



STFM National Convention 2011 New Orleans

The Essential Lower Back Exam

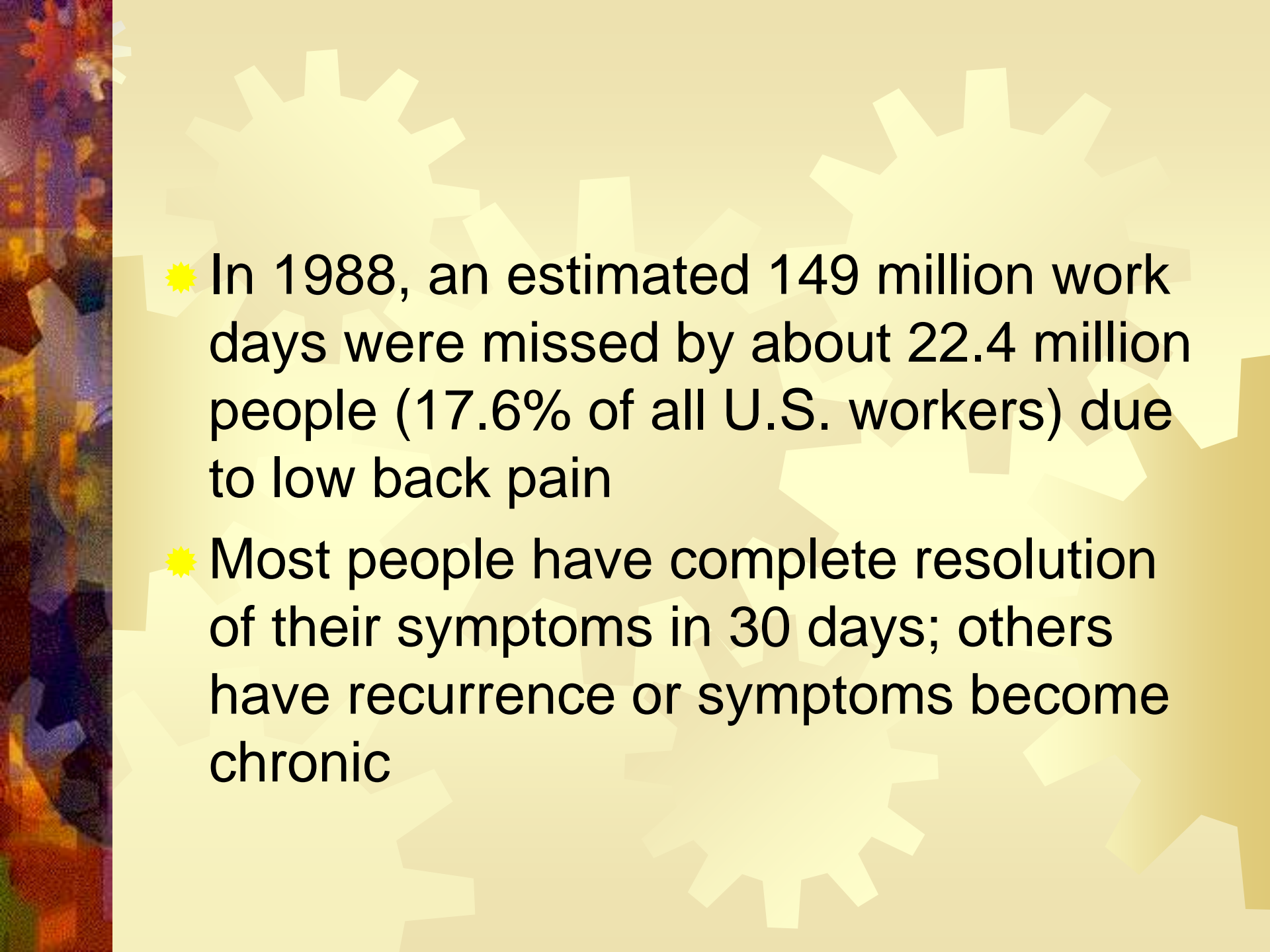
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Rob Rutherford, MD

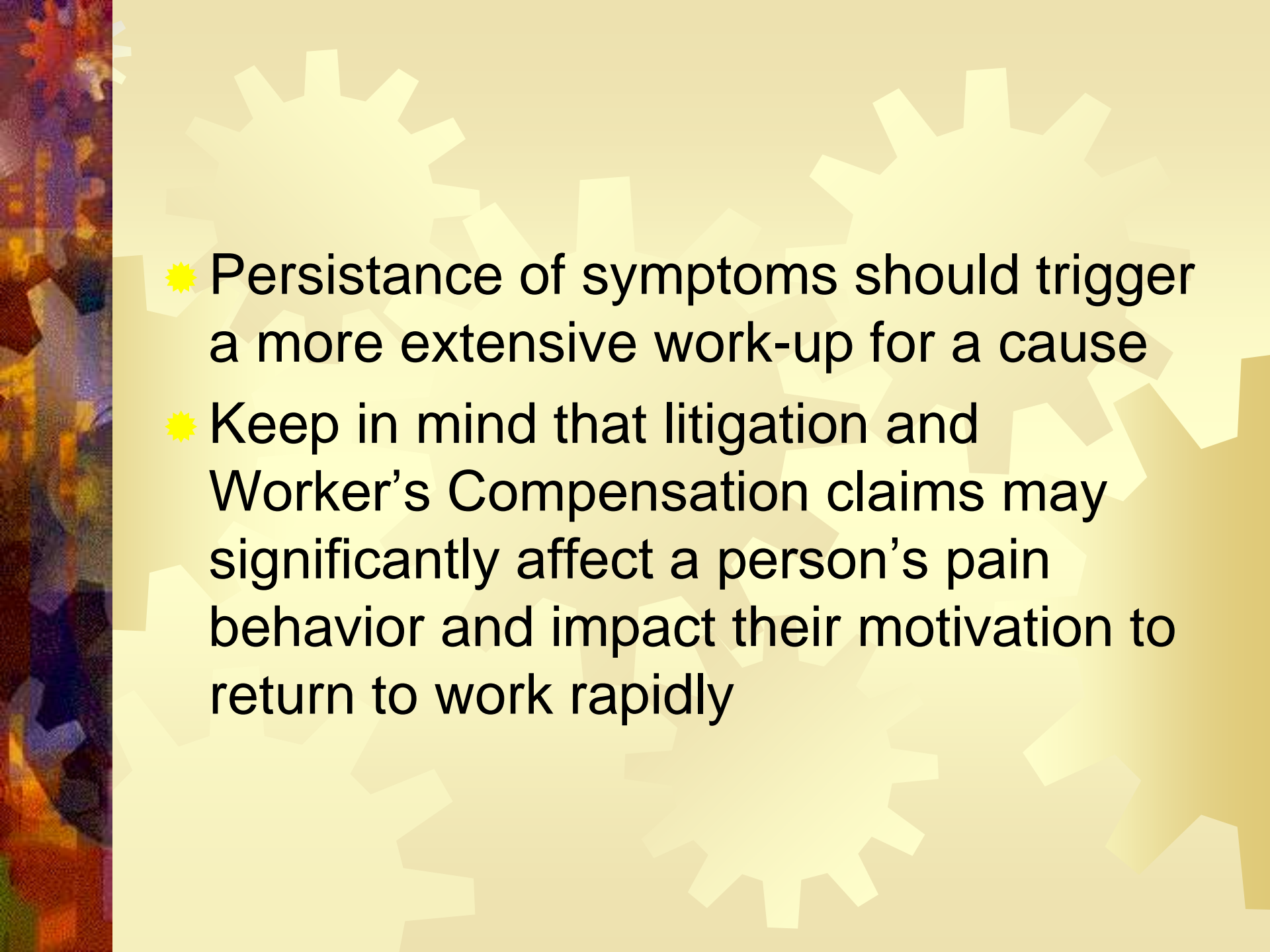
Objectives

- ✱ Brief review of the anatomy of the back, (hip and pelvis in Handout)
- ✱ Provide a systematic approach to examine the lower back, hip, and pelvis

Overview

- ☀ 60-70% of the adult population has been affected by low back pain at some time in their lives
- ☀ Up to 15-30% may be affected at one time
- ☀ Back pain is a common cause of absenteeism from work in employees between the ages of 30 and 60 years

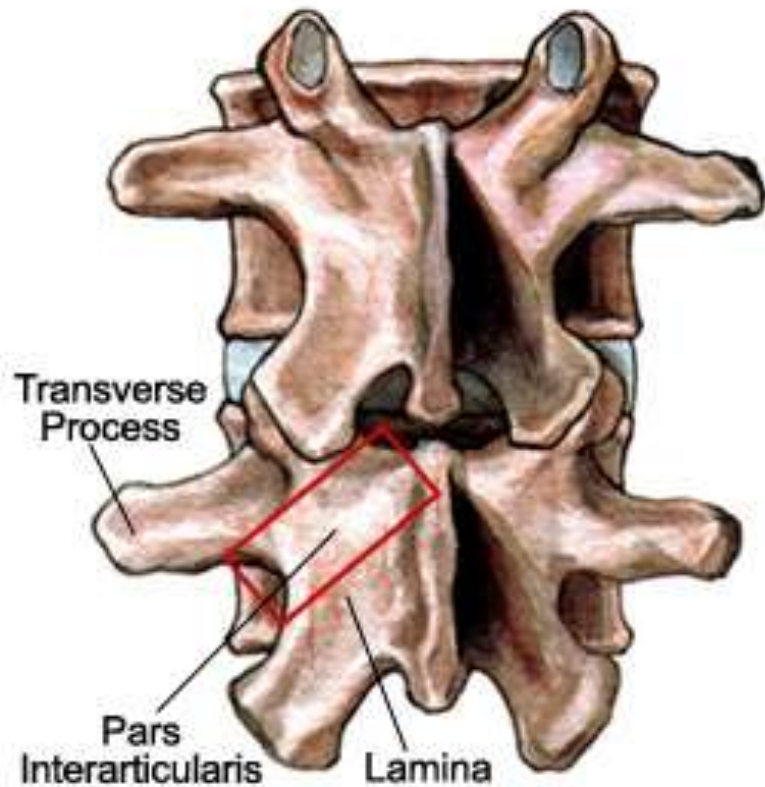
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- ☀ In 1988, an estimated 149 million work days were missed by about 22.4 million people (17.6% of all U.S. workers) due to low back pain
 - ☀ Most people have complete resolution of their symptoms in 30 days; others have recurrence or symptoms become chronic

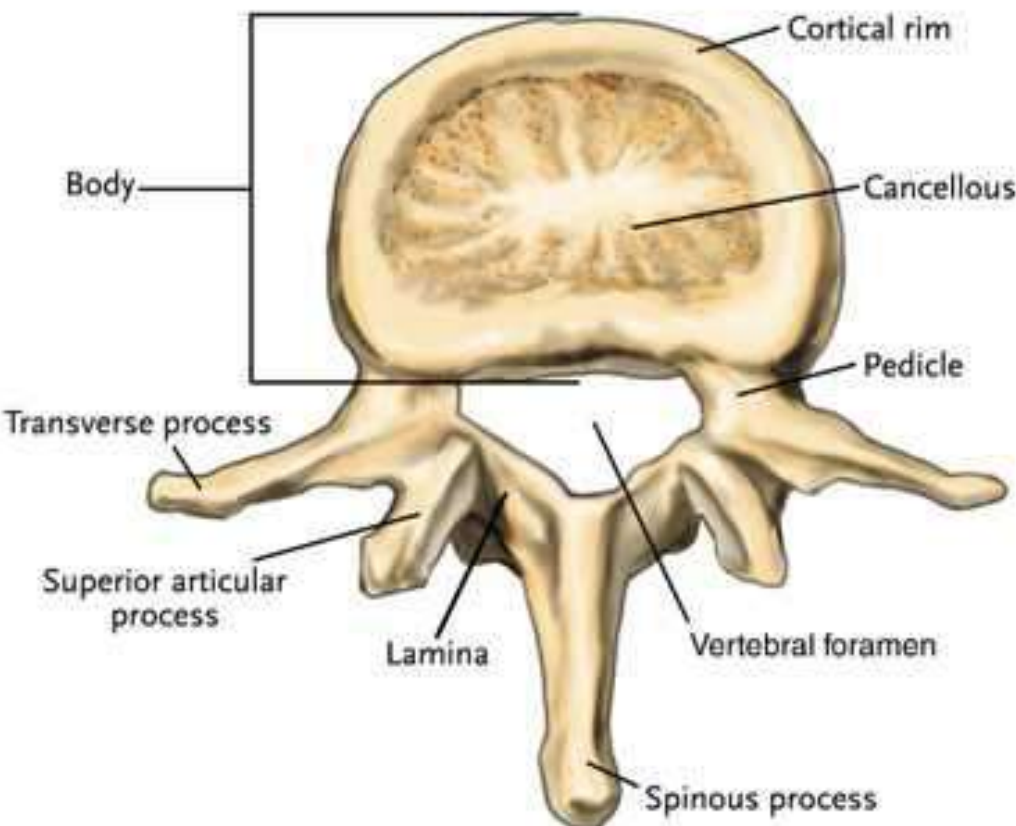
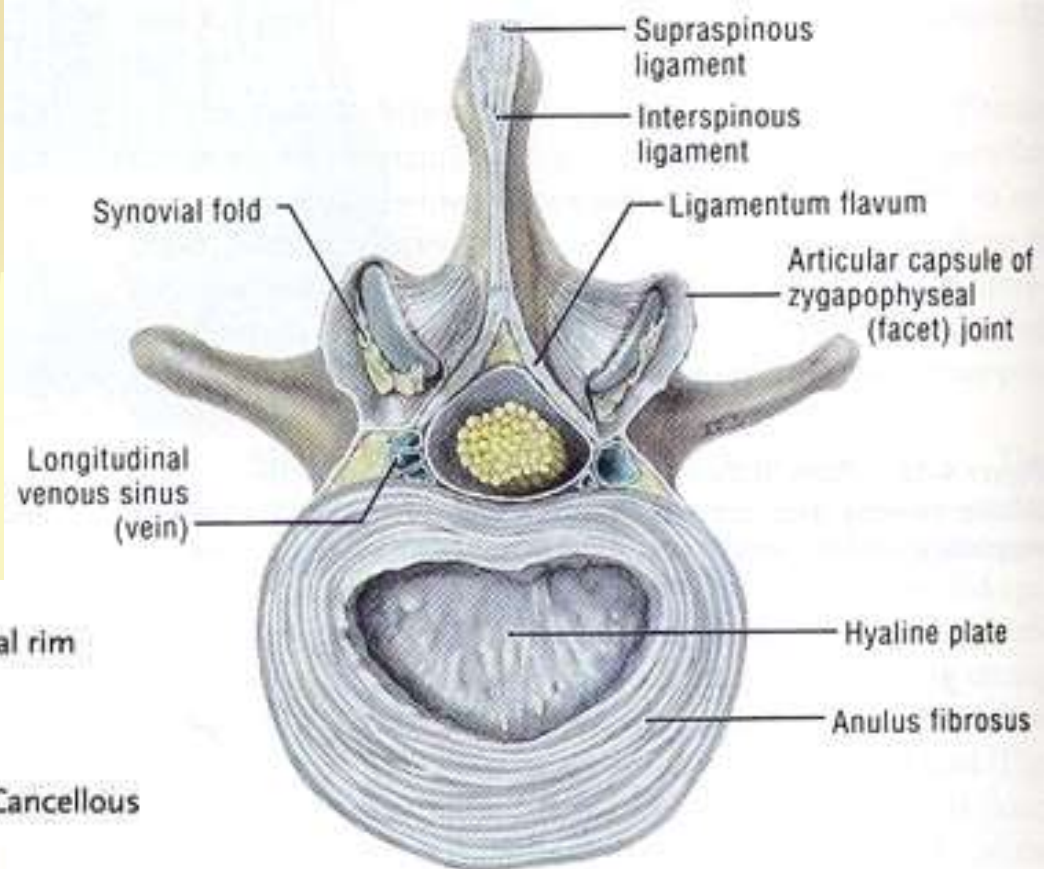
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- ✱ Persistence of symptoms should trigger a more extensive work-up for a cause
 - ✱ Keep in mind that litigation and Worker's Compensation claims may significantly affect a person's pain behavior and impact their motivation to return to work rapidly

Brief Review of Anatomy



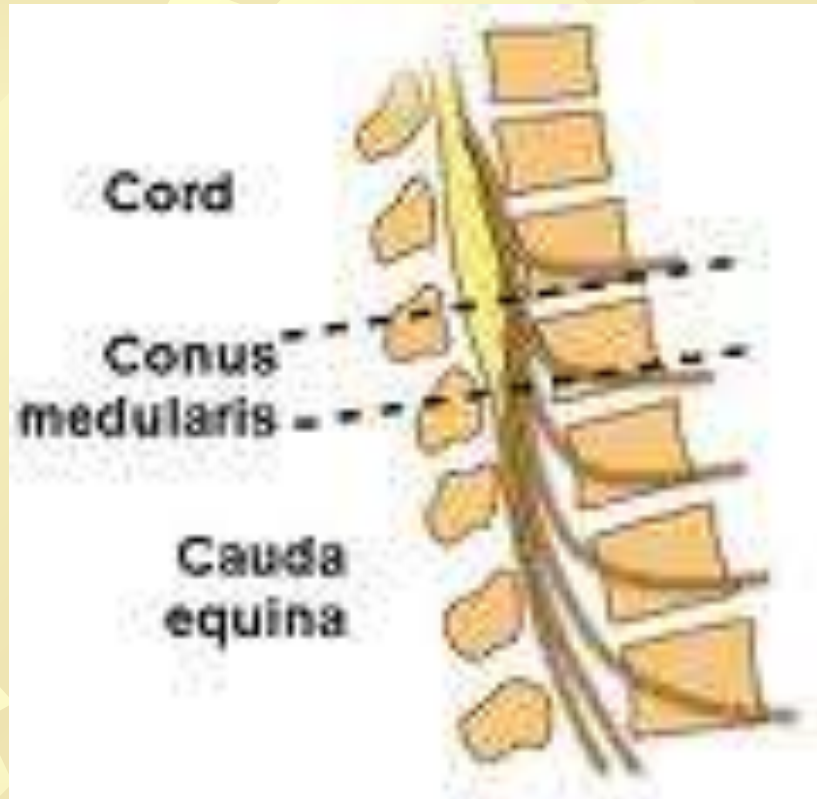
Lumbar Spine



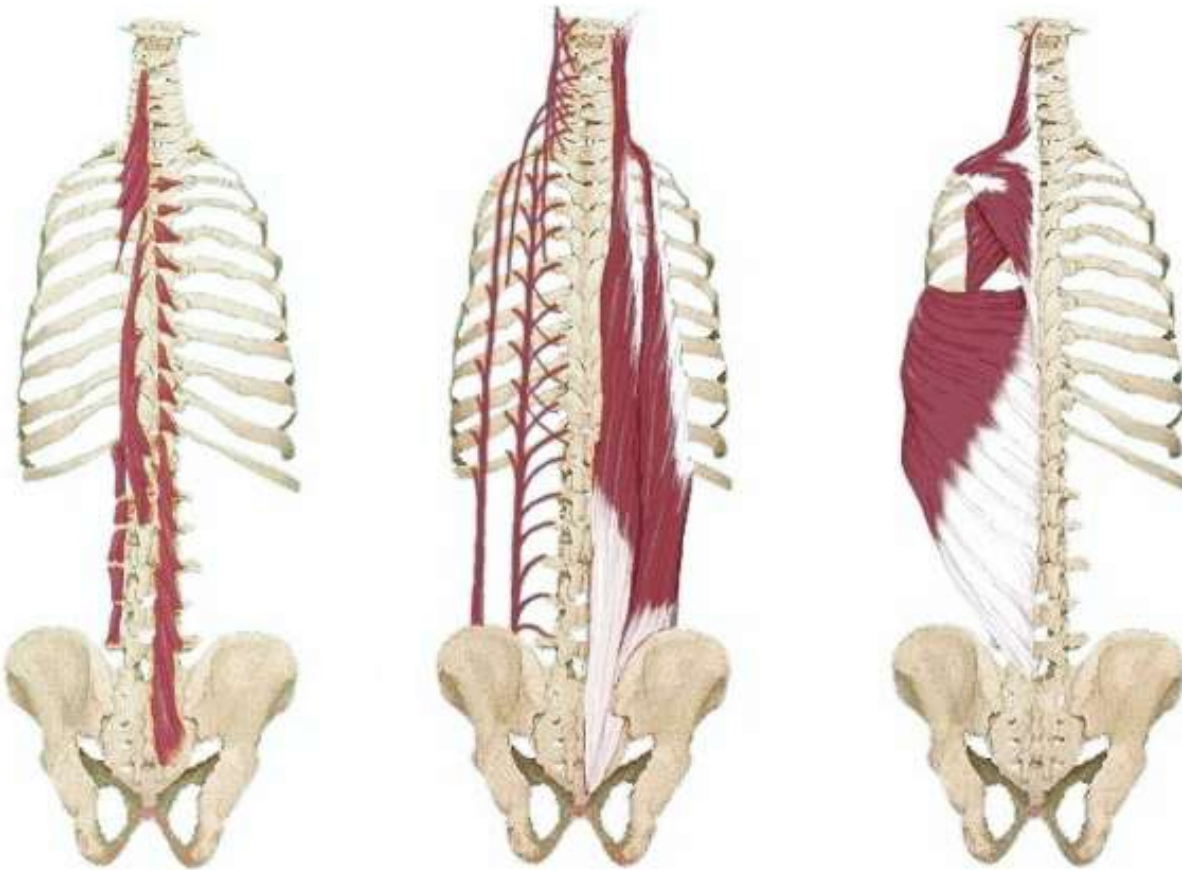


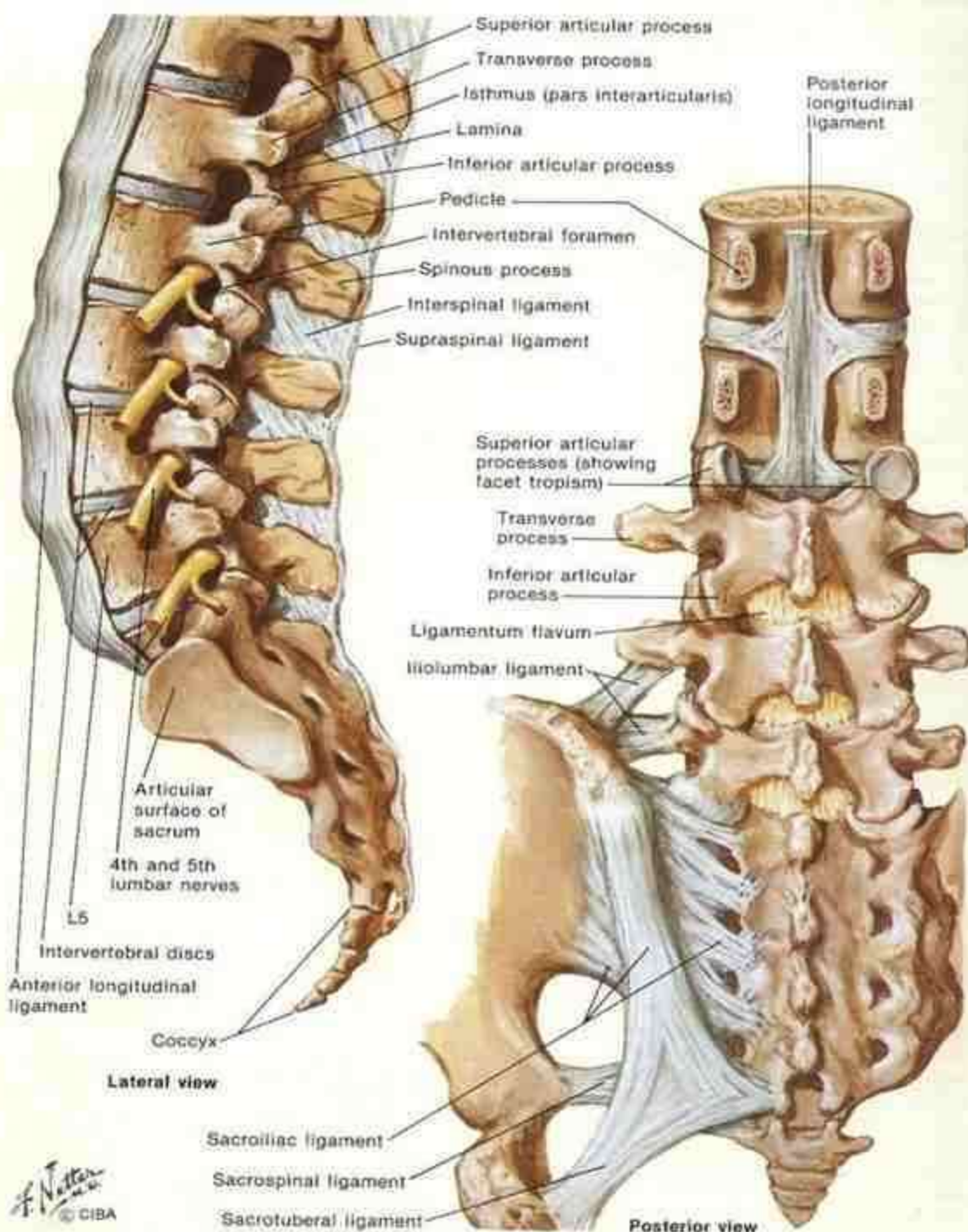


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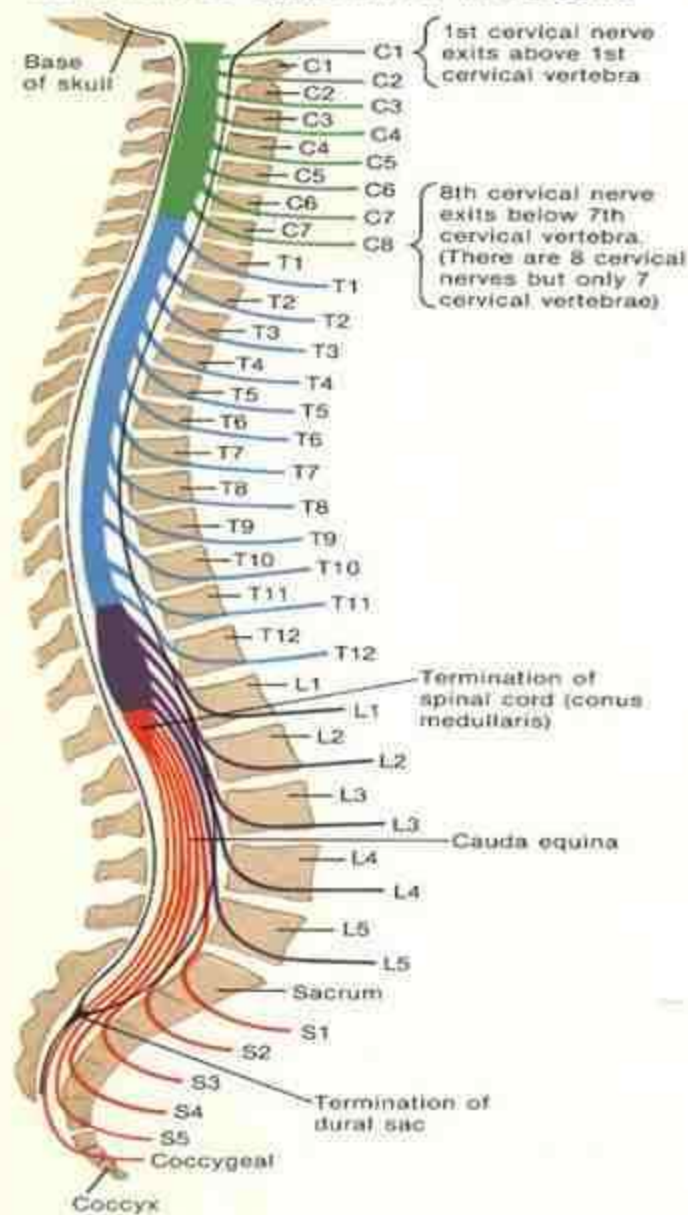


Muscles

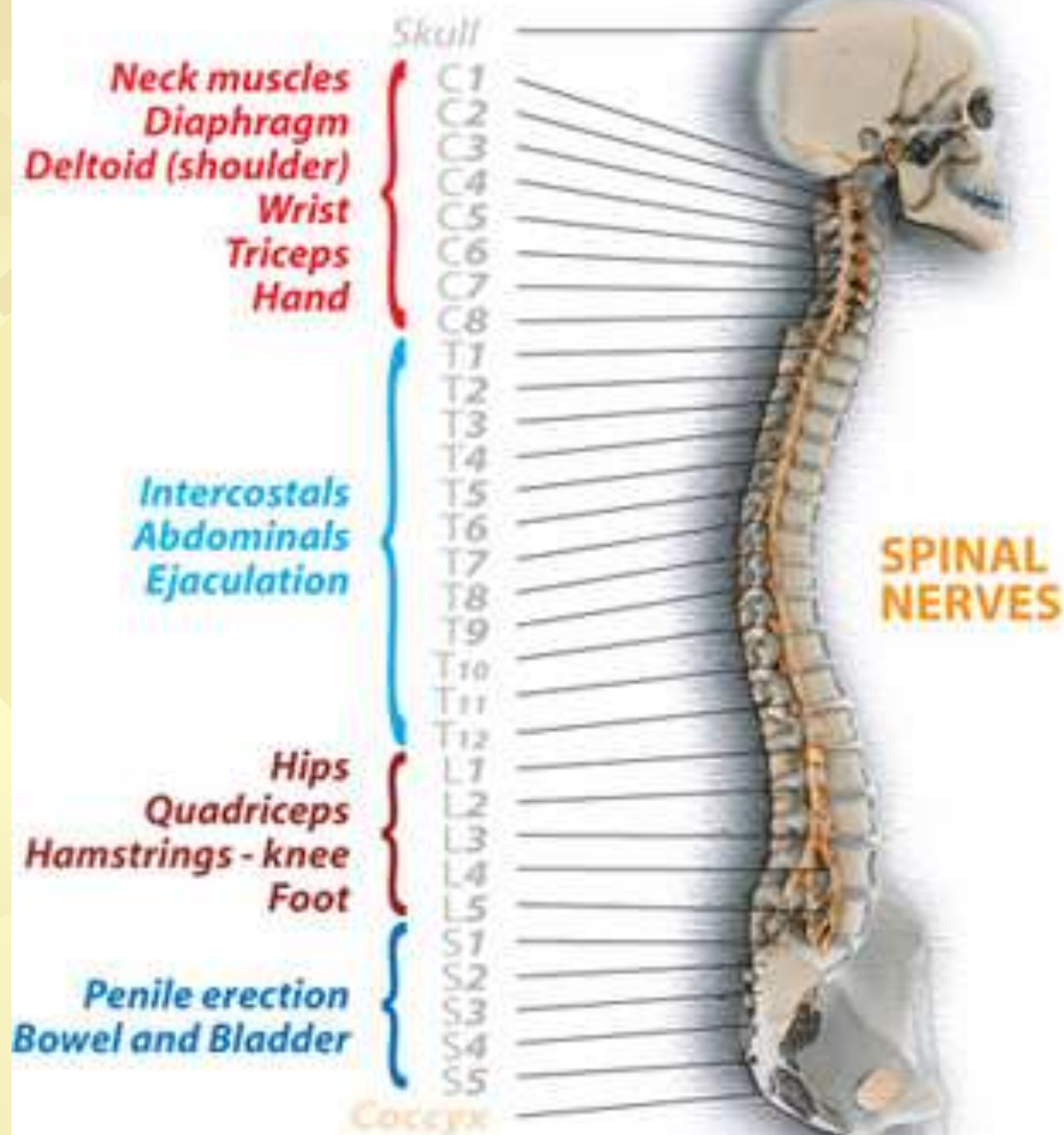




Relationship of Spinal Nerves to Vertebrae




- Cervical nerves
- Thoracic nerves
- Lumbar nerves
- Sacral and coccygeal nerves



Differential Diagnosis

- ✱ Inflammation
- ✱ Infection
- ✱ Degenerative disorders
- ✱ Neoplasms (primary and metastatic)
- ✱ Trauma
- ✱ Metabolic disorders

- 
- ✱ Developmental defects
 - ✱ Neurologic disorders
 - ✱ Referred pain
 - ✱ Psychological problems
 - ✱ Cauda equina syndrome

Types of Pain

- ☀ Night pain
- ☀ Acute post-traumatic pain
- ☀ Pain in children



Obtaining the History



- ☀ Location, duration, degree, and disability
- ☀ Determine the mechanism of injury or overuse
- ☀ Assess pain severity
- ☀ Establish the location of the pain
- ☀ Prior Surgery

Red Flags

- ☀ Cancer history
- ☀ Recent infection (urinary or skin)
- ☀ Immuno-compromised state
- ☀ Trauma
- ☀ Use of corticosteroids
- ☀ Progressive Neurological Deficit



- ☀ Bowel or Bladder changes
- ☀ Abdominal Pain
- ☀ Fever
- ☀ Saddle Anesthesia
- ☀ Night Pain
- ☀ Cauda Equina Syndrome

Physical Exam



Lumbar Spine, Hip, and Pelvis Physical Exam

- ☀ Remove clothing to expose the entire back
- ☀ Systematic Approach
 - ✳ Inspection
 - ✳ Palpation
 - ✳ ROM
 - ✳ Neuro-vascular Exam
 - ✳ Special Tests
 - ✳ Related areas



Inspection

- ☀ Observation

- ☀ Gait, signs of injury

- ☀ Asymmetry

- ☀ Pelvic Obliquity or Leg Length Discrepancy

- ☀ Edema

- ☀ Ecchymosis

- ☀ Redness

- ☀ Deformity

- ☀ Scoliosis

- ☀ Abnormal Hair Growth

Palpation

- ✱ Spinous processes
- ✱ Paraspinous muscles
- ✱ Sacroiliac joints
- ✱ Tip of coccyx
- ✱ Percuss firmly over posterior spine
- ✱ Assess for unequal leg length

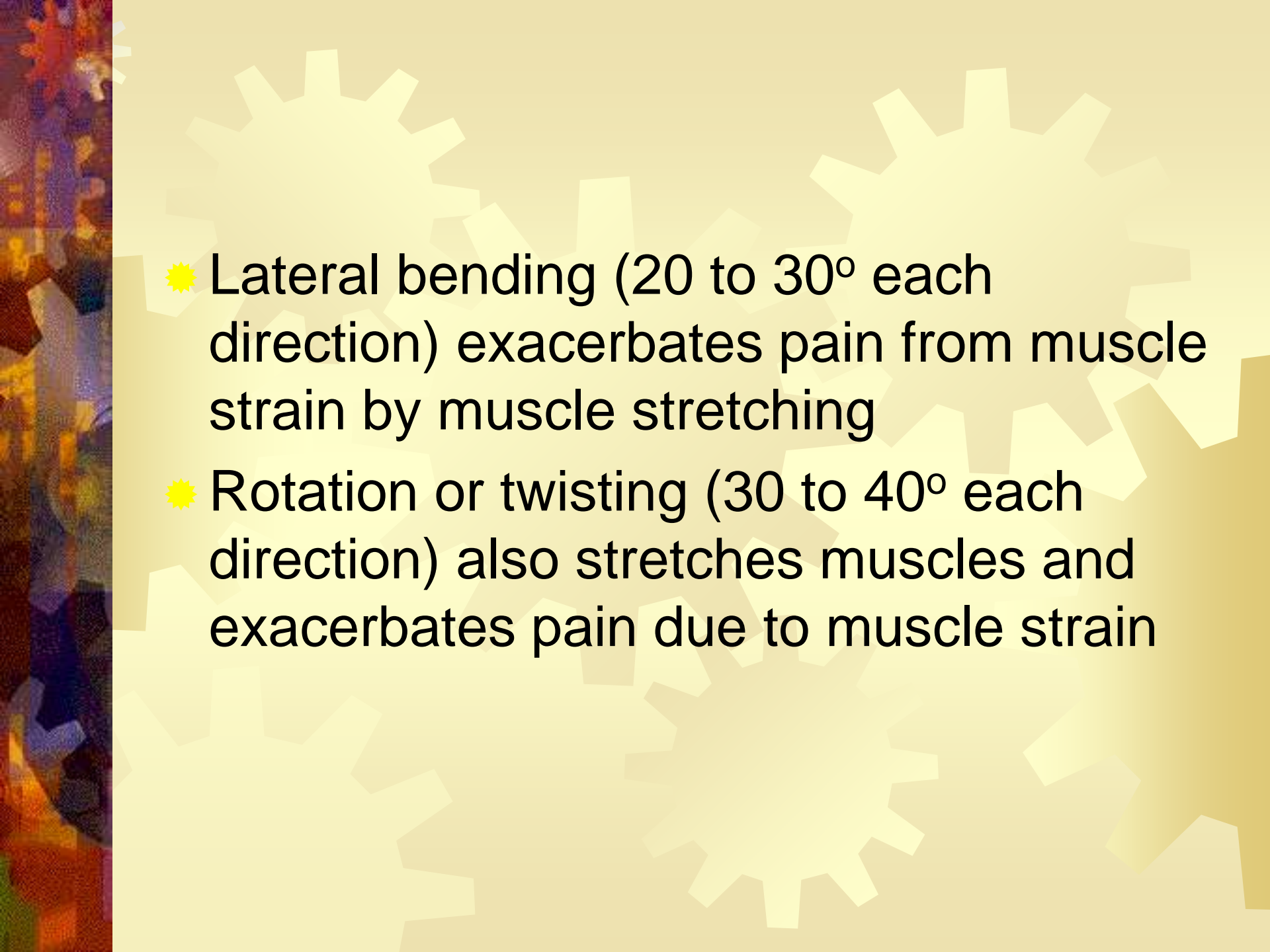
Palpation of Patient

☀ Osteopathic Criteria - TART

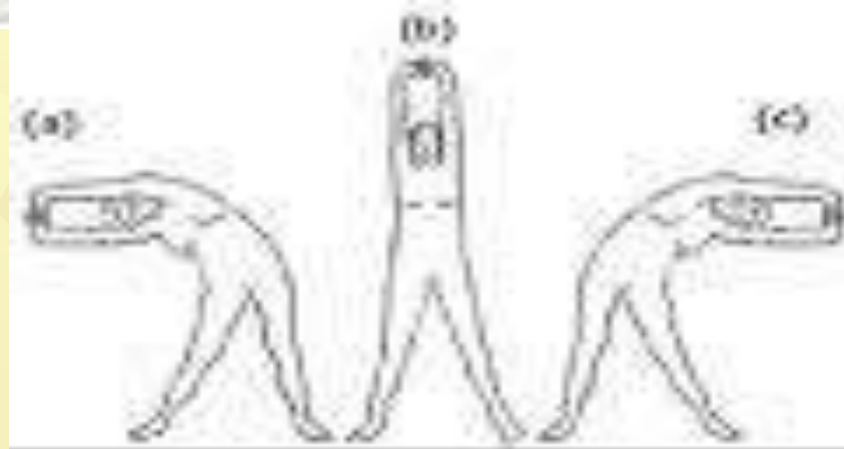
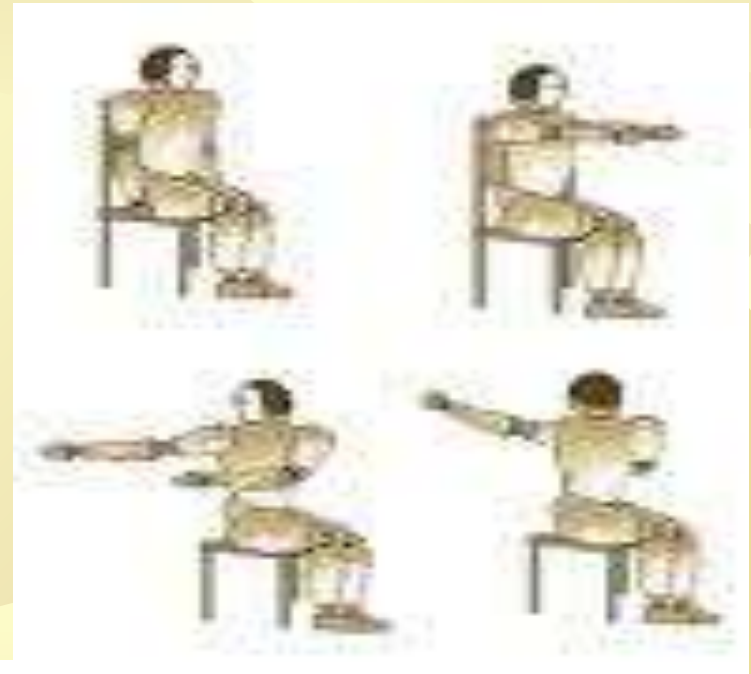
- ☀ Tissue texture changes
- ☀ Asymmetry
- ☀ Restriction of motion
- ☀ Tenderness (palpation)

Assessing Range of Motion

- ☀ Forward flexion (usually 80-90°) loads the discs and therefore can increase disc pain
- ☀ Observe this posture from the rear to evaluate for possibility of scoliosis
- ☀ Extension (usually 20-30°) loads the facets and can therefore increase facet pain

- 
- ☀ Lateral bending (20 to 30° each direction) exacerbates pain from muscle strain by muscle stretching
 - ☀ Rotation or twisting (30 to 40° each direction) also stretches muscles and exacerbates pain due to muscle strain

Range of Motion



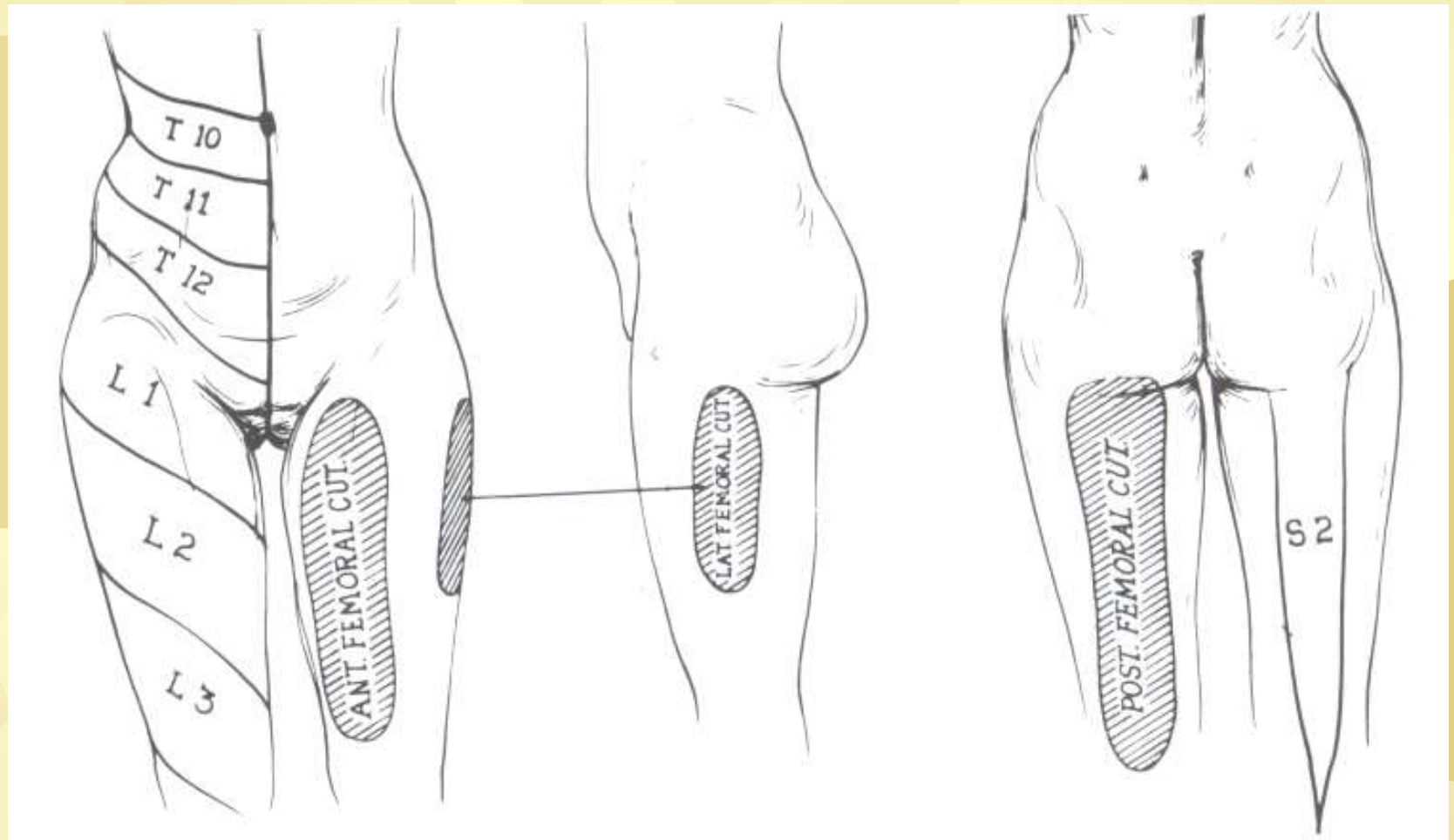
Strength Testing

- ☀ Heel walking (anterior tibial muscles – L4)
- ☀ Toe walking (gastroc-soleus muscles – S1)
- ☀ Resisted great toe dorsiflexion – L5

Focused Neurologic Exam

- ☀ Deep tendon reflexes – knee and ankle jerk
- ☀ Straight leg raise
- ☀ Evaluate for ankle clonus – positive response suggests an upper motor neuron lesion eg. proximal cord compression
- ☀ Crossed straight-leg raise test
- ☀ Rectal exam

Sensory Distribution



Normal Exam

- ☀ Video by Rob Rutherford, MD

Special Testing - Adults

- ☀ Thomas
- ☀ Trendelenburg
- ☀ Stork Test
- ☀ Leg Length
- ☀ Hamstrings
- ☀ Quadriceps
- ☀ Ely's Test
- ☀ Ober
- ☀ Straight Leg Raise
- ☀ FABER
- ☀ FADIR
- ☀ Fulcrum
- ☀ Pelvic Rock Test
- ☀ Flexion
 - ☀ Seated and Standing
- ☀ Spring Test

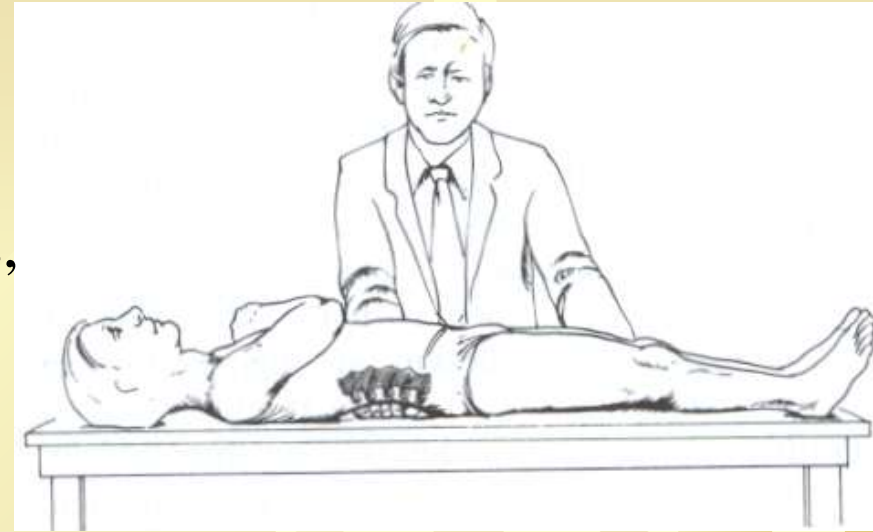
Thomas Test

Test: Iliopsoas, Rectus Femoris, TFL, ITB, Flexion Contracture

Patient: Supine

Physician: Stabilize pelvis w/hand under lumbar spine, Flex both pt legs until lumbar flattens, pt extends one leg

Positive Test: unable to have:
RF – 90 degrees of knee flexion;
IP – neutral angle of hip; or
TFL/ITB – 15 degrees of hip ABD.

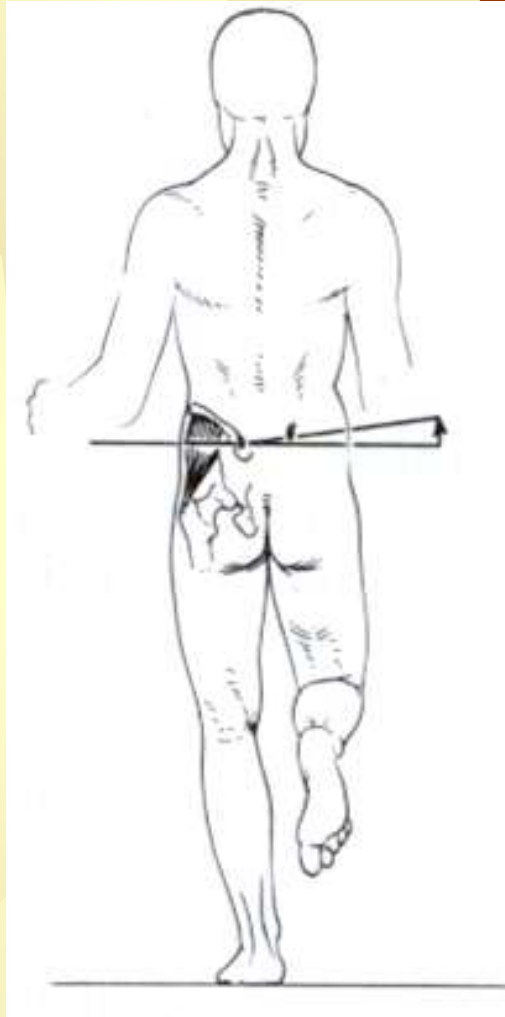


Hoppenfeld, Stanley, Physical Exam of Spine and Extremities, 1976.

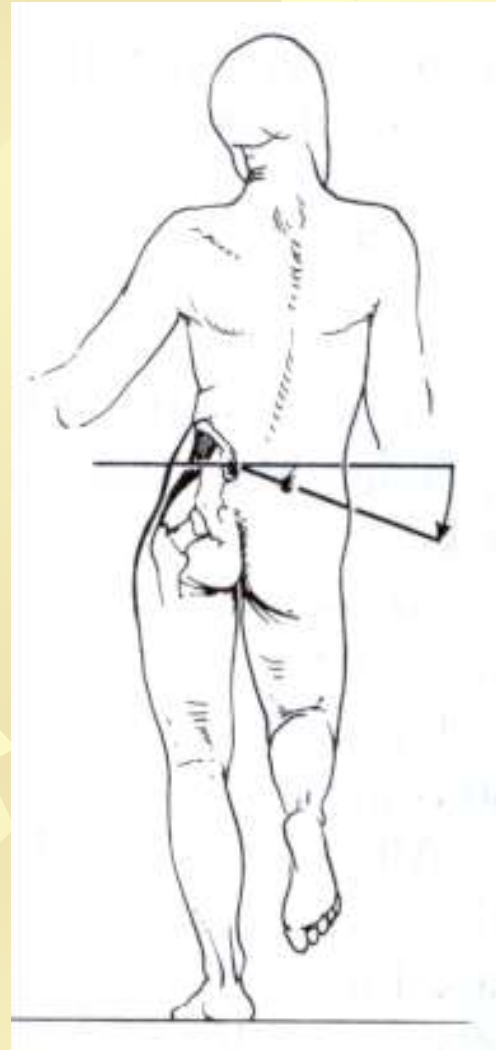
Trendelenburg's Test

- ✱ Test: Gluteus Medius Strength
- ✱ Patient: Standing
- ✱ Physician: Behind patient, ask pt to stand on one leg, monitor pelvis – horizontal vs. obliquity
- ✱ Positive: Pelvis drops on contralateral side of weak gluteus medius

Trendelenburg

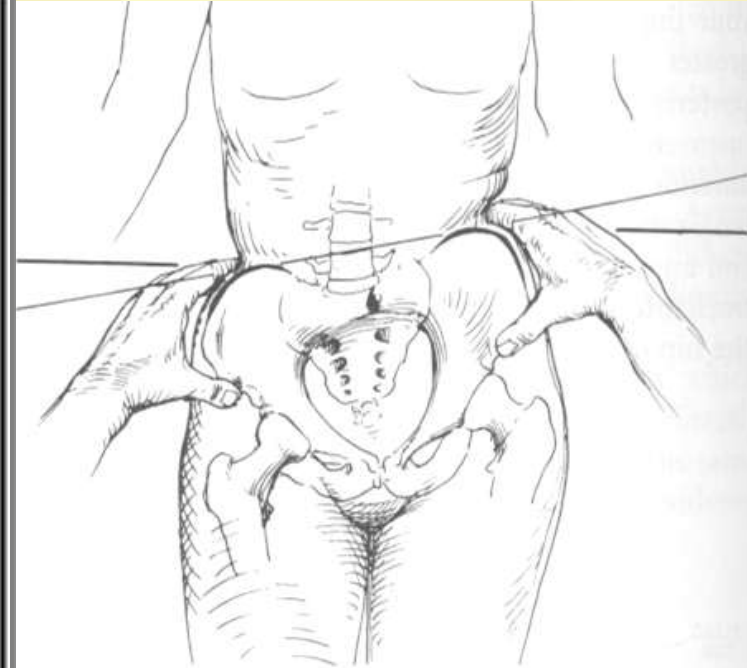
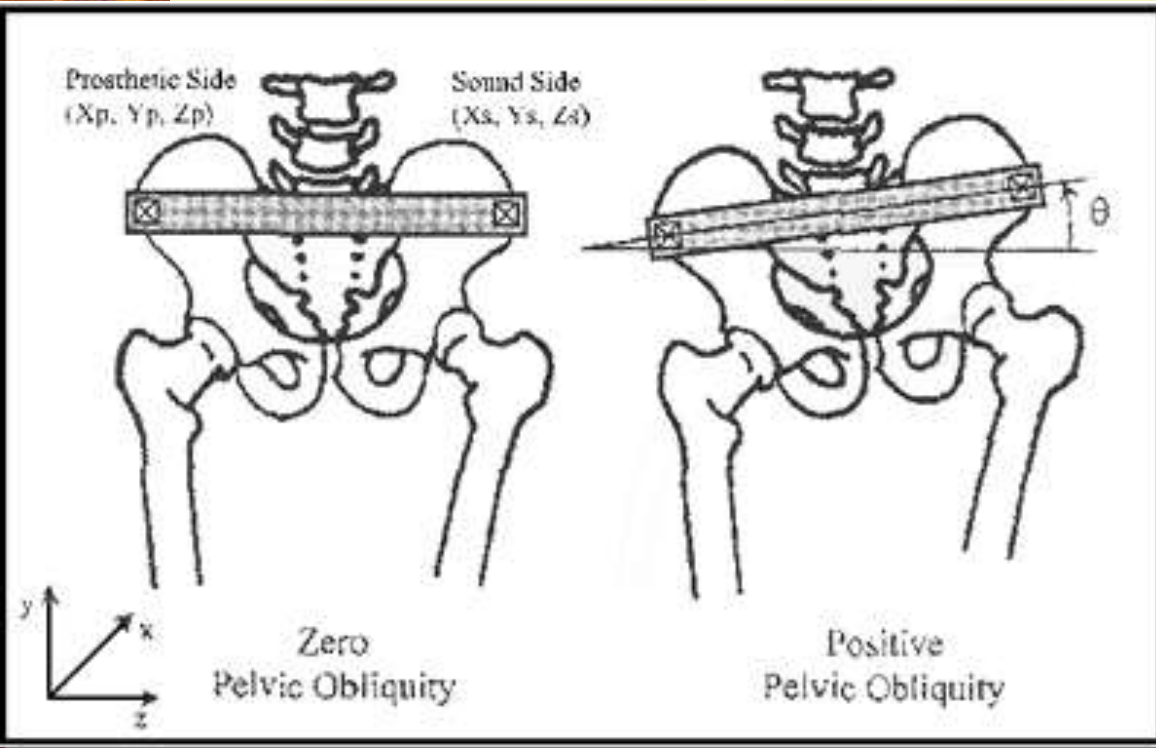


Negative
Trendelenburg Test



Positive
Trendelenburg Test

Pelvic Obliquity

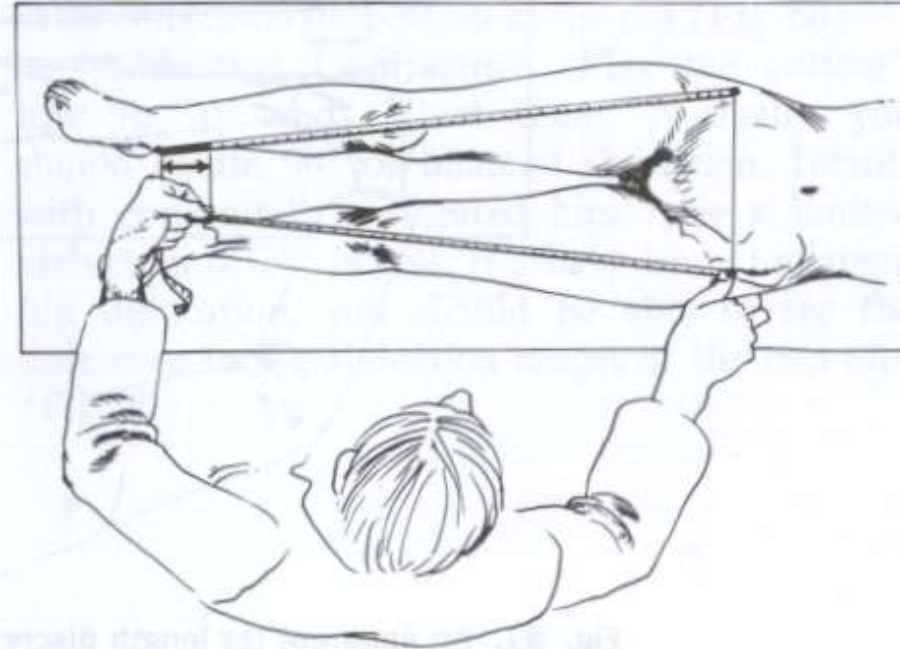
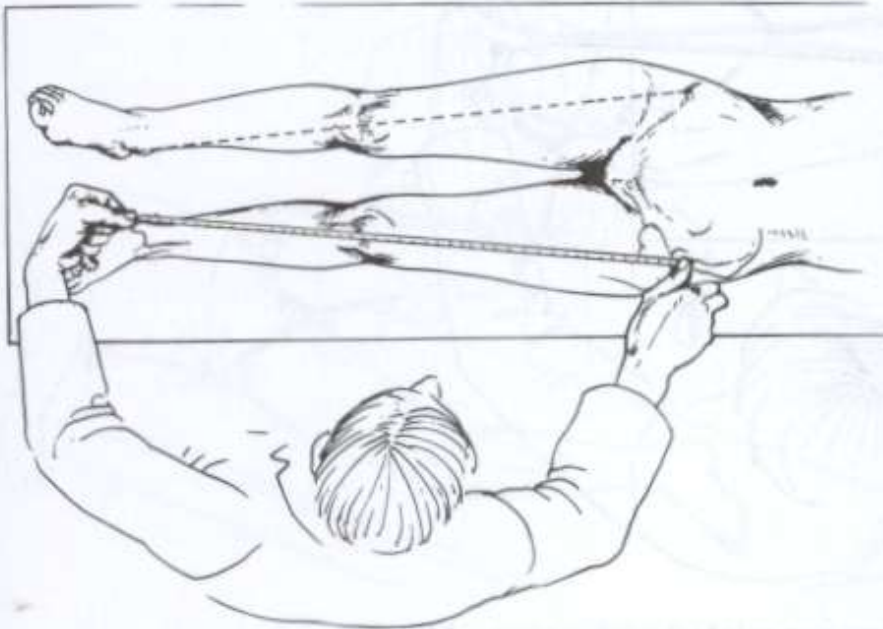


Stork Test

- ☀ Stork test (one-leg standing hyperextension test) – exacerbates pain related to spondylolysis, spondylolisthesis, or sacroiliac joint dysfunction



Leg Length

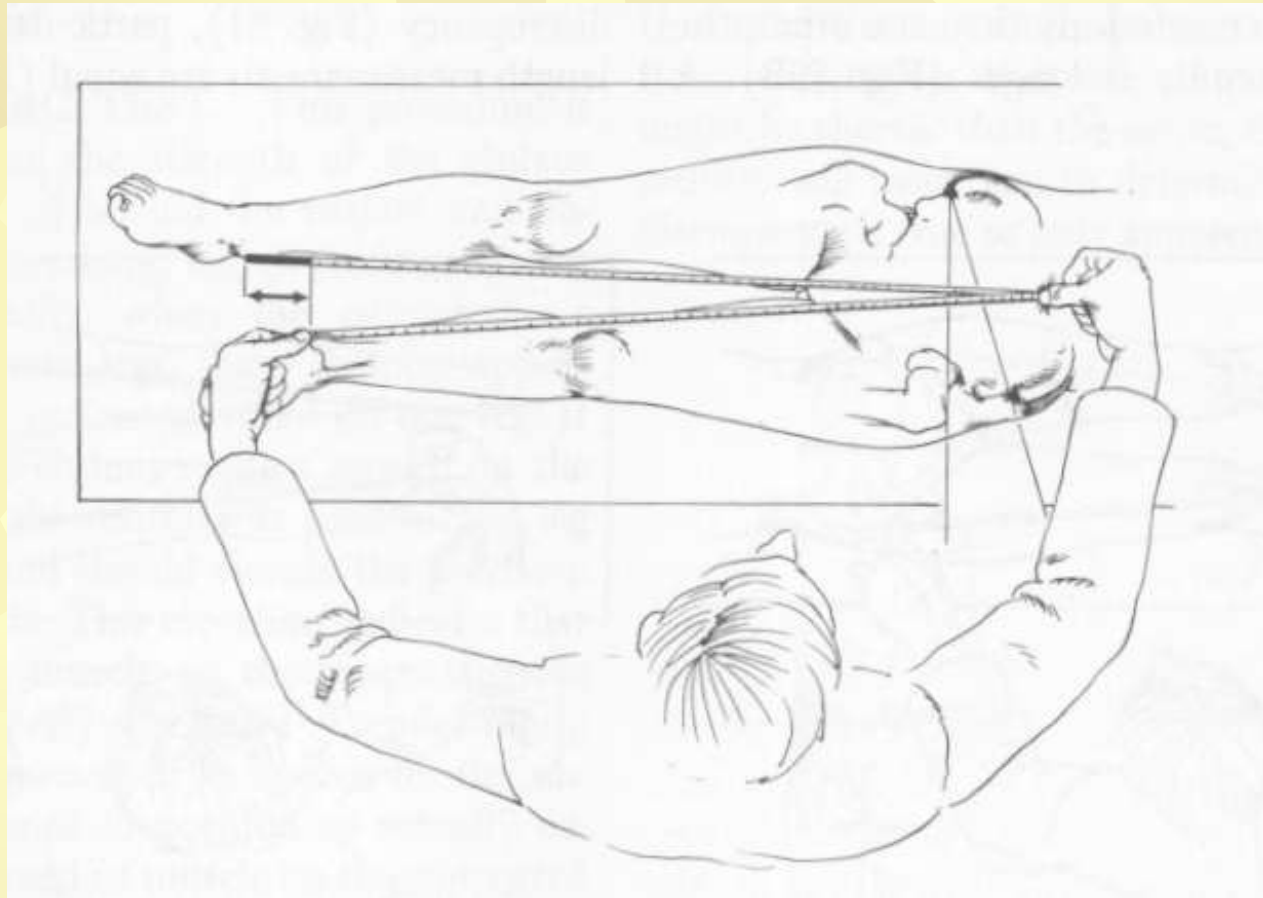


Measure from one fixed bony point to another to find true leg length (ASIS to Medial Malleolus)

True leg length discrepancy

Hoppenfeld, Stanley, Physical Exam of Spine and Extremities, 1976.

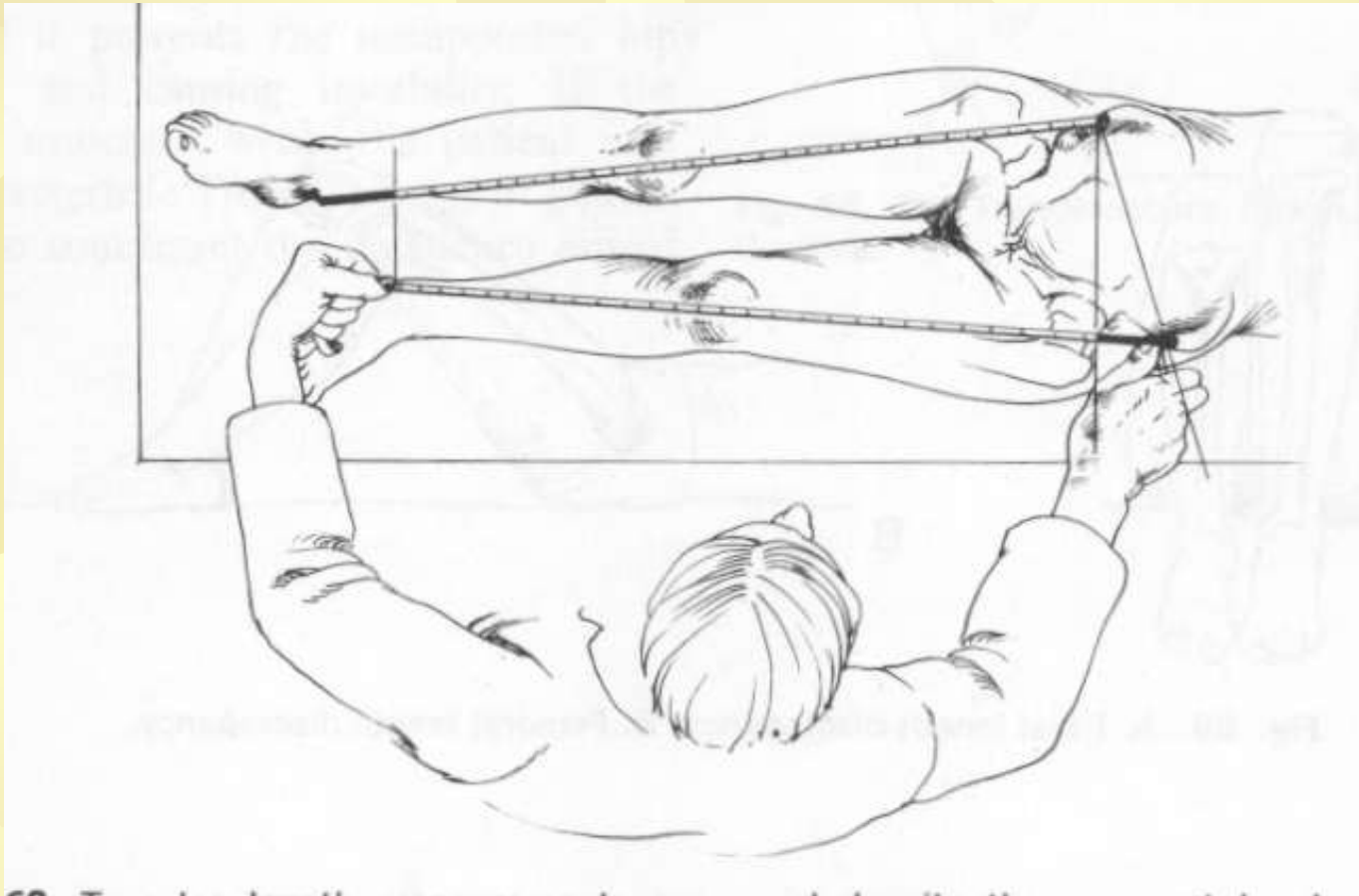
Apparent Leg Length Discrepancy



An apparent leg length discrepancy
due to pelvic obliquity

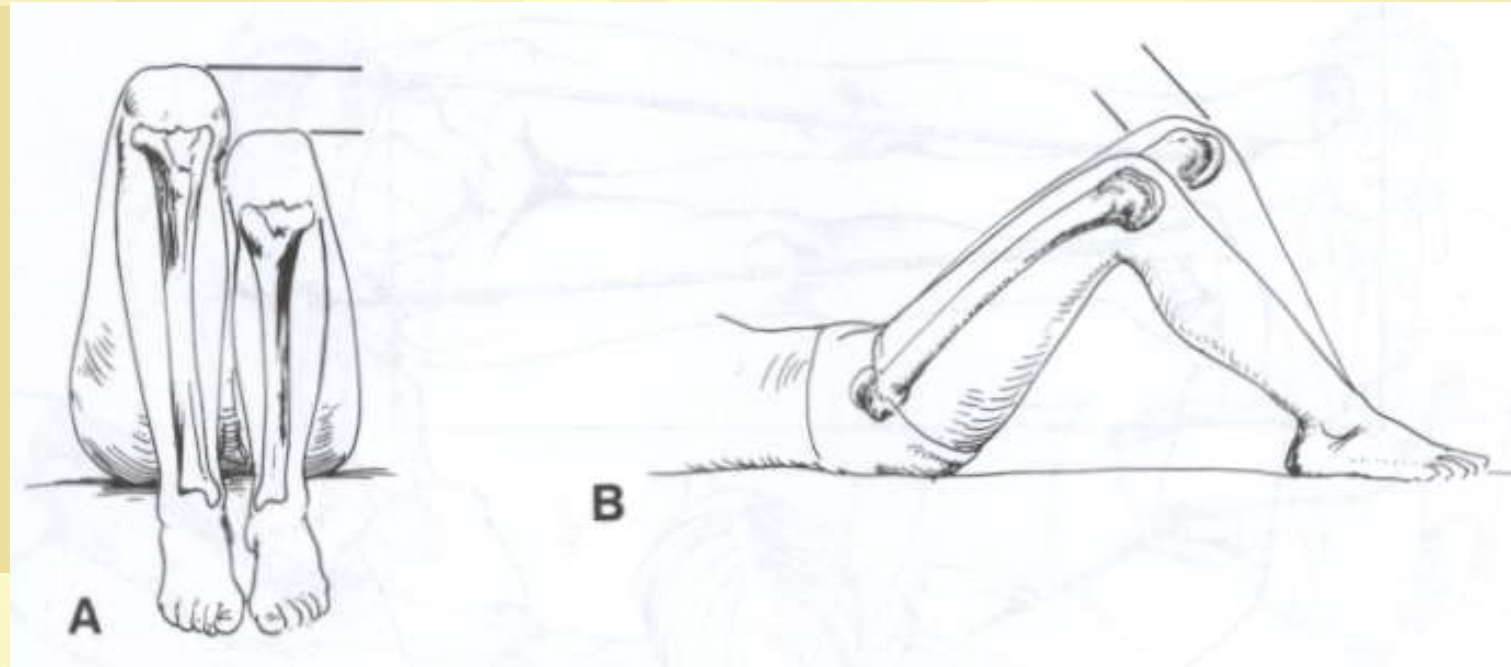
Hoppenfeld, Stanley, Physical Exam
of Spine and Extremities, 1976.

True Leg Length Discrepancy



True leg length measurements are equal despite the apparent discrepancy

Leg Length



Tibial length
discrepancy

Femoral length discrepancy

Hamstrings

- ☀ Test: Hamstring
- ☀ Patient: Supine
- ☀ Physician: Flex pt hip to 90, then extend knee
- ☀ Positive: Inability to extend the knee, Measure the contracture



Quadriceps

- ☀ Test: Quadriceps
- ☀ Patient: Prone
- ☀ Physician: Flex pt knee, heel to buttock
- ☀ Positive: Inability for heel to touch buttocks, Measure the contracture



Ely's Test

- ☀ Test: Rectus Femoris
- ☀ Patient: Prone
- ☀ Physician: Flex pt knees
- ☀ Positive Test: The hip on ipsilateral side spontaneous flexes

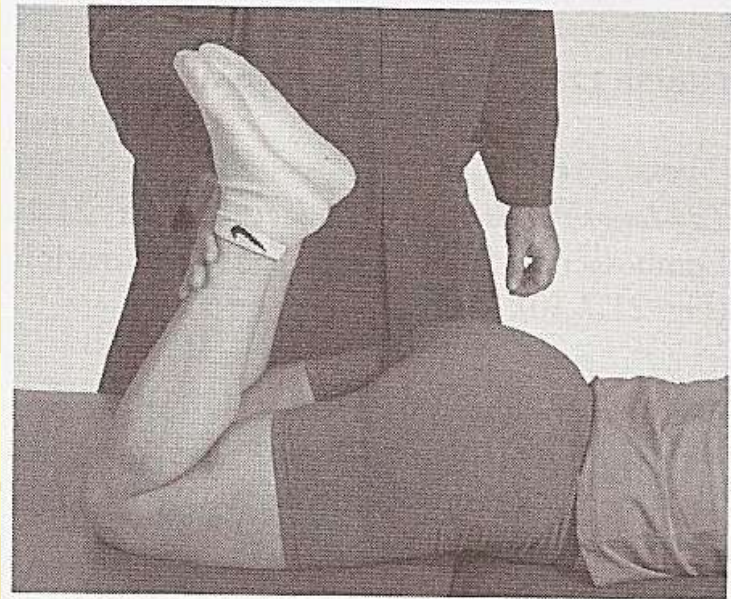


FIGURE 22.2.11. Ely's test.

Ober Test

- ☀ Test: IT Band
- ☀ Patient: Lateral Recumbant
- ☀ Physician: Behind pt, stabilize pelvis with one hand and support the pt leg with other, abduct hip and flex knee to 90, allow leg to drop to table
- ☀ Positive: Leg stays abducted



Ober Test

The Ober test to test for contraction of the tensor fascia lata and ITB



Negative Ober

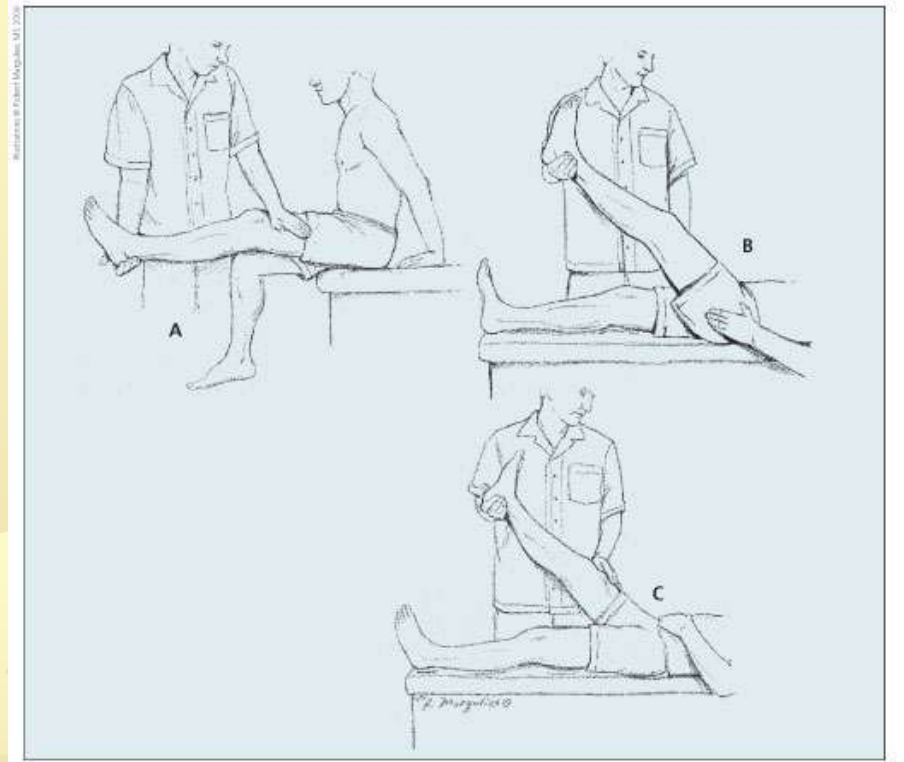


Positive Ober

Straight Leg Raise

- ✱ Lift the leg with knee extended while patient is sitting or supine
- ✱ Radiation of pain past the knee suggests sciatica, frequently caused by L5-S1 disc herniation
- ✱ Ankle dorsiflexion increases sciatic pain
- ✱ Ankle plantarflexion decreases sciatic pain

Straight Leg Raise Test



<http://www.musculoskeletalnetwork.com/display/article/1145622/1397911#>



FABER

- ☀ Test: Hip or SI Joint
- ☀ Patrick Test
 - ☀ Flexion
 - ☀ Abduction
 - ☀ Eternal Rotation
- ☀ Patient: Supine
- ☀ Physician: Cross pt one leg over other, F, AB, ER the hip
- ☀ Positive: Anterior – Hip, Posterior - SI



FADIR

- ☀ Test: Femoral Acetabular Impingement

- ☀ FADIR

 - ☀ Flexion

 - ☀ Adduction

 - ☀ Internal Rotation

- ☀ Patient: Supine

- ☀ Physician: Beside pt, F, ADD, IR the hip

- ☀ Positive: Anterior Lateral Hip Pain,
“C” Sign



Fulcrum Test

- ✱ Test: Stress Fracture Femur
- ✱ Patient: Seated, Knees extended
- ✱ Physician – one hand under femur, other hand on top of knee, applies pressure
- ✱ Positive – elicits pain in femur

Pelvic Rock Test

- ☀ Test: Restriction or SD of SI joints or pelvis
- ☀ Innominate Rock Test
- ☀ Patient: Supine
- ☀ Physician: Both hands over ASIS, apply alternating forces
- ☀ Positive – Firm palpatory findings



Flexion Tests

★ Standing

- ★ Physician seated, pt standing, Thumbs on PSIS
- ★ Pt forward flexes at waist
 - ★ POSITIVE – asymmetry
 - ★ Indicates: Iliosacral SD on ipsilateral side

★ Seated

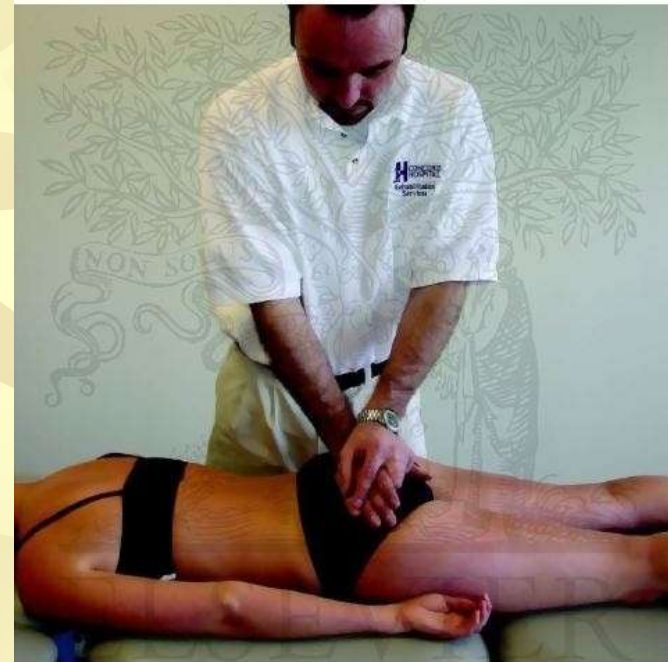
- ★ Pt seated on stool/table, physician thumbs on PSIS, pt forward flexes
 - ★ POSITIVE – asymmetry
 - ★ Indicates: sacroiliac SD on ipsilateral side

Standing Flexion Test



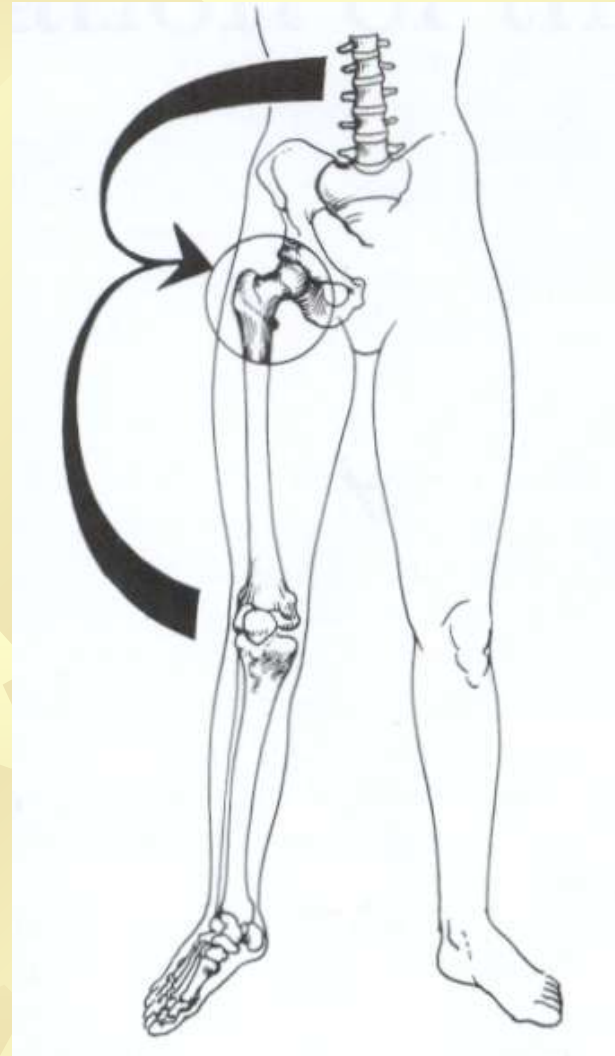
Spring Test

- ☀ Test: Sacral dysfunction
- ☀ Patient: Prone
- ☀ Physician: Gentle pressure
- ☀ Positive: Resistance to force
- ☀ Indicates: Sacral SD – unilateral or bilateral backward sacrum



Related Area Exam

- ✶ Lower Back
- ✶ Hip
- ✶ Knee



Questions?



Thank You!

References

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