Intervention in Low Back pain

SK Shakouri

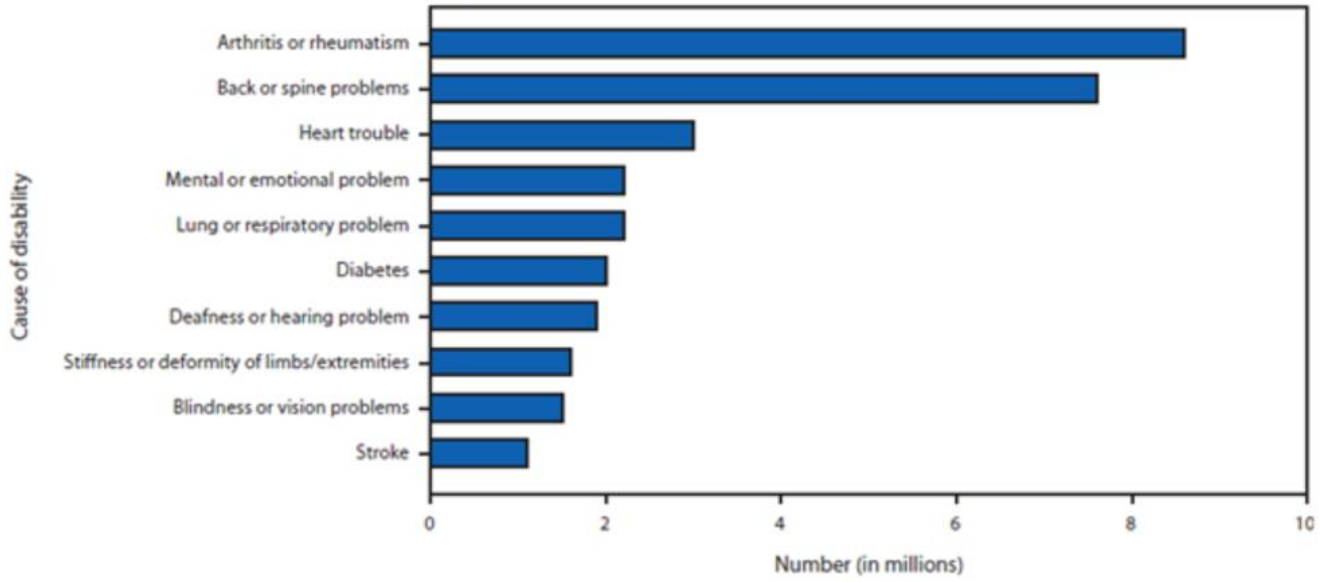
Professor Of Physical Medicine & Rehabilitation

Epidural Steroid Injection

- Clinical Relevance of Back Pain
- Anatomy Review
- Physical Assessment
- Differential Diagnosis
- Pharmacologic Treatment Options
- Indications/Contraindications to ESI
- Equipment
- Technique
- Additives
  - Local Anesthetics
  - Steroids
- Outcomes
- Case Studies

Clinical Relevance

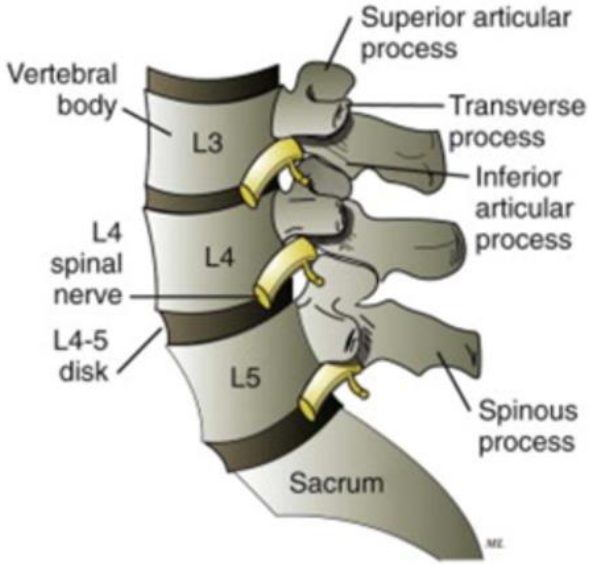
FIGURE 3. Top 10 causes of disability among adults — Survey of Income and Program Participation, United States, 2005



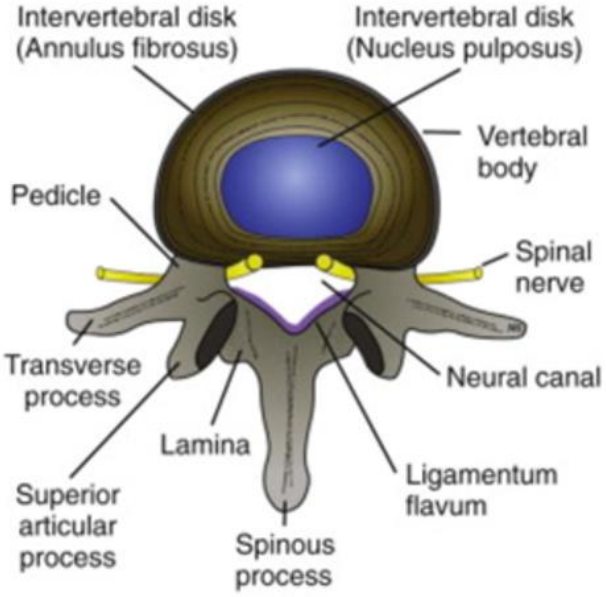
In **USA** it is the commonest cause of **limitation** of activity in those under the age of 45. (1)

The lifetime prevalence of non-specific (common) low back pain is estimated at **60–70%** (1)

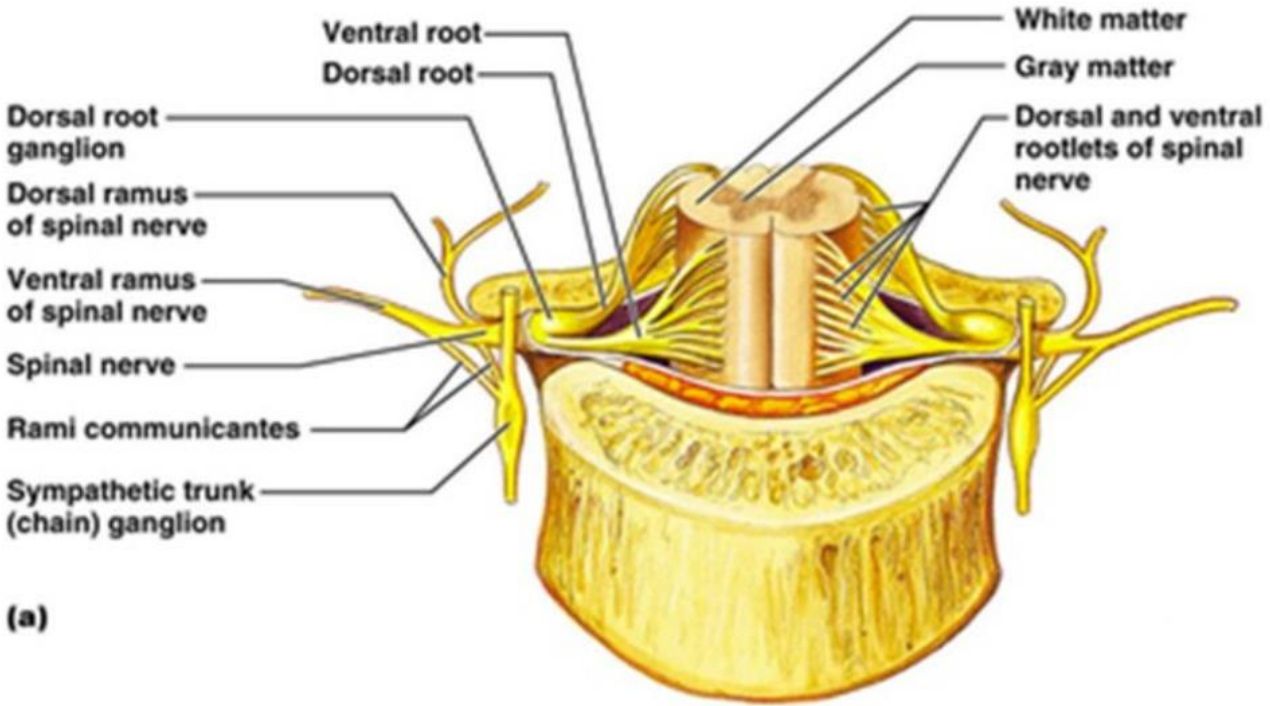
Anatomy Review

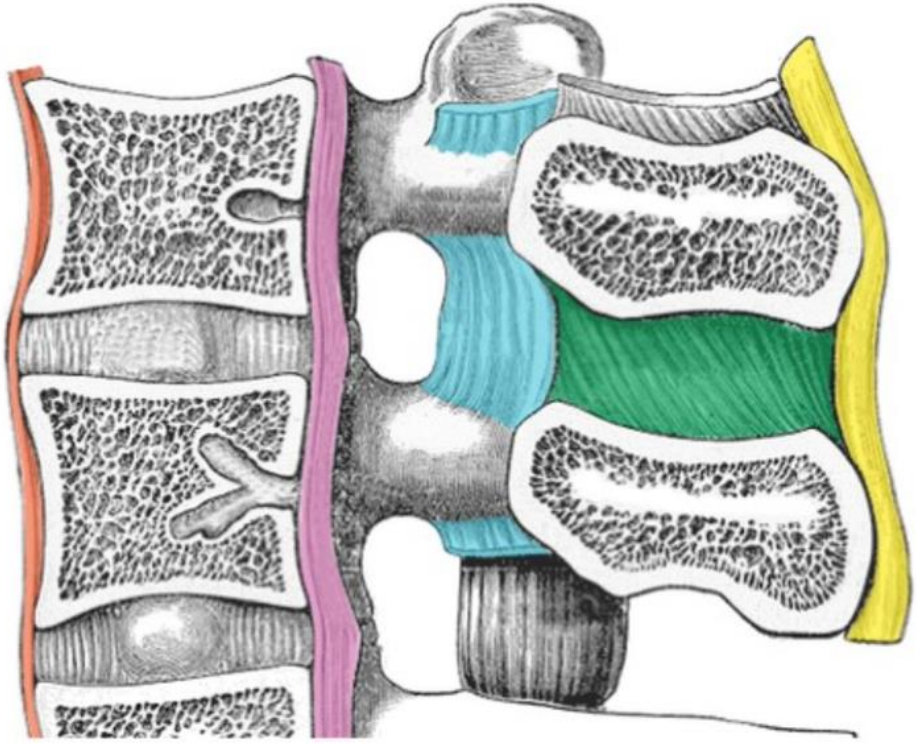


LATERAL VIEW

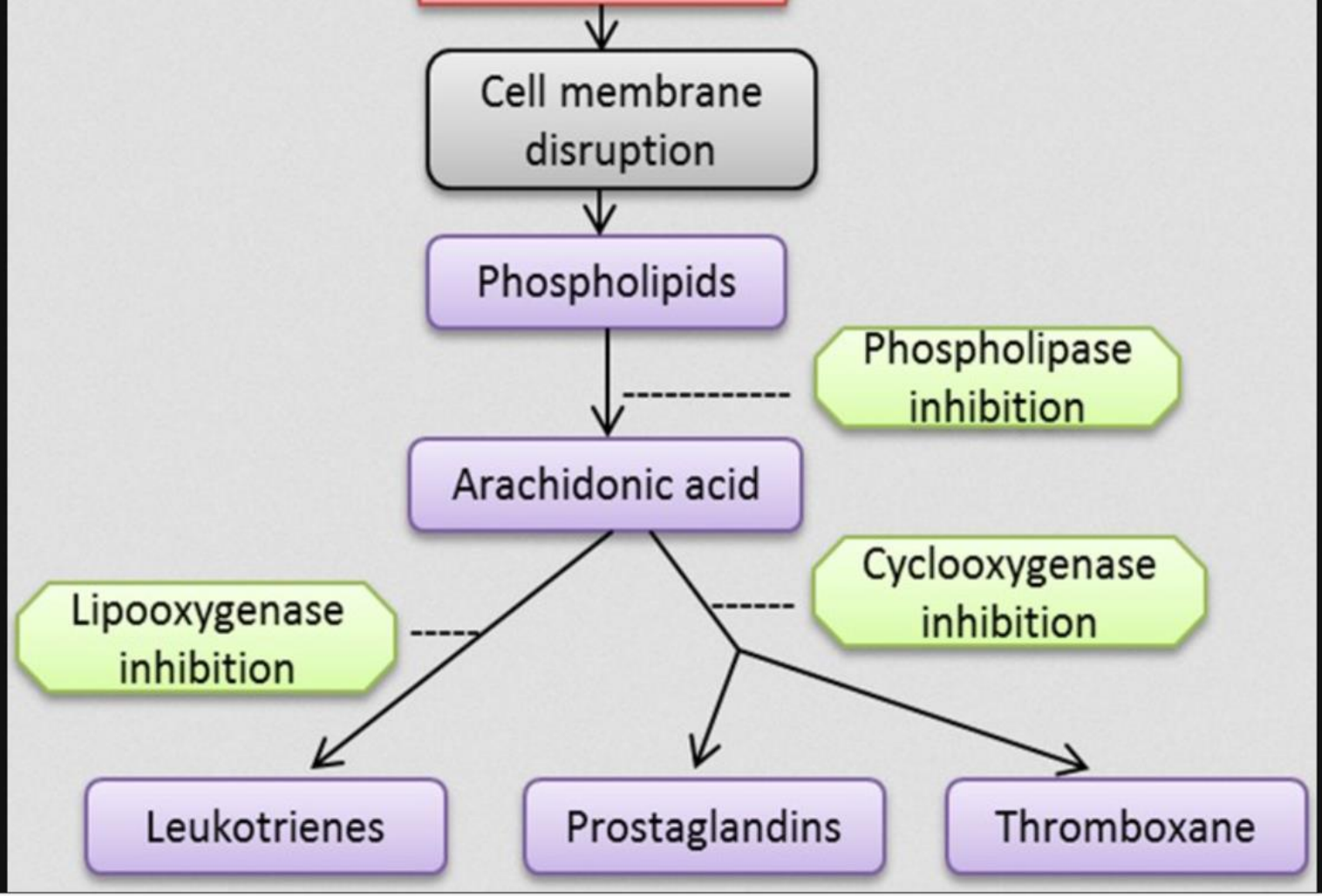


AXIAL VIEW


Ventral root
Dorsal root
Dorsal root ganglion
Dorsal ramus of spinal nerve
Ventral ramus of spinal nerve
Spinal nerve
Rami communicantes
Sympathetic trunk (chain) ganglion
White matter
Gray matter
Dorsal and ventral rootlets of spinal nerve
(a)



- Anterior longit. ligament
- Posterior longit. ligament
- Ligamentum flavum
- Interspinal ligament
- Nuchal ligament


Cell membrane disruption
Phospholipids
Phospholipase inhibition
Arachidonic acid
Lipooxygenase inhibition
Cyclooxygenase inhibition
Leukotrienes
Prostaglandins
Thromboxane

Hx taking

PMH

Trauma?

Cancer?

Psychatic?

Past Surgical Hx

Medications

Steroid?

Family, Social & Systemic Review

Inherited disease?

Smoking?

Alcohol?

Social?

DDx

Mechanical

- Lumbar strain or sprain
- Herniated disc and spinal stenosis
- Degenerative processes of disc and facet joint
- Compression fracture
- Spondylolysis

Systemic

- Malignancy
- Multiple myeloma
- Metastatic carcinoma
- Infection
- Osteomyelitis
- TB
- Brucellosis
- Inflammation
  Ankylosing spondylitis

Referred

- Acute Aneurysm
- Pelvic disease
- Prostatitis/Endometriosis
- Renal disease
- Stones / Pyelonephritis
- GI disease
- Pancreatitis
- Cholecystitis

Oswestry Low Back Pain Questionnaire

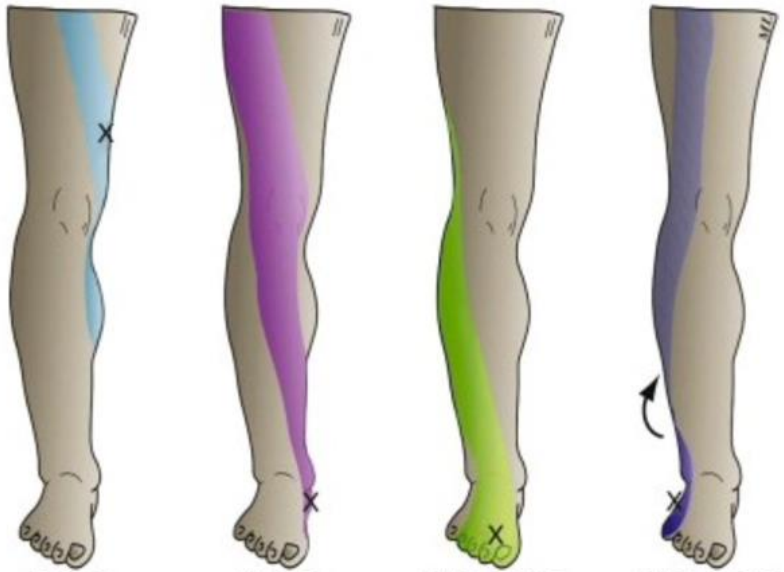
- Section 1- Pain Intensity
- Section 2- Personal Care
- Section 3- Lifting
- Section 4- Walking
- Section 5- Sitting
- Section 6- Standing
- Section 7- Sleeping
- Section 8- Sex Life
- Section 9- Social Life
- Section 10- Traveling

Interpretation of scores

0% to 20%: minimal disability:	The patient can cope with most living activities. Usually no treatment is indicated apart from advice on lifting sitting and exercise.
21%-40%: moderate disability:	The patient experiences more pain and difficulty with sitting, lifting and standing. Travel and social life are more difficult and they may be disabled from work. Personal care, sexual activity and sleeping are not grossly affected and the patient can usually be managed by conservative means.
41%-60%: severe disability:	Pain remains the main problem in this group but activities of daily living are affected. These patients require a detailed investigation.
61%-80%: crippled:	Back pain impinges on all aspects of the patient's life. Positive intervention is required.
81%-100%:	These patients are either bed-bound or exaggerating their symptoms.

Definition of Low Back Pain

- Non-radicular- Pain which does not radiate along a dermatome
- Radicular- Pain which radiates along a dermatome
- Radiculopathy- Pain present beyond source of spinal nerve root irritation.

Nerve root level	L3	L4	L5	S1
Pain location				
Stress test	R-SLR	R-SLR	SLR, C-SLR	SLR, C-SLR
Sensation ("X")	Medial thigh	Medial foot	Between 1st and 2nd toe	Lateral foot
Strength	Hip flexion	Knee extension	Big toe/ankle dorsiflexion	Ankle plantar flexion
Reflex	—	Patellar	—	Achilles

Root Affected	Pain Distribution	Sensory Distribution	Motor Distribution	Reflexes
S1	Posterior thigh Posterior leg Lateral foot	Posterolateral leg Lateral foot	Foot/toe plantar flexion Knee flexion Hip extension	Achilles
L5	Posterolateral thigh Lateral leg Medial foot	Lateral leg Dorsal foot Great toe	Foot/toe dorsiflexion Knee flexion Hip extension	
L4	Anterior thigh Medial leg	Medial leg Medial malleolus	Knee extension Hip flexion Hip adduction	Patellar
L3	Anterior thigh Knee	Distal anteromedial thigh	Knee extension Hip flexion Hip adduction	Patellar Thigh adductors
L2	Inguinal region Anterior thigh	Anterior thigh	Hip flexion Hip adduction	Cremasteric Thigh adducturs

Neurological?

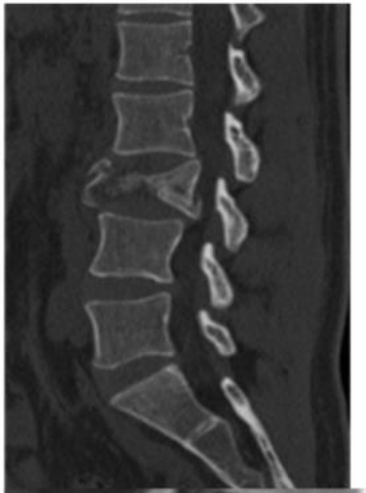
Red Flags!

"Red Flag" Symptoms in Ba = TUNA FISH
T = Trauma
U = Unexplained Weight Loss
N = Neurologic Symptoms
A = Age > 50
F = Fever
I = IVDU
S = Steroid Use
H = History of Canc tate, Renal, Breast, Lung)

Warrant additional diagnostic imaging

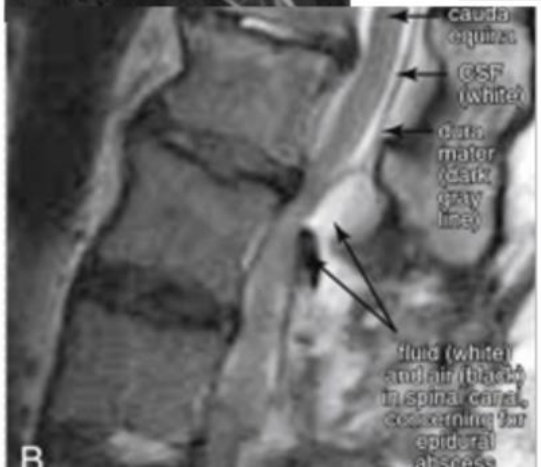
Red Flag Diagnosis

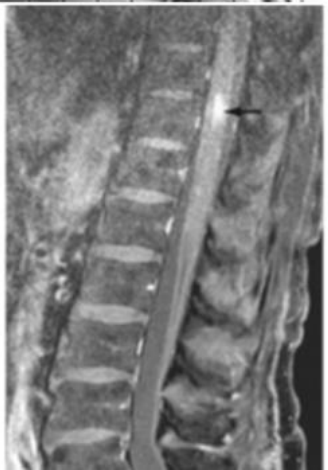
Fracture



Cauda Equinda Syndrome

Spinal Infection





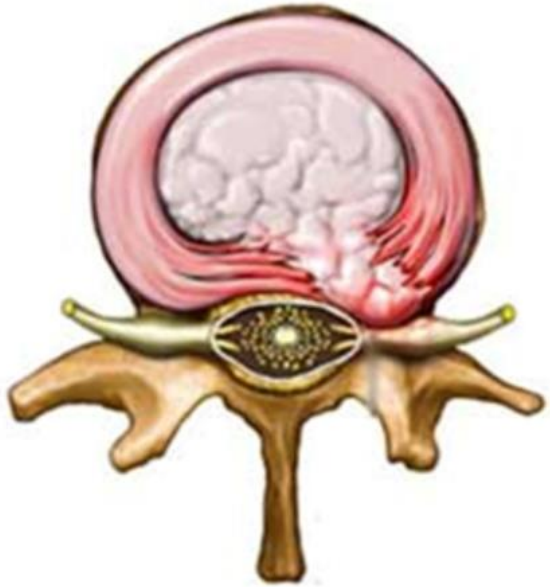
Malignancy

Indicators for Serious Spinal Pathology

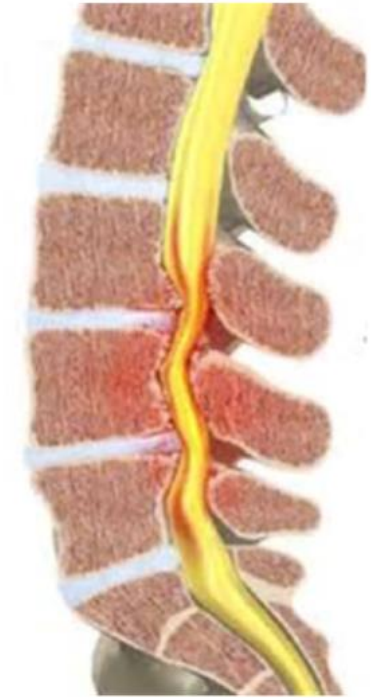
- Fever
- Unexplained weight loss
- Bladder and bowel dysfunction
- Rapidly progressing neurologic deficit
- Saddle anesthesia
- Abnormal gait
- History of carcinoma
- Abnormal presentation (thoracic pain)

Indications for ESI

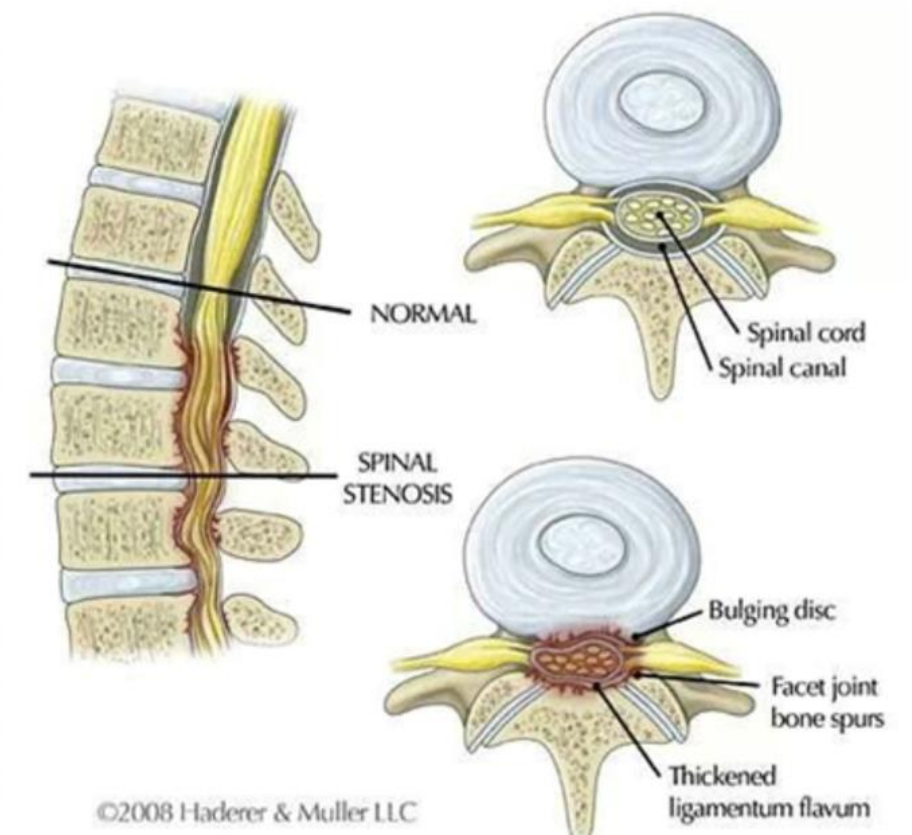
Herniation



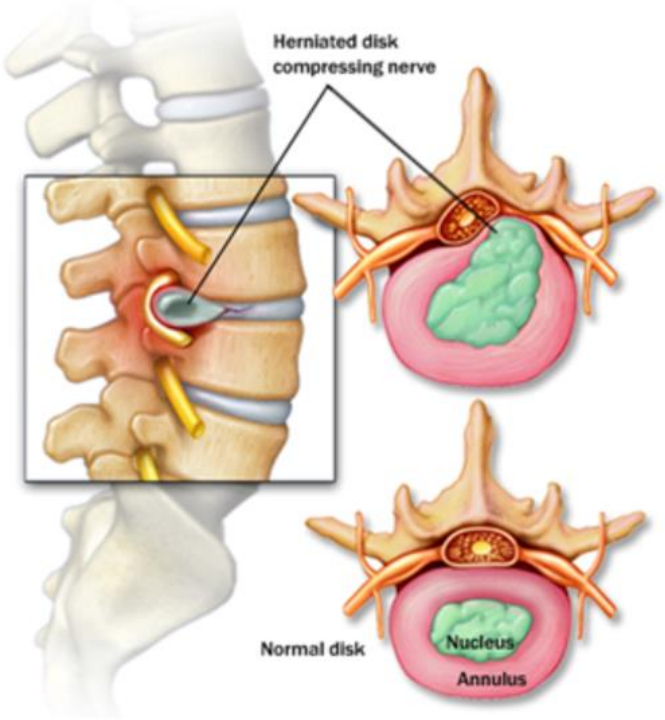
Spinal Stenosis

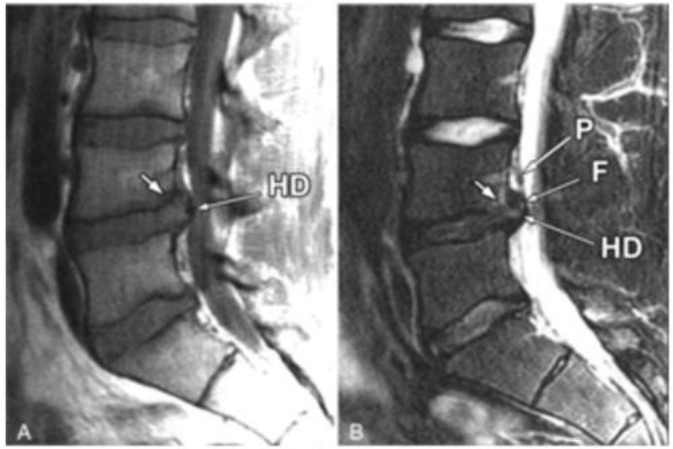


Spinal Stenosis



Herniated Disk





Locally Injectable Steroids

	Hydrocortisone	Methylprednisolone (Depo Medrol®)	Triamcinolone Acetonide (Kenalog®)	Betamethasone Sodium Phosphate and Acetate (Celestone® Soluspan®)
Relative antiinflammatory potency	1	5	5	25
pH	5.0–7.0	7–8	4.5–6.5	6.8–7.2
Onset	Fast	Slow	Moderate	Fast
Duration of action	Short	Intermediate	Intermediate	Long
Concentration mg/mL	50	40-80	20	6
Relative mineralocorticoid activity	2+	0	0	0

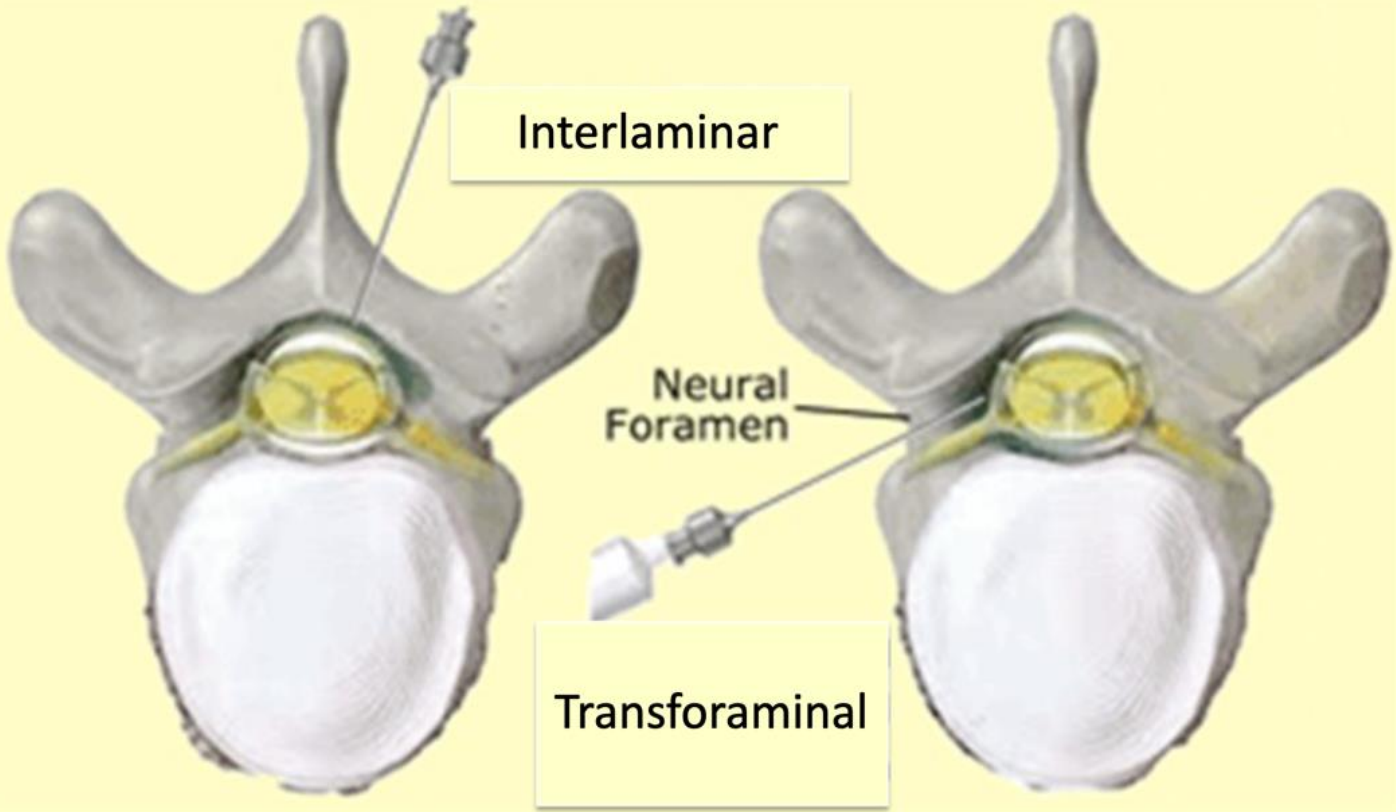
Best Outcome Suggested Steroid Doses

Type of Injection	Depo Medrol® (40 mg/mL)	Celestone® Soluspan® (6 mg/mL)
Cervical, thoracic and lumbar transforaminal	2.4 cc	3.0 cc
Cervical nerve root block	1.4–1.6 cc	2 cc
Lumbar nerve root block	1.6 cc	2 cc
Cervical and lumbar intra-articular facet joint	0.8 cc	0.8 cc
Sacrolliac intra-articular	1.6 cc	2.0 cc

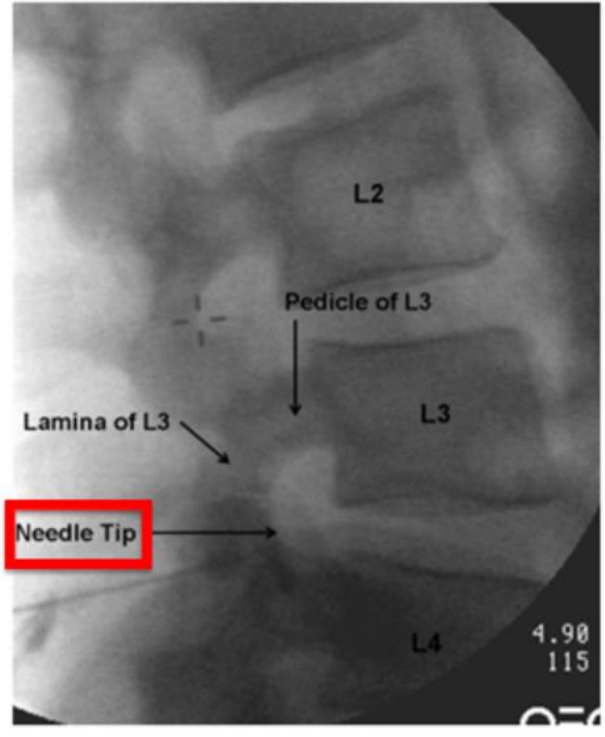
Additives to Spinal Injections

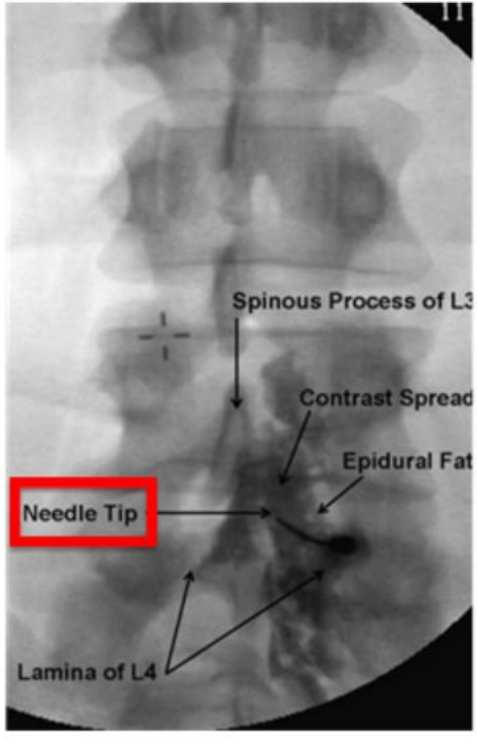
Local Anesthetics

Steroids

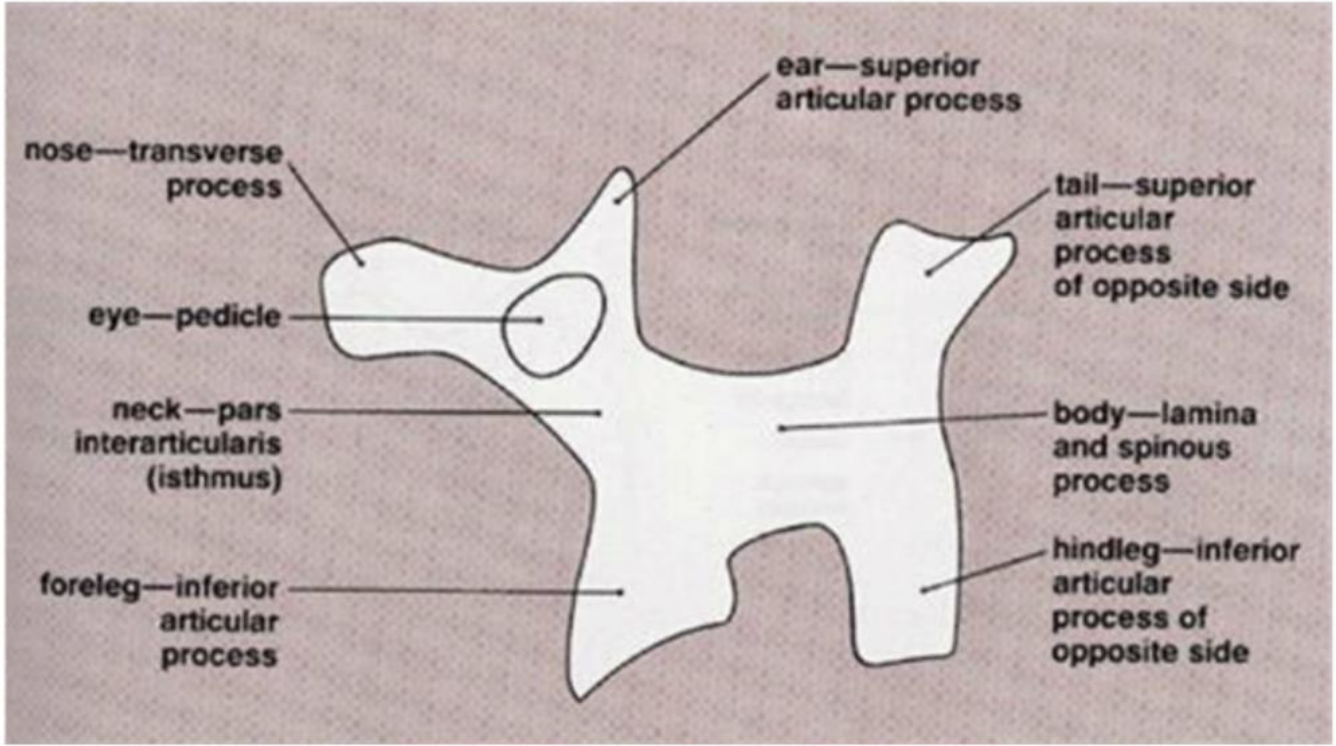

Interlaminar
Neural Foramen
Transforaminal

Interlaminar Approach

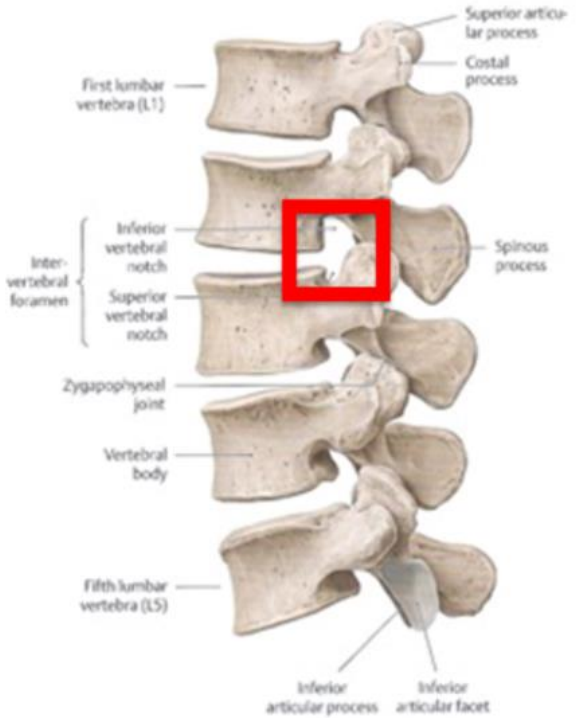




Scotty Dog View

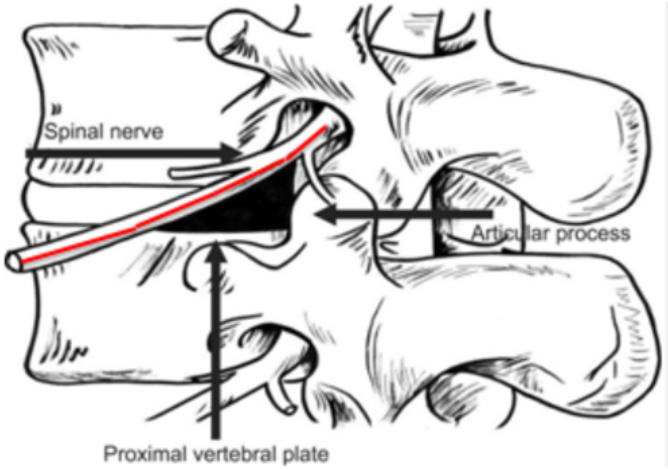


Transforaminal Approach

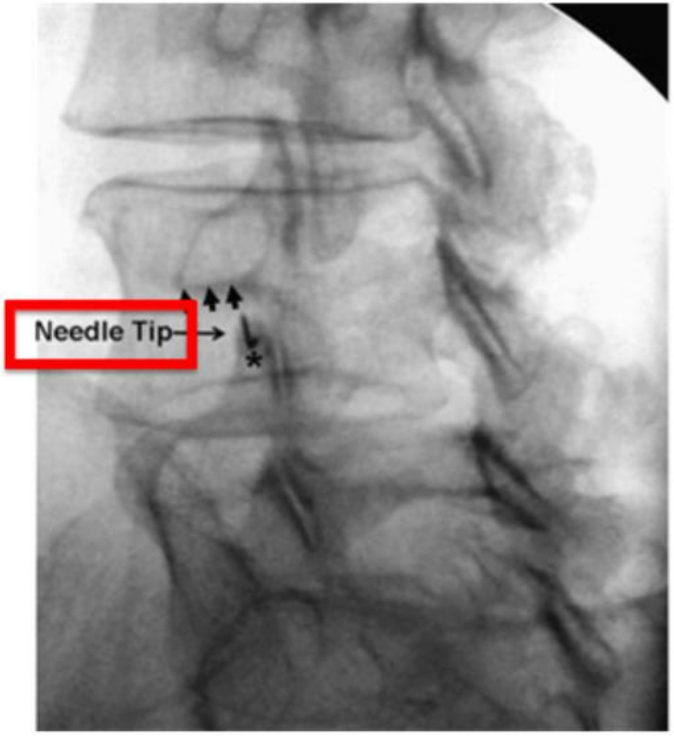


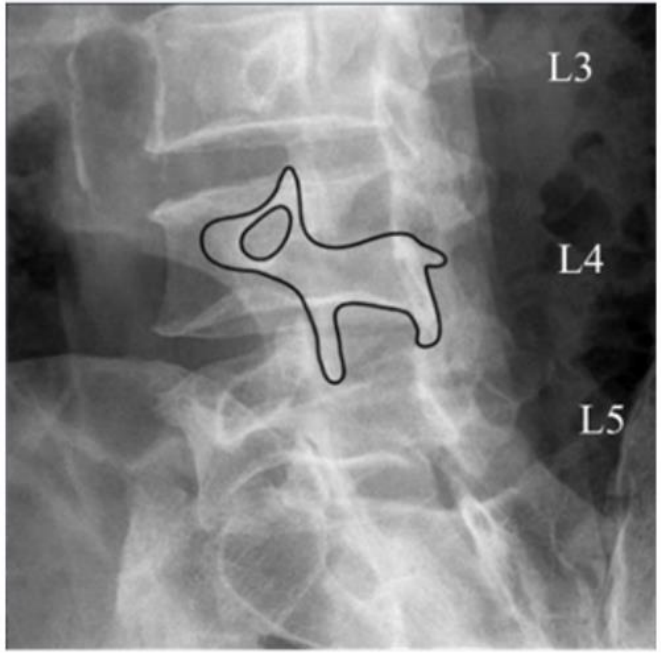
Transforaminal Approach

Kambin's Triangle



Transforaminal Approach

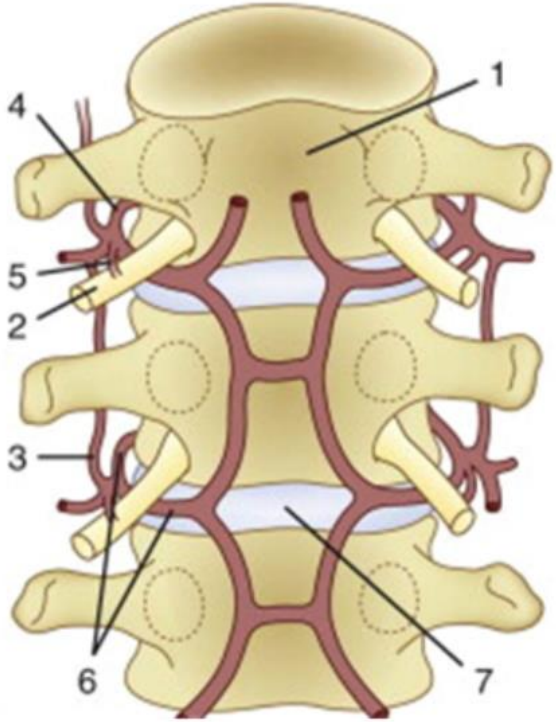


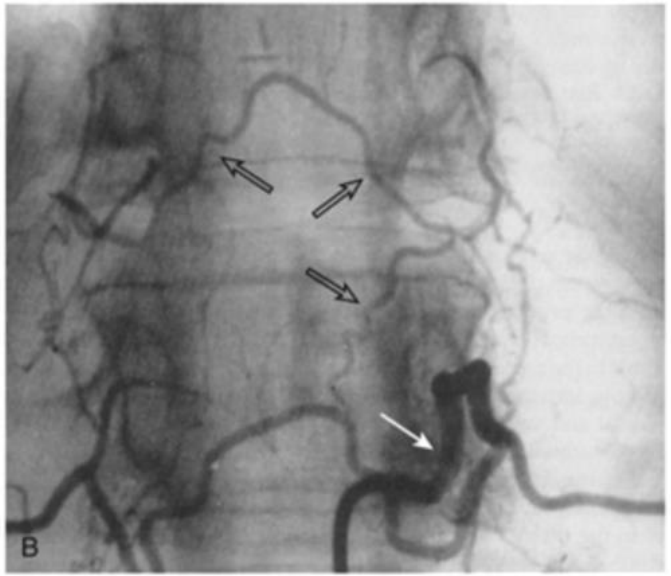


Factors Associated with Poor Outcomes after ESI

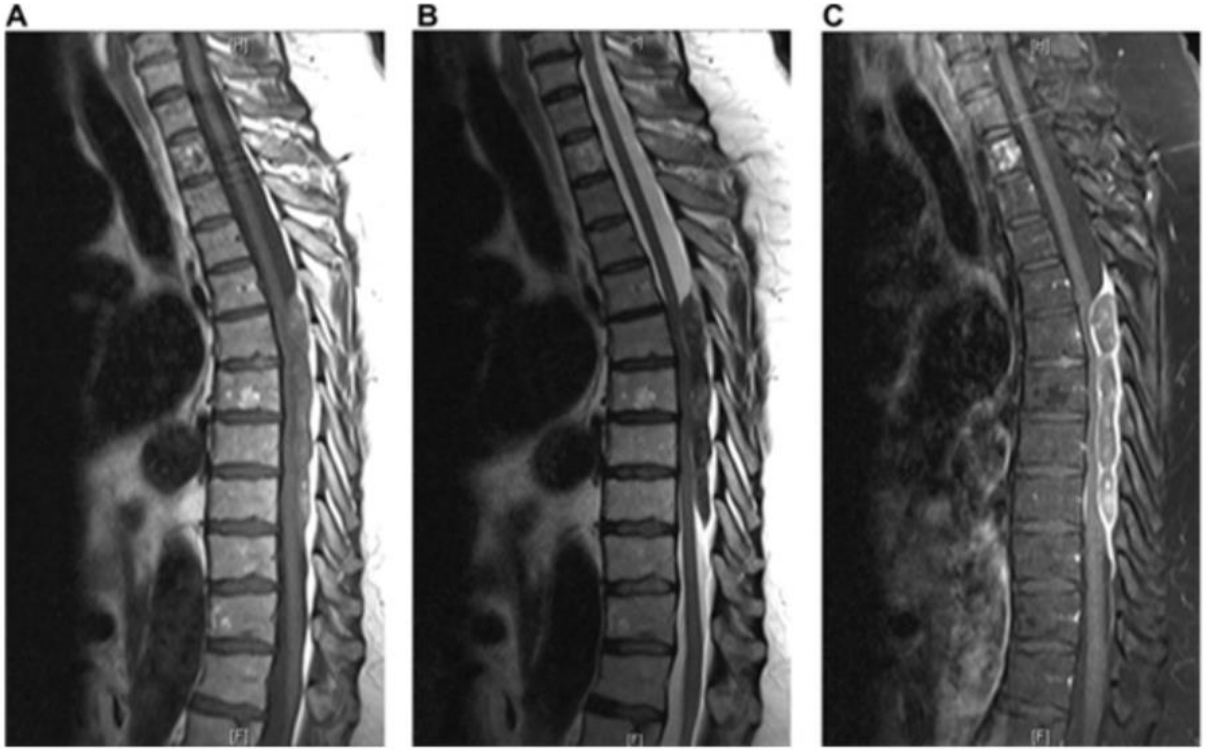
- Smoking
- Disability and lack of employment
- Prolonged duration
- Constant nonradicular pain
- Sleep and social disruption
- Psychologic factors

Arterial Supply

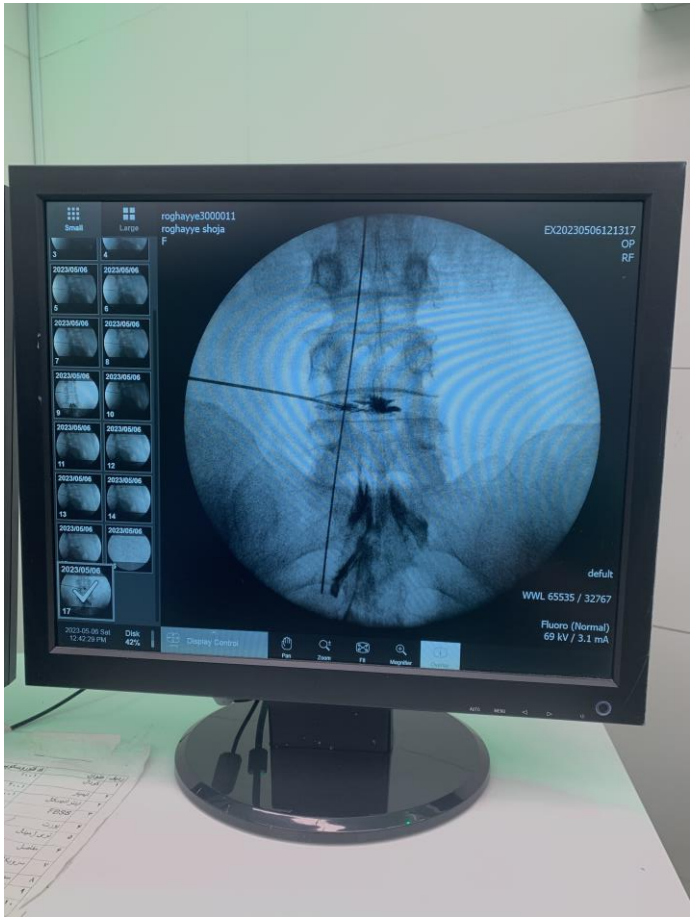




Contraindications



Equipment


Small
Large
roghayye3000011
roghayye shoja
F
EX20230506121317
OP
RF
defult
WWL 65535 / 32767
Fluoro (Normal)
69 kV / 3.1 mA
Disk
42%
Display Control
Pan
Zoom
Fit
Magnifier


8.30


thank
you