

Low Back Pain



Jalali.J.S M.D.

Assistant professor of rheumatology, ARUMS

Low back pain (LBP)

One of the most common conditions encountered in clinical medicine

LBP is a symptom, not a disease, and can result from several different known or unknown abnormalities or diseases

Affects the area between the lower rib cage and gluteal folds



EPIDEMIOLOGY

- ✓ In the first decade of life ... uncommon
- ✓ Prevalence increases steeply during the teenage years ... 40% of 9 to 18 year olds
- ✓ Increases with age until between 60-65 yrs then gradually declines

EPIDEMIOLOGY

- ✓ 65% to 80% of the population will experience LBP during their lifetime
- ✓ Global prevalence ... 12-23% (22-48%)
- ✓ More common in women

EPIDEMIOLOGY

- ✓ Most prevalent chronic pain syndrome
- ✓ The most common cause of disability in individuals <45 years of age
- ✓ The second most frequent reason for a visit to the physician's office

EPIDEMIOLOGY

The prevalence of LBP Iran (COPCORD study)

- ✓ In rural area =% 23.4
- ✓ In urban area =% 15.4

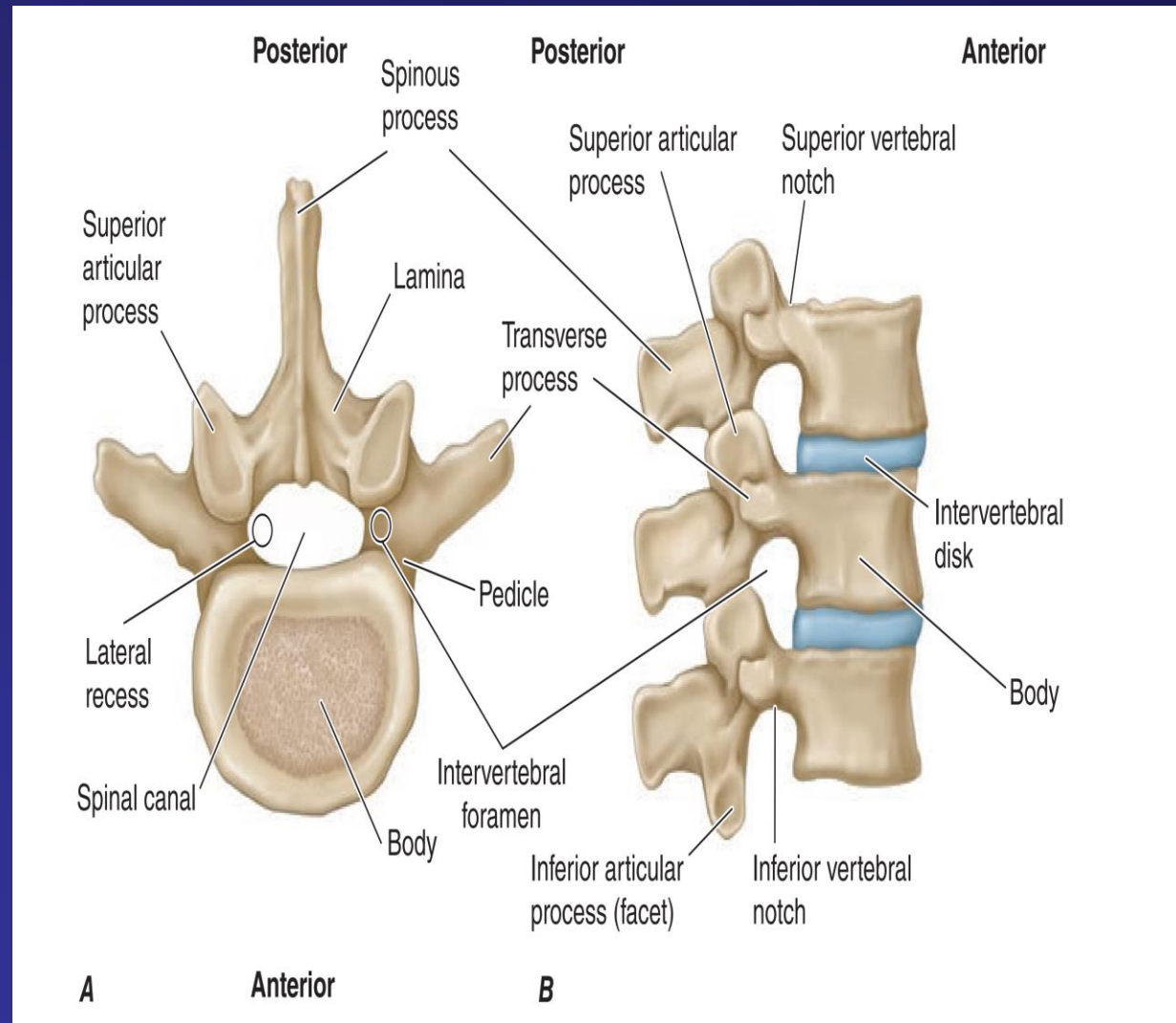
ANATOMY

Anterior spine

- ✓ Vertebral bodies
- ✓ Intervertebral disks
- ✓ longitudinal lig (Ant /post)

Posterior spine

- ✓ Arch
- ✓ Processes
- ✓ Facet joint



ANATOMY

The intervertebral disks

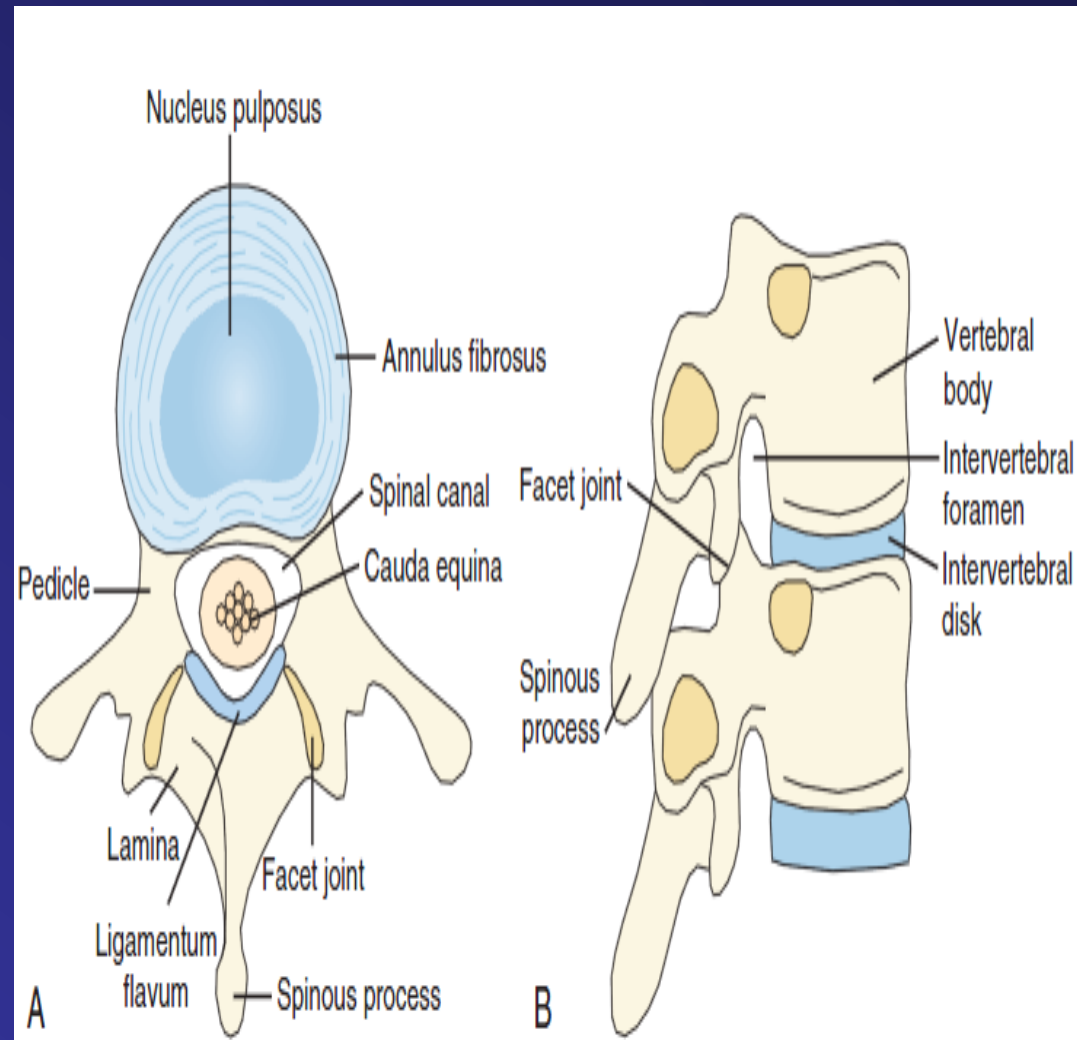
Nucleus pulposus

central gelatinous
shock-absorbing

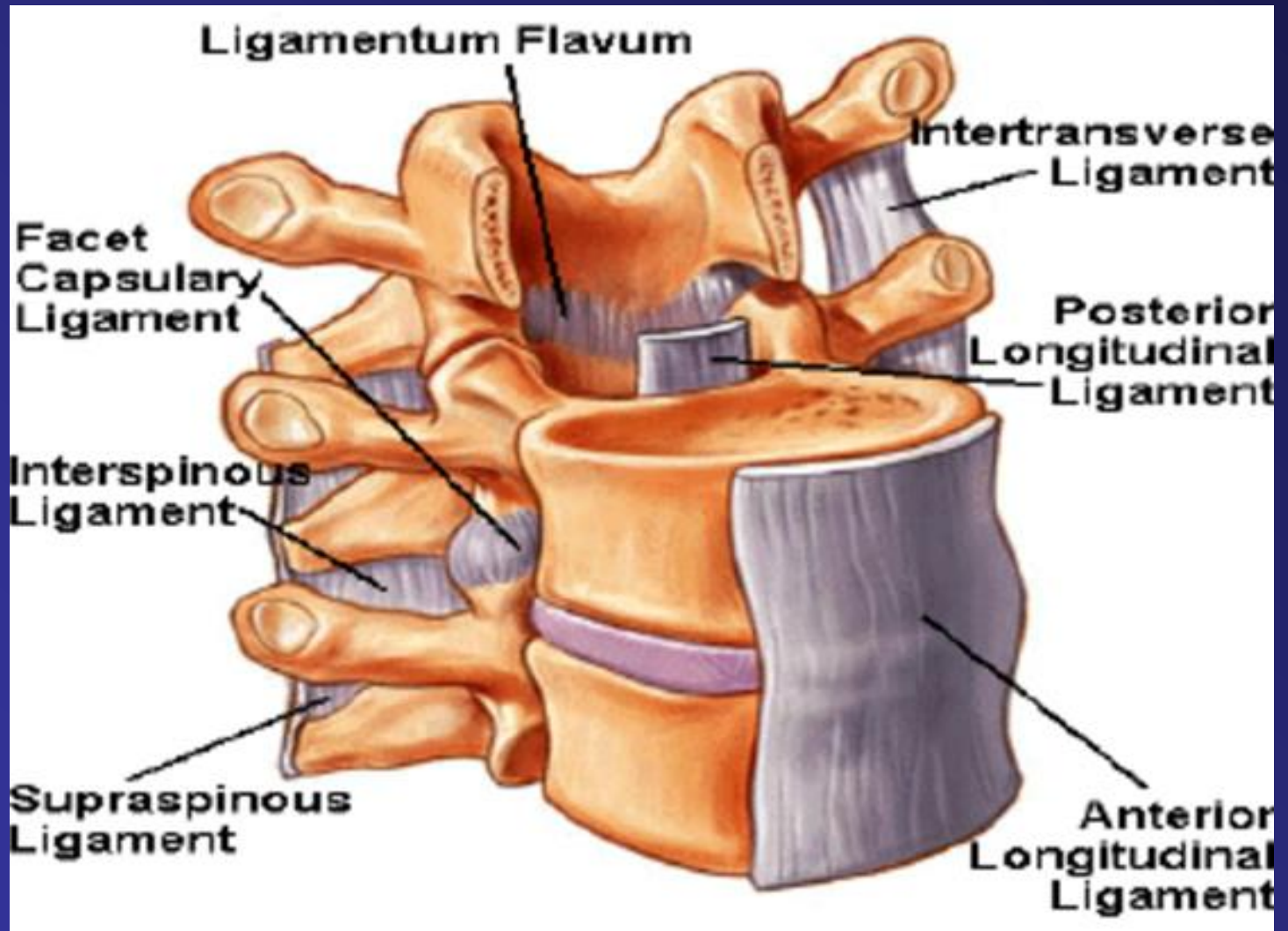
Annulus fibrosis

concentric layers
dense, tough cartilaginous ring

Disks are responsible for
25% of spinal column length

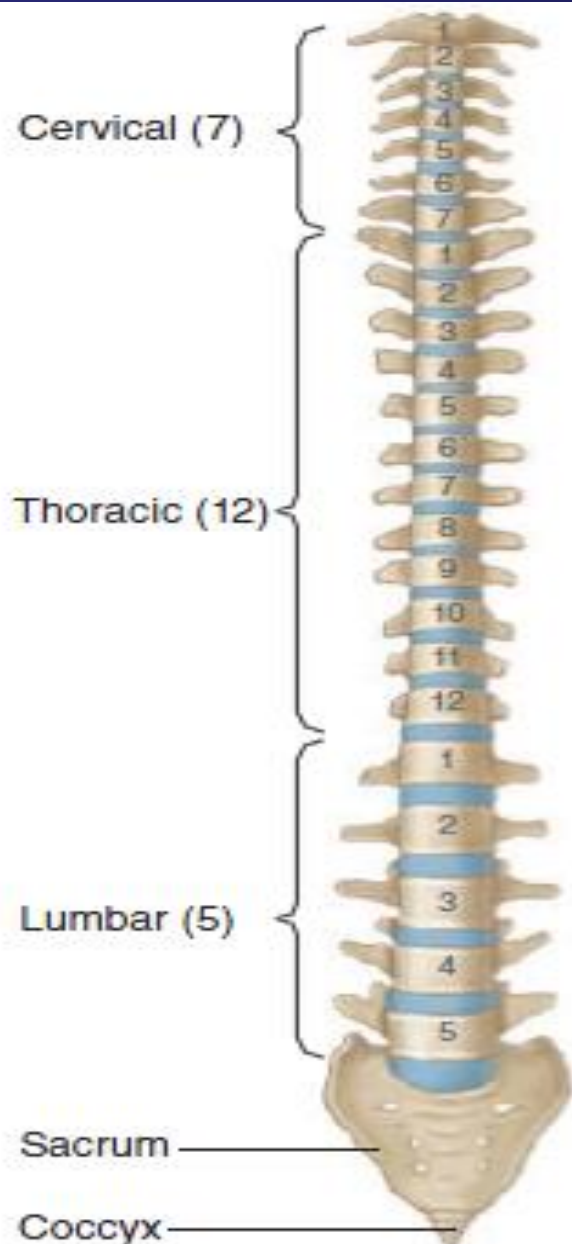


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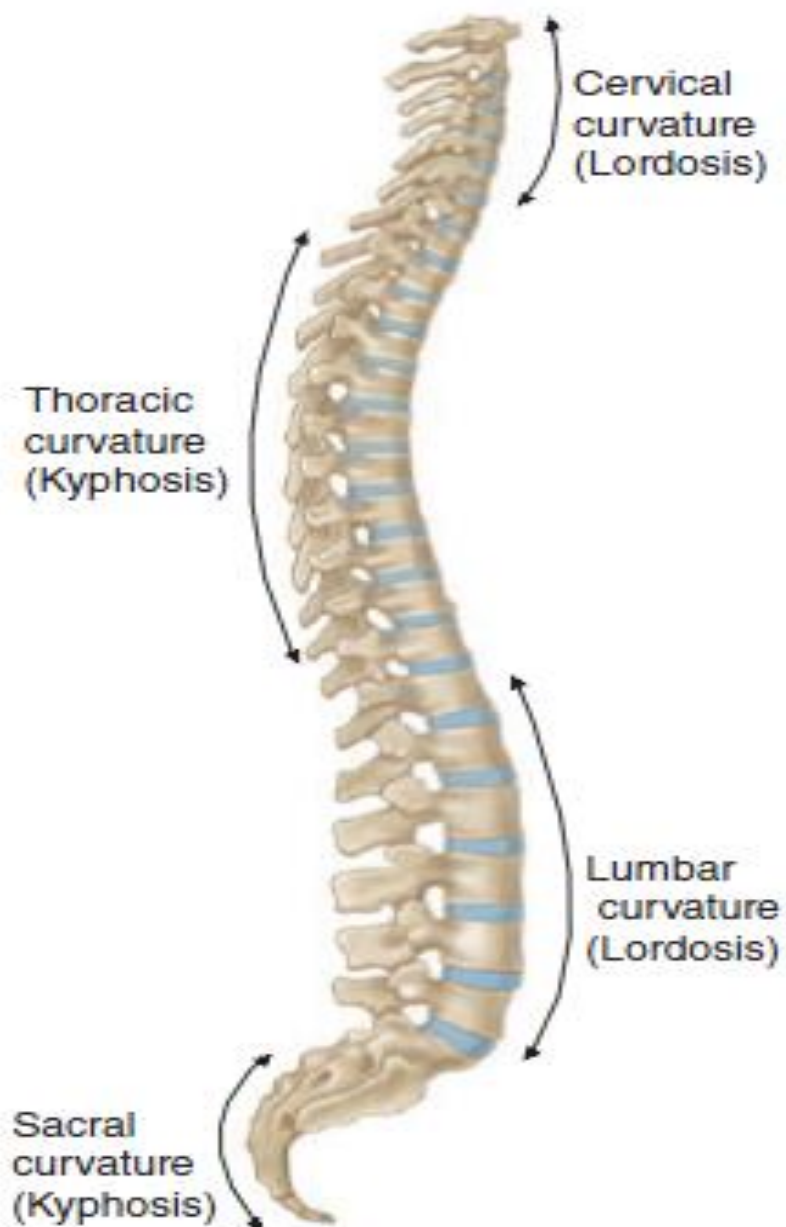


1. 1st Lumbar vertebra
2. 2nd Lumbar vertebra
3. 3rd Lumbar vertebra
4. 4th Lumbar vertebra
5. 5th Lumbar vertebra
6. T12
7. Twelfth rib
8. Sacroiliac joint
9. Sacrum
10. Sacral foramen
11. Ilium
12. Pelvic brim
13. Superior ramus of pubic bone
14. Pubic symphysis



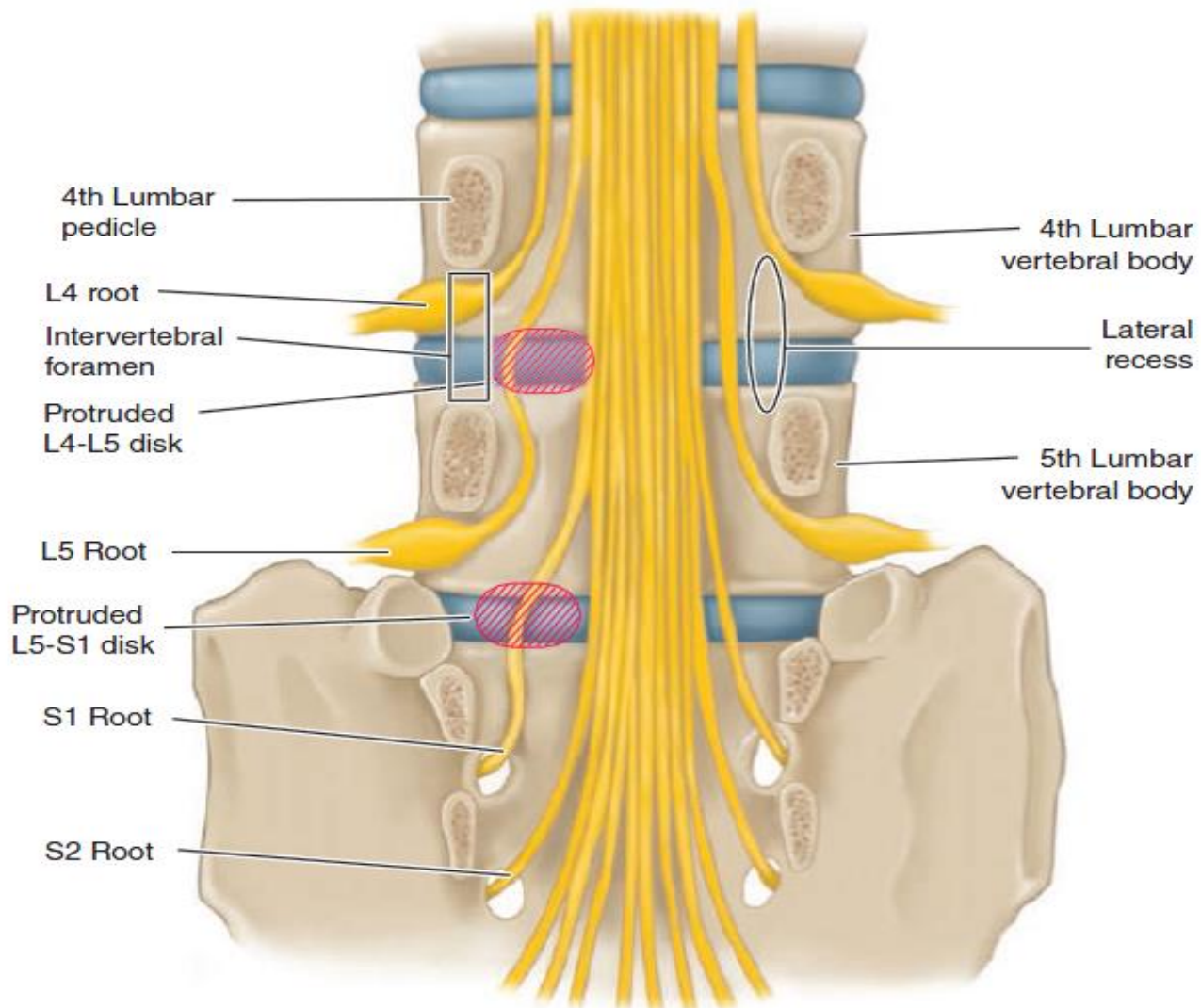


Anterior view



Right lateral view

ANATOMY



ANATOMY

Pain-sensitive structures of the spine

- ✓ Periosteum of the vertebrae
- ✓ Facet joints
- ✓ Longitudinal ligaments
- ✓ Annulus fibrosus of the intervertebral disk
- ✓ Dura
- ✓ Epidural veins and arteries
- ✓ Nerve root

Low back pain

✓ **Acute LBP** (<3 months)

Improves in most patients within 4 weeks

More than 90% are better at 8 weeks

Recurrences ... common and also tend to be brief

✓ **Chronic LBP** (>12 weeks) ... **7% to 10%**

Persistent, and at times disabling

Responsible for the high costs associated with LBP

Low back pain

► **Risk factors** have been associated with **LBP**

Heredity

Psychosocial factors

Heavy lifting

Obesity

Pregnancy

Weaker trunk strength

Cigarette smoking

Low income and educational status

Low back pain

► **Risk factors** have been associated with **CLBP**

Obesity

Female gender

Older age

Prior history of back pain

Psychiatric comorbidities

Smoking

Job dissatisfaction

Widespread pain

Poor general health status

Causes of Low Back Pain

Mechanical

Lumbar spondylosis^a
Disk herniation^a
Spondylolisthesis^a
Spinal stenosis^a
Fractures (mostly osteoporotic)
Nonspecific (idiopathic)

“strain” or “sprain”

Neoplastic

Primary
Metastatic

Inflammatory

Spondyloarthritis

Infectious

Vertebral osteomyelitis
Epidural abscess
Septic diskitis
Herpes zoster

Metabolic

Osteoporotic compression fractures
Paget's disease

Referred Pain to Spine

From major viscera, retroperitoneal structures, urogenital system, aorta, or hip

^aRelated to degenerative changes.

APPROACH TO THE PATIENT

- ▶ The **initial evaluation** should focus on identification of the few(<5%) patients with

Neurologic involvement

Fracture

Possible systemic disease

infection

malignancy

SPA

CLINICAL EVALUATION

History... most important part of the clinical evaluation

- ✓ **Type of pain ... Mechanical, Inflammatory ,...**
- ✓ **Site of the pain**
- ✓ **Red flags**

Presence of multiple red flags generates higher predictive values

Red Flags for Potentially Serious Underlying Causes of LBP

Spinal Fracture

Significant trauma
Prolonged glucocorticoid use
Age >50 yr

Infection or Cancer

History of cancer
Unexplained weight loss
Immunosuppression
Injection drug use
Nocturnal pain
Age >50 yr

Cauda Equina Syndrome

Urinary retention
Overflow incontinence
Fecal incontinence
Bilateral or progressive motor deficit
Saddle anesthesia

Spondyloarthritis

Severe morning stiffness
Pain improves with exercise, not rest
Pain during second half of night
Alternating buttock pain
Age <40 yr

Red Flags for an Important Structural Cause

History

Pain worse at rest or at night

Prior history of cancer

History of chronic infection (especially lung, urinary tract, skin)

History of trauma

Incontinence

Age >70 years

Intravenous drug use

Glucocorticoid use

History of a rapidly progressive neurologic deficit

Examination

Unexplained fever

Unexplained weight loss

Palpation/percussion tenderness over the midline spine

Abdominal, rectal, or pelvic mass

Internal/external rotation of the leg at the hip; heel percussion sign

Straight leg- or reverse straight leg-raising signs

Progressive focal neurologic deficit

Physical Examination

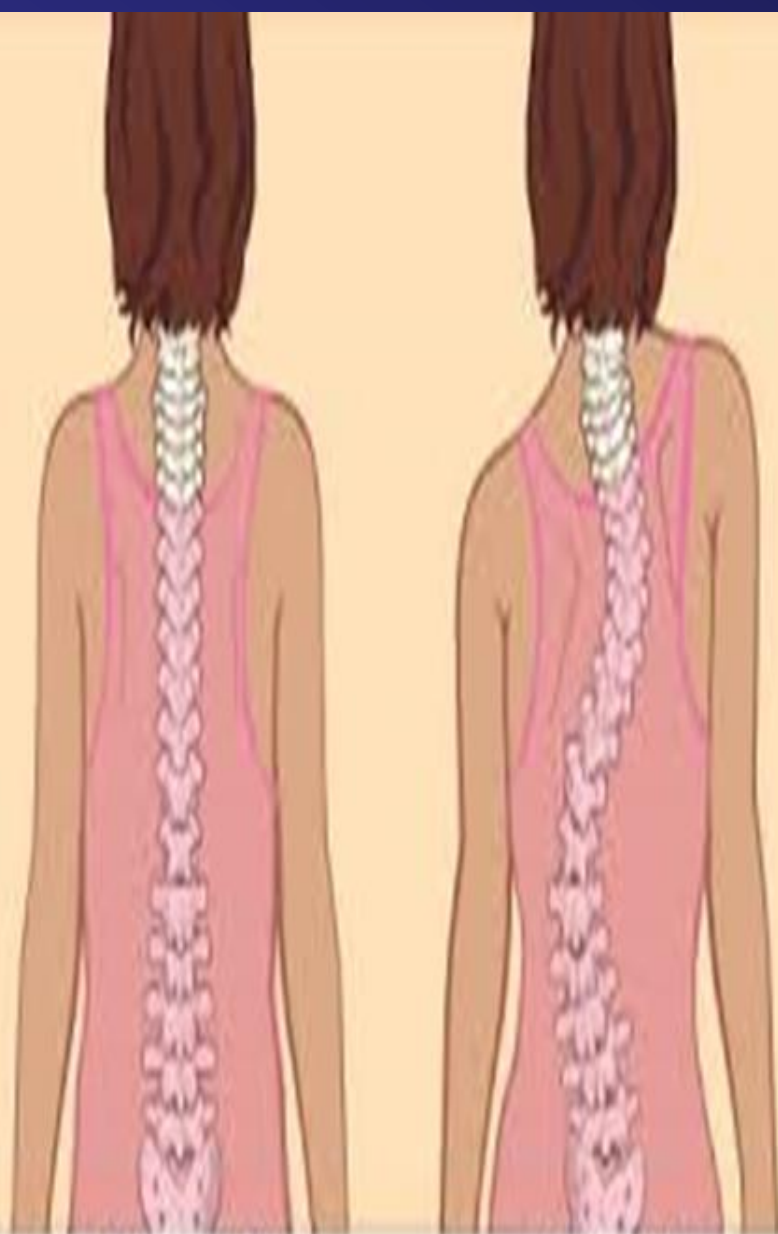
- ▶ **Scoliosis**
 - ✓ Functional
 - ✓ Structural
- ▶ **Paravertebral muscle spasm**
- ▶ **Loss of the normal lumbar lordosis**
- ▶ **Palpable step-off**
- ▶ **Tenderness on percussion**

Inspection

Palpation

percussion

ROM



Straight Spine

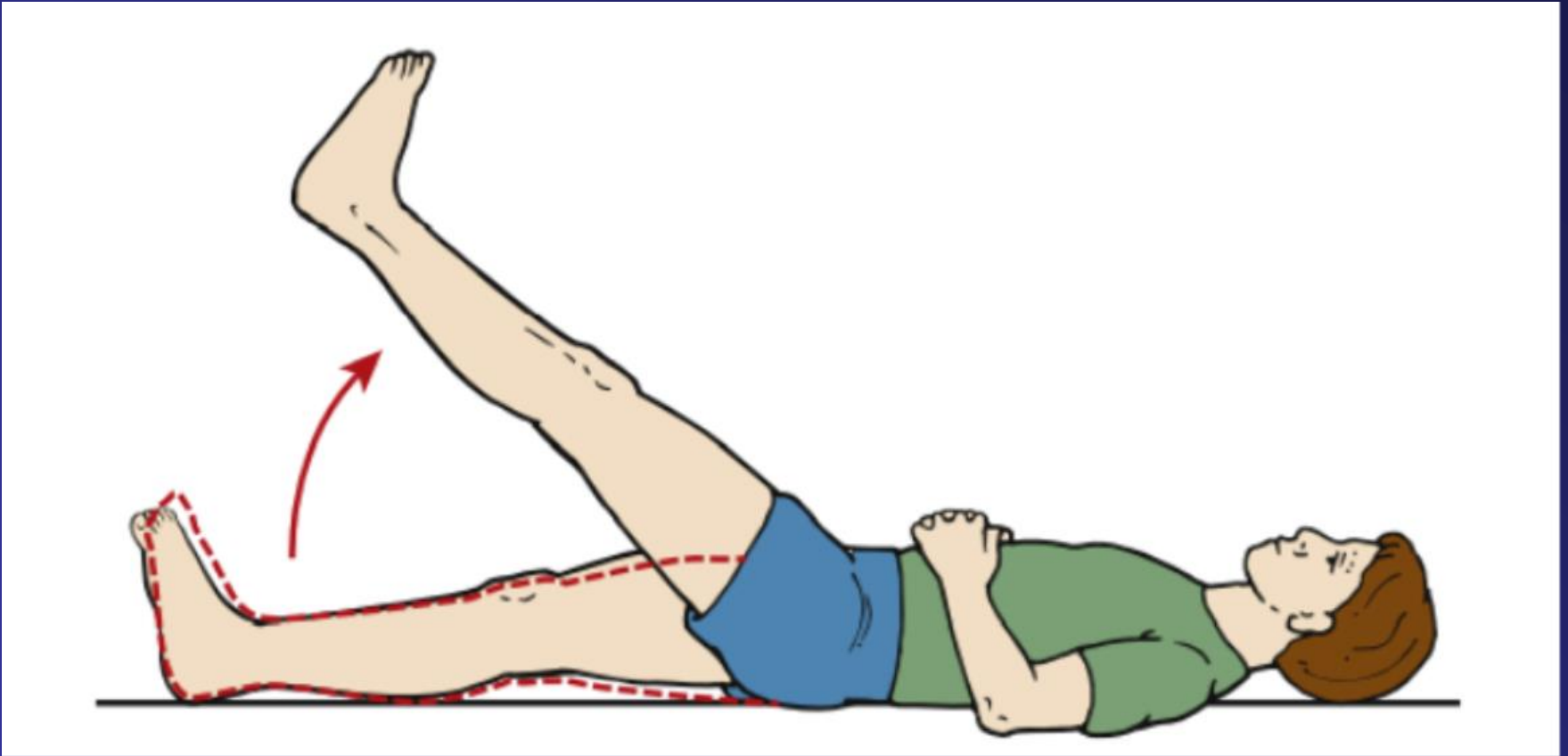
Scoliosis



Physical Examination

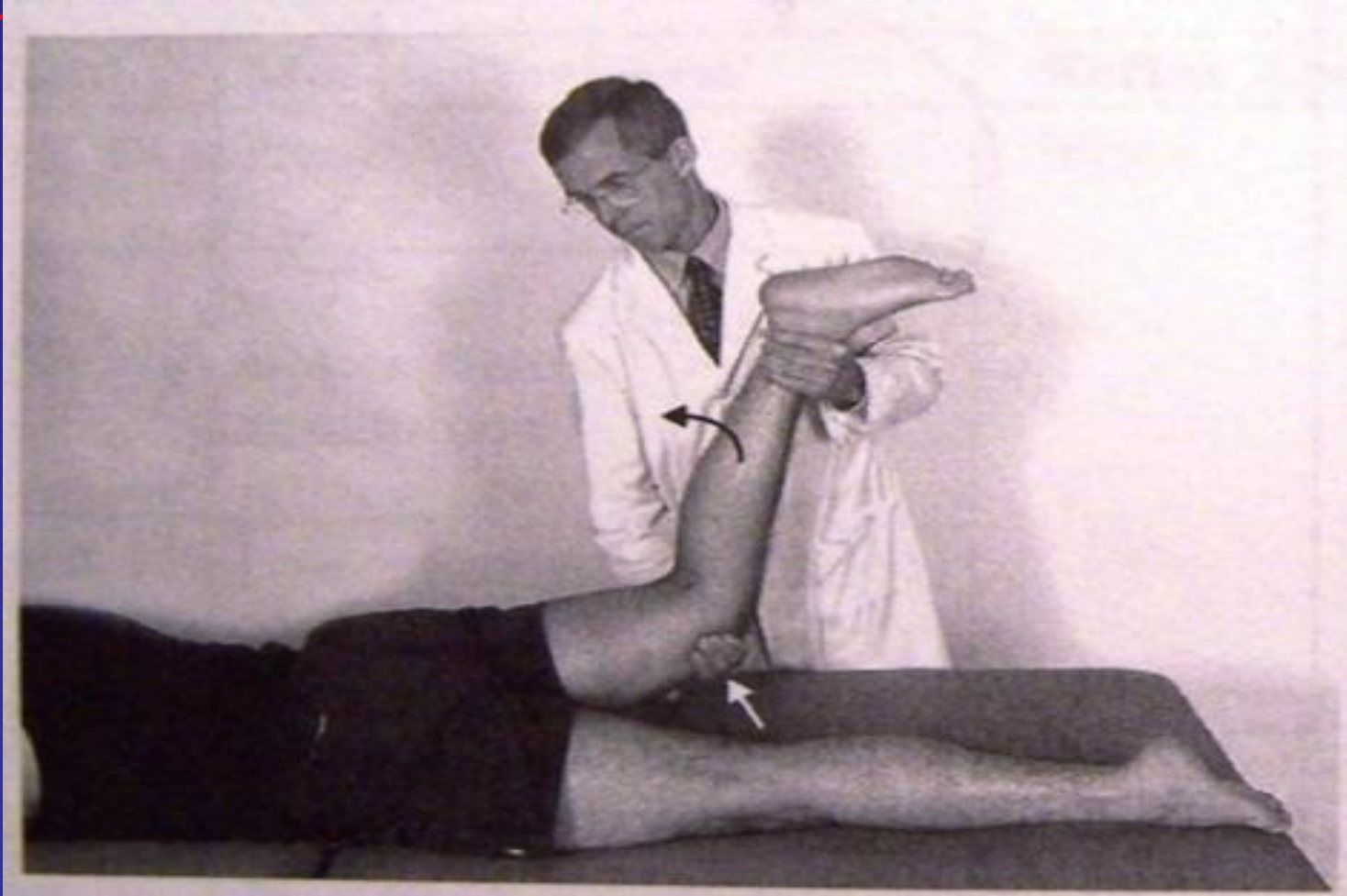
- ▶ **Hip joints examination**
- ▶ **Complete neurologic examination**
 - Motor testing**
 - Deep tendon reflexes**

Straight leg-raising(SLR)



sensitive (91%) but not specific (26%) for clinically significant disk herniation at the L4-5 or L5-S1 level

Reverse SLR



L2-L4 nerve roots, lumbosacral plexus, and femoral nerve

Diagnostic Tests

- ▶ **Imaging**
- ▶ **Electrodiagnostic Studies**
- ▶ **Laboratory Studies**

Imaging

Major function of imaging ... identification of pathology in those few patients who have :

- ✓ **Evidence of a major or progressive neurologic deficit**
- ✓ **Underlying systemic disease**
- ✓ **Vertebral fracture is suspected**
- **Weak association between imaging abnormalities and symptoms**
- **Imaging is not required unless significant symptoms persist beyond 6 to 8 weeks**

Imaging

- ✓ **Plain radiographs MRI**
- ✓ **CT can**
- ✓ **CT myelography**
- ✓ **Bone scanning**

Plain radiographs

In patients with persistent LBP of greater than 6 to 8 weeks:

- ✓ First option if there are no symptoms suggesting radiculopathy or spinal stenosis
- ✓ Standing AP and lateral ... usually adequate
- ✓ **Oblique?**

Gonadal radiation in a woman from a two-view radiograph of the lumbar spine ...equivalent to radiation exposure from a chest radiograph taken daily for more than 1 year

MRI

Best initial test for patients with LBP who require advanced imaging

Preferred modality for the detection of:

- ✓ spinal infection
- ✓ cancers
- ✓ herniated disks
- ✓ spinal stenosis

CT versus MRI

MRI is generally preferred versus CT scanning

CT is superior when:

- ✓ Bone anatomy is critical ...lateral recess
- ✓ Spondylolysis is suspected
- ✓ Claustrophobic patients
- ✓ Ferromagnetic implant such as a cardiac pacemaker
- ✓ Metal hardware (anterior or posterior spinal fusion)... CT or CT myelography ... assess hardware position or fractures close to the hardware

Bone scanning (tc-99m)

Bone scans have limited specificity ... poor spatial resolution

- ✓ Primarily to detect infection
- ✓ Bony metastases
- ✓ Occult fractures

Abnormal findings often require further confirmatory imaging such as MRI

Diagnostic Tests

▶ Electrodiagnostic Studies

EMG

NCV

▶ Laboratory Studies

CBC

ESR

U/A



Thanks for your attention