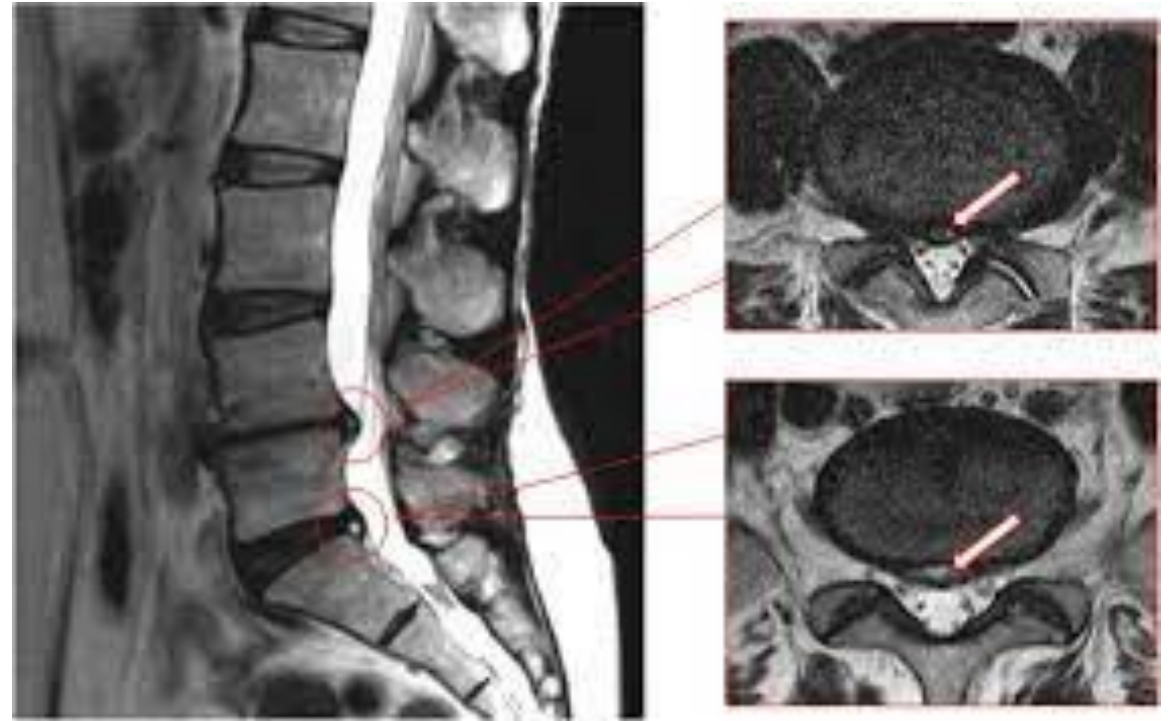
# Lumbar disc sequestration

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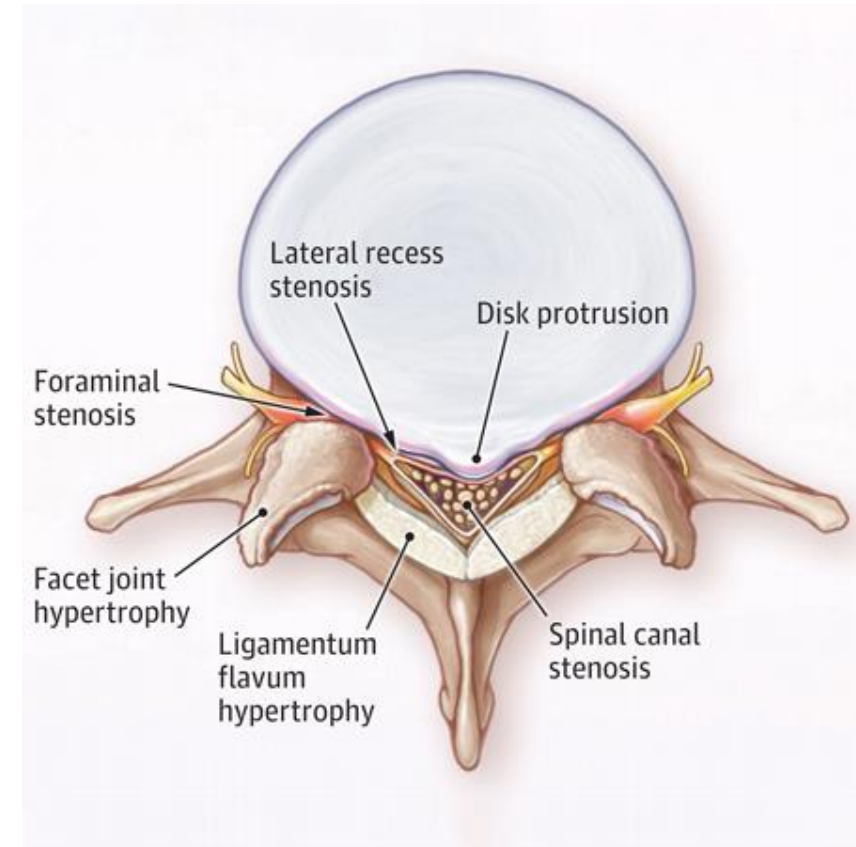
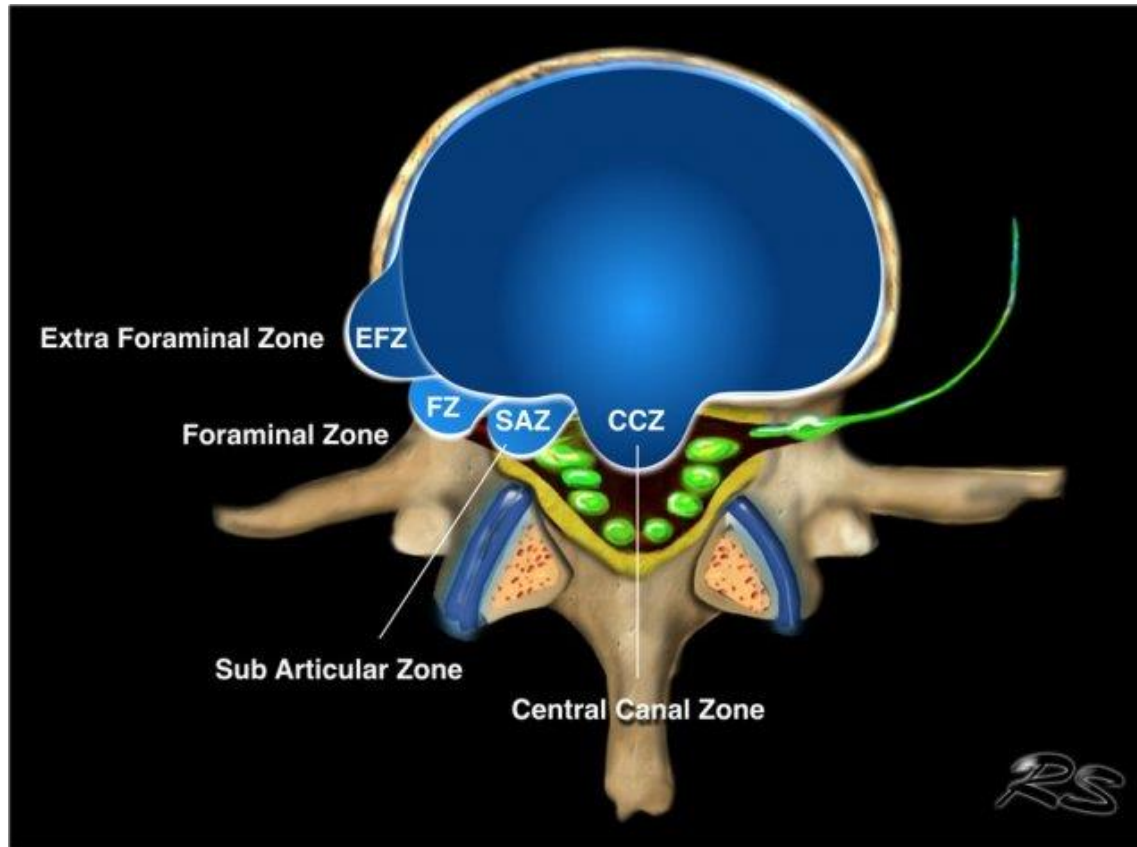


# Lumbar sagittal and axial view – annular fissure

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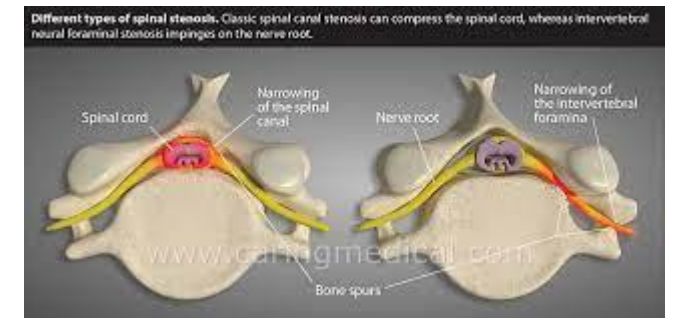
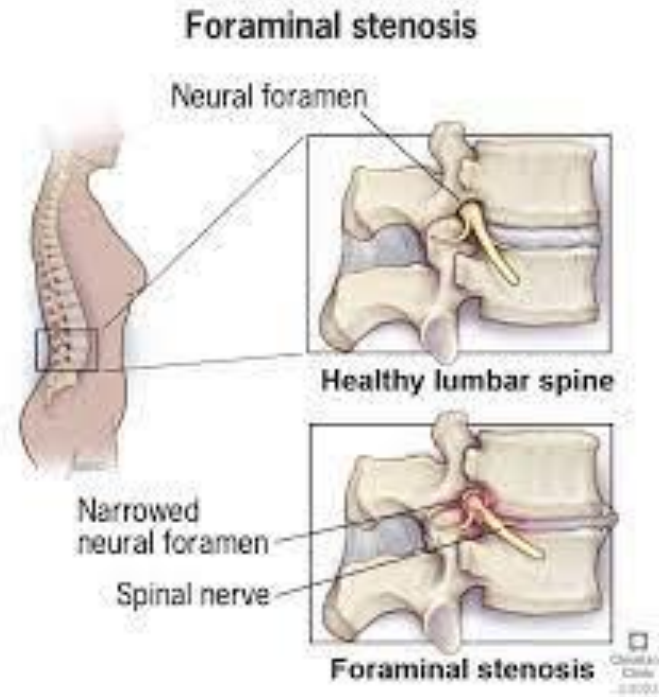


# Lumbar axial view – disc herniation





# Lumbar sagittal view – Neural foraminal stenosis



# Park criteria for grading NFS

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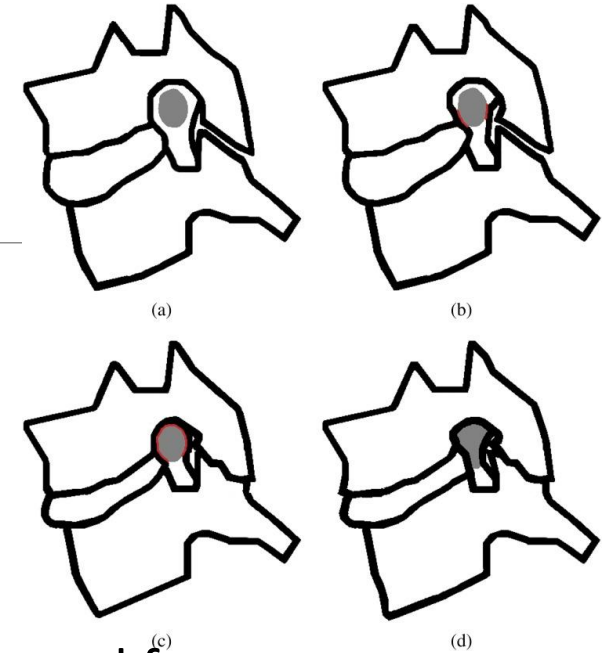
This grading is performed on sagittal oblique T2WI:

grade 0: absent stenosis

grade 1 (mild stenosis): partial (<50% of root circumference) perineural fat obliteration surrounding the nerve root without nerve root morphological change

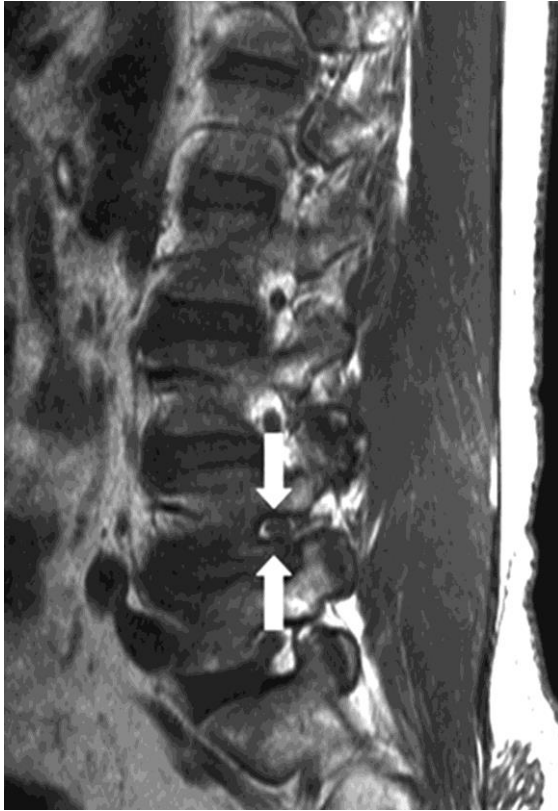
grade 2 (moderate stenosis): near-complete (>50% of root circumference) perineural fat obliteration without nerve root morphological changes

grade 3 (severe stenosis): nerve root morphological change, e.g. collapse, combined with perineural fat obliteration

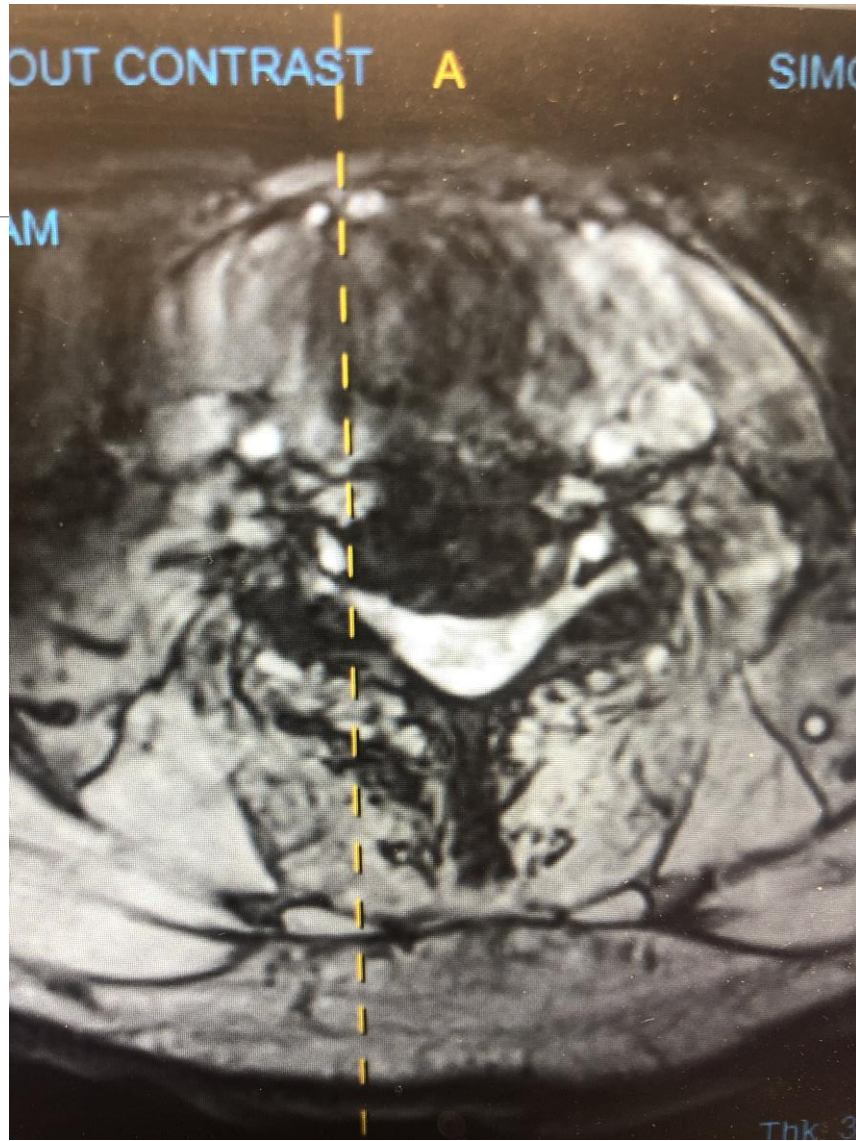


# Lumbar sagittal view – Neural foraminal stenosis

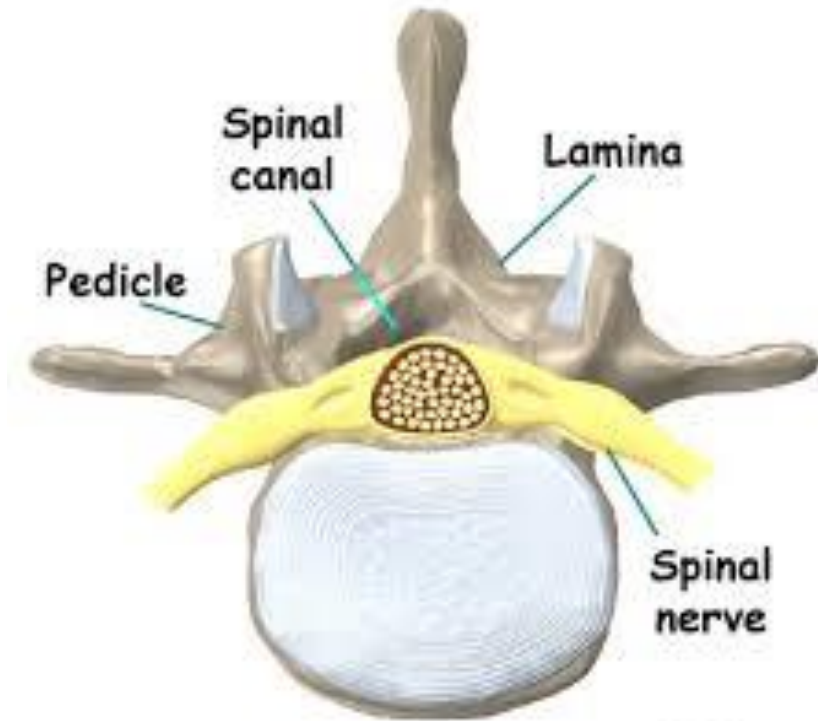
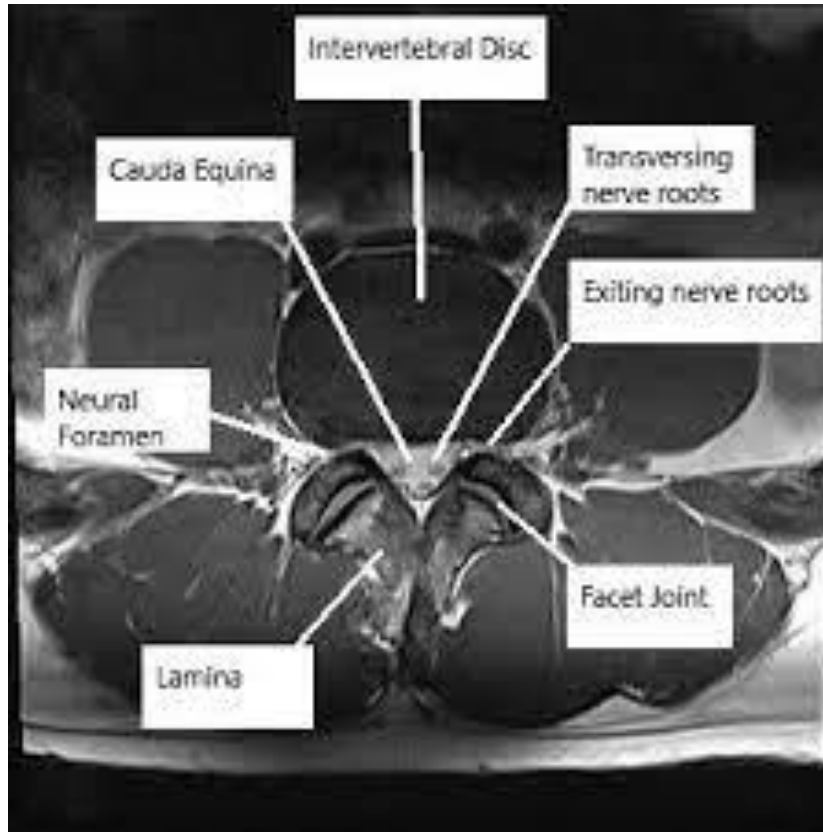
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# Axial view – T2



©MMG 2002



# Kim Criteria for Neural Foraminal Stenosis

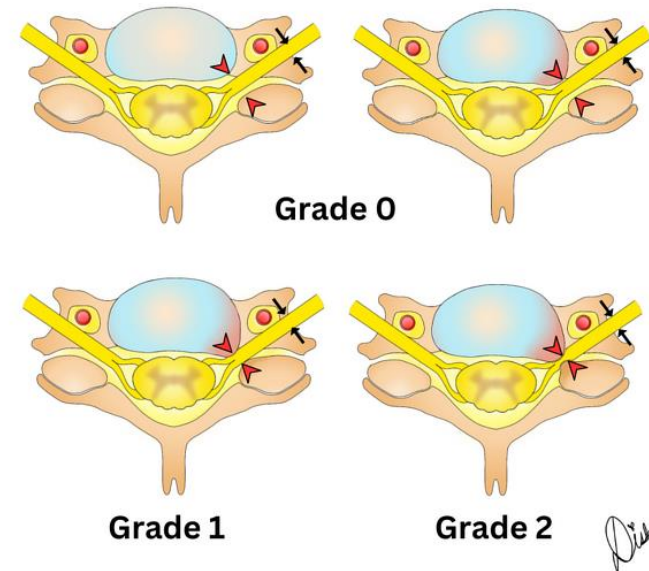
This grading is performed on axial T2WI at the level of the disc:

grade 0 (normal): narrowest width of the neural foramen is more than the extraforaminal nerve root width at the level of the anterior margin of the superior articular process

grade 1 (moderate or non-severe stenosis): narrowest width of the neural foramen is 51–100% of the width of the extraforaminal nerve root at the level of the anterior margin of the superior articular process

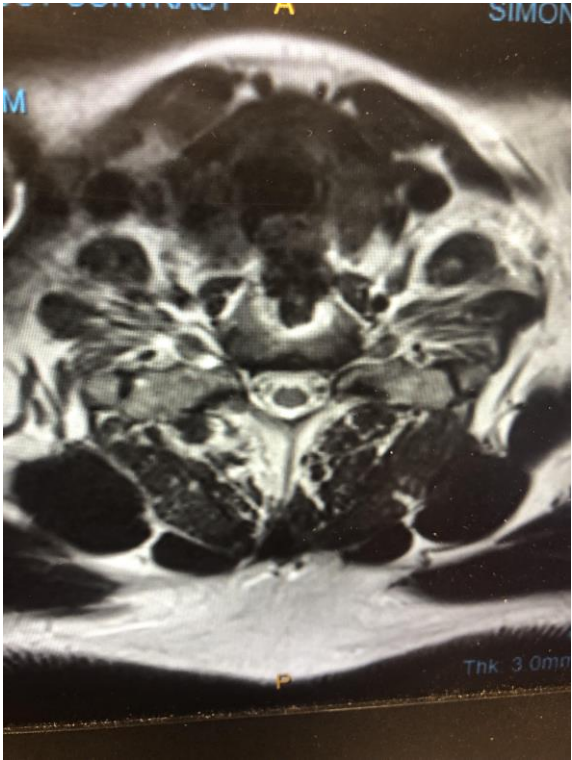
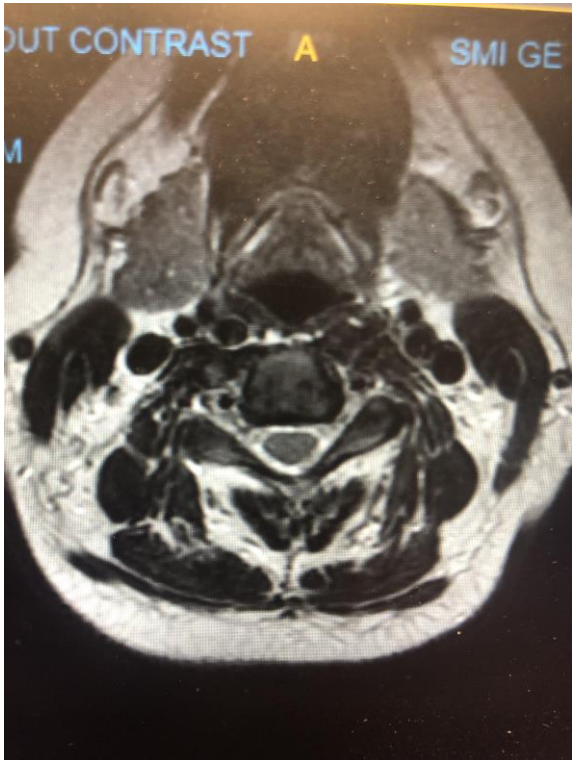
grade 2 (severe stenosis): narrowest width of neural foramen  $\leq 50\%$  of extraforaminal nerve root width

**Kim grading system for cervical neural foraminal stenosis**

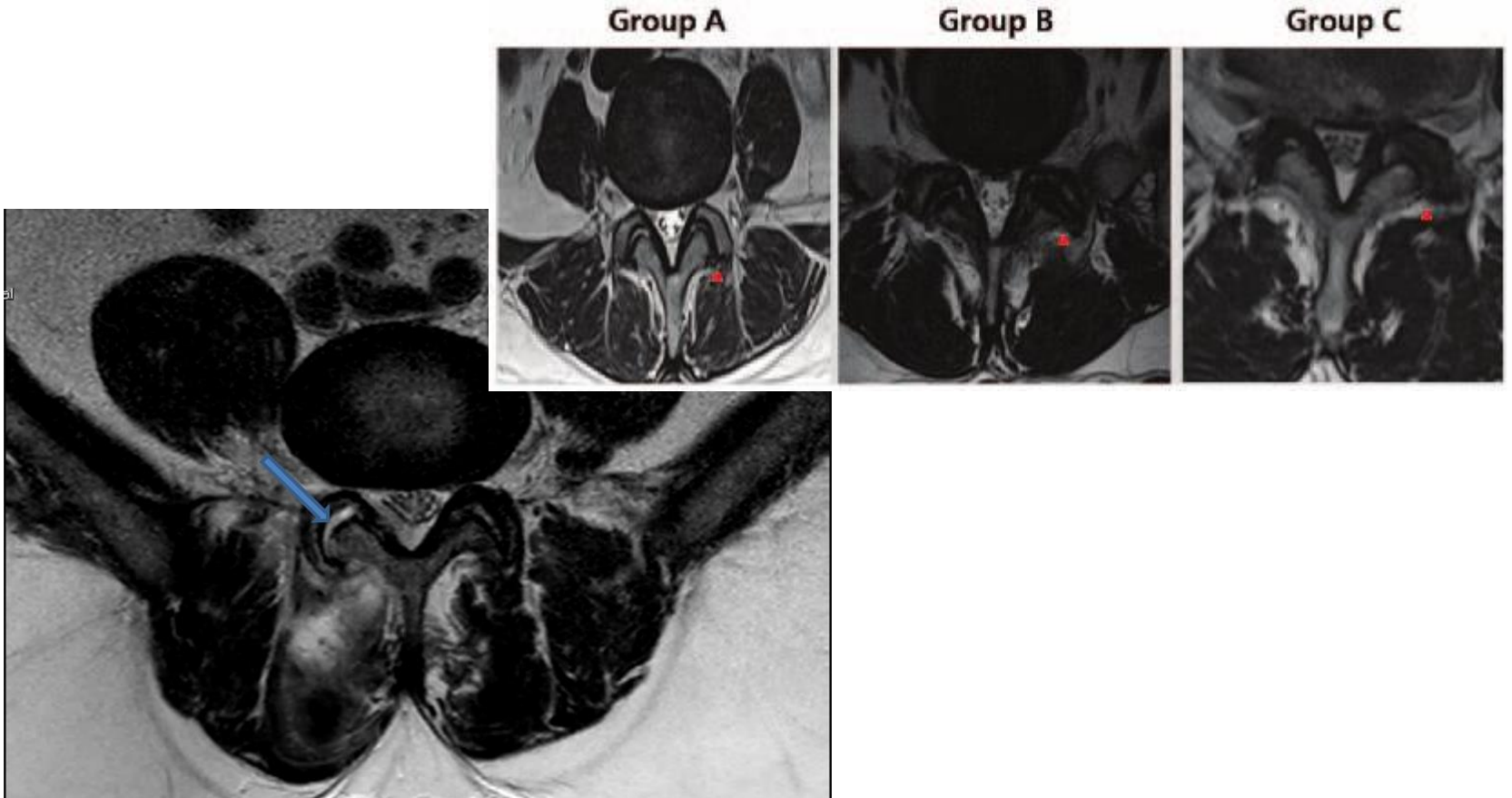
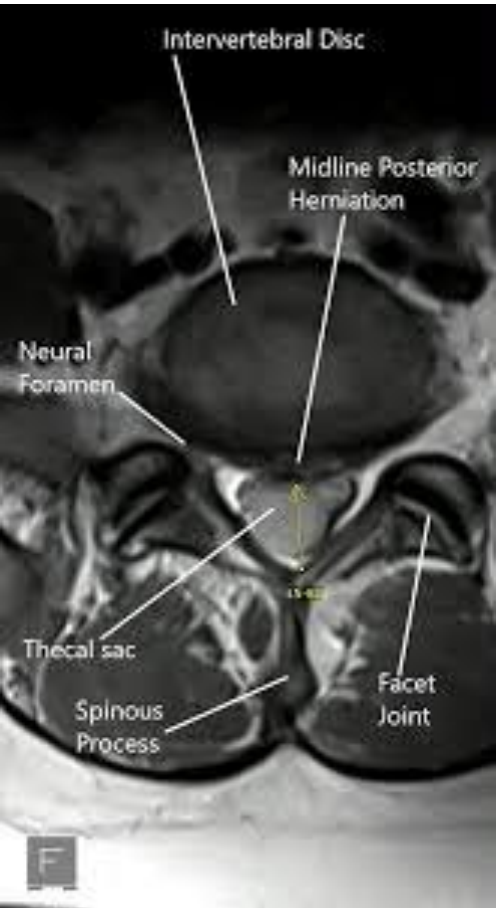


# Neural foraminal stenosis

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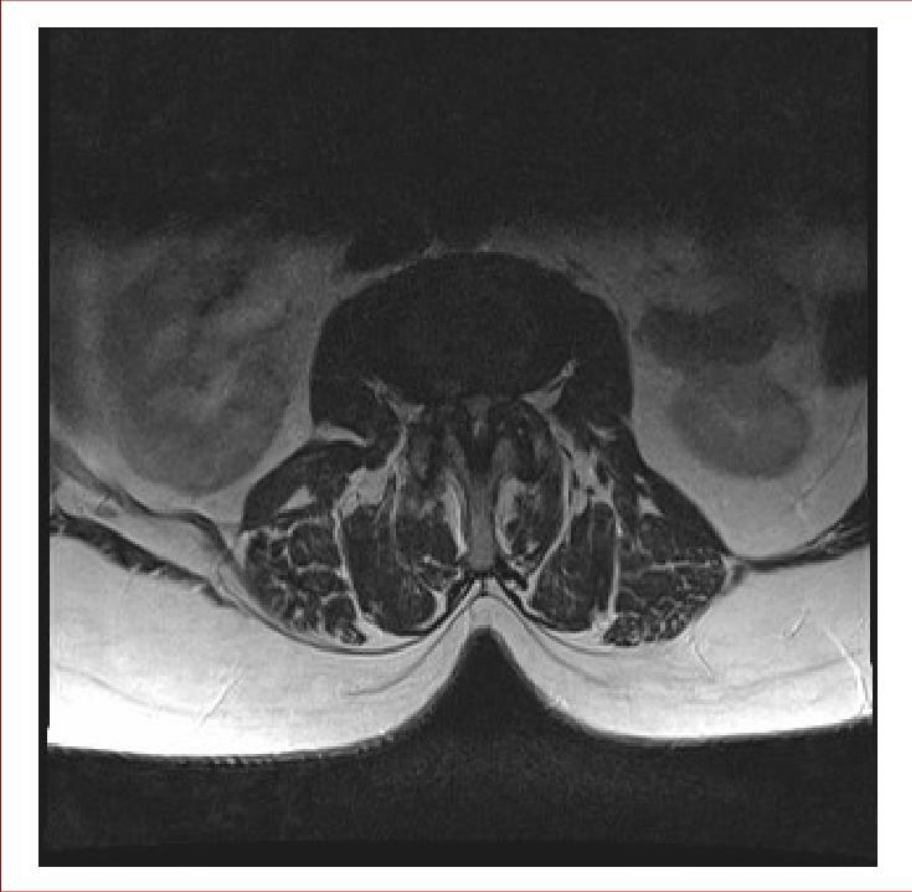


# Lumbar axial view - facet arthropathy



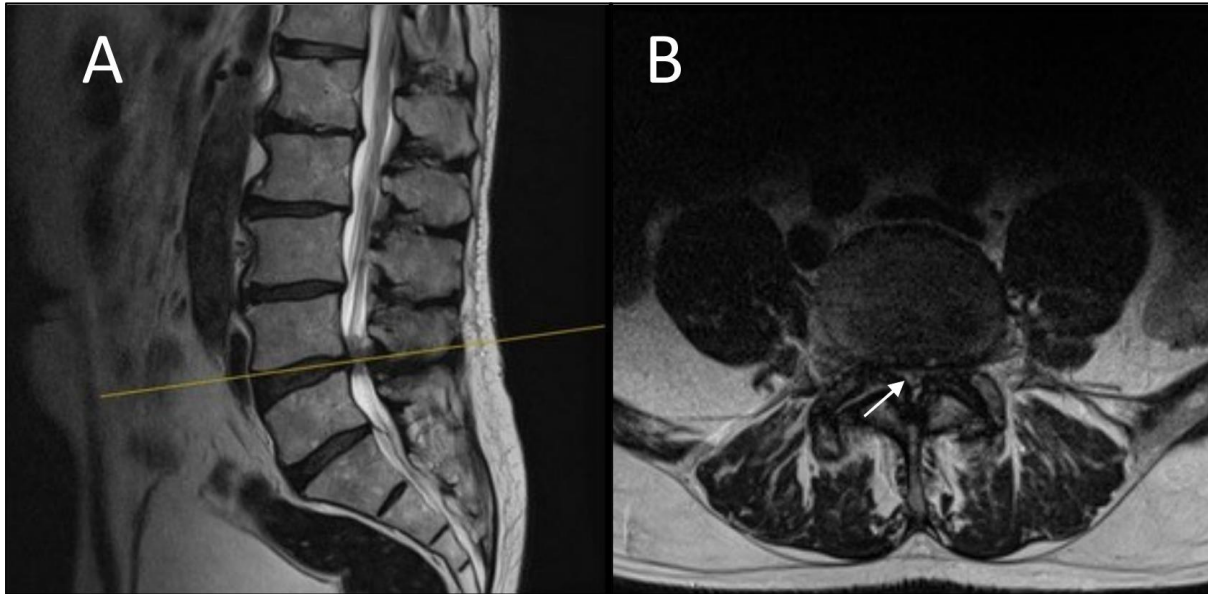
# Lumbar axial view – spinal stenosis

**Lee classification**  
Grade 0: no stenosis



# Lumbar sagittal/axial view – spinal stenosis

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# “Treat the person, not just the image”

## Improved Function and Sustained Pain Relief Following Transforaminal Epidural Steroid Injections

Kyle Wentz DO, Nasser Ayyad DO  
UT Southwestern Medical Center

### Case Diagnosis

Severe Multilevel Lumbar Stenosis With Radiculopathy And Neurogenic Claudication

### Case Description

A 72 year old male presented to clinic with a two month history of insidious low back and left leg pain. The pain radiated to his left posterolateral calf and inner thigh with associated numbness and tingling. He described the pain as 9 out of 10 with ambulation. He stated inability to walk more than 50 meters due to pain. His initial Oswestry score was 36. His initial PROMIS-29 physical function and pain interference scores were 9 and 15 respectively. He was taking NSAIDS and Gabapentin with mild relief of the pain.

Lumbar Spine Exam: Increased lumbar lordosis with antalgic gait. Pain with thoracolumbar rotation, flexion, or extension. Positive left straight leg raise. Impaired sensation to left lateral foot to soft touch. Bilateral Patella and Achilles DTRs 1+. Strength 5/5 bilaterally.

Lumbar Spine MRI: Left severe neuroforaminal narrowing with probable compromise of the left L3 and S1 nerve roots.

### Discussions

Given his L3 and S1 radicular pattern the patient received left L2-3 and L5-S1 transforaminal epidural steroid injections one time. Flow migrated to L3-4 and L4-5 levels from these two injection levels. To avoid iatrogenic Cauda Equina syndrome the injection was not performed at L4-5, given its severe narrowing.

After the injections, he discontinued all pain medications. At two week and two month followups he reported 100% relief of pain that was 0 out of 10 on VAS pain scale, reduced from baseline pain score of 9 out of 10 prior to injections. Given his relief he deferred formal physical therapy. He continued pool exercises only. On physical exam he exhibited full and non-painful range of motion of his lumbar spine.

### Conclusions

He was seen in clinic by neurosurgery who recommended continuing conservative management without surgical intervention. This case demonstrates sustained complete pain relief and improved function following epidural steroid injections in a patient with severe lumbar stenosis with neurogenic claudication.

**Transforaminal Epidural Steroid Injections providing sustained pain relief and improved function in a patient with severe lumbar stenosis**



Take a picture of the QR code with the link to our abstract

Lumbar Spine T2 Weighted Sagittal MRI



### Initial Promis-29 Physical Function

	Without any difficulty	With mild difficulty	With some difficulty	With much difficulty
Are you able to do chores such as vacuuming or yard work?				X
Are you able to go up and down stairs on a regular basis?				X
Are you able to go for a walk or to the store?			X	
Are you able to run, dance and sleep?				X

### Initial Promis-29 Pain Interference

In the past 7 days...	Not at all	A little bit	Somewhat	Quite a bit
How much do pain interferes with your ability to do work?				X
How much do pain interferes with your ability to do housework?				X
How much do pain interferes with your ability to participate in social activities?				X
How much do pain interferes with your social activities?				X

**UT Southwestern**  
Medical Center

# “Treat the person, not just the image”

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

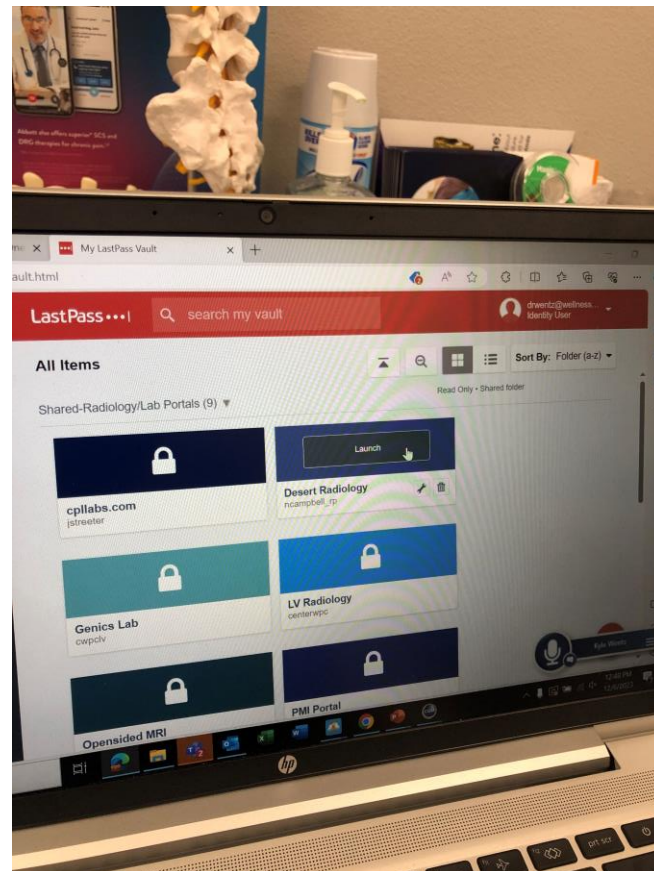
Imaging Finding	Age (yr)						
	20	30	40	50	60	70	80
Disk degeneration	37%	52%	68%	80%	88%	93%	96%
Disk signal loss	17%	33%	54%	73%	86%	94%	97%
Disk height loss	24%	34%	45%	56%	67%	76%	84%
Disk bulge	30%	40%	50%	60%	69%	77%	84%
Disk protrusion	29%	31%	33%	36%	38%	40%	43%
Annular fissure	19%	20%	22%	23%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

\*Prevalence rates estimated with a generalized linear mixed-effects model for the age-specific prevalence estimate (binomial outcome) clustering on study and adjusting for the midpoint of each reported age interval of the study.

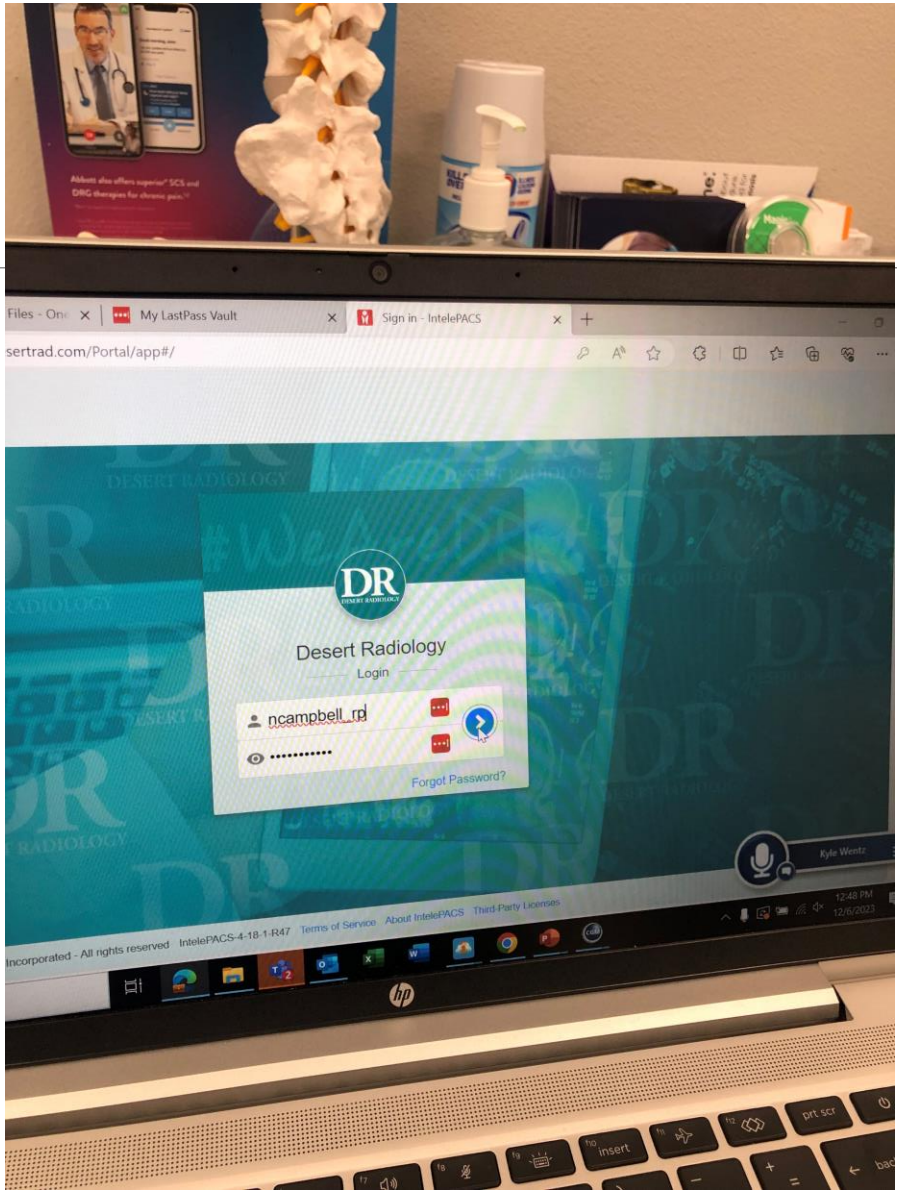
# “How to review”

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Login to lastpass, then choose the imaging facility...

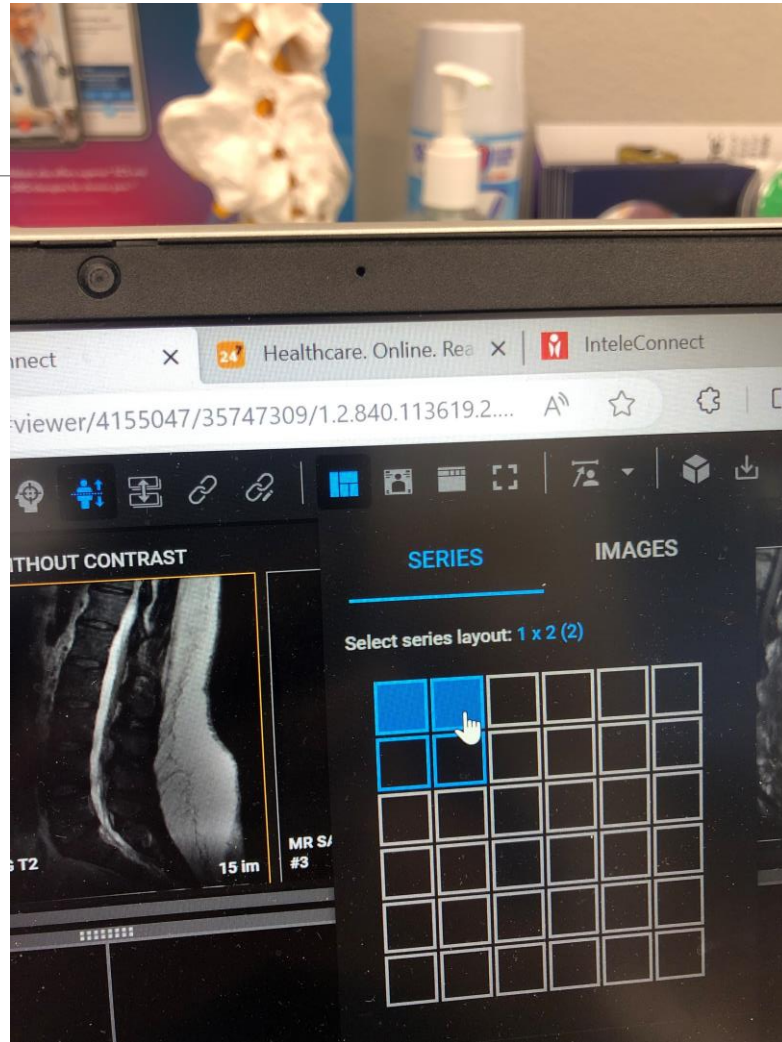


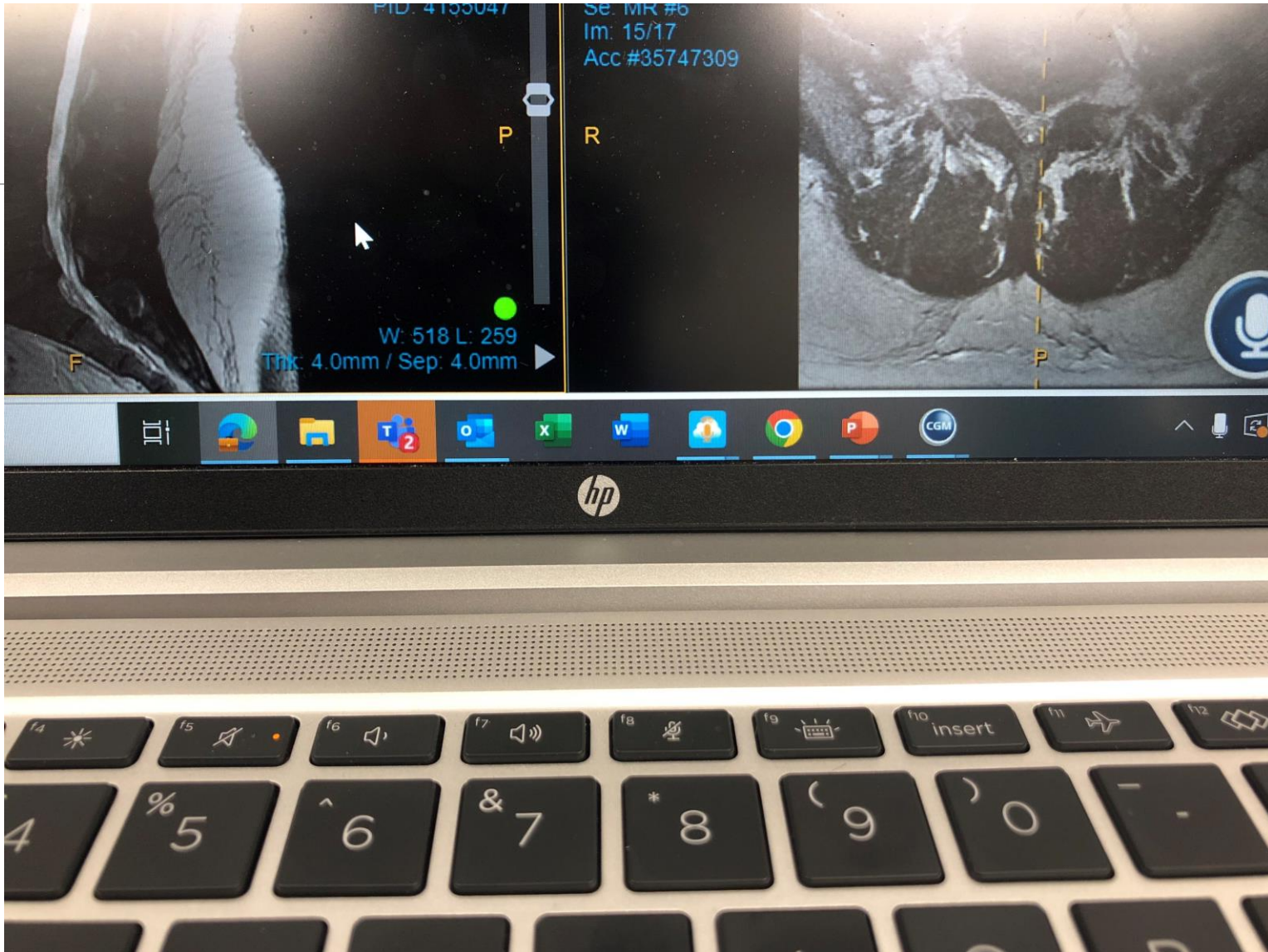


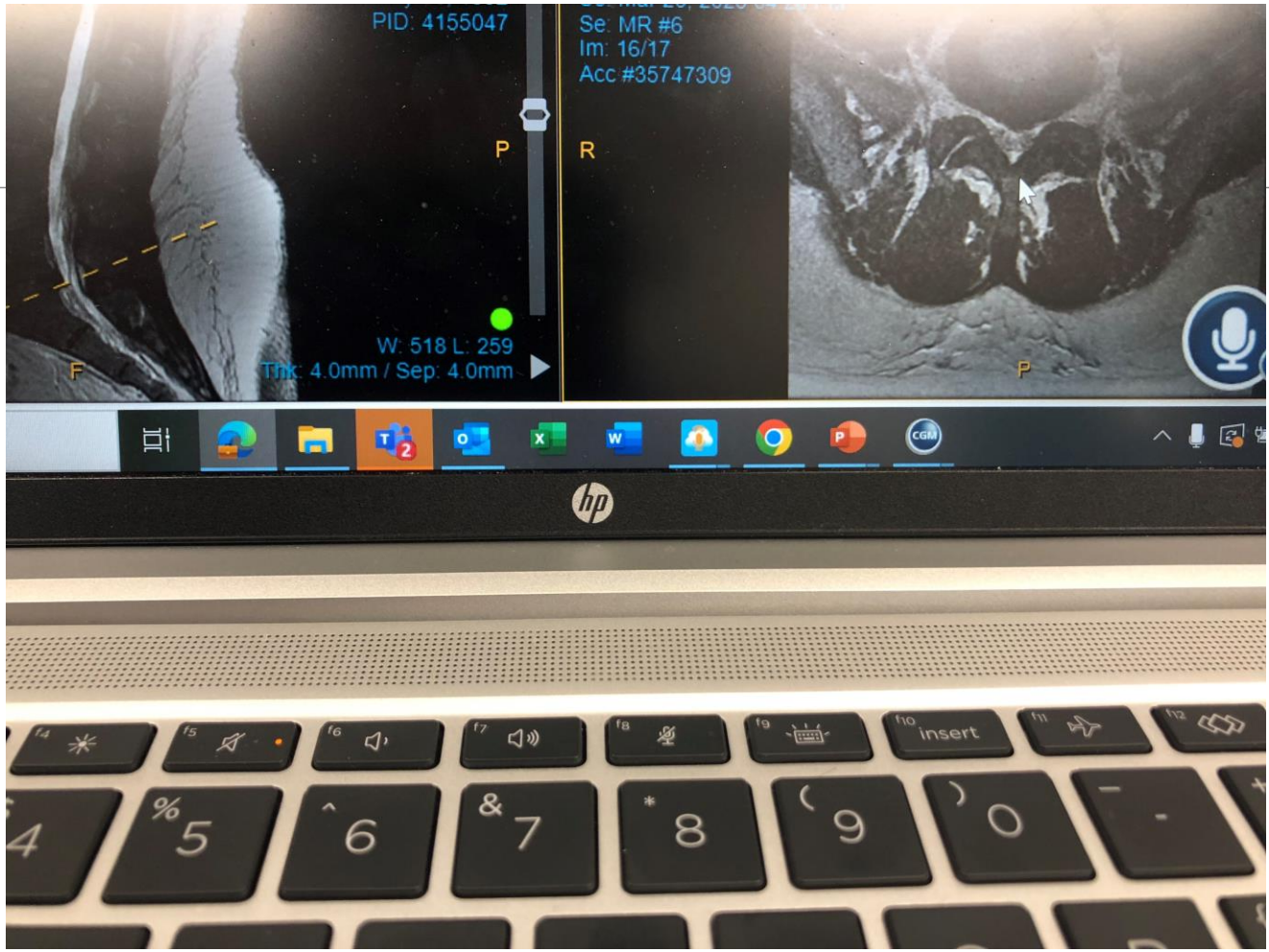












Thank You

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