Practical Assessment of the Chiropractic Patient

A 9 Procedure Spinal Screening Examination

K. Jeffrey Miller, DC, FACO, MBA
Chiropractic Orthopaedist

Are you familiar with….?

- The Slump Test
- Sphinx Test
- Prone Knee Flexion Test
- Brachial Plexus Stretch Test
- Fortin's Finger Sign
- Aberrant Range of Motion
- Arm Rolling
- Finger Rolling
- Maximal Foraminal Compression Test
- Bonnet's Test
- FAST
- Cincinnati Prehospital Screening Test
- Drift
- Tandem Stance
- Vanzetti's Test

Nine Procedures

1. Drift & Maximal Foraminal Compression Tests
2. Brachial Plexus Stretch Test
3. Seated Kemp's Test
4. Modified Slump Test
5. Sphinx & Prone Knee Flexion Tests
6. Yeoman's & Femoral Stretch Tests
7. Hibb's & Patrick FABER Tests
8. Fluid Motion Test
9. Rotation/Side Posture Screening & FAIR/Piriformis Tests

Disclaimer

- The following examination procedures are the author's best recommendations for the profession based on his education and experience. The procedures do not establish a standard of care for the profession

Disclaimer

- The following procedures ARE NOT the encouragement of short cuts or skipping important procedures. THEY ARE designed to make the examiner efficient by gathering more information in a shorter period of time to improve diagnosis, plans of care, treatment and ultimately prognosis

Non-Technique Specific

- The following procedures are independent of examination procedures utilized by individual chiropractic adjusting techniques

Non-Technique Specific

- The doctor can combine any of the exam procedures and concepts described here with his or her choice of technique(s) and the technique's analytical procedures

Important Concepts

- Observation; Many clinical findings related and unrelated to the test being performed can be observed during performance of that test

Important Concepts

- Everything Moves;
- In a midline test for example…
  - If you flex the cervical spine…The bones, ligaments, disks muscles, the cord, blood vessels, the trachea, the esophagus etc., all move

Important Concepts

- Everything Moves;
- In a bilateral test…
  - If a structure on one side is compressed the same structure on the opposite side is often stretched

Important Concepts

- Replication; many tests have the same mechanism of performance but have different pathological meanings

Important Concepts

- Combinations; orthopedic and neurological tests can be combined to improve efficiency and differential diagnosis

Important Concepts

- There are four methods for combining tests
- 1. Testing by Indirect Method
- 2. Same Mechanism/Different Pathology
- 3. Different Mechanism/Same Pathology
- 4. Sequential Testing

Testing by Indirect Method

- Examples
  - Pulse and Respiration Rates
  - Orthopedic Tests and Range of Motion

Same Mechanism/Different Pathology

- Examples
  - Soto-Hall and Lindner's
  - C6 Motor Function and Cozen's Test

Different Mechanism/Same Pathology

- Examples
  - SLR and Lindner's
  - Brudzinski's and Kernig's

Sequential Testing

- Examples
  - SLR and Bragard's
  - Cervical Compression and Cervical Distraction

Important Concepts

- Patient Position; Orthopedic and neurological tests have traditional patient positions but most can be performed in more than one position.
  - Tests depicted in photos may vary slightly from the recommended examination procedures for demonstration purposes…Why?

Important Concepts

- Space Considerations: There are instances where a test may replace another when examination room space is limited

Combination Drift and Maximum Foraminal Compression Test

PROCEDURE ONE

Drift and Maximum Foraminal Compression

- Drift is a test for upper motor neuron lesions
- Maximal Foraminal Compression Test is for radicular problems emanating from the cervical spine

Drift

- Basic Life Support (BLS)
  - American Heart Association
  - Cincinnati pre-hospital stroke
- Scale (one positive)
  - Facial droop
  - Arm drift
  - Abnormal speech
- Acceptance/Reliability

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Drift

- F.A.S.T.
  - Face
  - Arms
  - Speech
  - Time

Drift

- Names
  - Drift
  - Pronator Drift
  - Spontaneous Drift
  - Barre's Test (some confusion here because there is a Barre's test for the cervical spine)
    - Jean Alexandre Barre' first described the sign

Drift

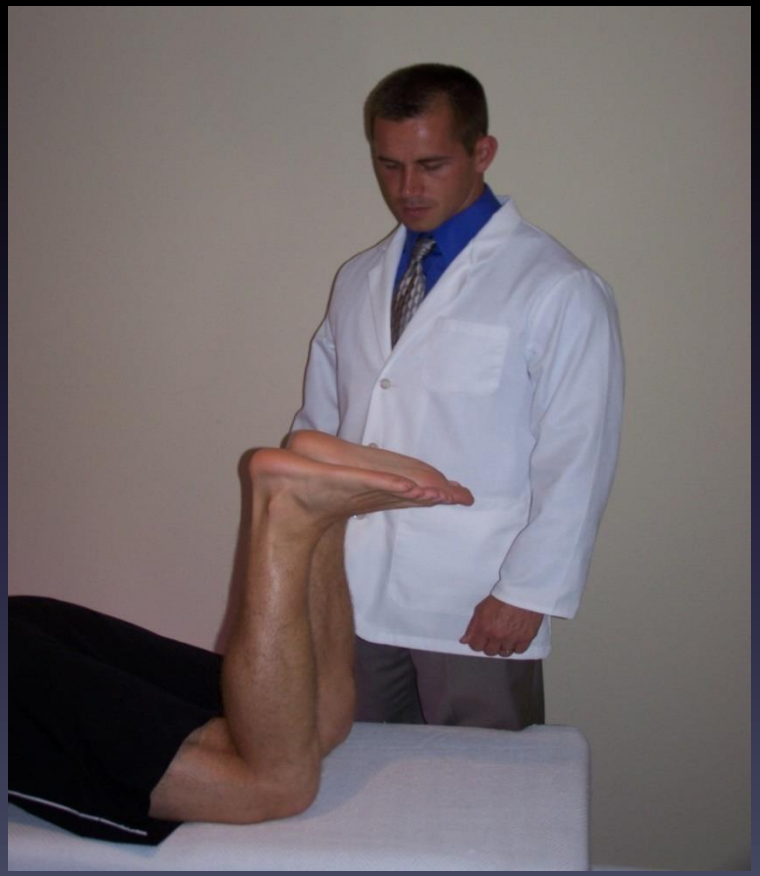
- Positive Indications:
  - One hand rolling from supination to pronation is a positive
  - Typical sign is the hand rolling from supination to pronation with the arm dropping toward the floor
  - The arm drifts laterally (outward) in cerebellar lesions
    - These lesions are unilateral
  - The arm drifts upward in Parietal lesion
    - These lesions are contralateral

Drift

- Positive Indications:
  - Movements are slow and may take a few seconds to initiate
  - Tapping the hand or arm may help initiate movement
  - Both arms drifting is not significant

Lower Extremity Drift Starting and Normal

- This is a side note
- Confirmatory Test to Upper Extremity Drift (UMN)
- The eyes



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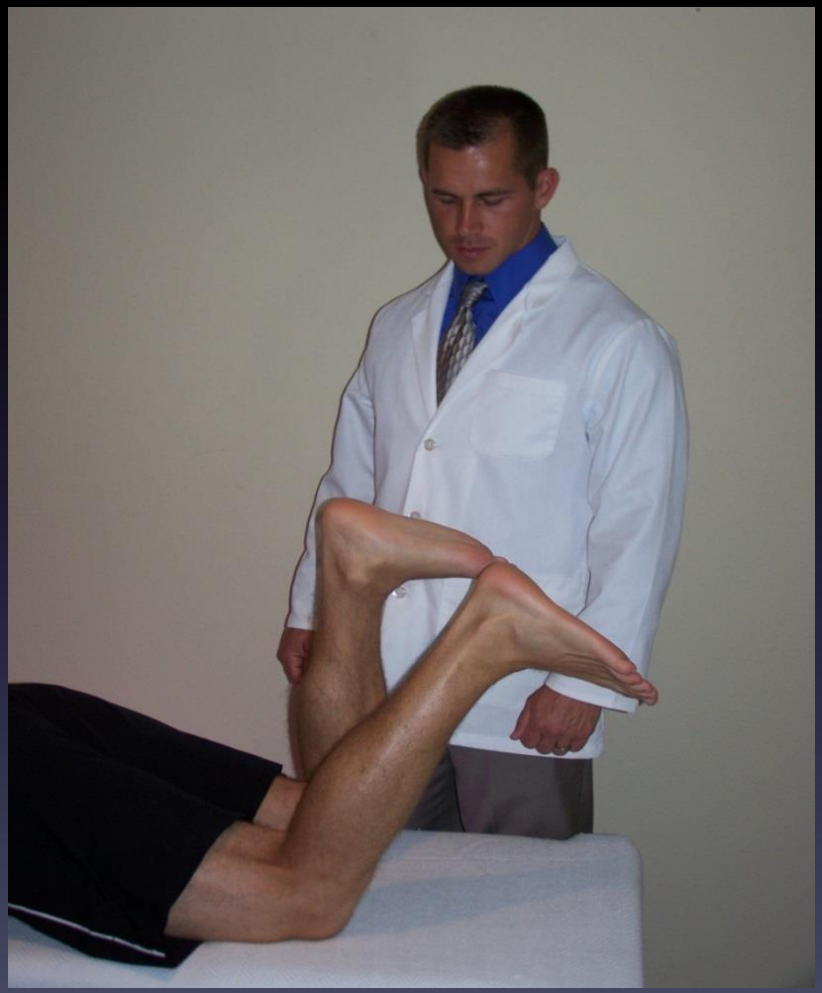
Lower Extremity Drift Abnormal

- This is a side note
- Are the eyes closed?
- Does it matter?



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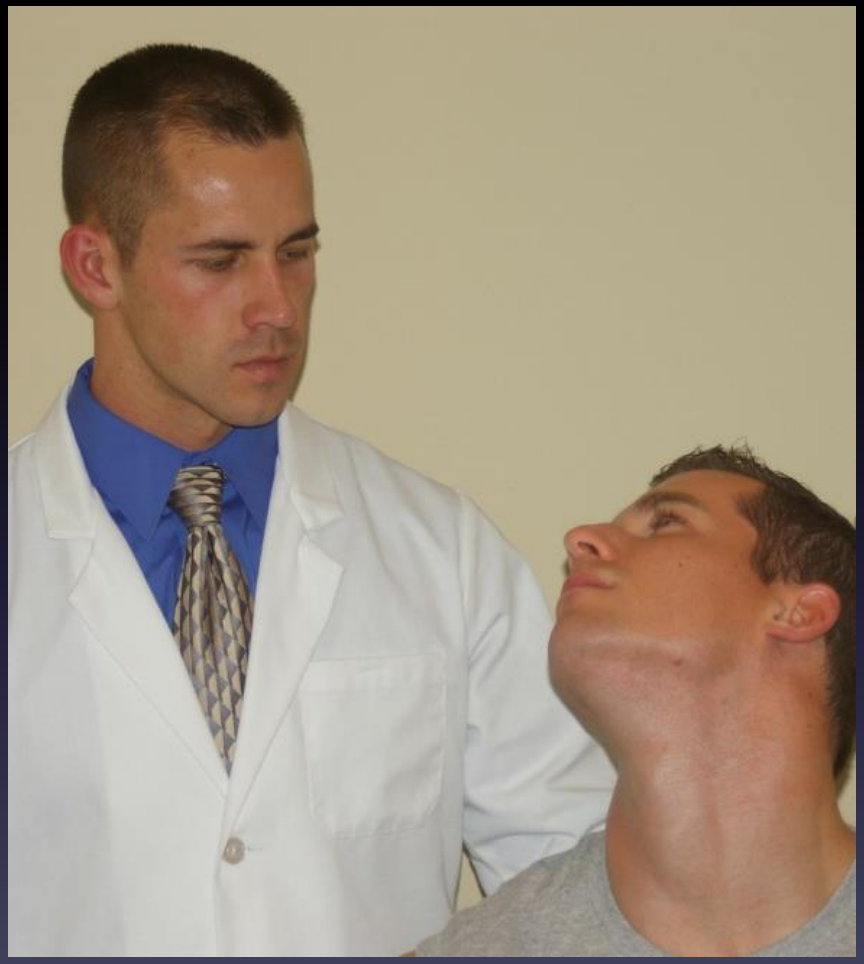
Maximum Foraminal Compression



- Max Cervical
  - Upper Extremity

    Radicular Symptoms

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Head Rotation

- The lesions identifiable by Drift are present regardless of head position
- This allows the test to be performed with the head rotated and allows the test to be combined with other tests

Drift and Maximum Foraminal Compression

UMN vs. LMN

- Upper Motor
  - Spastic Muscle Weakness
  - Hyper-reflexia
  - Pathological Reflexes Present
  - Superficial Reflexes Diminished/Absent
  - Centralization
- Lower Motor
  - Flaccid Muscle Weakness
  - Hypo-reflexia
  - No Pathological Reflexes Present
  - Superficial Reflexes are Present
  - Localization

Adson's and Halstead's

- While the examiner will not be palpating the radial pulse during the examination recommended, the patient may report TOS extremity symptoms with this head position
- S/S on side of head rotation=Adson"s
- S/S on the side opposite of head rotation=Halstead's

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Replication of Hautant's Test

- Vertebral Artery Test
- Doctor Should Position Patient's Head
- Eyes Must be Closed
- Held 15-30 Seconds Each Side
- Drift
  - Objective
  - Validity by Common Use

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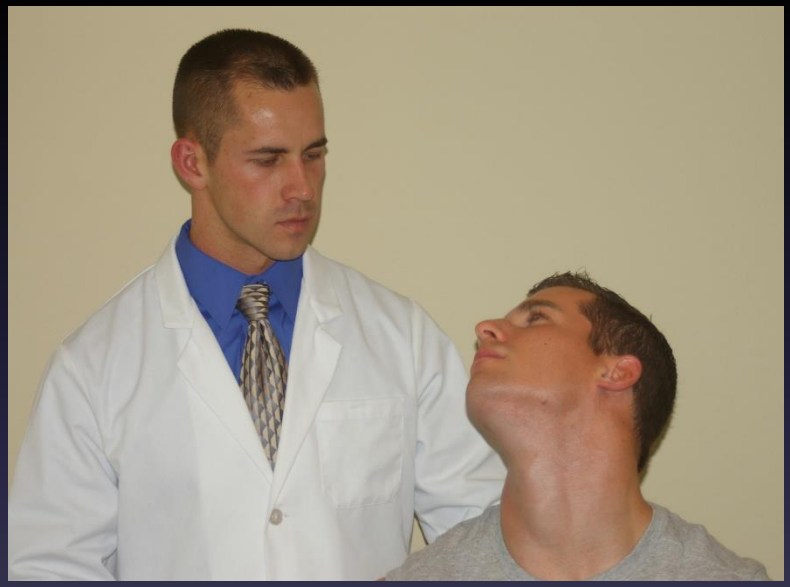
An Additional Test Replicated During Drift Test

- George's Functional Maneuver



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Vertebral Artery

- Worth Mentioning
  - Another side note
  - Underberg's Test
    - Hautant's combined with marching in place
      - It tests for the same pathology
      - While we like combinations, stability is a question here
  - Underberg's Test without head rotation is a Fukuda test
    - The test is for balance and the positive indicator is the patient rotating has he marches

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Vertebral Artery

- Worth Mentioning
  - Interesting Clinical Information
  - Drop Attacks
  - Anxiety
    - Two curious experiences
    - The fighter pilot
  - Amarosis Fugax
    - DDx - Migraines

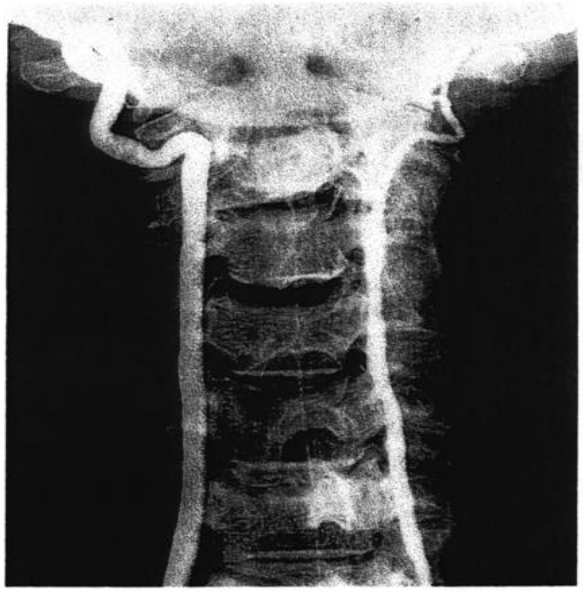

Fig. 2-25 Roentgenogram of the cervical spinal column while the vertebral artery is filled. On the right the proper course of the artery with its loop may be seen. The left shows a significant change of the arterial lumen, especially in its loop.

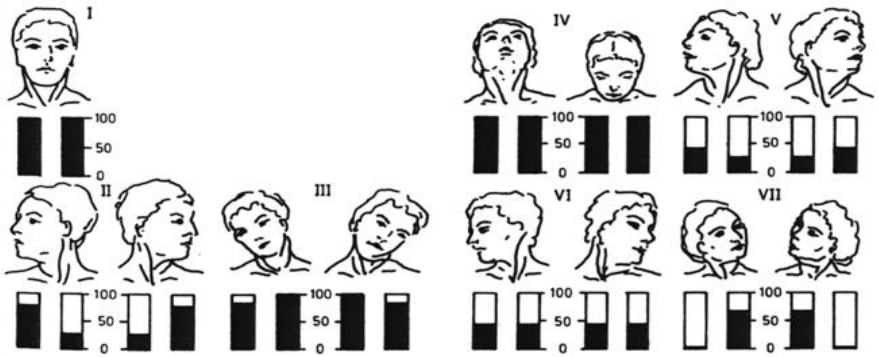

Fig. 2-26 Influence of head position on cerebral circulation: schematic depiction of obstruction of the vertebral artery during various head movements. (I) neutral position, (II) head rotation, (III) lateral flexion, (IV) extension and flexion, (V) extension and rotation, (VI) rotation and lateral flexion to the same side, and (VII) rotation and lateral flexion to the opposite side. Circulation is given in percentages [from Gutmann et al. (1985)].

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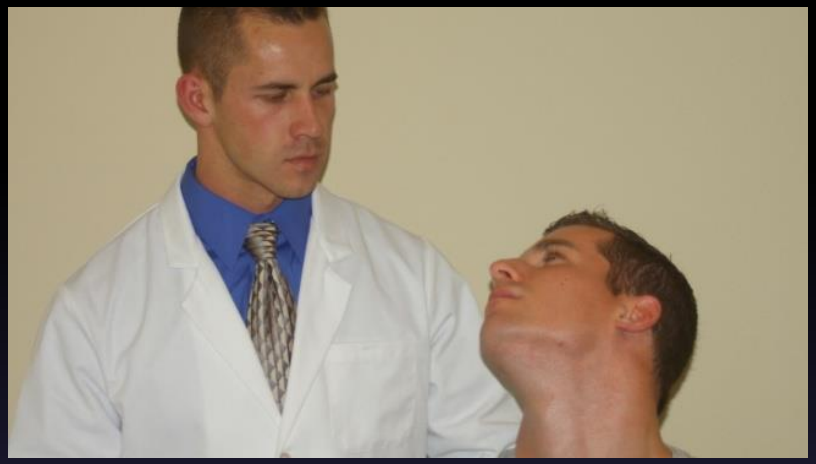
Comparison



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Brachial Plexus Tension Test

PROCEDURE TWO

Brachial Plexus Tension Test

- Brachial Plexus/Nerve Root Test
- Upper Extremity Equivalent of SLR
- Built in Confirmatory Test
- Nerve vs. Muscle

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Tests Replicated or Observed During Brachial Plexus Testing

- Shoulder Depressor Test
- Don't Whip the Head to the Side!!

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Shoulder Depressor

- Brachial Plexus Test
  - Nerve vs. Muscle
  - Head Stabilization and Shoulder Motion (Depression)

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Kemp's Test

PROCEDURE THREE

Kemp's Test Seated

- Facet Syndrome/Lumbar Disc Pathology
- Seated Over Standing?
- Medial vs. Lateral Disc

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Tests Replicated or Observed During Kemp's Test

Antalgia Sign

Scheplemann's

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Antalgia Sign

- Correlate with medial vs. lateral disc
- Can be seen standing or seated
  - In some cases lying down
- Also Known As
  - Vanzetti's Sign

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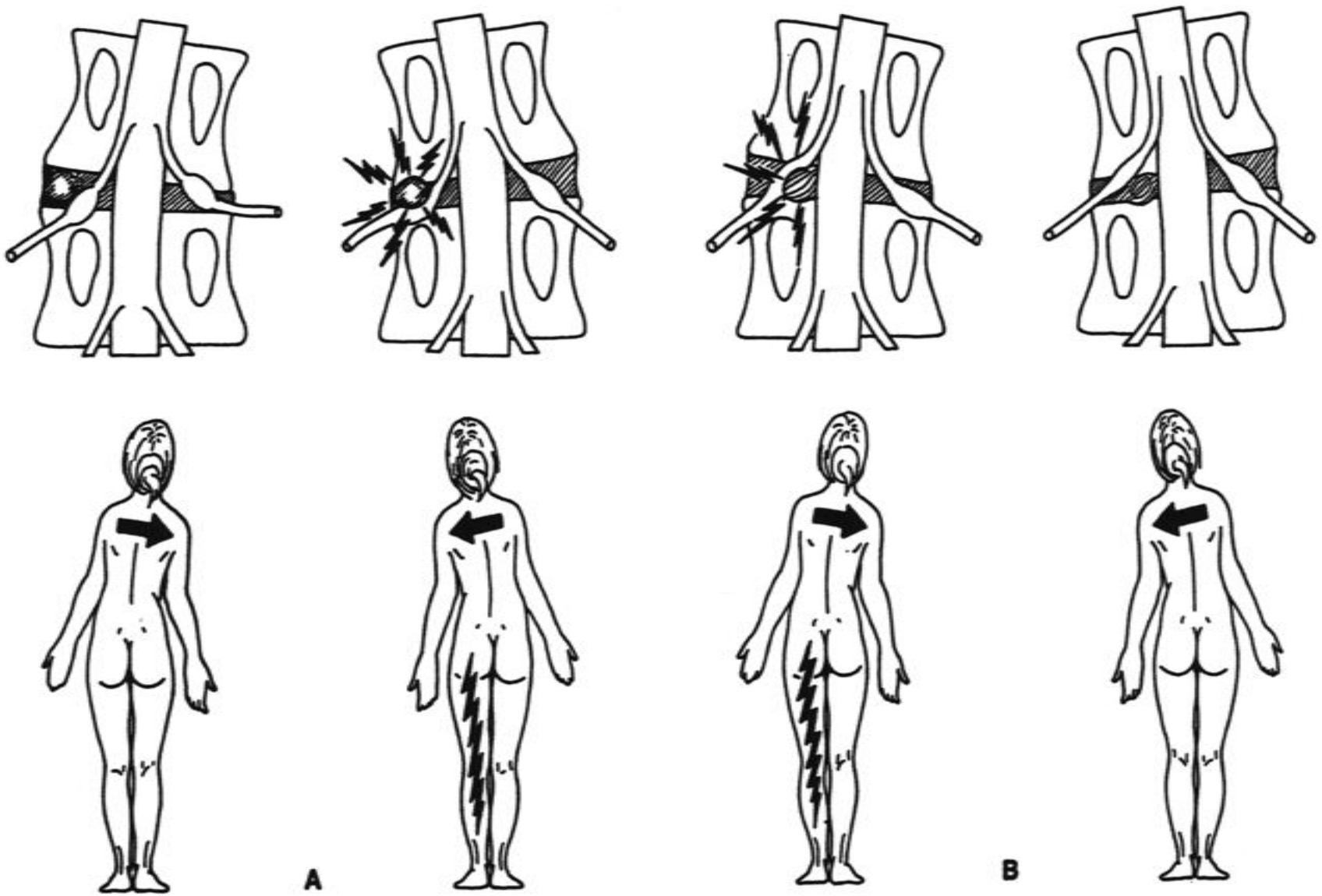
A
B

Scheplemann's Test

- Pain possible on either or both sides
- Intercostal Neuralgia of Rib Cage Strain/Sprain
  - Other rib pathologies

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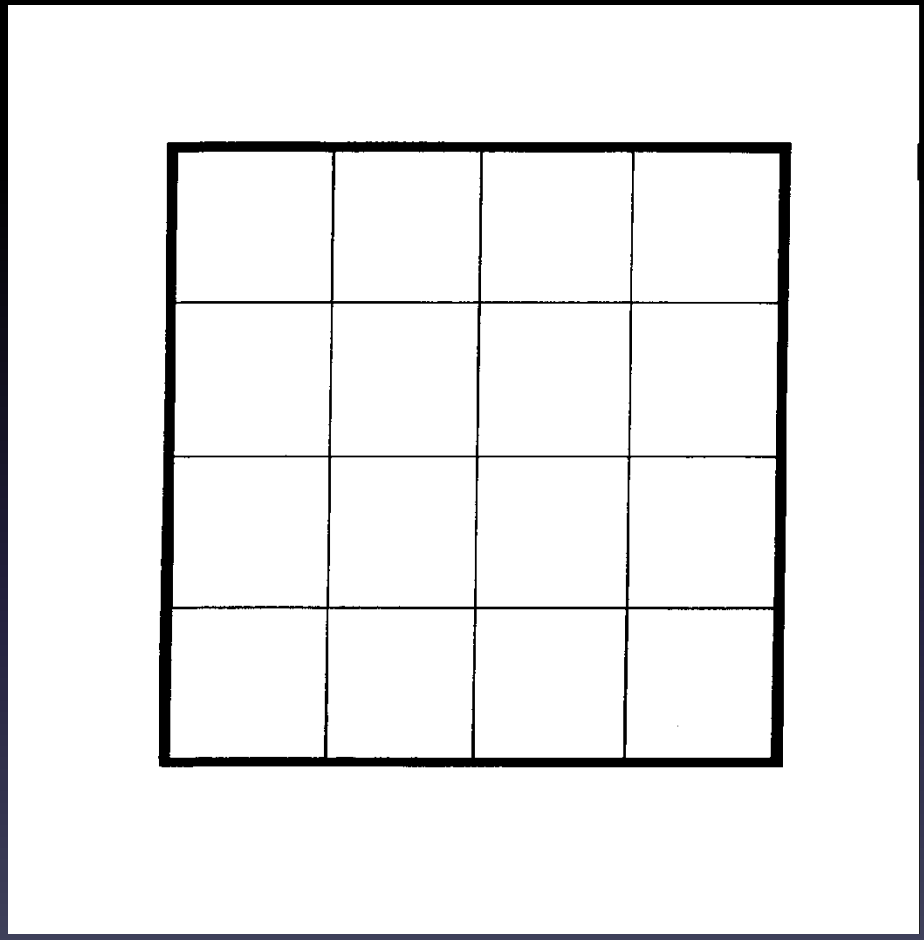
Modified Slump Test

PROCEDURE FOUR

Test-How Many Squares?



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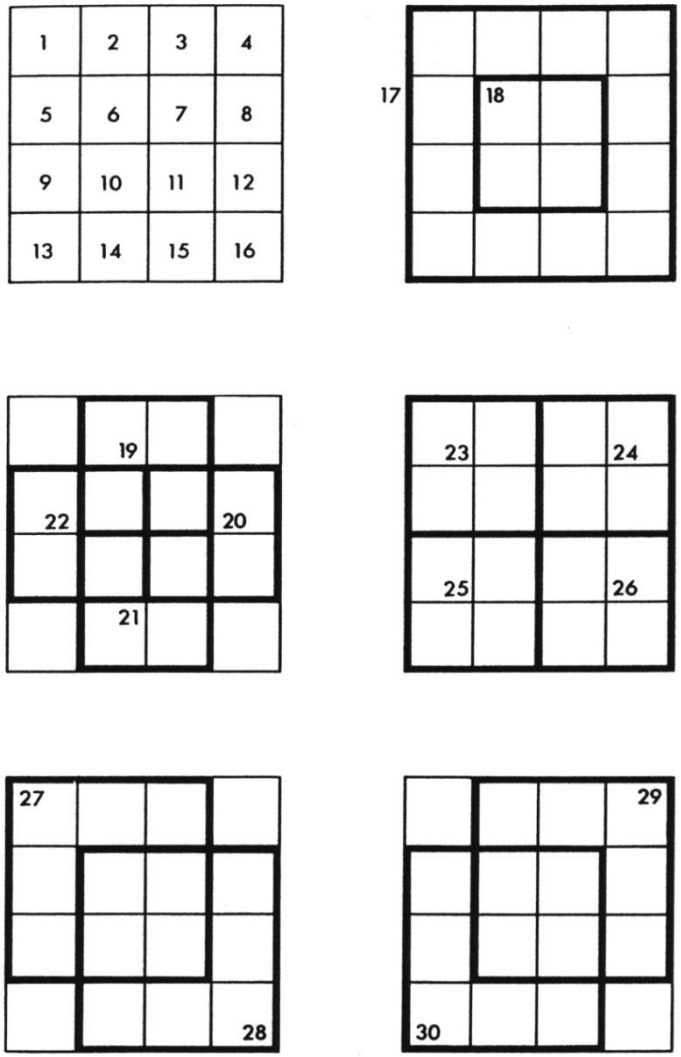
COUNT THE SQUARES



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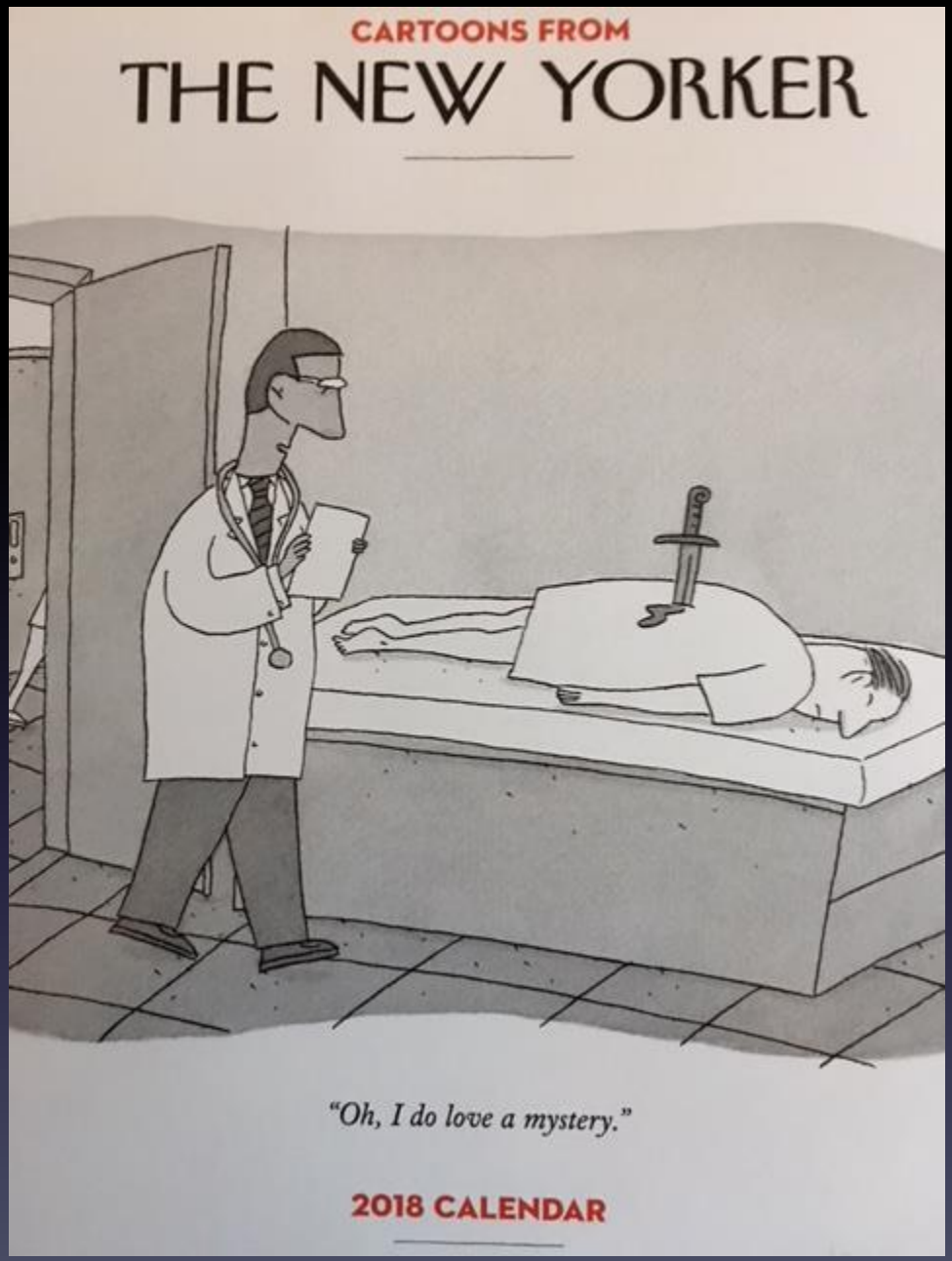

The Modified Slump Test

- Tests for Neuromeningeal Tract Tension
- The Most Complicated Yet Most Productive Test

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Tests Replicated or Observed During the Modified Slump Test

- Soto-Hall
- Lindner's
- L'Hermitte's
- Brudzinski's
- Seated Adams
- Compression Fracture
- Bechterew's
- SLR / Lasegue's
- CSLR
- Tripod
  - Hamstring Tension
- Kernig's
- Bragard's
- Fajersztajn's
- Homan's
- Dejerine's
  - Valsalva's
- Fortin's Finger Sign

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Papers on the Slump Test

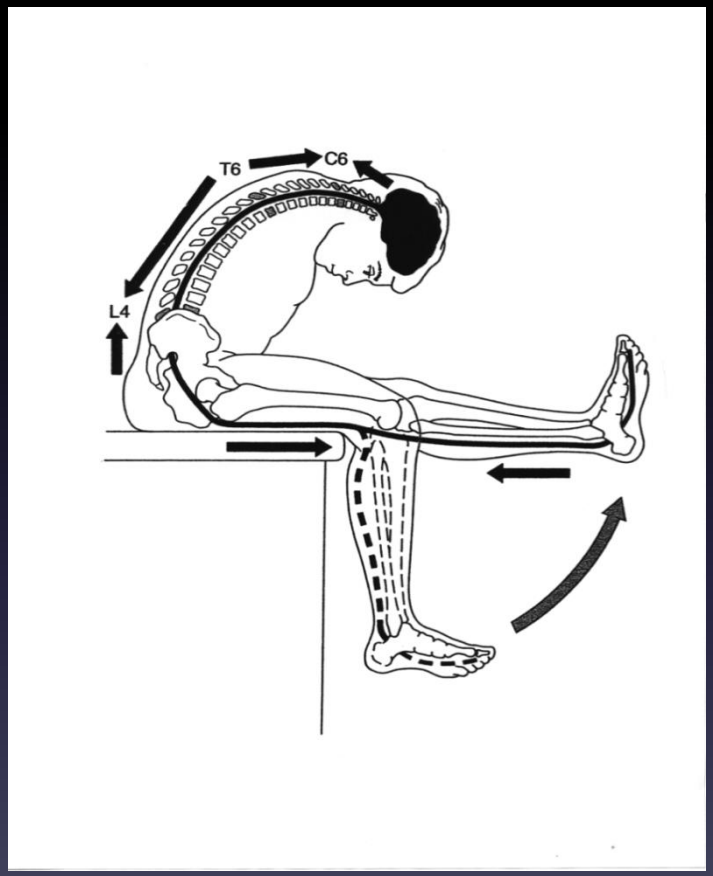
- Maitland, GD. The slump test: examination and treatment. The Australian Journal of Physiotherapy. 1985
- Miller, KJ. The slump test: application and interpretations. Chiropractic Technique. November 1999

Breaking It Down

- The Slump Test
  - The Original Description
    - Five Steps
      - The Slump, Cervical Flexion, Leg Extension, Foot Dorsiflexion, Cervical Extension
  - Miller's Modifications
    - Three Steps
      - Simultaneous Leg Extension. Simultaneous Bilateral Foot Dorsiflexion, Cough

The Neuromeningeal Tract

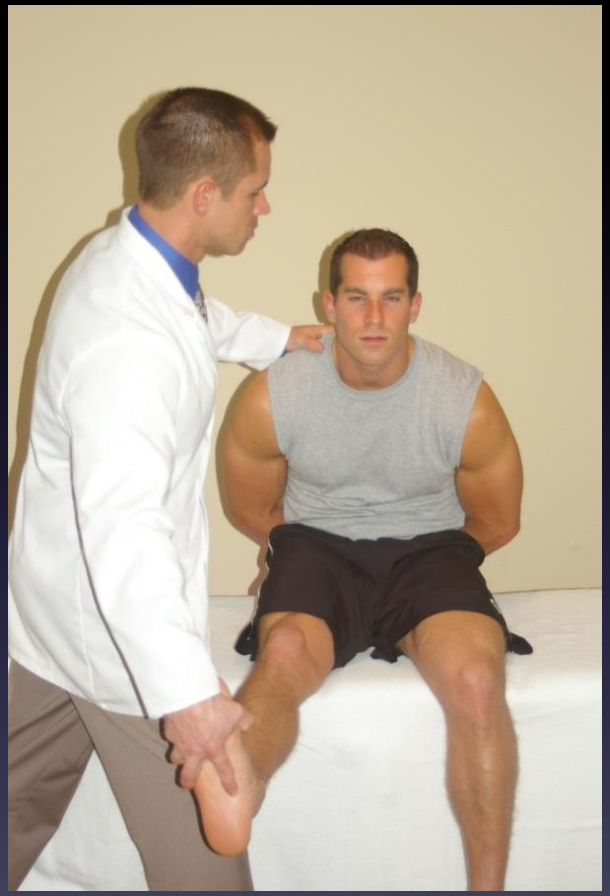
- Note the tension and direction of pull on the cord and Sciatic nerve



Slump Steps 1 & 2

Slump Steps 3 & 4

Slump Step 5



Modified Slump

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- Fajersztajn's
- Homan's
- Dejerine's
  - Valsalva's
- Fortin's Finger Sign

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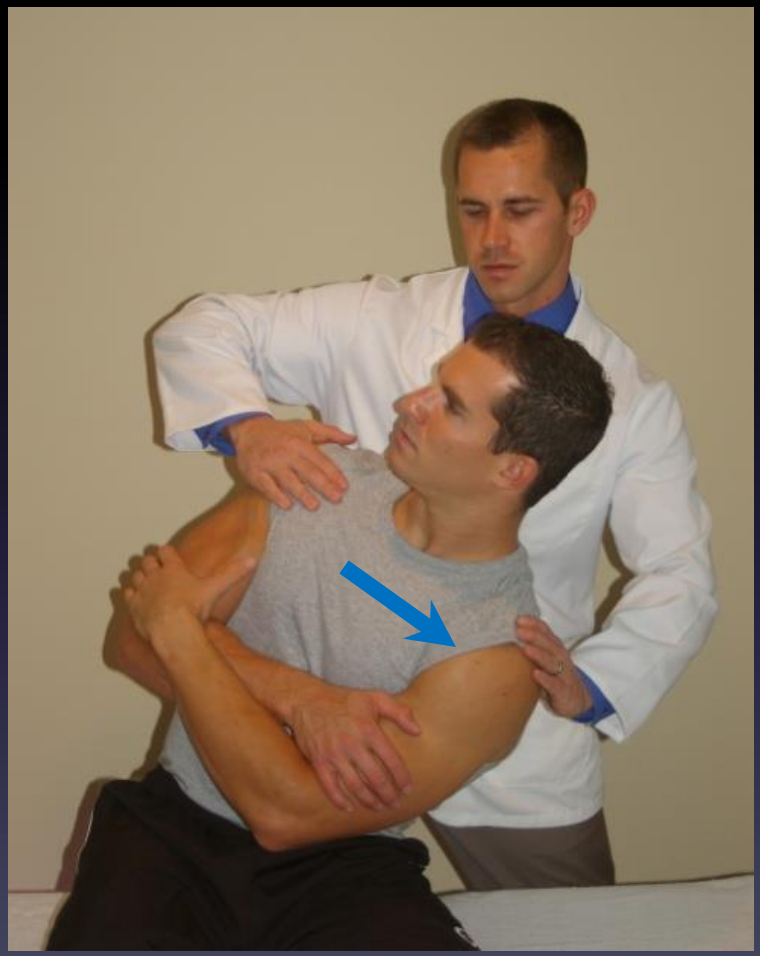
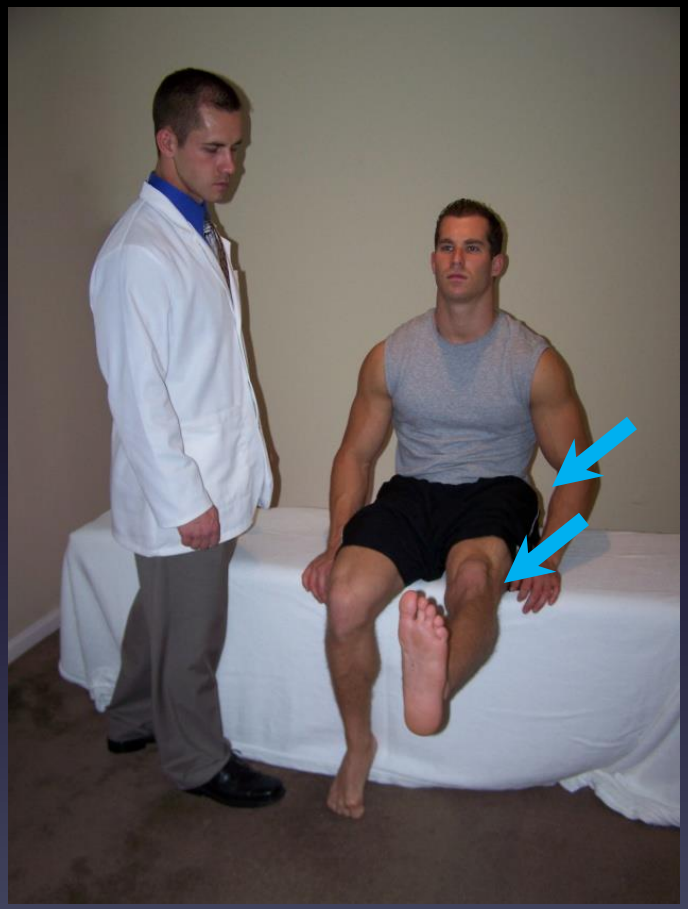
Physical Maneuvers that Create Lower Extremity Nerve Root and/or Sciatic Nerve Tension

- Primary Maneuvers
  - Lumbar Lateral Bending
  - Hip Flexion
  - Knee Extension
  - Foot Dorsiflexion
- Secondary Maneuvers
  - Cervical Flexion
  - Spinal Flexion
  - Hip Internal Rotation
  - Hip Adduction
  - Great Toe Extension
  - Increased Intrathecal-Intradiscal Pressure
  - Patient Position

Lumbar Lateral Bending

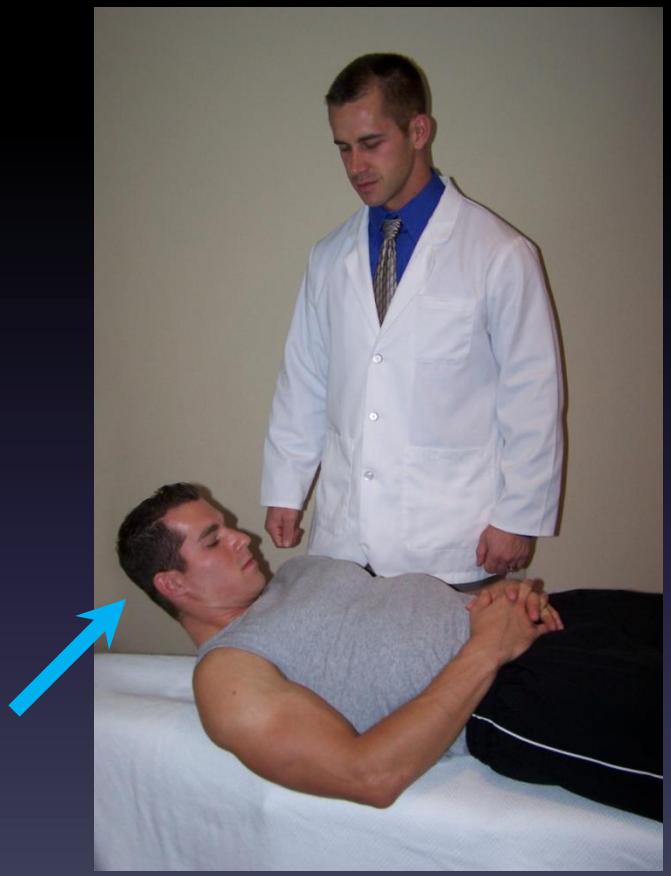


Hip Flexion-Knee Extension

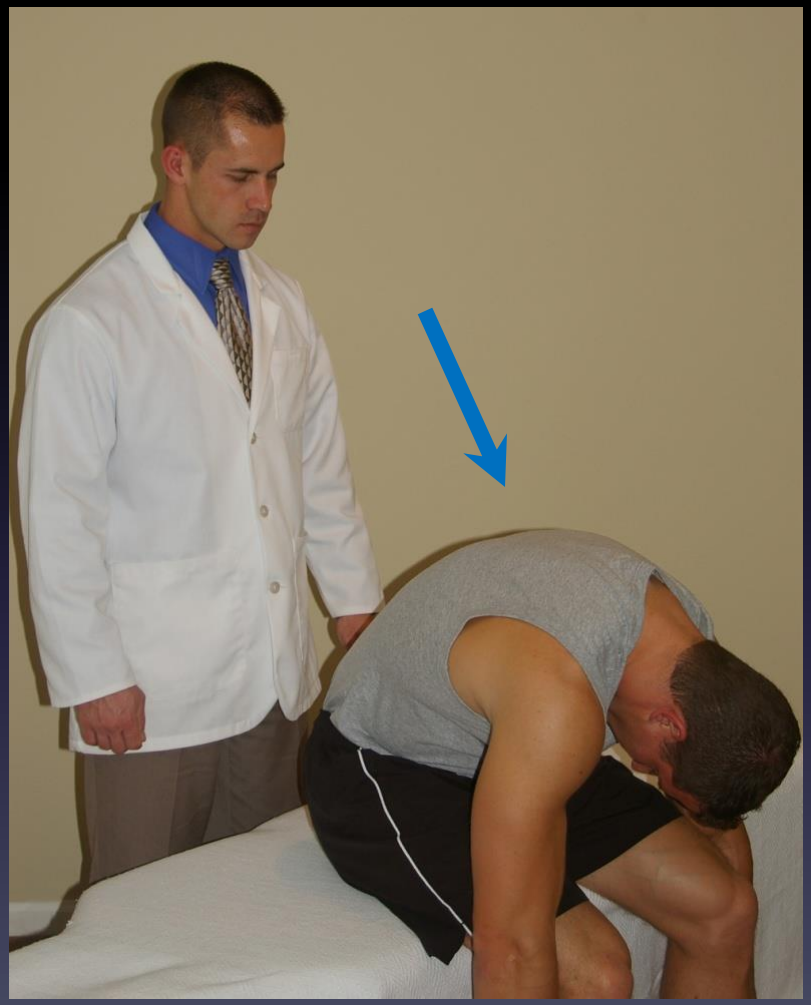


Foot Dorsiflexion

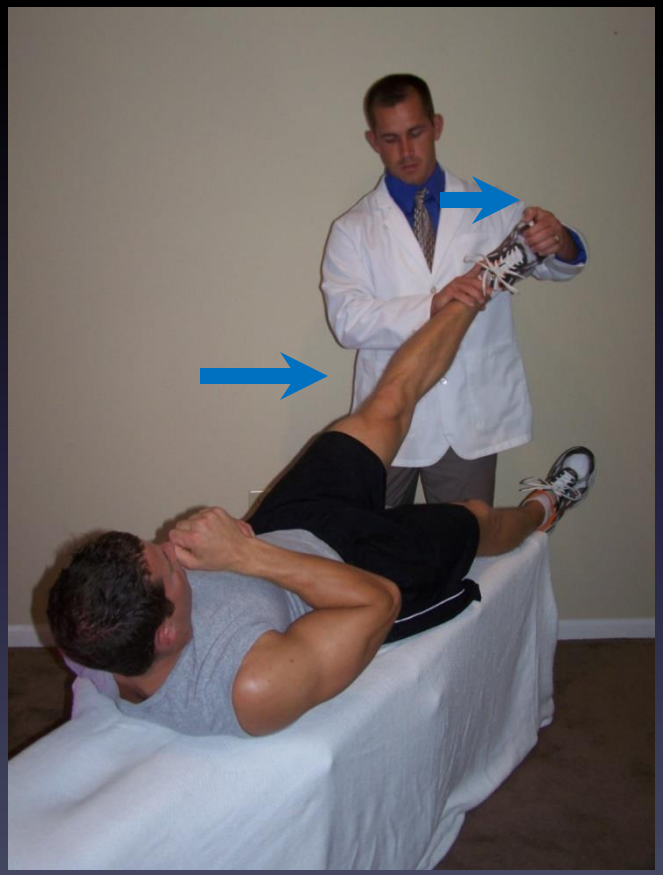
Cervical Flexion



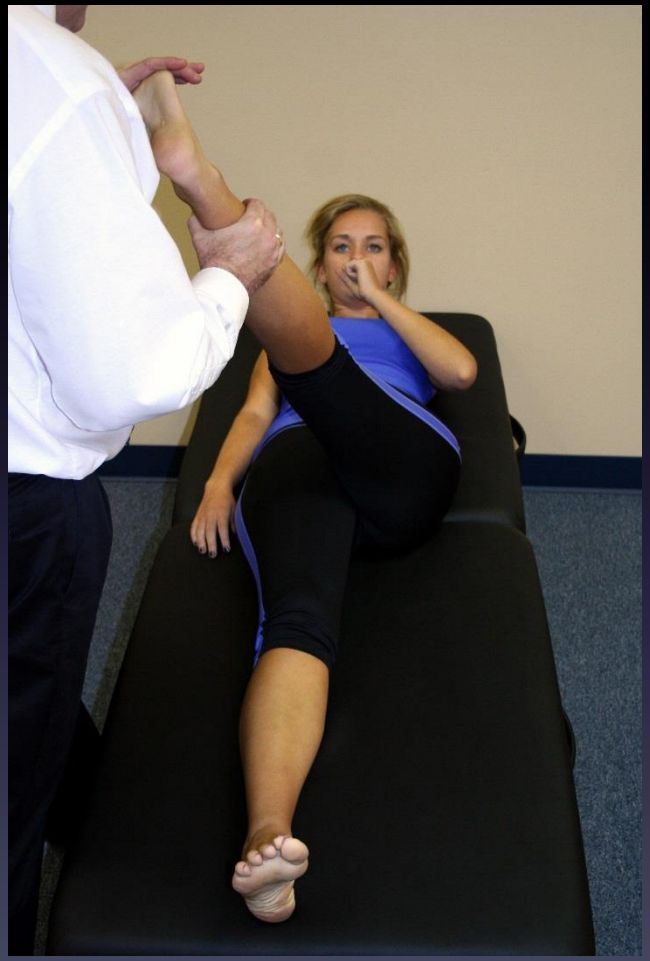
Spinal Flexion



Hip Internal Rotation-Hip Adduction



Hip Internal Rotation-Hip Adduction



Great Toe Extension

Increased Intrathecal-Intradiscal Pressure

Disc Pressure

• Lying on Back	• 30kg/cm
• Standing	• 70kg/cm
• Walking	• 85kg/cm
• Twisting	• 90kg/cm
• Sitting	• 100kg/cm
• Coughing	• 110kg/cm
• Jumping	• 110kg/cm
• Straining	• 120kg/cm
• Laughing	• 120kg/cm

Testing Postures/Positions

- The Majority of Disc, Radicular and Sciatic Tests are Performed
  - Lying on the Back-30kg/cm
- Bechterew's - Slump are Performed
  - Seated-100kg/cm
- Supine vs. Seated MR Scans

Recumbent Vs. Seated

Recumbent MRI

Seated MRI

Disc Pressure

• Lying on Back (SLR)	• 30kg/cm²
• Standing (Neri's)	• 70kg/cm²
• Walking	• 85kg/cm²
• Twisting	• 90kg/cm²
• Sitting (Bechterew's)	• 100kg/cm²
• Cough (Dejerine's)	• 110kg/cm²
• Jump	• 110kg/cm²
• Strain (Valsalva's)	• 120kg/cm²
• Laugh	• 120kg/cm²

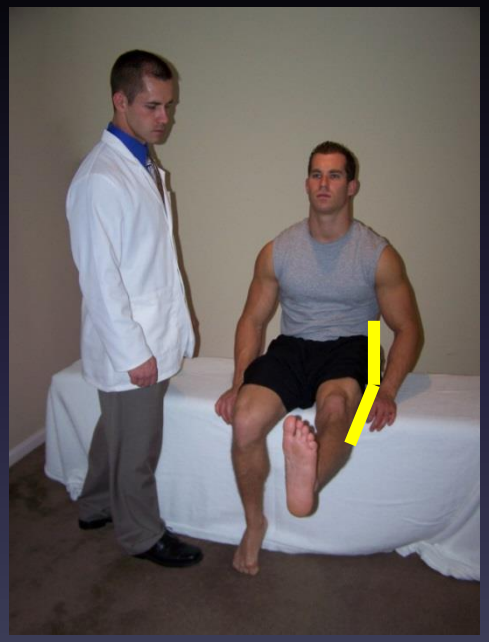
History-ADL

- Sitting in a Bathtub
- Sitting in a Recliner
  - Legs Up vs.
  - Fully Reclined
- Bowel Movements
- Dejerine's Triad = ADL (cough, sneeze, strain, laugh)

Patient Position

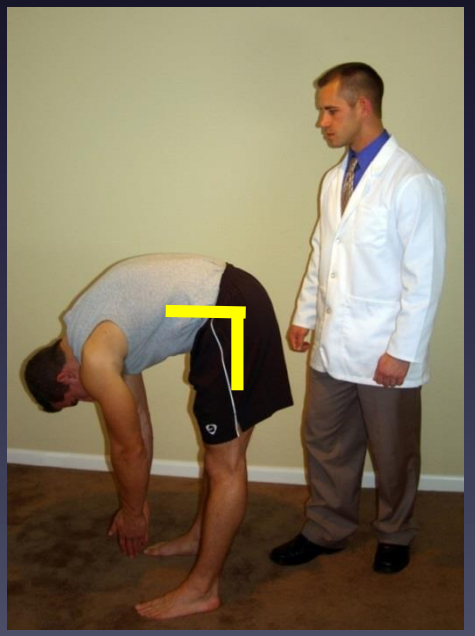
Escalating Pressure in the Disc

SLR-Lasegue's
Lying 30 kg/cm2 in the Disc



Slump-Bechterew's
Sitting 100 kg/cm2 in the Disc

Neri's Bowing
Standing then bending
70-120 kg/cm2 in the disc



Soto-Hall

- Very General Test
- Cervicothoracic
  - Subluxation
  - Disc
  - Sprain
  - Strain
  - Fracture
- Rib Fracture, The Compression Test

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Lindner's

- Lower Extremity Radicular Complaints
- Tethered Nerve Roots

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L'Hermitte's

- Electrical-Shock Like Sensations in One or More Extremities
- Spinal Cord-UMN

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Brudzinski's

- Meningitis
- Bacterial vs. Viral
- What are the Odds of Seeing This?

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Seated Adams

- Scoliosis
- Seated vs. Standing
- Why do both? Compare to Kemp's

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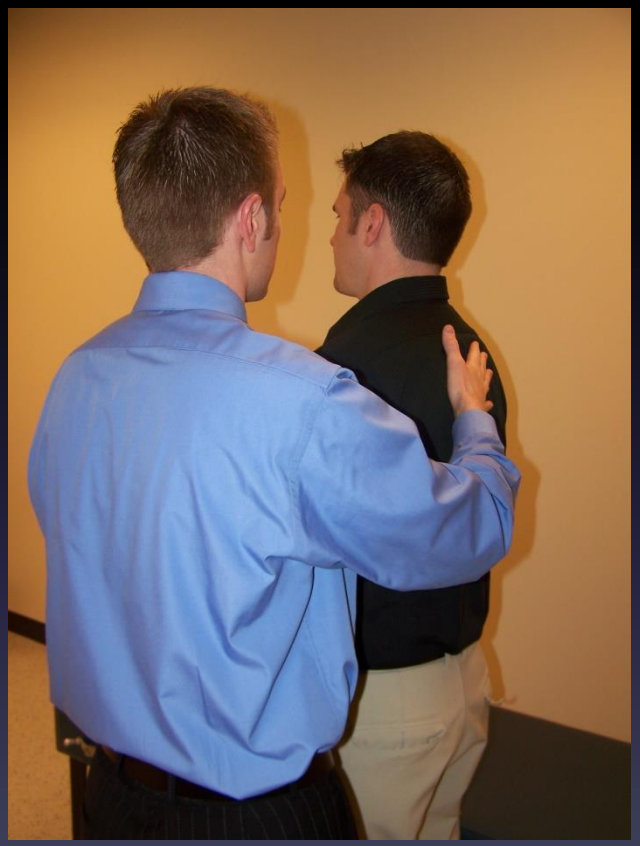
Compression Fracture



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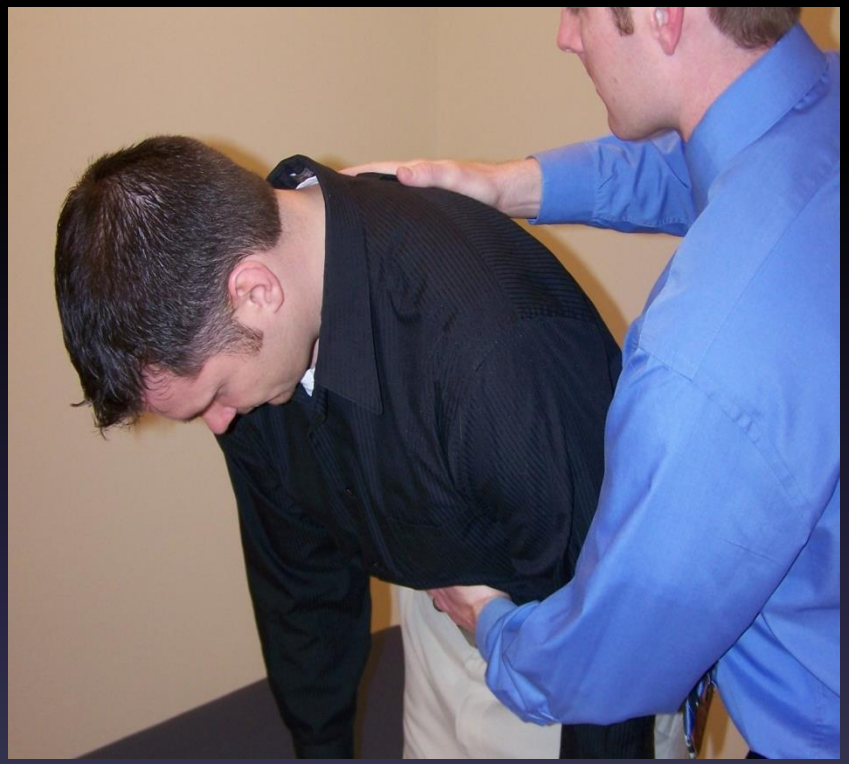
Compression Fracture

- Be careful!
  - A reason for allowing the patient to move into a testing positioning
- Localized pain and possible angular deformity with short transition



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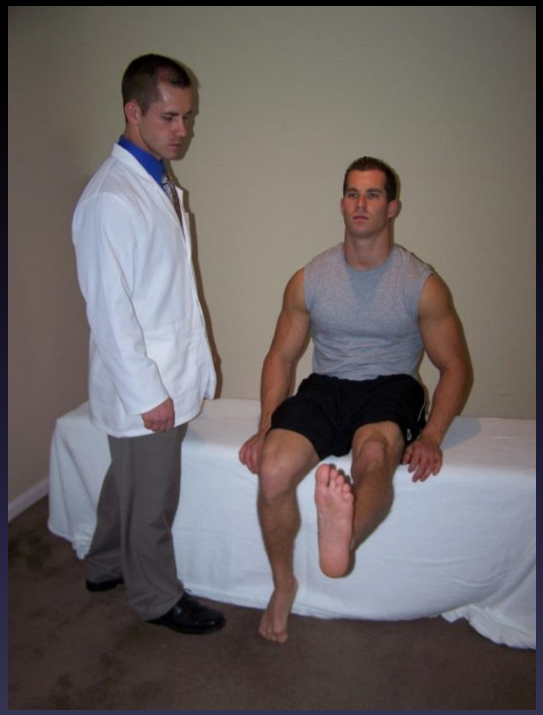
Bechterew's



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SLR/Lasegue's

- The same or different?
  - They both use hip flexion and knee extension
  - The only difference is the order the two motions occur
- Seated Vs. Supine

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Lasegue's

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CSLR

- Good Hurts the Bad
- Medial vs. Lateral Disc

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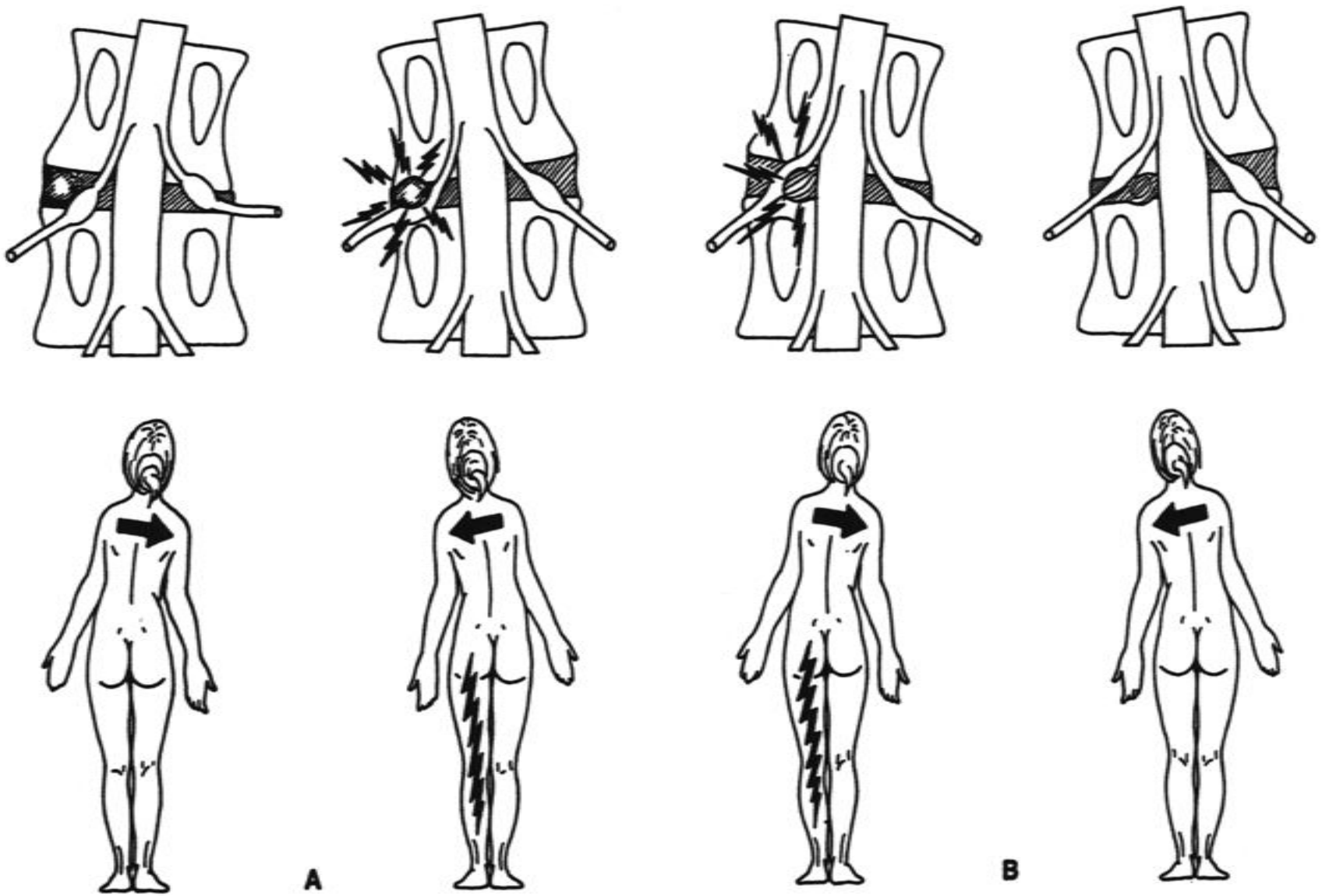
A
B

Medial vs. Lateral Disc

- The majority of disc lesions protrude lateral to the left or right and then lie either medial or lateral to the nerve root.
- Medial and lateral refer to the relationship of the disc lesion to the nerve root.
- Lateral disc protrusions that are lateral to the nerve root are the most common presentation

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Best Tests for Medial vs. Lateral

- Antalgia Sign
- SLR/Braggard's
- CSLR/Fajersztajn's
- Kemp's
- Slump

Adjusting

- Side Posture
  - Lateral Disc Protrusion = Adjust with the side of leg pain up
  - Medial Disc Protrusion = Adjust with the side of leg pain down
- This works with the antalgic posturing of the patient and the biomechanics of the pathology

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Tripod Sign

- Radicular Pathology vs. Hamstring Tension?
- Tripod Name?
- Flip Test
- Recliner Sign (Miller)
- Tripod Sign Related to Lung Disorders

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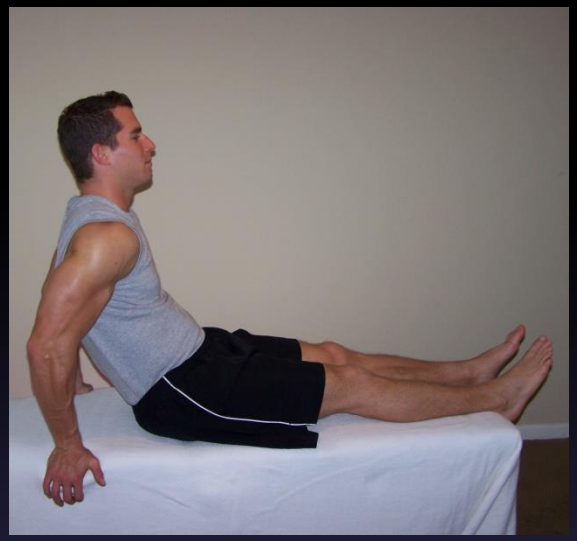
Hamstring Tension

- The second photo is a side note at this point and will be covered in greater detail when tests in the prone posture are discussed



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Kernig's

- Note the leg not being moved!

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Lasegue's vs. Kernig's

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Braggard's

- Palmer is to chiropractic

  what…
- Don't do fast
- SLR
  - Lateral disc

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Fajersztajn's

- …sterling is to silver
- Is speed as important here?
- CSLR
  - Medial disc

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Homan's

- DVT
- The knee is key
- Efficiency
  - If Supine
    - SLR
    - Bragard's
    - Lasegue's Differential
    - Homan's
    - The combination can be performed sitting

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Dejerine's

- Space Occupying Lesions
  - Head and/or Spinal Symptoms
- Cough, Sneeze, Bear Down (Valsalva's)
- Easiest to perform?

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Valsalva's

- Space Occupying Lesions
- Part of Dejerine's

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What if the patient cannot get into the Modified Slump position?

- Do the original version of the Slump Test in steps
- Maximum SLR

Record Keeping

- Soto-Hall
- Lindner's
- L'Hermitte's
- Brudzinski's
- Seated Adams
- Compression Fracture
- Bechterew's
- SLR / Lasegue's
- CSLR
- Tripod
  - Hamstring Tension
- Kernig's
- Bragard's
- Fajersztajn's
- Homan's
- Dejerine's
  - Valsalva's
- Fortin's Finger Sign

They can All be recorded based on performing the one procedure !

Miller 2002

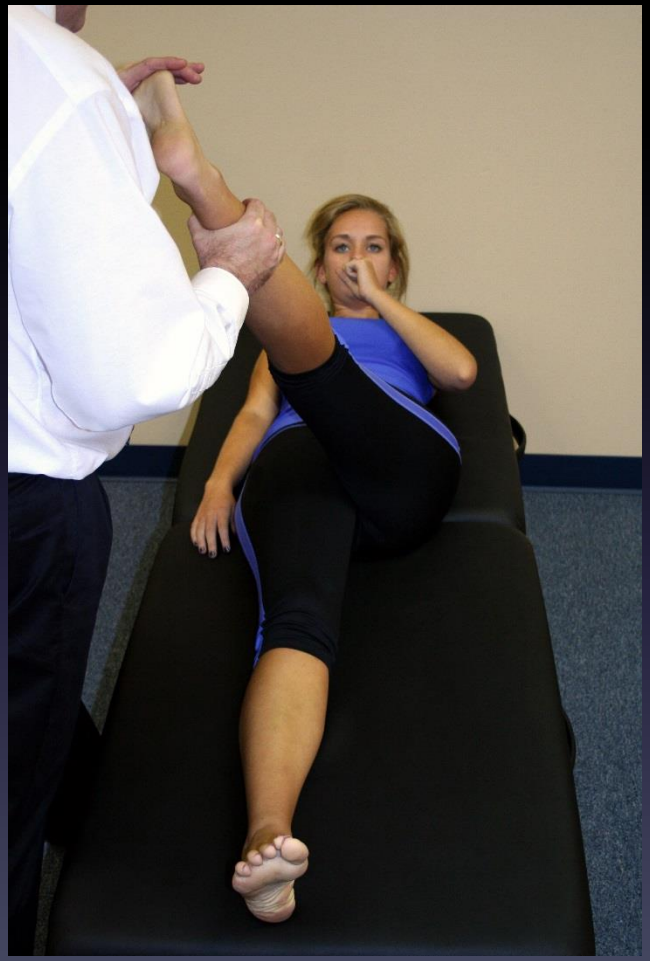
Fall Back

- You can back up or fall back to Maximum Straight Leg Raising if you wish to confirm the Slump test or need and alternate test

Maximum Straight Leg Raising Test

- SLR
- Braggard's
- Lindner's
- Dejerine's Cough
- Bonnet's
- Piriformis

Maximum Straight Leg Raising Test



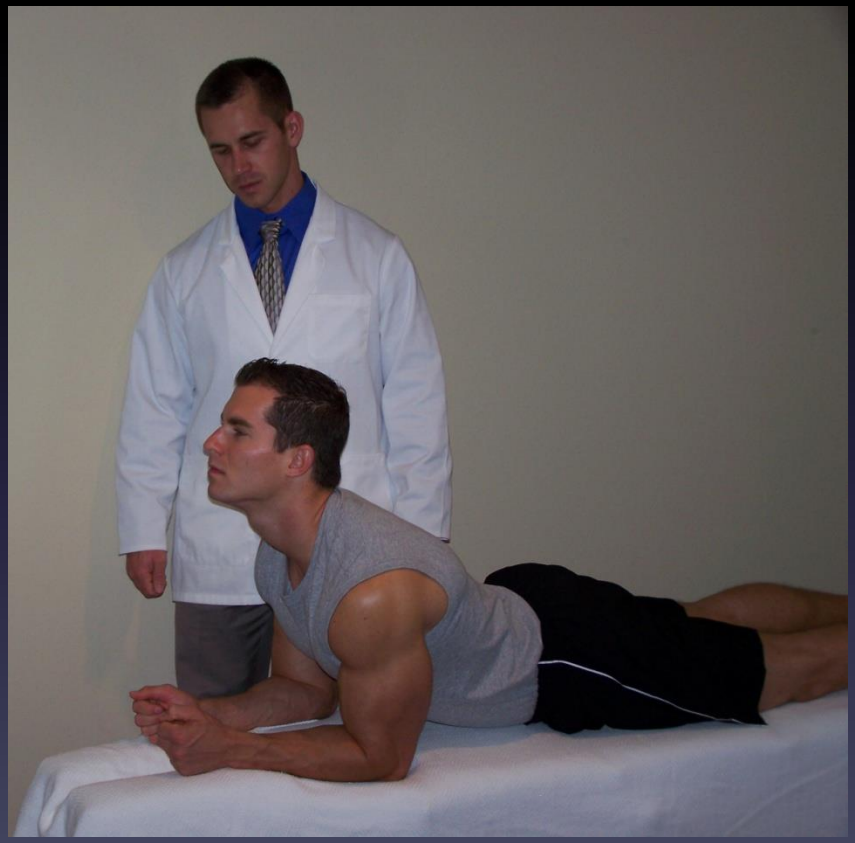
Sphinx and Prone Knee Flexion

PROCEDURE FIVE

Combine Sphinx and Pheasant's Tests

Sphinx Test

- Tests Lumbar Extension and Extension of the Spine Above this Level
- Narrows the Spinal Canal
- Combine with Prone Knee Flexion



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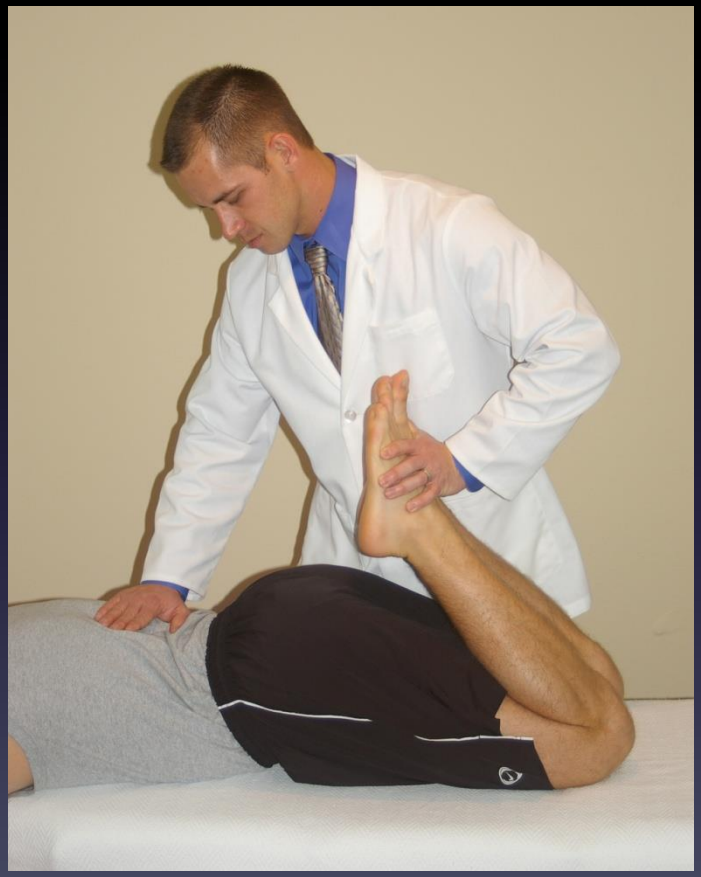
Pheasant Test

- Same Position as Prone Knee Flexion
- Lumbosacral Pain a Sign of Lumbar Instability



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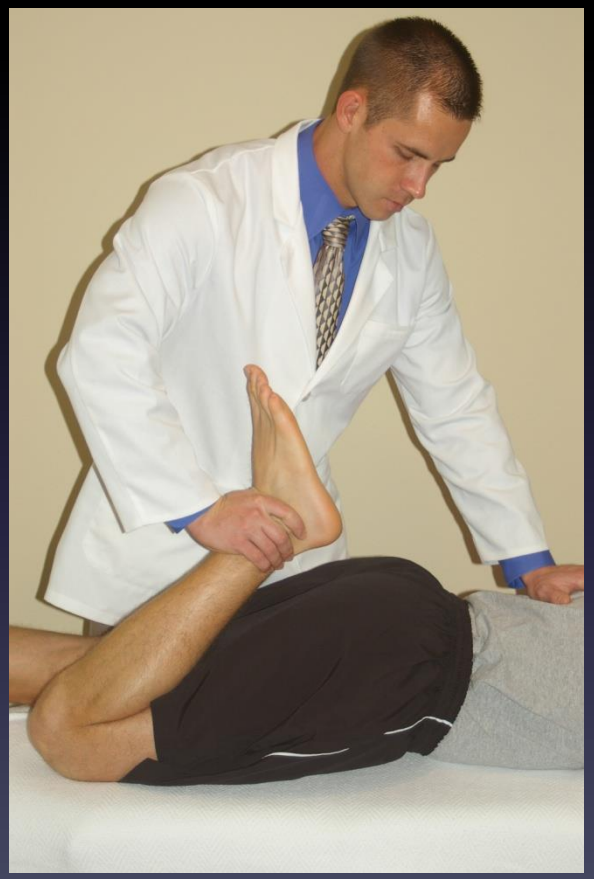
Tests Replicated or Observed During the Combined Sphinx – Pheasant Tests

- Sphinx
- Pheasant Test
- Nachlas Test
- Femoral Stretch Test
- Ely's Test
- Quadriceps Tension

Miller 2002

Nachlas

- L/S and/or SI Joint Pathology
- Note approximation of the heel to the buttocks



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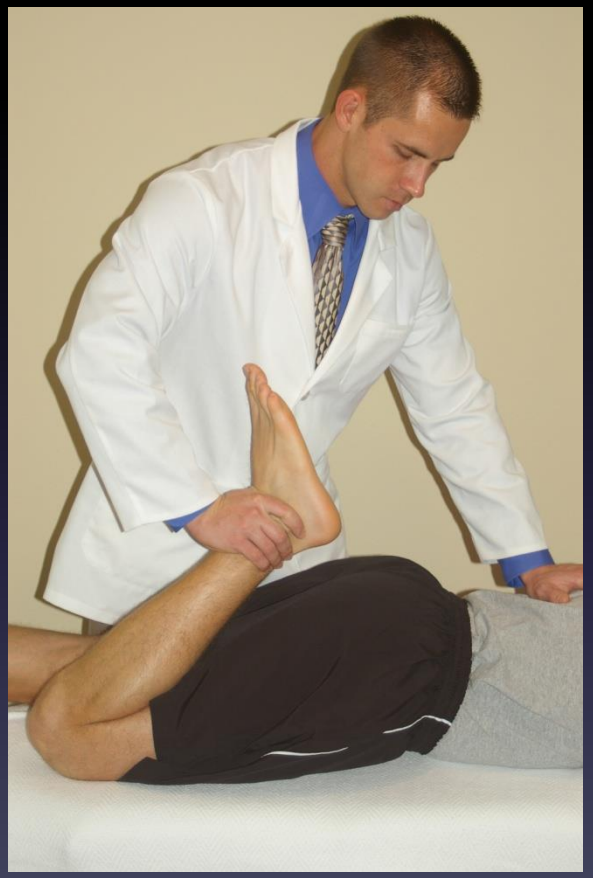
Ely's Test

- Hip Flexion Contracture
- Note; hip flexion with heel approximating the buttocks

Miller 2002

Femoral Stretch Test

- Same position as Nachlas
- Femoral Stretch creating paresthesia in the anterior thigh and/or lower leg



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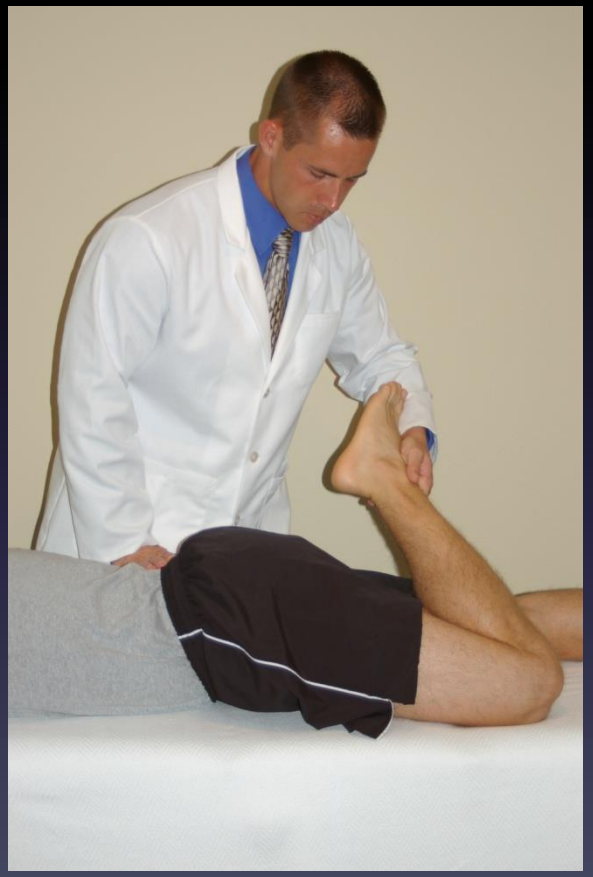
Quadriceps Tension

- Note the distance between the heel and the buttock



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Sphinx and Prone Knee Flexion

PROCEDURE SIX

Yeoman's and Femoral Stretch Tests

Miller 2002

Yeoman's Test

- Tests for Anterior SI Ligament Sprains
- Replicates Gaenslen's and Lewin-Gaenslen's Tests
- Psoas Sign

Miller 2002

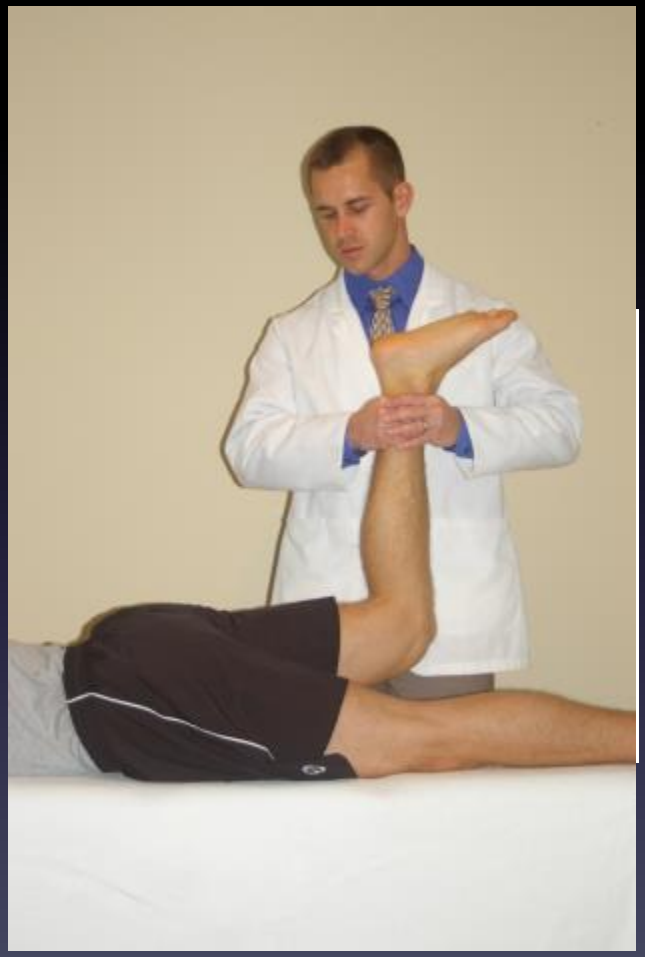
Femoral Stretch Test

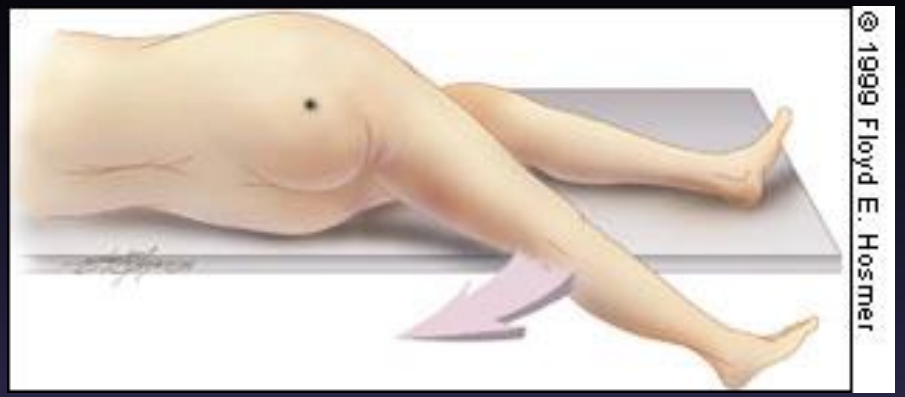
- Tests for Femoral Never Irritation
- Replicates Gaenslen's and Lewin-Gaenslen's Tests
- Psoas Sign

Miller 2002

Psoas Sign

Comparison: Yeoman-Psoas





Tests Replicated or Observed During Yeoman's Test (side note)

- Gaenslen's (supine)
- Lewin-Gaenslen's (side posture)
- Psoas Sign (side posture)

Sphinx and Prone Knee Flexion

PROCEDURE SEVEN

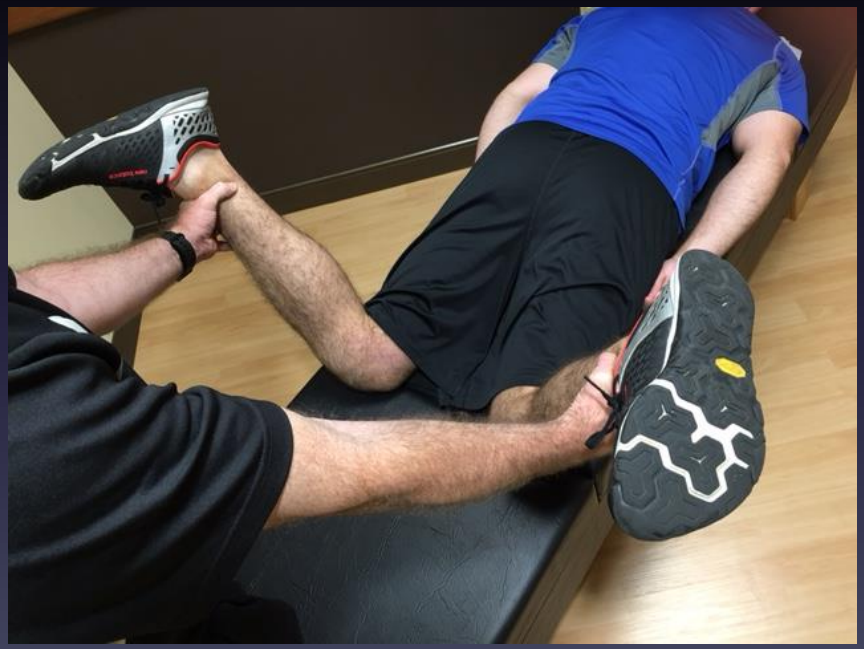
Hibb's Test

- Tests for Hip Joint Pathology Early and SI Joint Pathology Late
- Better than Patrick's Test
  - Why?
- Obturator Sign

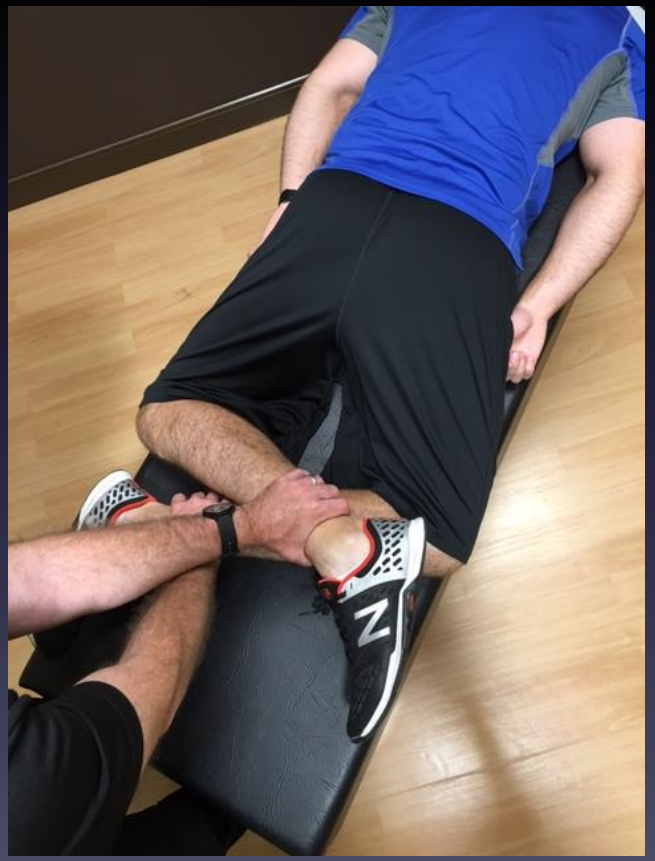
Miller 2002

Hibb's and Patrick's Tests

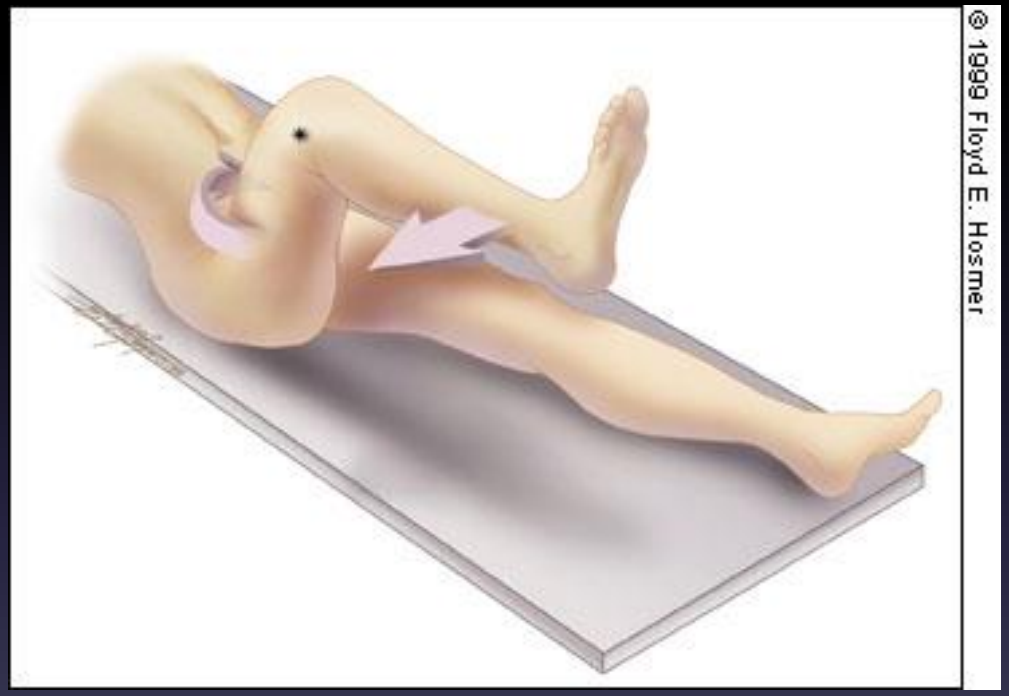
Hibb's

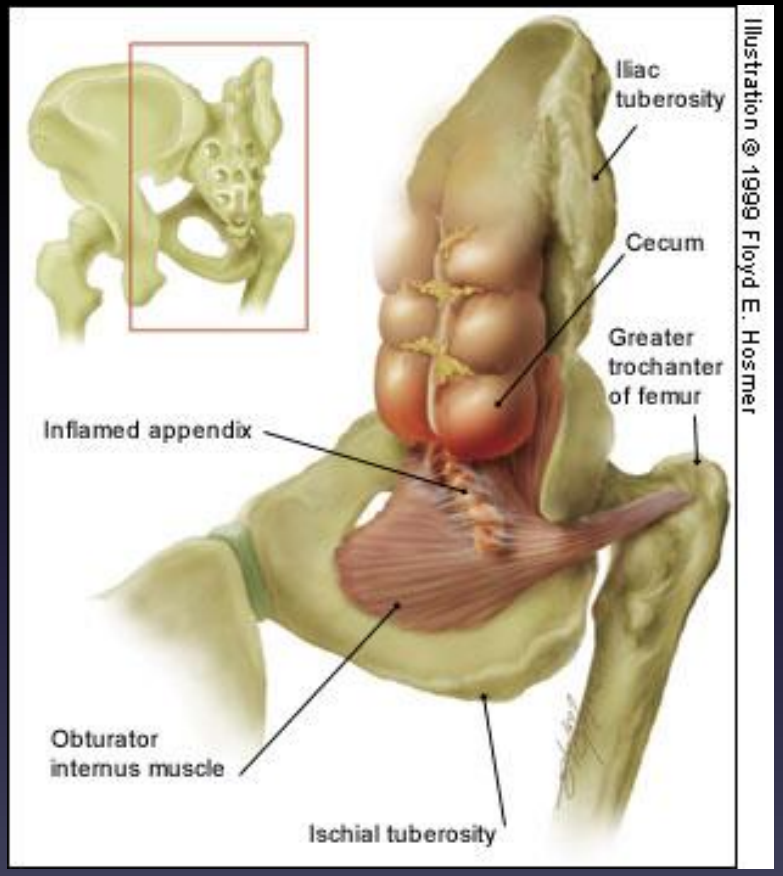


Patrick FABER



Obturator Sign





Tests Replicated or Observed During Hibb's Test

- 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What is wrong with the previous slide?

Sphinx and Prone Knee Flexion

PROCEDURE EIGHT

Fluid Motion Test

- Tests for SI Joint Fixation-Subluxation
- Not Leg Length Dependent
-

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This Examination Format Separates the Doctor from the Technicians

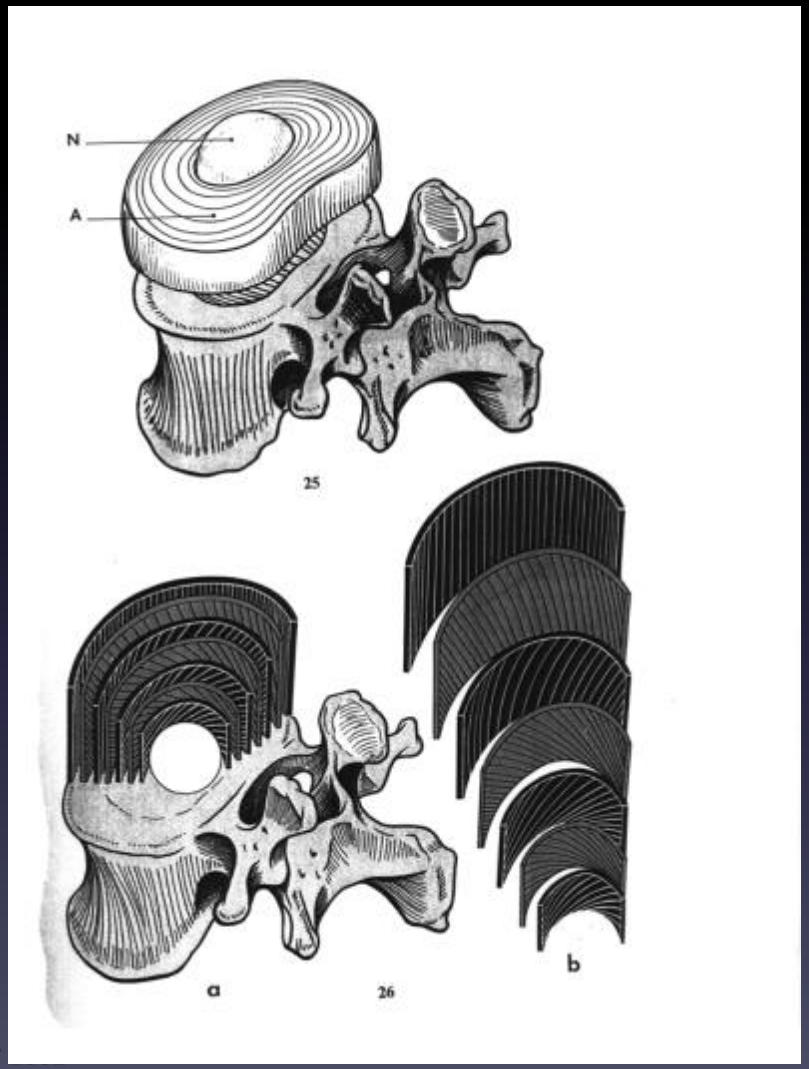
Handedness

- Ambidextrous
- Shoulder Height-levelness
  - Dominant side lower
- Grip Strength
  - Dominant side stronger by 10%
- Impairment Rating
  - Non-dominant often rated lower
- Side Posture Adjusting
  - Farfan's Torsion Test
  - Side of handedness up

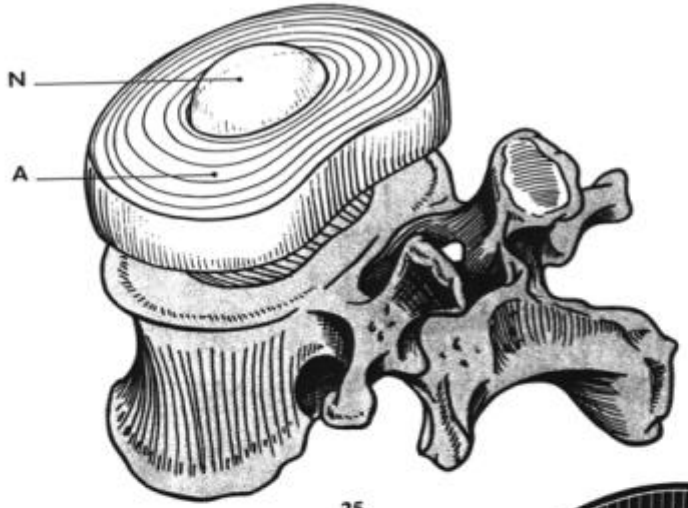
Miller 2002

The Disc

- Alternating Layers of Fibers
- Twisting/Sports; Right Handed vs. Left Handed Individuals



Miller



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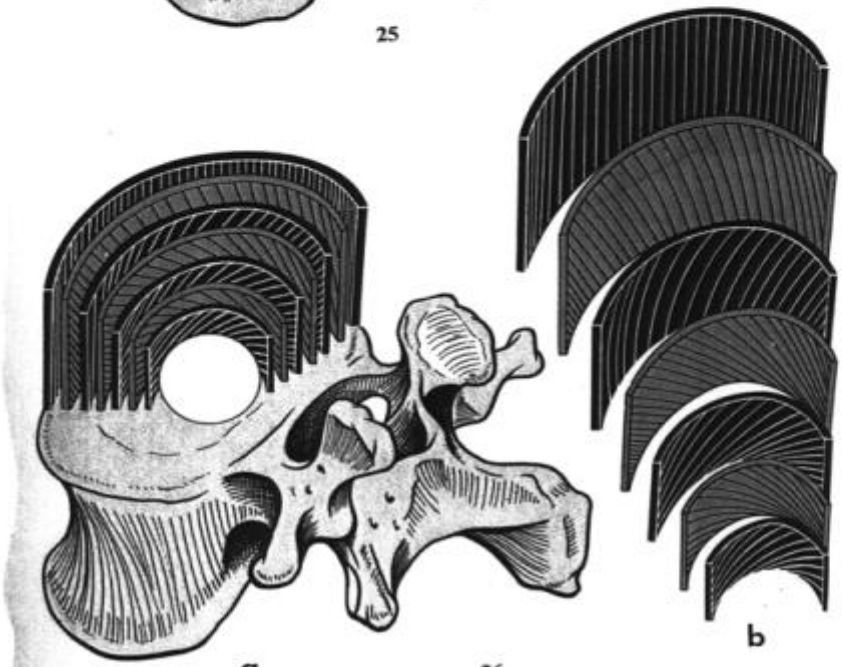

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Sphinx and Prone Knee Flexion

PROCEDURE NINE

Farfan's Torsion Test

Miller 2002

Farfan's Simplified

- After studying Farfan's reasoning and torsion test you will discover that the entire concept can be boiled down to knowing if the patient is left handed, ambidextrous or right handed
- Just ask the patient
  - Guess and impress!

Side Posture Screening and FAIR Tests

Range of Motion
Indirect Testing

- Cervical Range of Motion
- Thoracic
- Lumbosacral Range of Motion

Cervical Ranges of Motion

- Flexion 80-90° Brach Plex/Slump
- Extension 70° Max For../Sphinx
- Rotation 70-90° Max For Comp
- Lateral Bend 20-45° Brachial Plexus

Miller 2002

Thoracic Ranges of Motion

- Flexion 20-45 degrees Slump
- Extension 225-35 degrees Sphinx
- Rotation 35-50 degrees Kemp's
  - Side Posture/FAIR
- Lateral Bend 20-40 degrees Kemp's

Lumbosacral Ranges of Motion

• Flexion	80°	Slump
• Extension	35°	Kemp's/Sphinx
• Lateral Bending	25°	Kemp's

  – Rotation in the lower spine is considered a primary component of thoracic range of motion

Miller 2002