

Not All Gluteal Pain is Sciatica

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Neuromusculoskeletal Medicine



L A R K I N
COMMUNITY
HOSPITAL

A TEACHING HOSPITAL



INSTITUTE FOR
NON-SURGICAL
ORTHOPEDICS

Objective

- **Build a differential diagnosis for gluteal pain**
- **Briefly discuss sciatica as a leading diagnosis**
- **Describe four other commonly seen etiologies**
- **Review relevant anatomy**
- **Describe relevant orthopedic tests**
- **Review applications for ultrasound-guided musculoskeletal injections**
- **Discuss Osteopathic diagnosis and treatment of the pelvis and sacrum**

Background of Posterior Gluteal Pain

- A common complaint to the primary care office
- One of the top 3 workman's compensation expenses
- US healthcare costs: \$33 billion annually
- Disability and costs are related to pain, not to the disease process



One
person
dies
every



19 MINUTES

from drug overdose
in the United States

and this increasing trend
is driven by Rx painkillers.



Opioid pain relievers are
responsible for more
overdose deaths than
cocaine and heroin
combined.



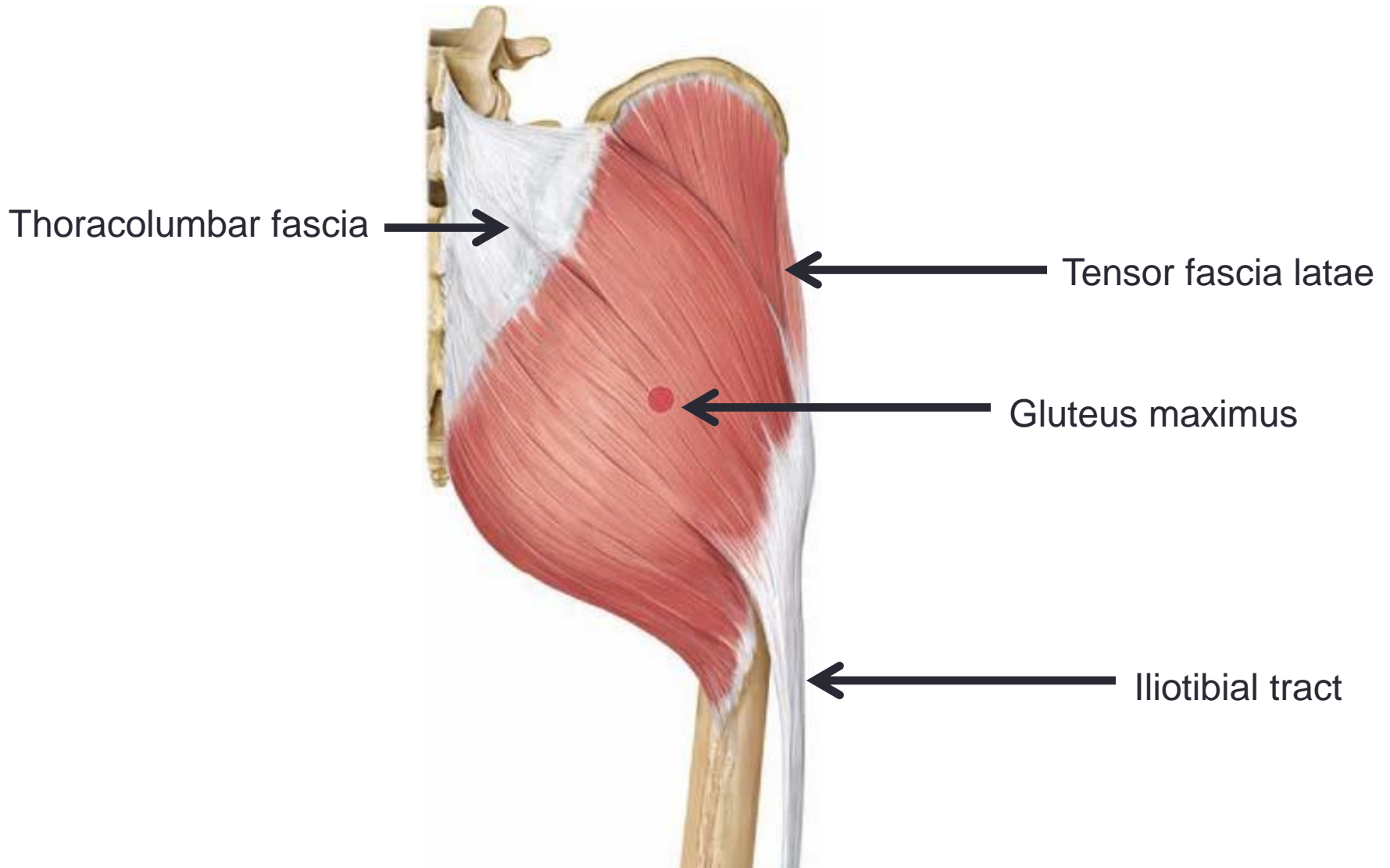
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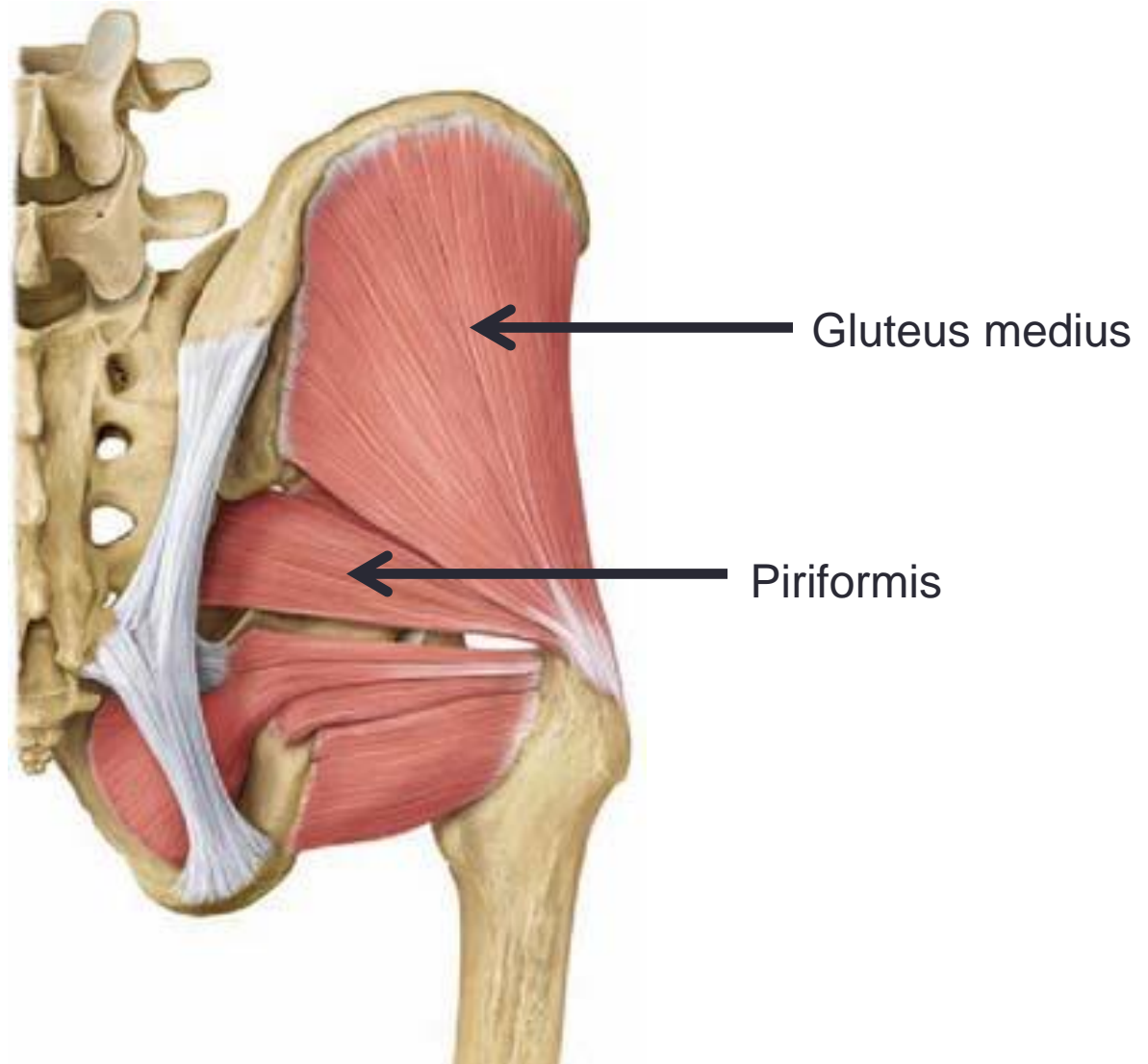
Brief Anatomy Review



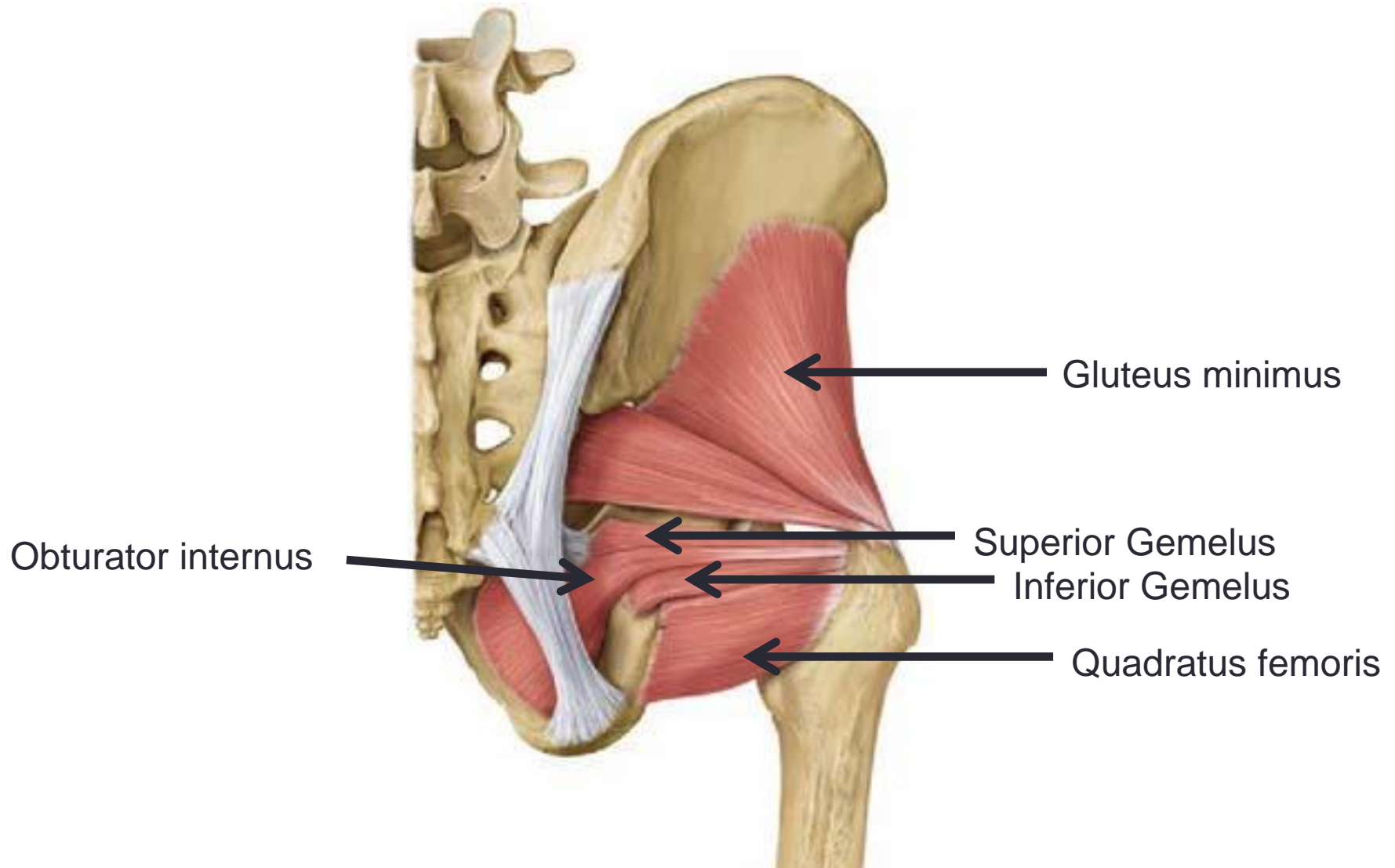
Superficial Gluteal Structures



Mid Gluteal Structures

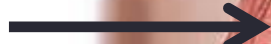


Deep Gluteal Structures

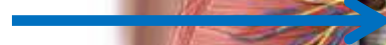


Gluteal Nerves

Gluteus maximus



Posterior femoral cutaneous nerve



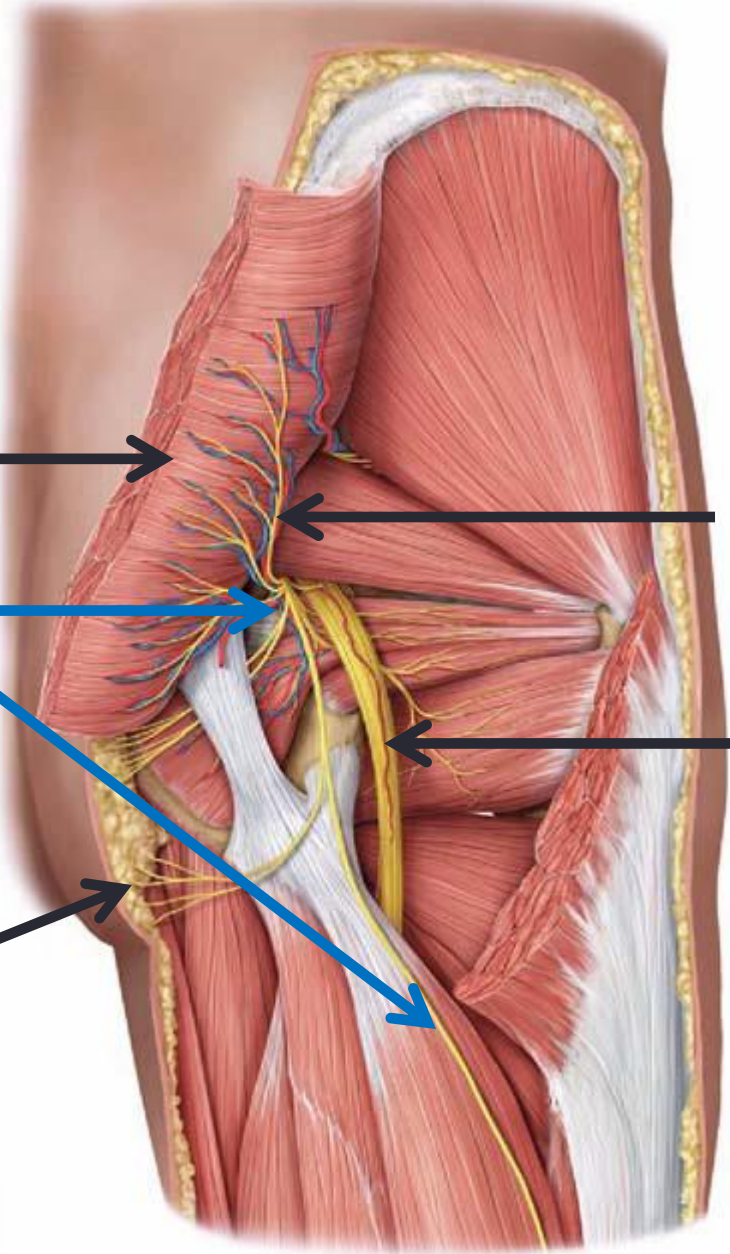
Inferior cluneal (bbr of PFCN)



Sciatic nerve



Perineal (bbr of PFCN)



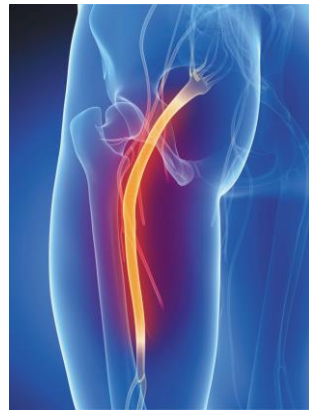
Case

A 68 y/o woman presents for **constant left sided lower back pain**, varying in intensity from **3-7/10**, occasionally **radiating** down the back of the left side of her thigh to above her knee.

She states this happened when she bent down to pick up some boxes. The pain is minimally improved with chiropractic treatments and Advil OTC PRN and worse with walking. She denies acute onset, muscle weakness, numbness/tingling down either lower extremity, or loss of bowel or bladder function.



Differential Diagnosis?



DDX Buttock Pain

- **Sciatica**
- **Piriformis syndrome**
- **Hip joint arthritis**
- **Lumbosacral radiculopathy**
- **Spinal stenosis**
- **Gluteus medius / minimus tendinosus**
- **Greater trochanteric bursitis**
- **Proximal hamstring strain**
- **Somatic dysfunction (Innominate, Sacral, Lumbar)**
- **Myofascial pain syndrome**
- **Mononeuritis**
- **Ischial bursitis**
- **Sacroiliac joint pain**
- **Sacroilitis (eg Ankylosing spondylitis)**
- **Infected Pilonidal cyst**
- **Gluteal abscess**
- **Coccygodynia**



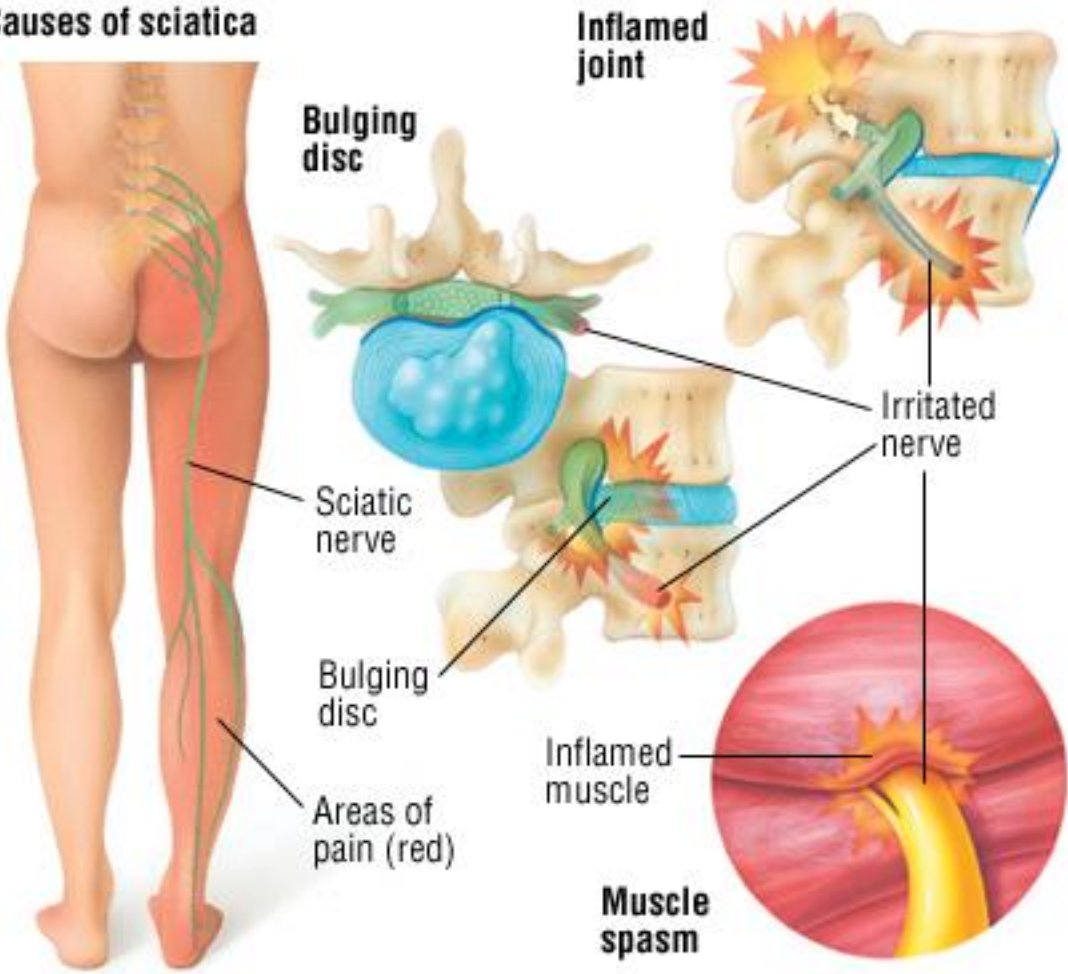
Sciatica M54.30

Pathophysiology

Pain in the lower extremity resulting from irritation of the sciatic nerve, which is typically felt from the low back to the buttock and radiating down and below the knee



Causes of sciatica



Sciatica ~ Lasegue Test



Sciatica ~ MSK Ultrasound



Surgical Orth TEST EXAMPLES,
28PM ADM 122233446



LEFT SCIATIC NERVE LONG





LEFT SCIATIC NERVE LONG







Piriformis Syndrome G57.00

Pathophysiology

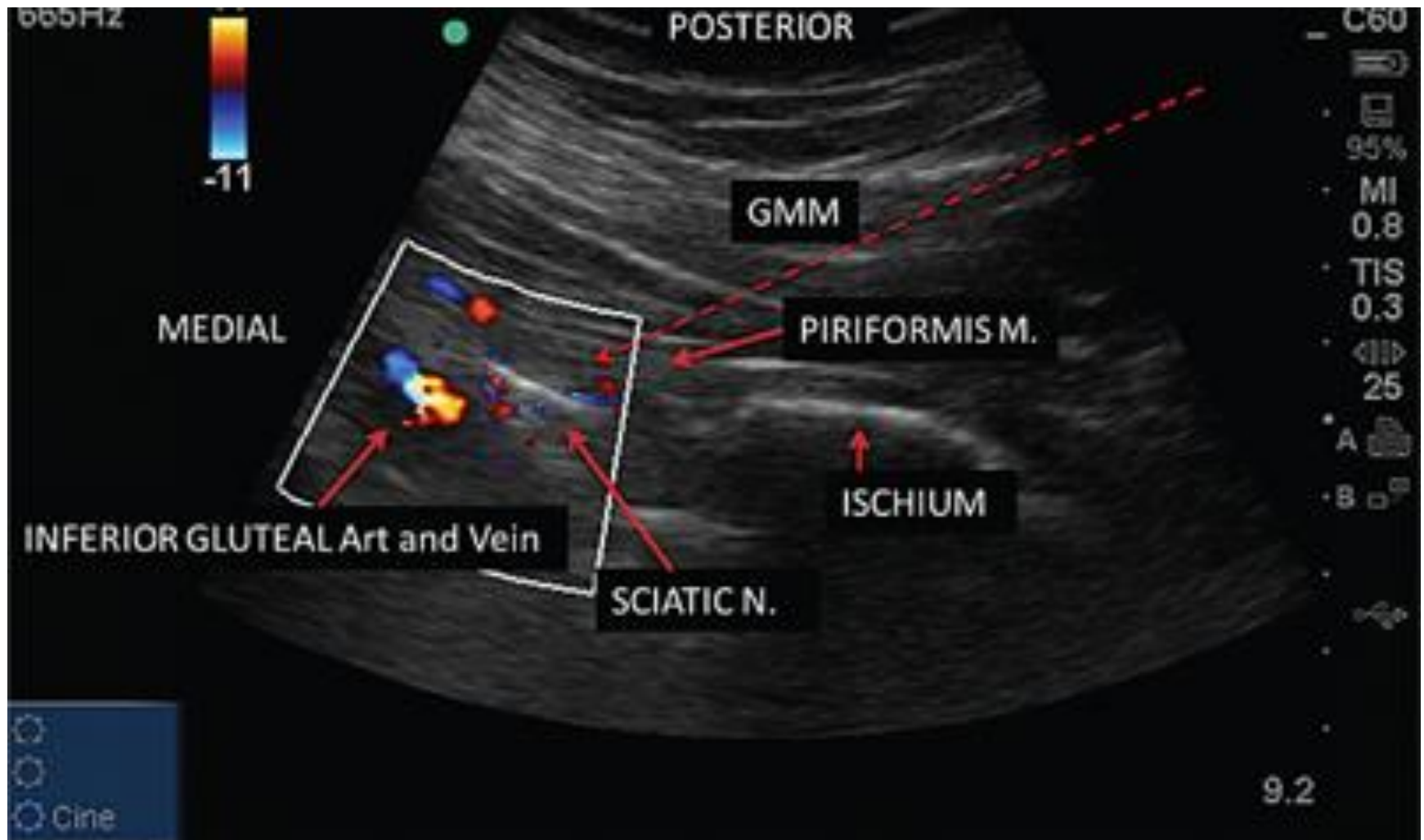
Sciatica-like pain caused by compression of the sciatic nerve by the piriformis muscle



Piriformis Syndrome ~ Freiberg Test



Piriformis Syndrome ~ MSK US

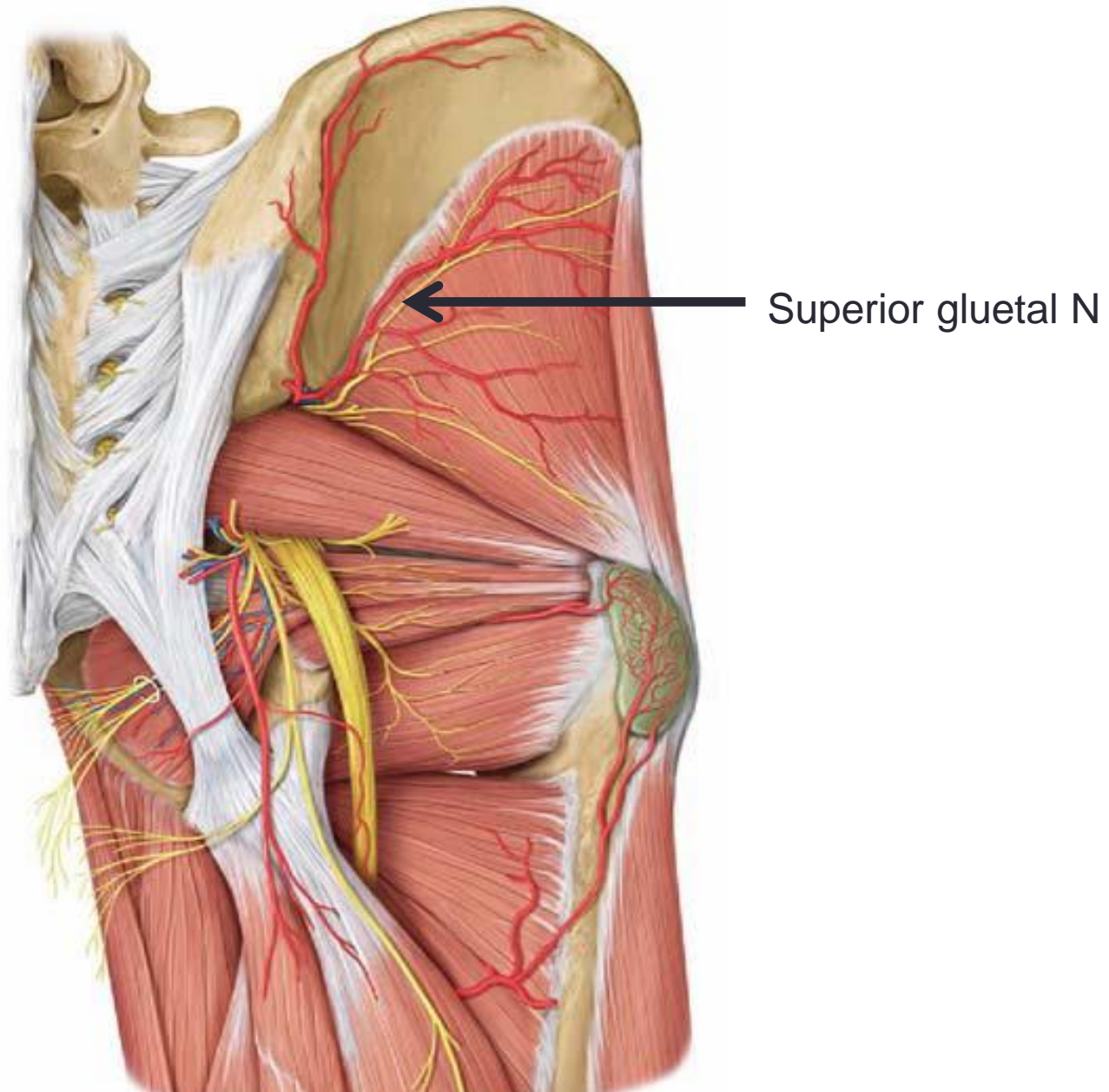


Mononeuritis G58.9 (Superior Gluteal Nerve)

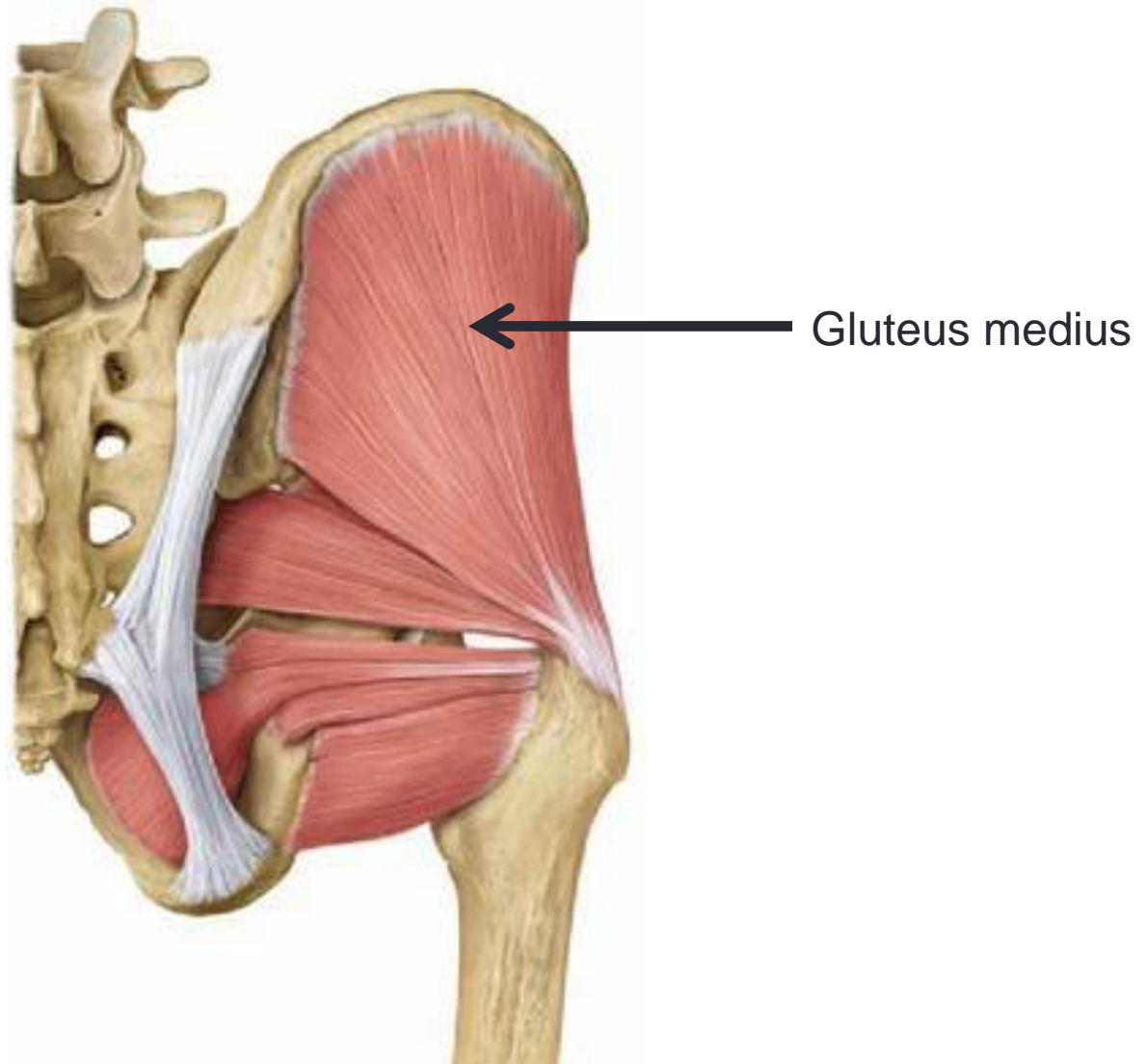
Pathophysiology

- Disease or trauma involving a single peripheral nerve
- Posterior gluteal irritation or pain

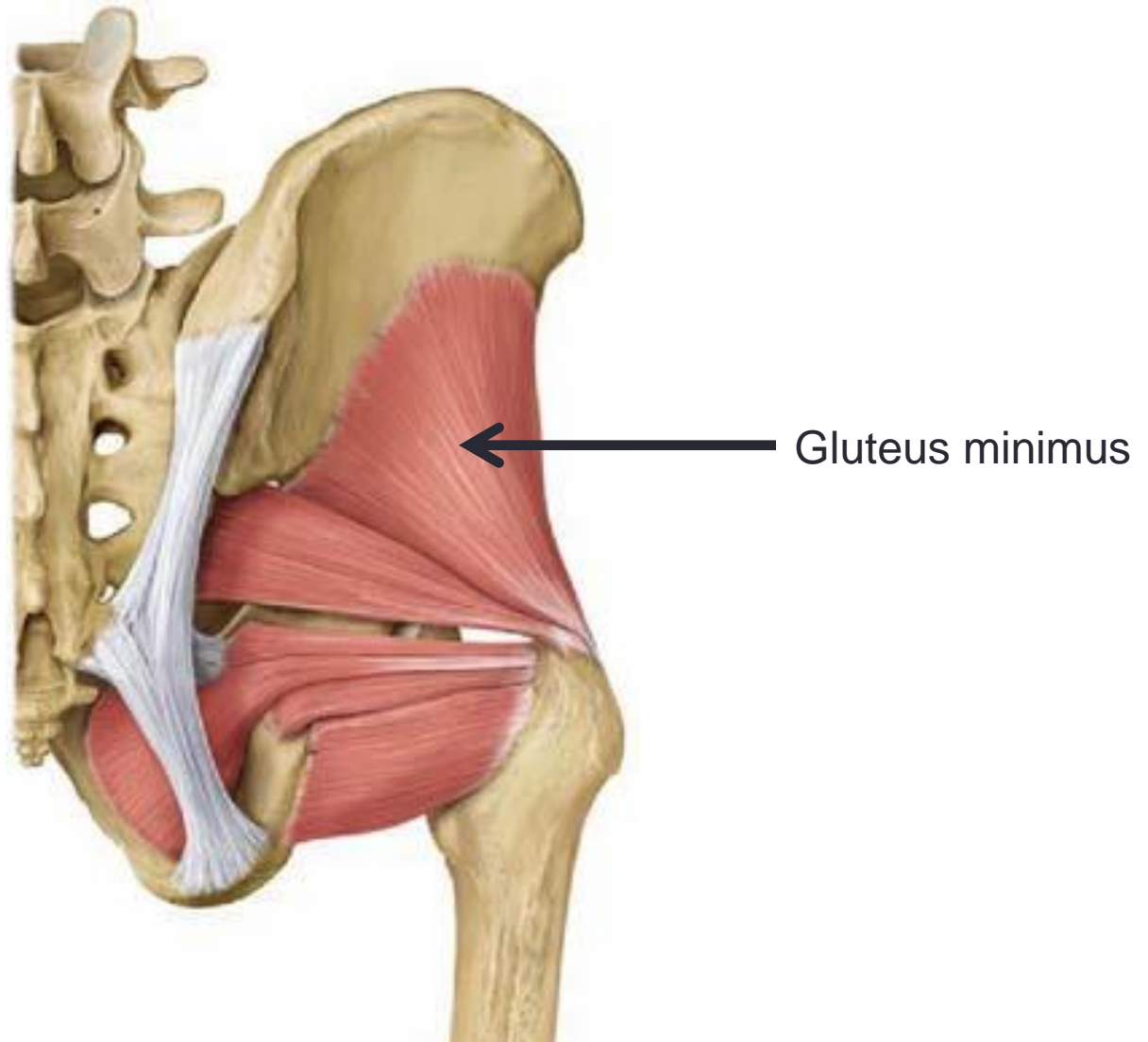
Superior Gluteal Nerve



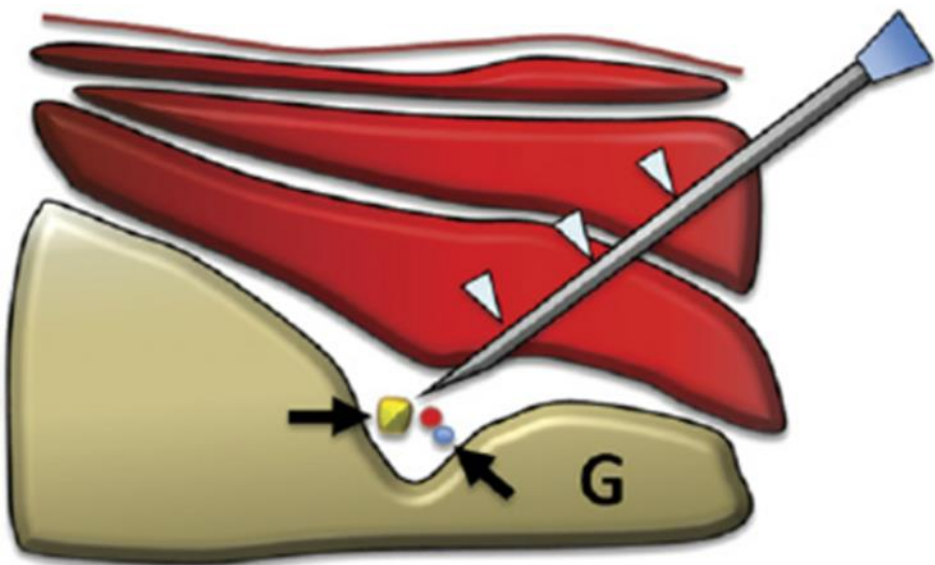
Superior Gluteal Nerve



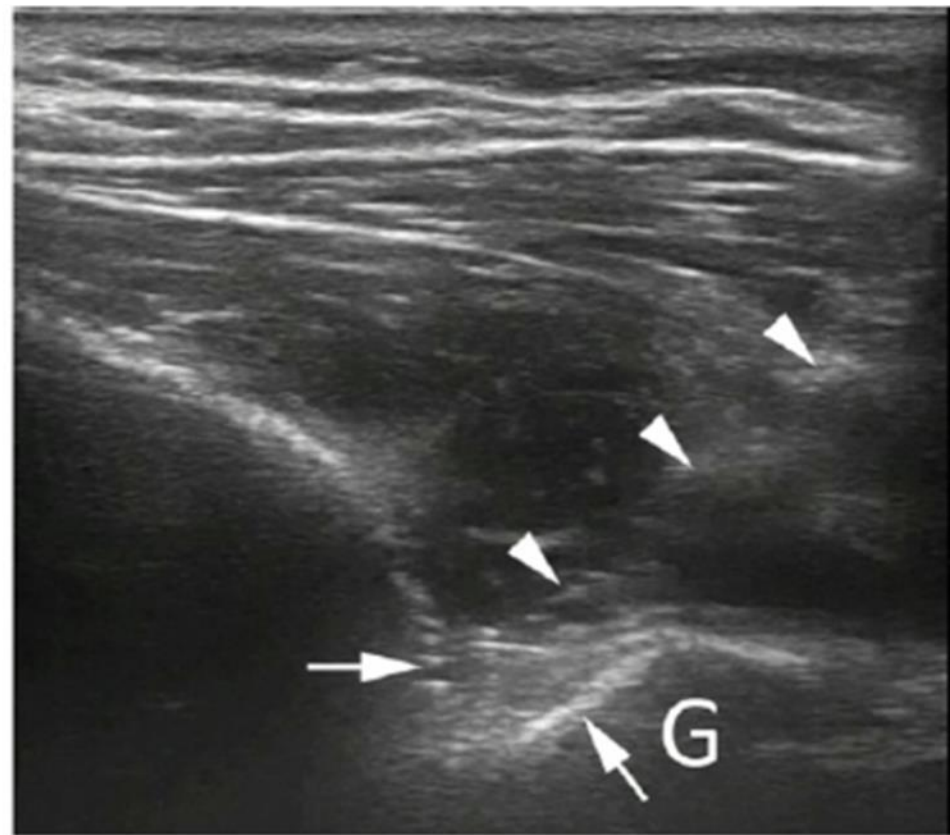
Superior Gluteal Nerve



Mononeuritis (Superior Gluteal Nerve) ~ MSK US



(a)

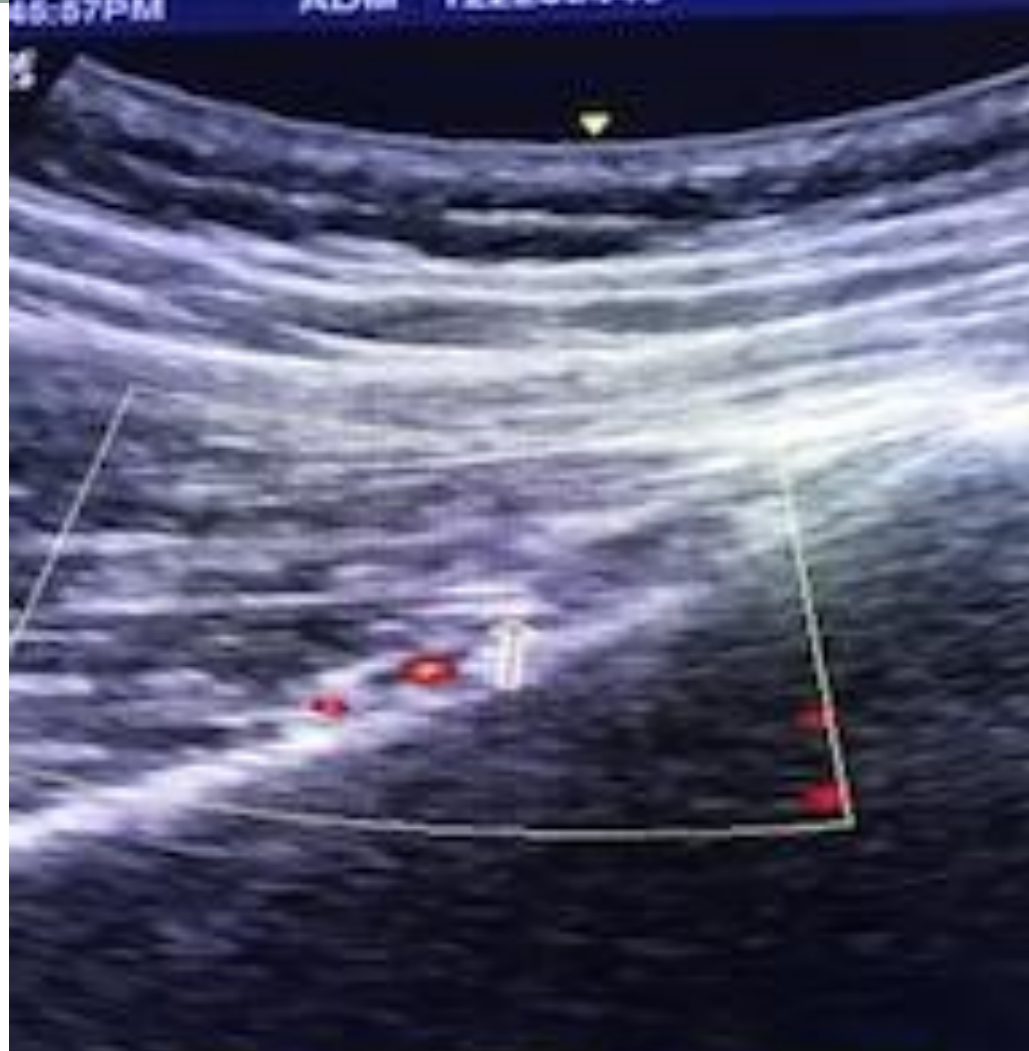


(b)

urgical Orth TEST EXAMPLES,
M ADM 122233446



LEFT SUPERIOR GLUTEAL NERVE



LEFT SUPERIOR GLUTEAL NERVE

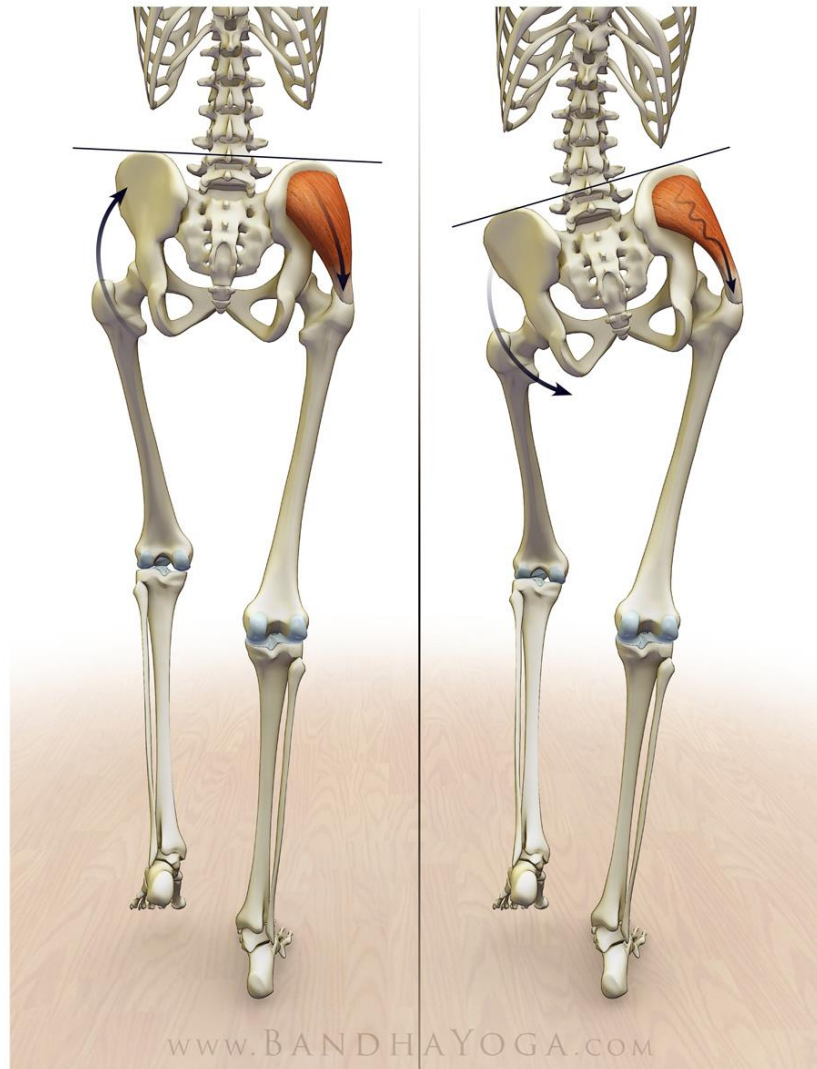


Gluteus Medius Tendinopathy M76.0 & Trochanteric Bursitis M70.6

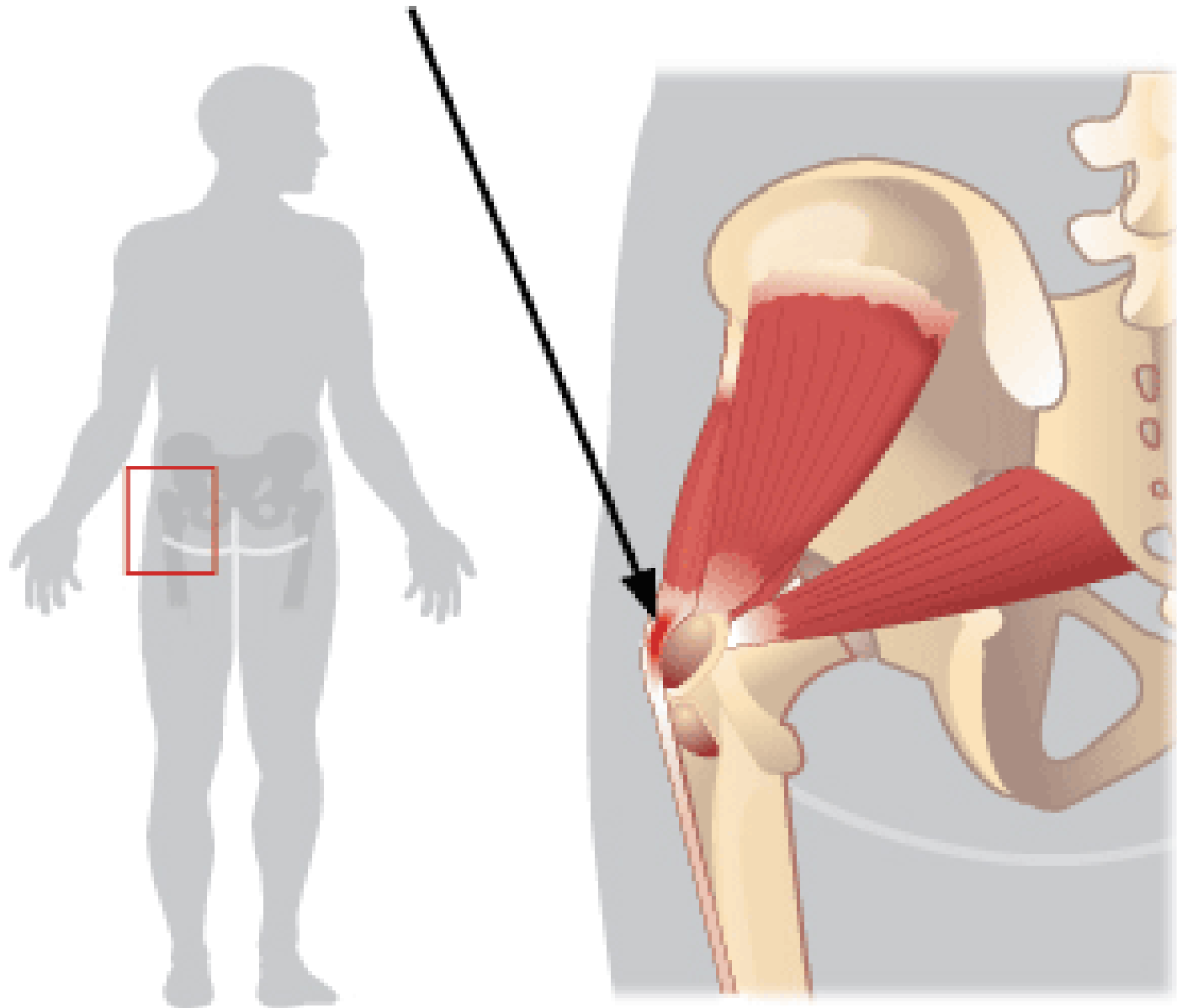
Pathophysiology

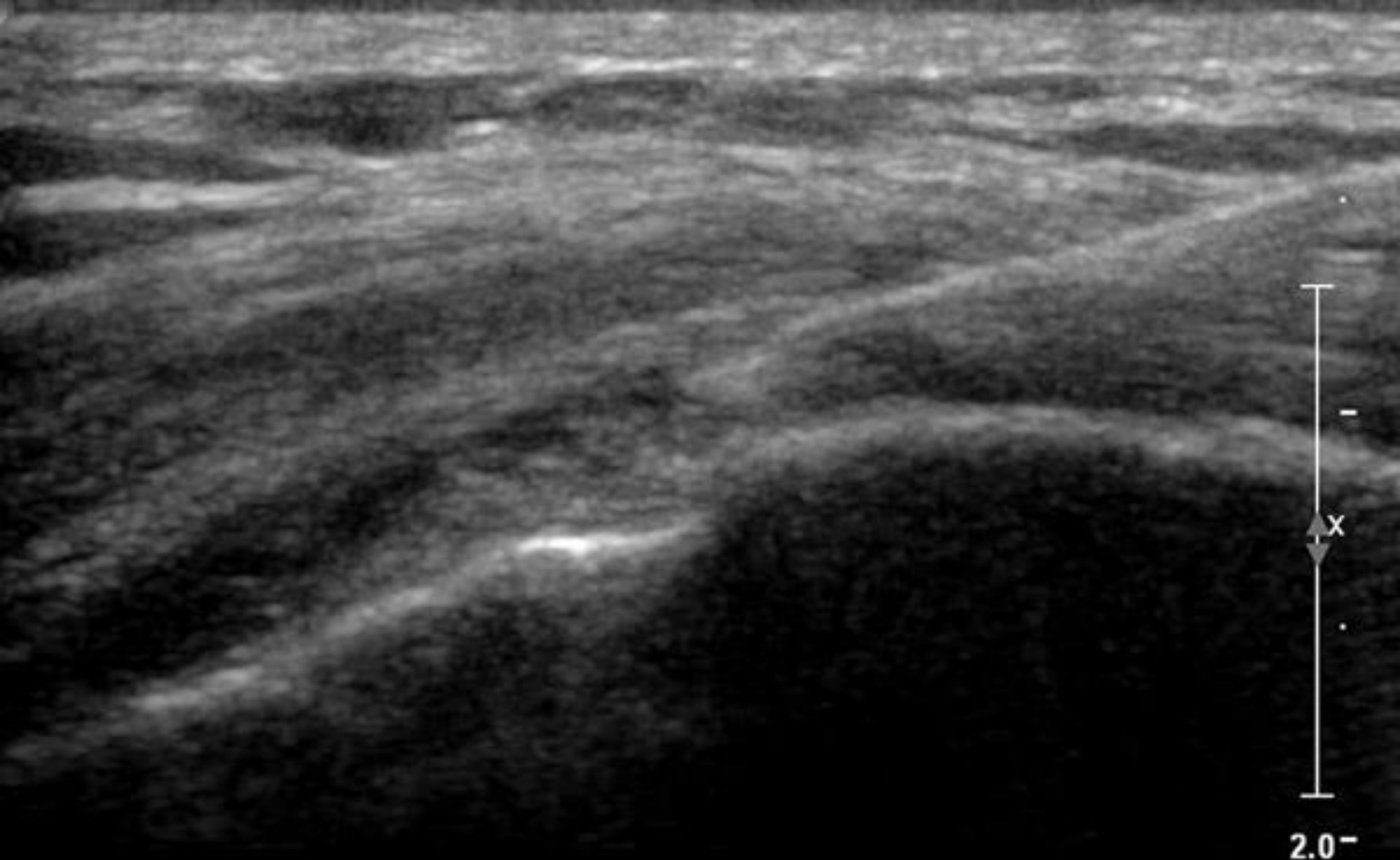
- Lateral hip pain
- Insidious onset
- Exacerbated with activity
- Pain may be exacerbated in lateral recumbent position
- Pain may radiate down the lateral thigh

Gluteus Medius Tendinopathy ~ Trendelenburg Test



Trochanteric Bursitis





LT TROCH BURSA INJECTION



Sacroiliac Joint Pain M53.3

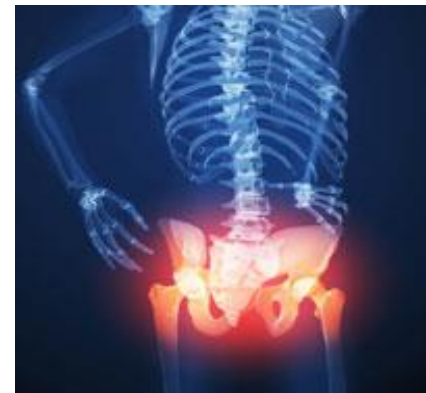
- Posterior hip pain
- Most commonly mechanical
- Reproducible on palpation

Sacroiliac Joint Pain M53.3

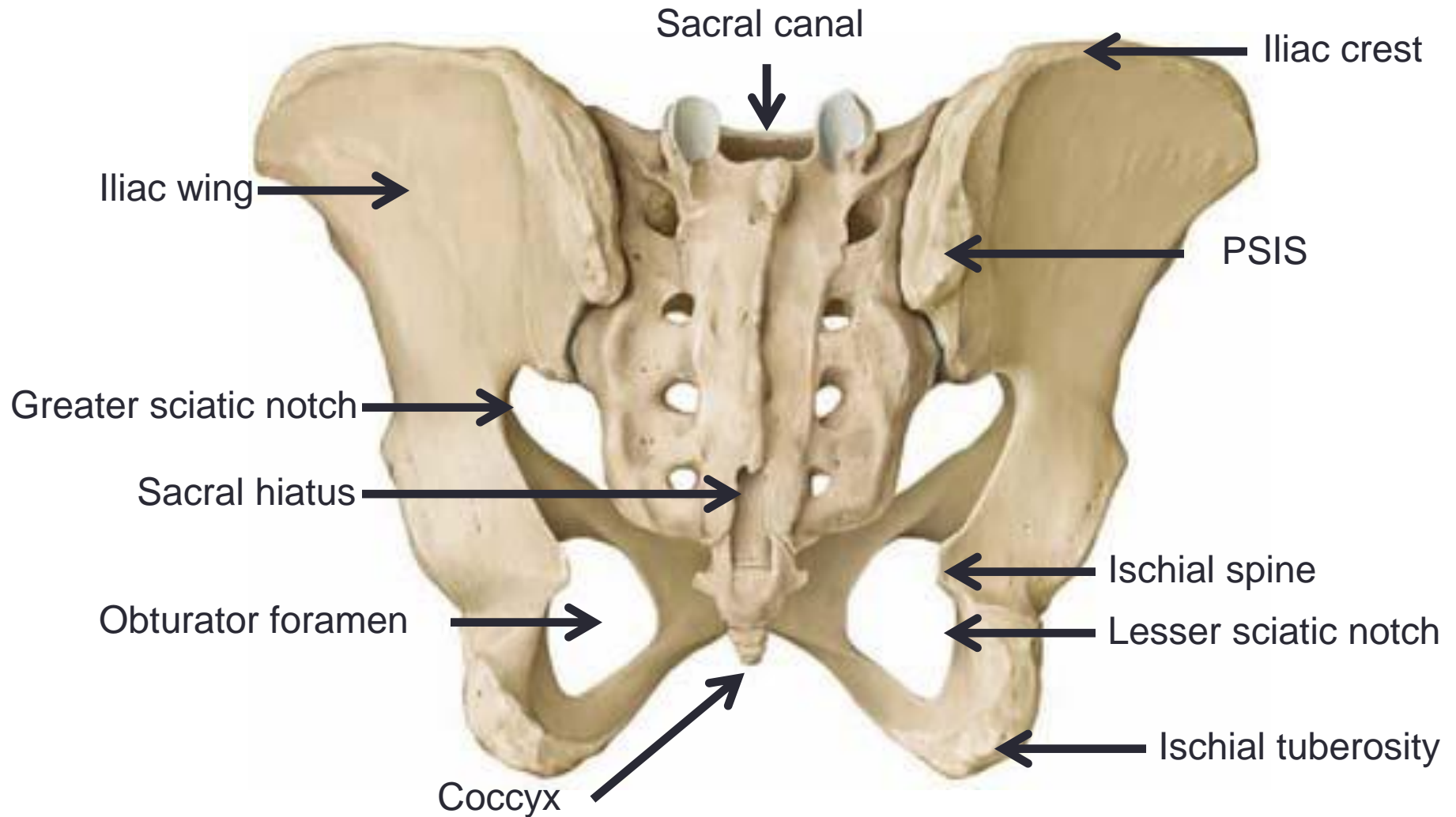
Identify

Locating via anatomic landmarks

- Palpate medial and deep to PSIS
- Pain on palpation along lateral margin of sacrum



Posterior Pelvic Structures

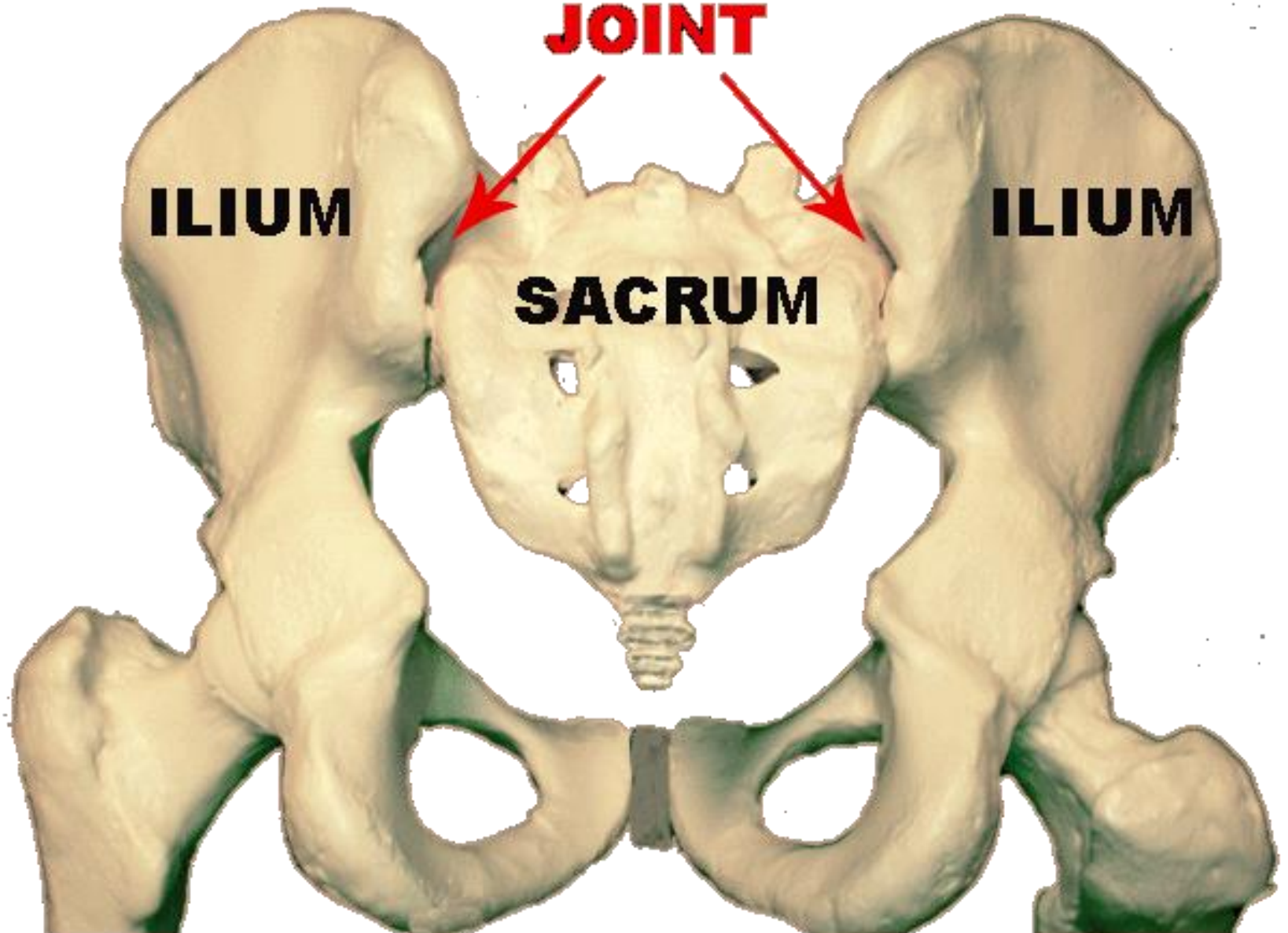


**SACROILIAC
JOINT**

ILIUM

ILIUM

SACRUM





Sacroiliac Joint Pain ~ Yeoman's Test



Sacroiliac Joint Pain ~ Gaenslen's Test

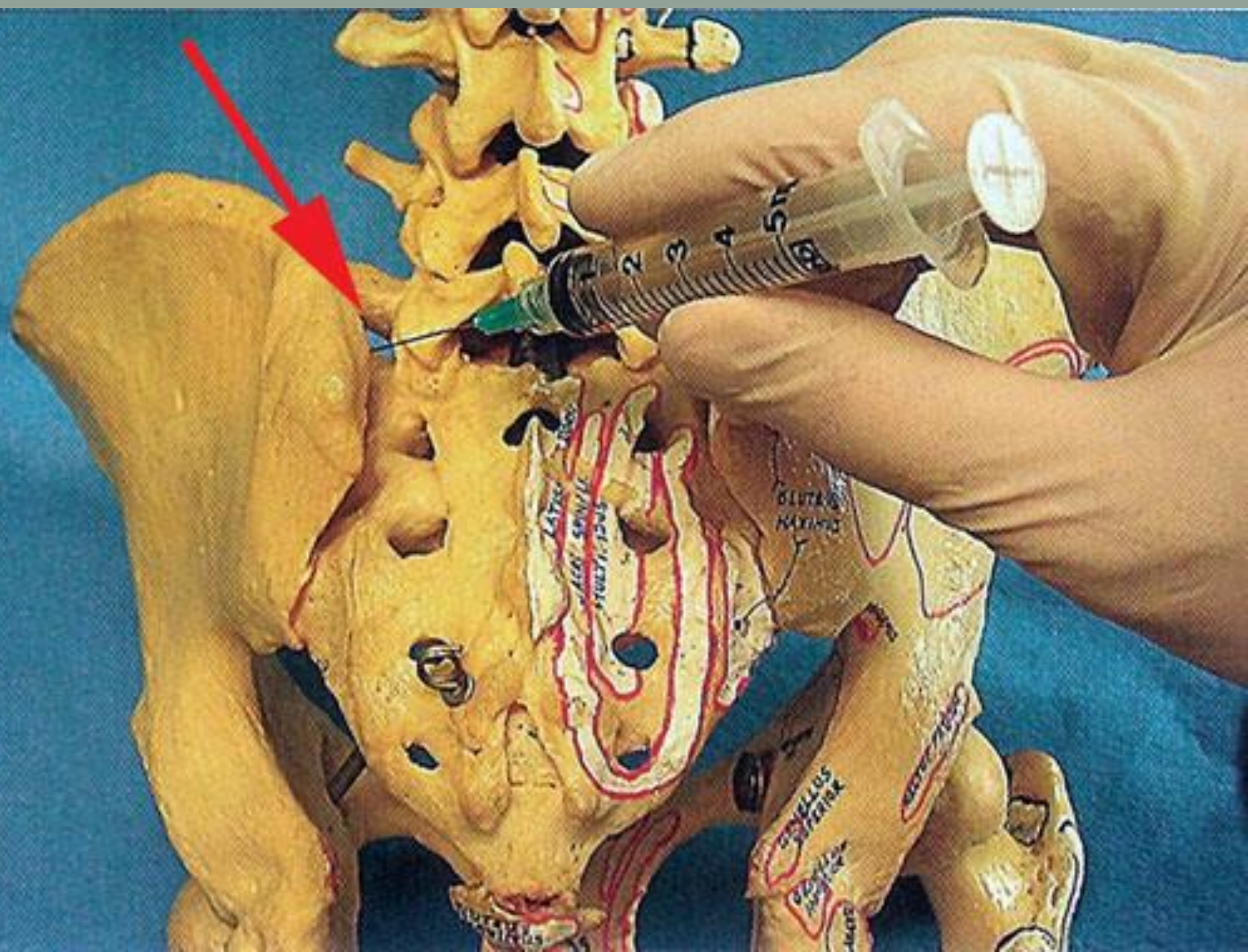


Sacroiliac Joint Pain ~ Patrick's Test

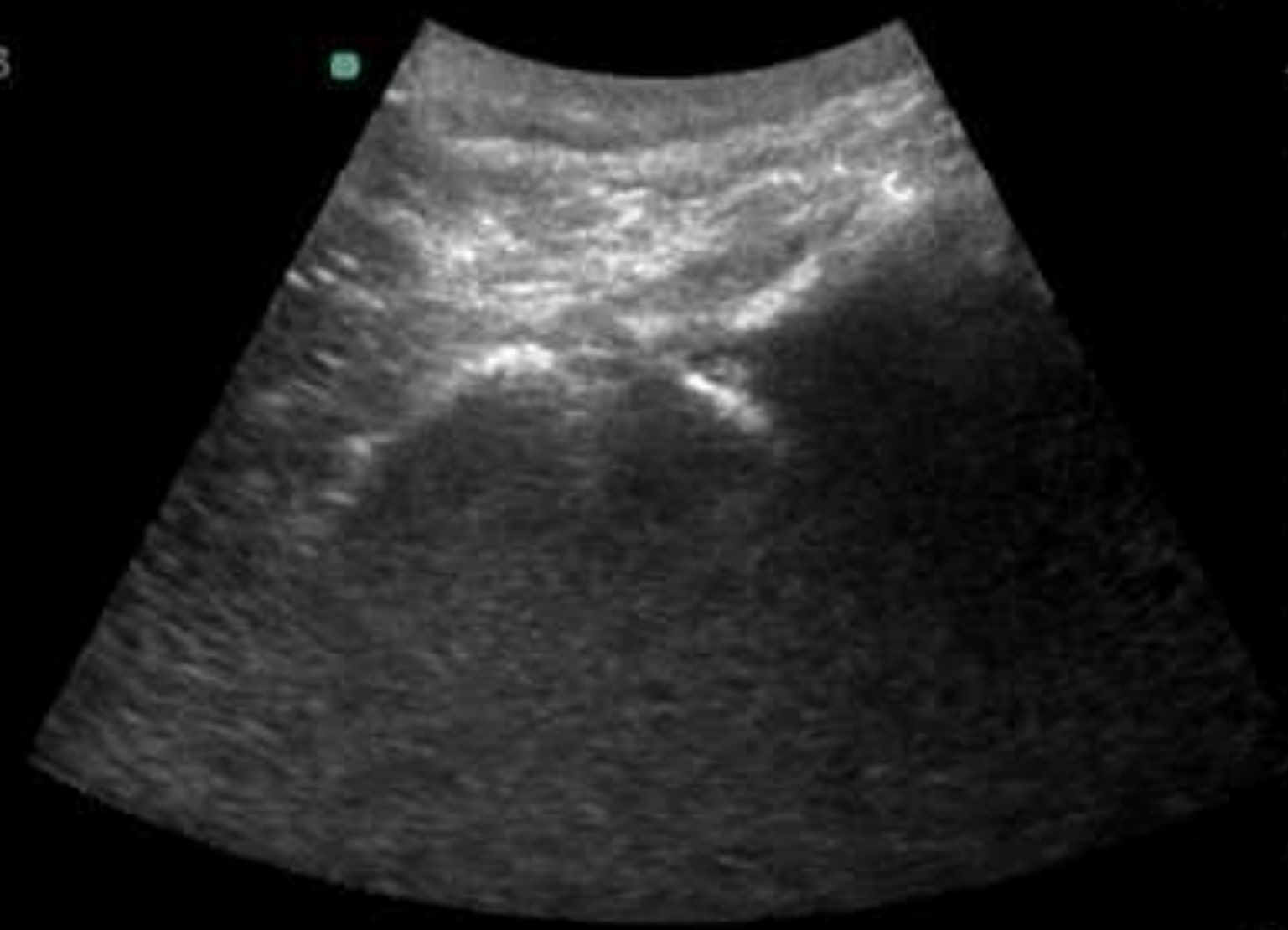


Sacroiliac Joint Pain ~ MSK US





Gen
S MB



Nrv
- C50
MI
0.6
TIS
0.1
A
8

FR24

P75

THI On

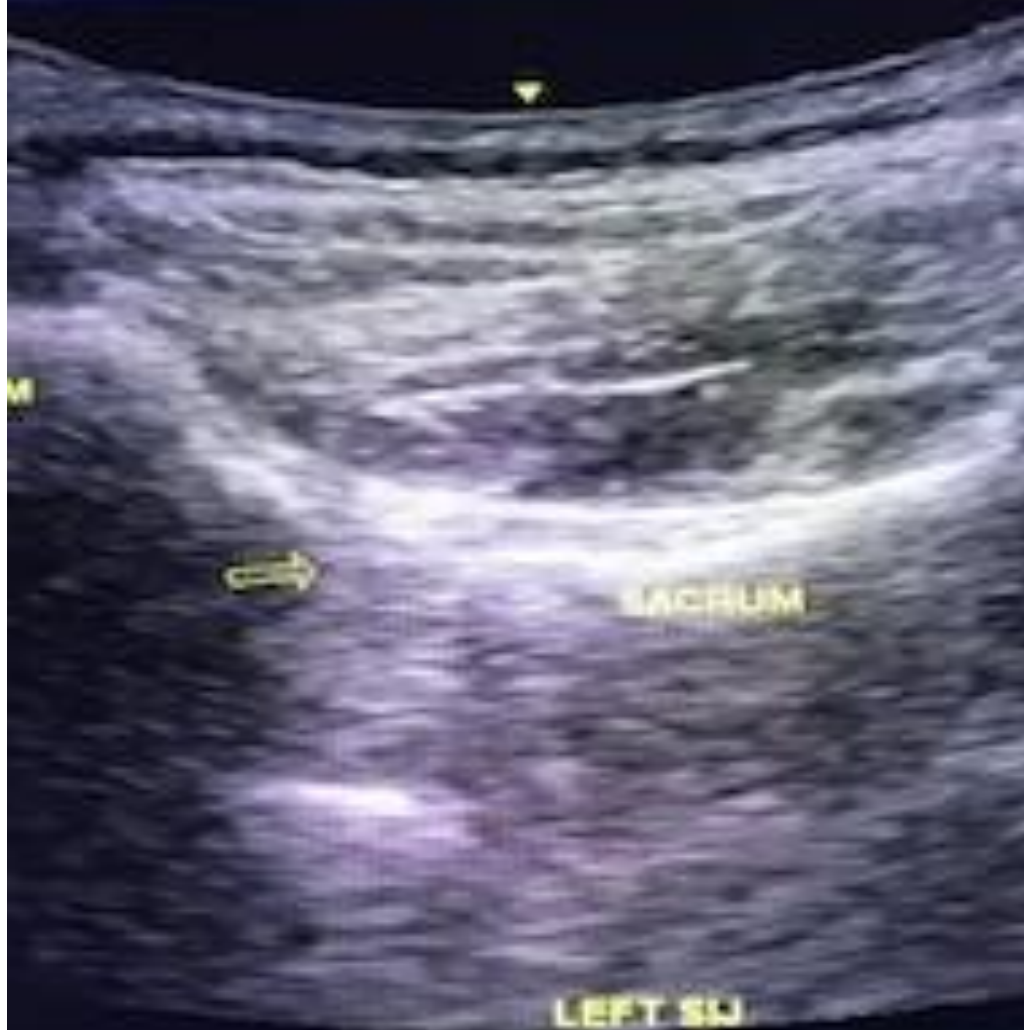
HRes

BG20

DR60



SACROILIAC JOINT



Osteopathic Medicine Review

- Diagnosis of somatic dysfunction relies on physical exam findings (TART):
 - 1) Tissue texture changes
 - 2) Asymmetry
 - 3) Restriction
 - 4) Tenderness
- Treatment (**OMT**) *relies on a diagnosis of somatic dysfunction*
- Eg M99.01 Segmental and somatic dysfunction of cervical region.
 - Billable procedure = OMT

Osteopathic Diagnosis

PELVIS & SACRUM

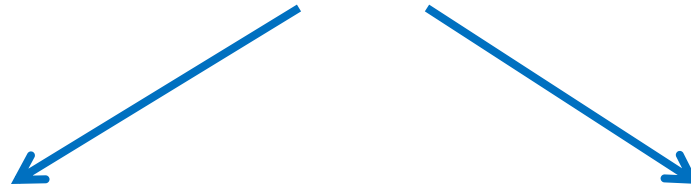
RELATED REGIONS

- Lumbar spine
- Lower extremities

**So how do we diagnose
somatic dysfunctions
of the pelvis or sacrum?**

Osteopathic Diagnosis

TWO DIFFERENT PATHWAYS...



PELVIS

- Iliosacral motion
- How the pelvis moves relative to the sacrum

SACRUM

- Sacroiliac motion
- How the sacrum moves relative to the pelvis

Osteopathic Diagnosis

PERFORM TWO SIMPLE TESTS...

STANDING FLEXION TEST



SEATED FLEXION TEST



Osteopathic Diagnosis

**POSITIVE STANDING
FLEXION TEST**



**PELVIS
(ILIOSACRAL)**

How the pelvis moves relative
to the sacrum



**POSITIVE SEATED
FLEXION TEST**



**SACRUM
(SACROILIAC)**

How the sacrum moves
relative to the pelvis



Osteopathic Diagnosis

**POSITIVE STANDING
FLEXION TEST**



**PELVIS
(ILIOSACRAL)**

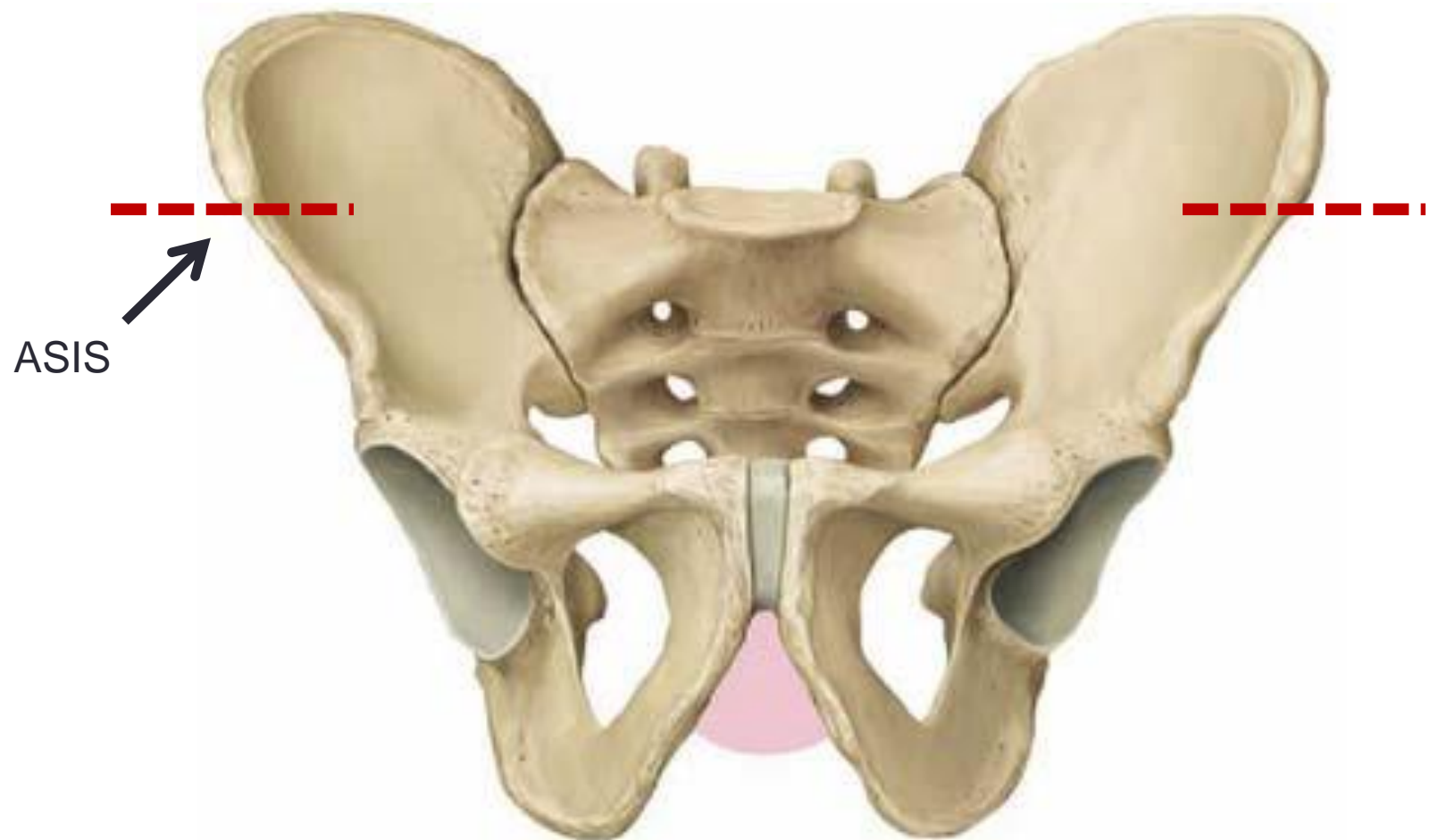
How the pelvis moves relative
to the sacrum



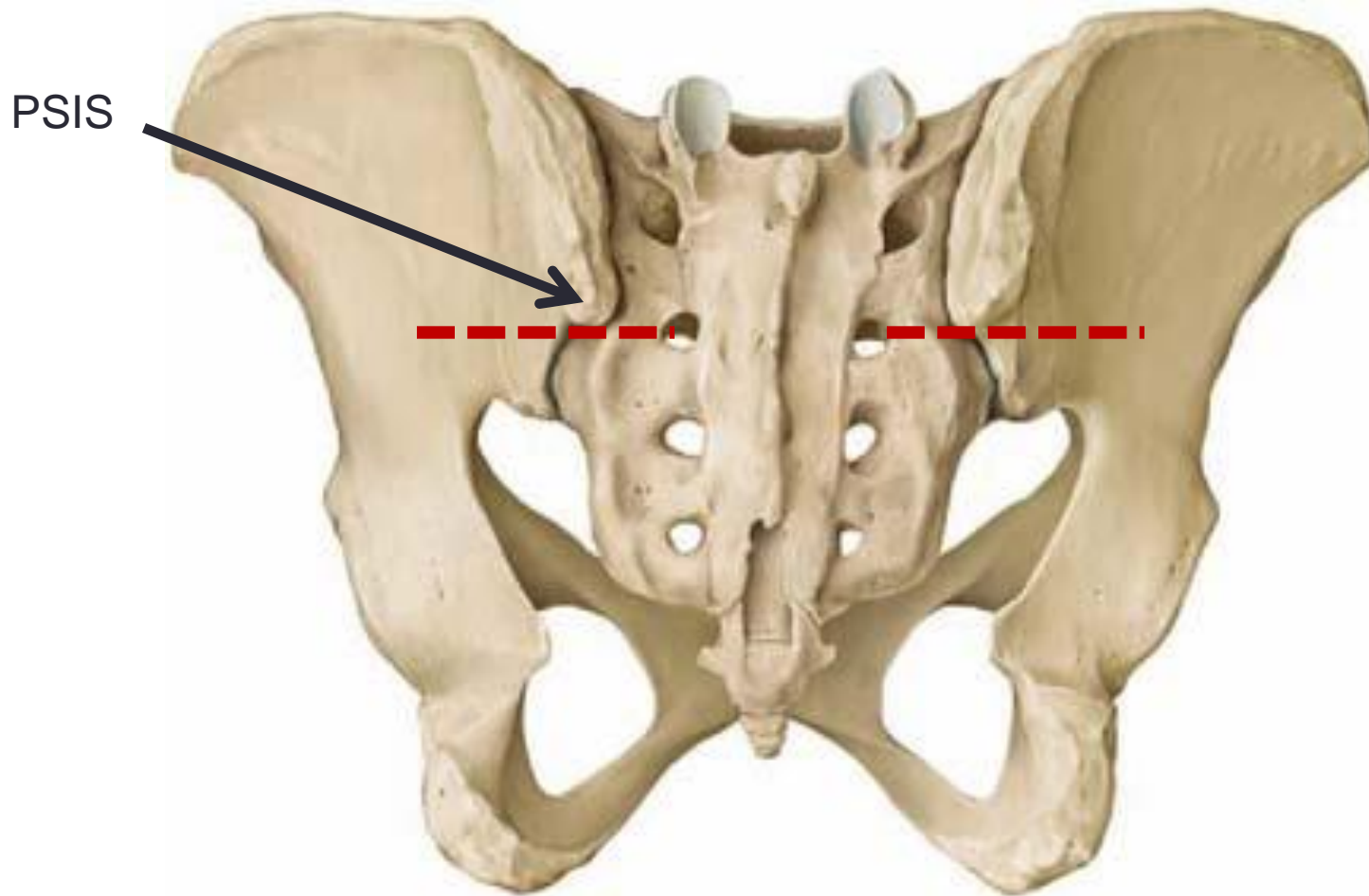
Osteopathic Diagnosis ~ PELVIS

- **Positive Standing Flexion Test**
 - Indicates iliosacral dysfunction
- **Iliosacral landmarks**
 - ASIS
 - PSIS
 - Pubic symphysis
 - (medial malleoli)
- Evaluate anatomic landmarks relative to the positive side

Pelvis Landmarks - Anterior



Pelvis Landmarks - Posterior



M99.05 Segmental and Somatic Dysfunction of Pelvic Region

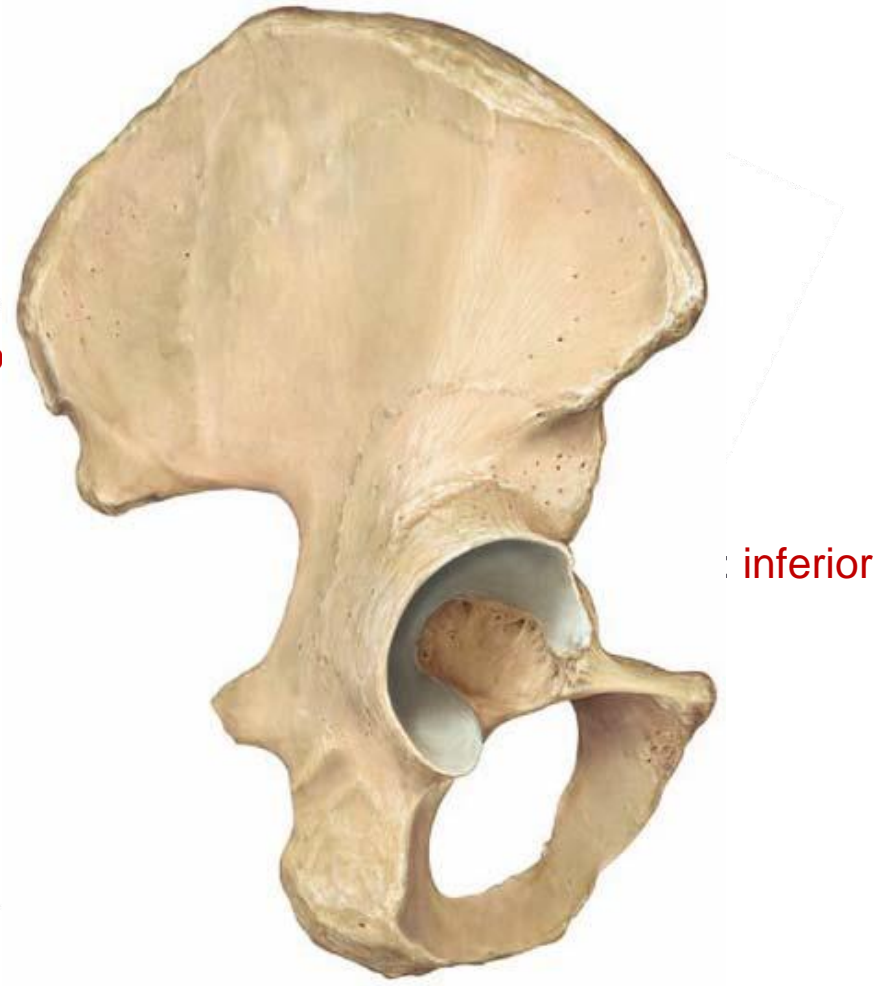
Osteopathic segmental findings:

- Anterior Innominate Rotation
- Posterior Innominate Rotation
- Superior Innominate Shear
- Inferior Innominate Shear
- Innominate Inflare
- Innominate Outflare

Anterior Innominate Rotation

Example:

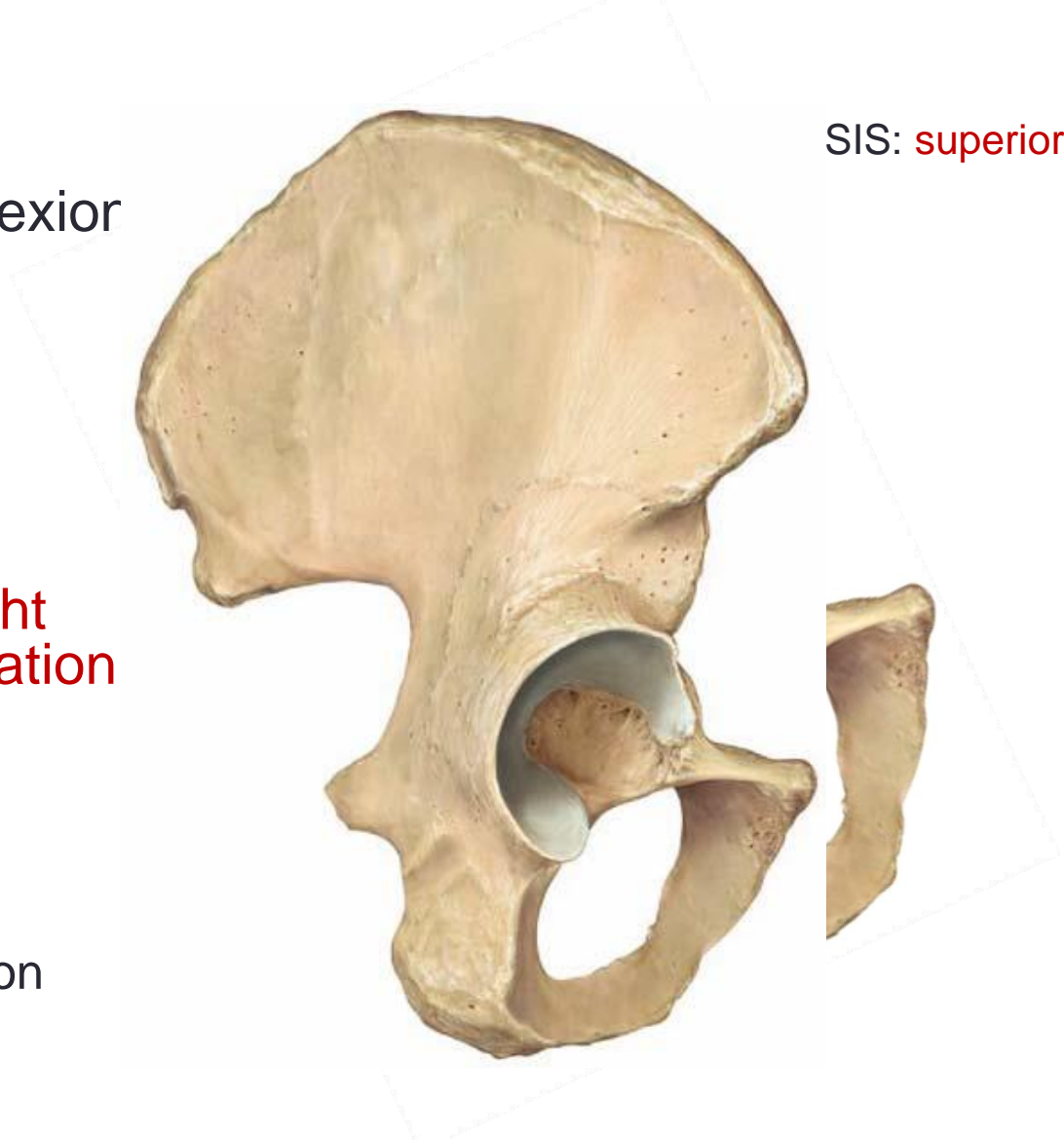
- Positive right standing flexion test
- R ASIS: **inferior** R PSIS: **superio**
- R PSIS: **superior**
- Osteopathic finding: **Right anterior innominate rotation**
- Diagnosis:
 - M99.05
 - Segmental and somatic dysfunction of pelvic region



Posterior Innominate Rotation

Example:

- Positive right standing flexion test
- R ASIS: **superior**
- R PSIS: **inferior**
- Osteopathic finding: **Right posterior innominate rotation**
- Diagnosis:
 - M99.05
 - Segmental and somatic dysfunction of pelvic region



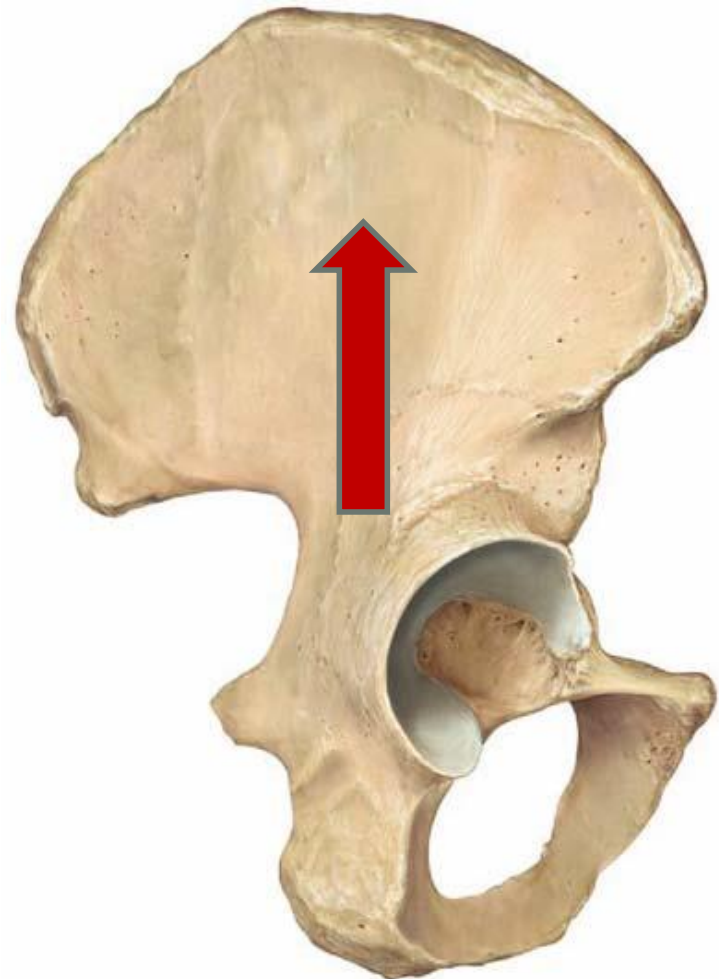
Superior Innominate Shear

Example:

- Positive **RIGHT** standing flexion test
- R ASIS: **superior**
- R PSIS: **superior**

- Osteopathic finding: **Right superior** innominate shear

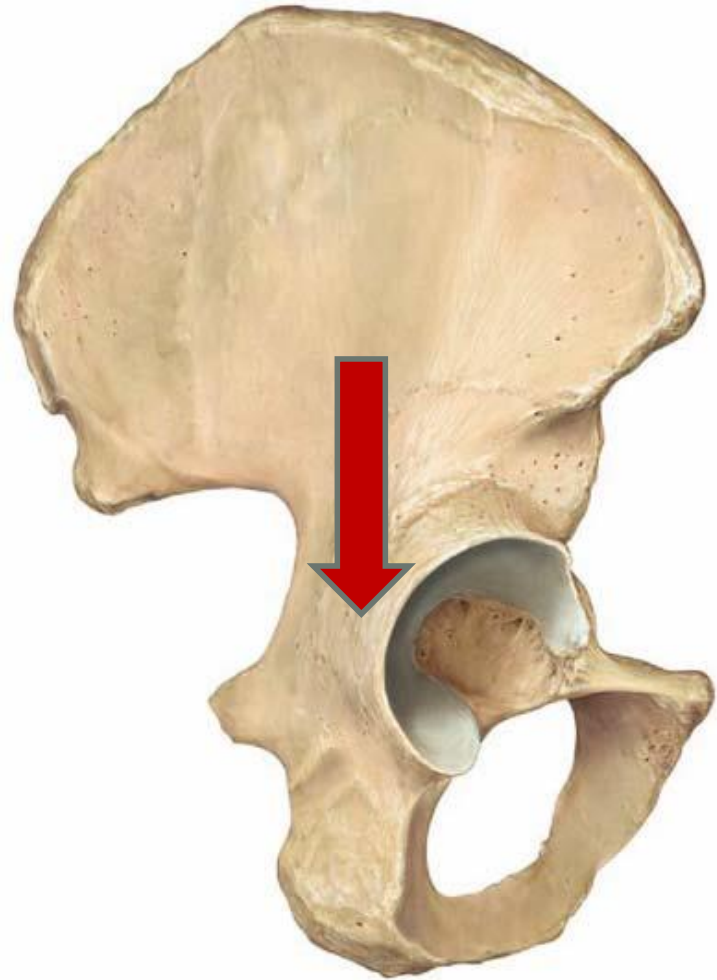
- Diagnosis:
 - M99.05
 - Segmental and somatic dysfunction of pelvic region



Inferior Innominate Shear

Example:

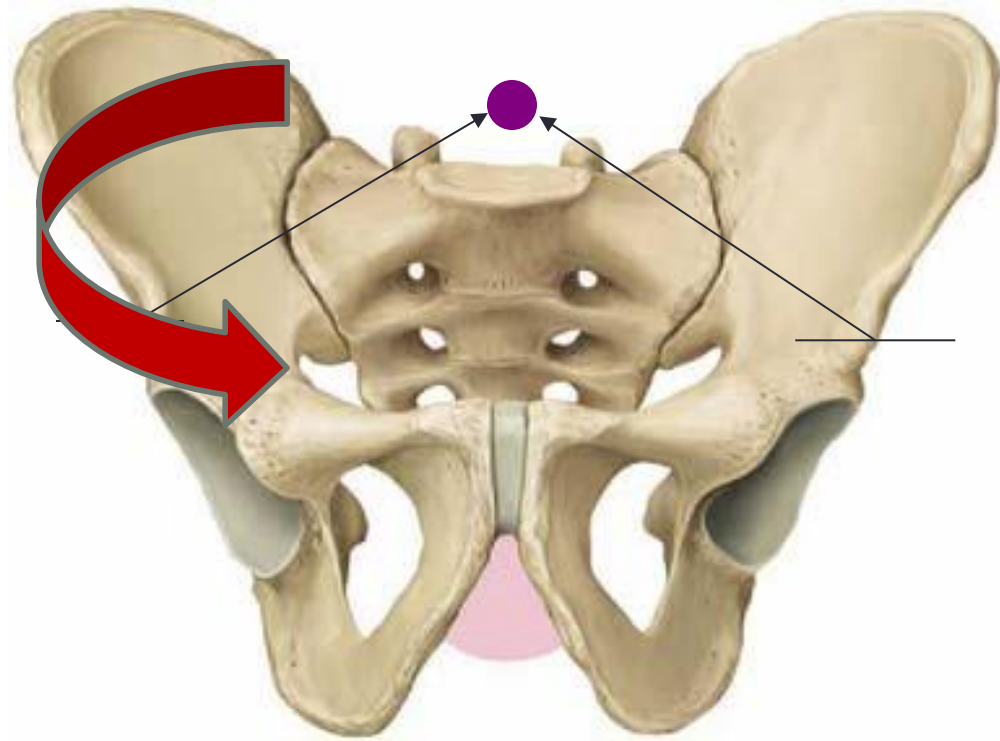
- Positive **RIGHT** standing flexion test
- R ASIS: **inferior**
- R PSIS: **inferior**
- Osteopathic finding: **Right inferior** innominate shear
- Diagnosis:
 - M99.05
 - Segmental and somatic dysfunction of pelvic region



Innominate Inflare

Example:

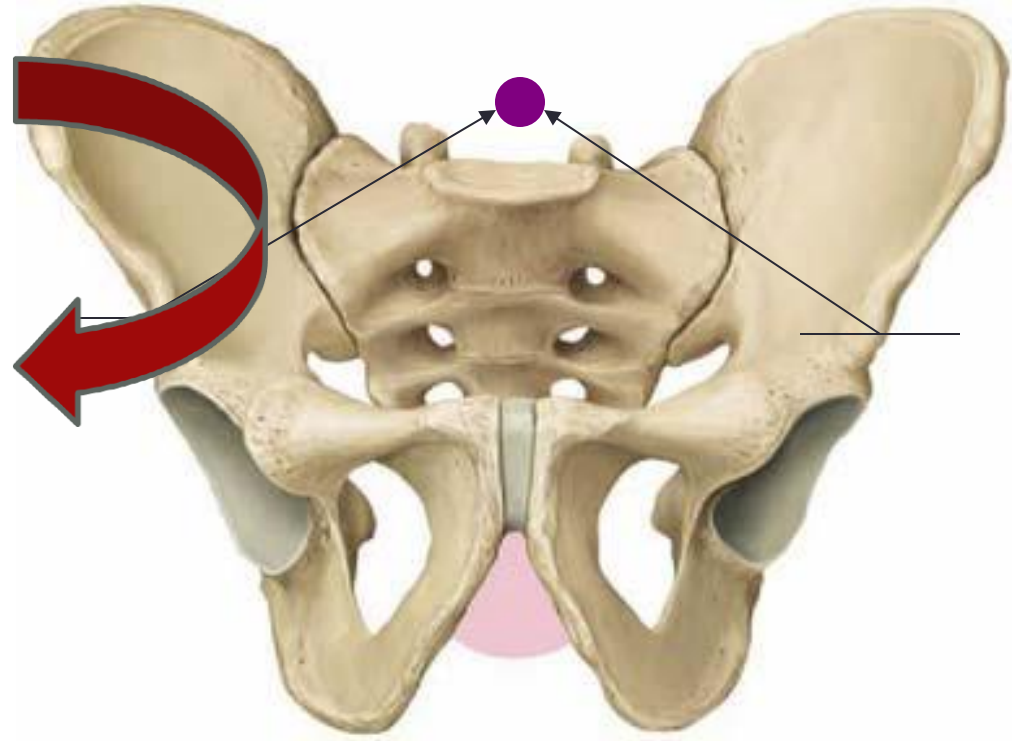
- Positive **RIGHT** standing flexion test
- R ASIS is more medial to the midsagittal line
- Osteopathic finding: **Right innominate inflare**
- Diagnosis:
 - M99.05
 - Segmental and somatic dysfunction of pelvic region



Innominate Outflare

Example:

- Positive **RIGHT** standing flexion test
- R ASIS is more lateral to the midsagittal line
- Osteopathic finding: **Right innominate outflare**
- Diagnosis:
 - M99.05
 - Segmental and somatic dysfunction of pelvic region



Osteopathic Diagnosis

POSITIVE STANDING
FLEXION TEST



PELVIS
(ILIOSACRAL)

How the pelvis moves relative
to the sacrum

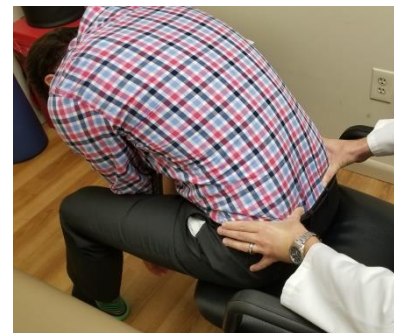


POSITIVE **SEATED**
FLEXION TEST



SACRUM
(SACROILIAC)

How the sacrum moves
relative to the pelvis



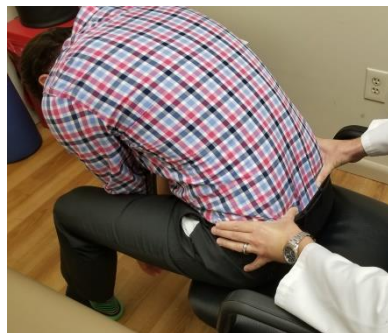
Osteopathic Diagnosis ~ SACRUM

POSITIVE SEATED
FLEXION TEST



SACRUM
(SACROILIAC)

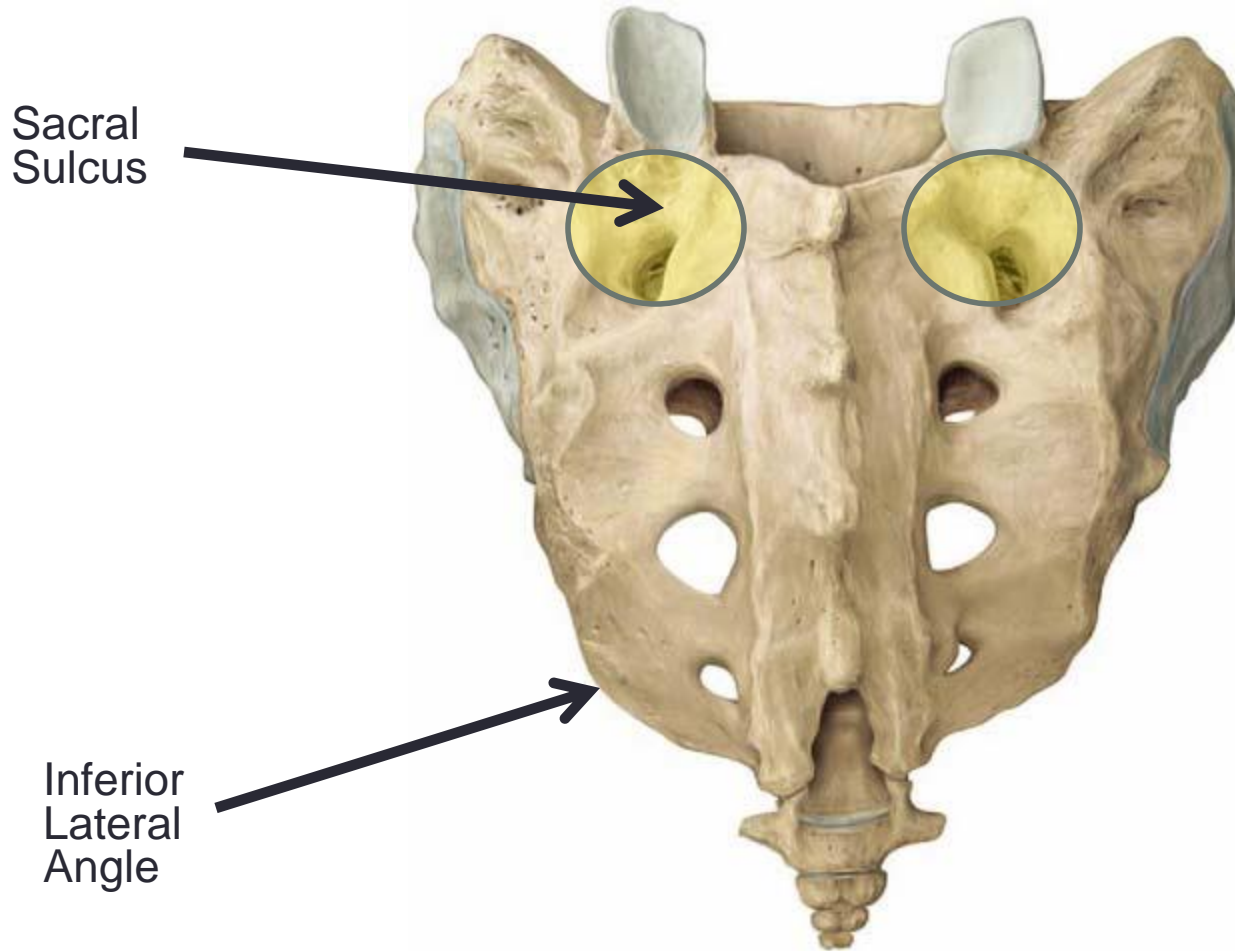
How the sacrum moves
relative to the pelvis



Osteopathic Diagnosis

- **Positive Seated Flexion Test**
 - Indicates Sacroiliac dysfunction
- **Sacrum landmarks**
 - Sacral base
 - Inferior Lateral Angles

Sacral Landmarks



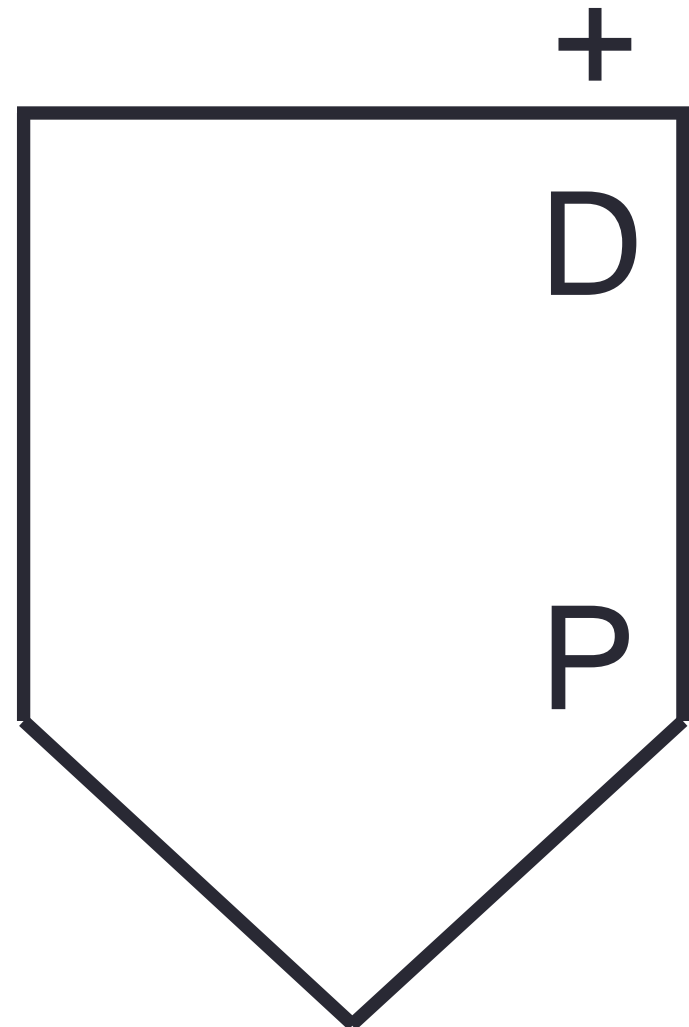
Segmental and Somatic Dysfunction of Sacral Region ICD-10: M99.04

Osteopathic segmental findings:

- Unilateral sacral flexion
- Bilateral sacral flexion
- Unilateral sacral extension
- Bilateral sacral extension
- Forward sacral torsion
 - L/L vs R/R
- Backward sacral torsion
 - L/R vs R/L

Unilateral Sacral Flexion

1. Positive **RIGHT** seated flexion test
2. Palpation
 - R sacral sulcus **deep**
 - R ILA **posterior**
3. Osteopathic finding
 - **Right unilateral** sacral **flexion**
4. **Diagnosis**
 - M99.04 Segmental and somatic dysfunction of sacral region



Bilateral Sacral Flexion

1. Positive **RIGHT & LEFT** seated flexion test

2. Palpation

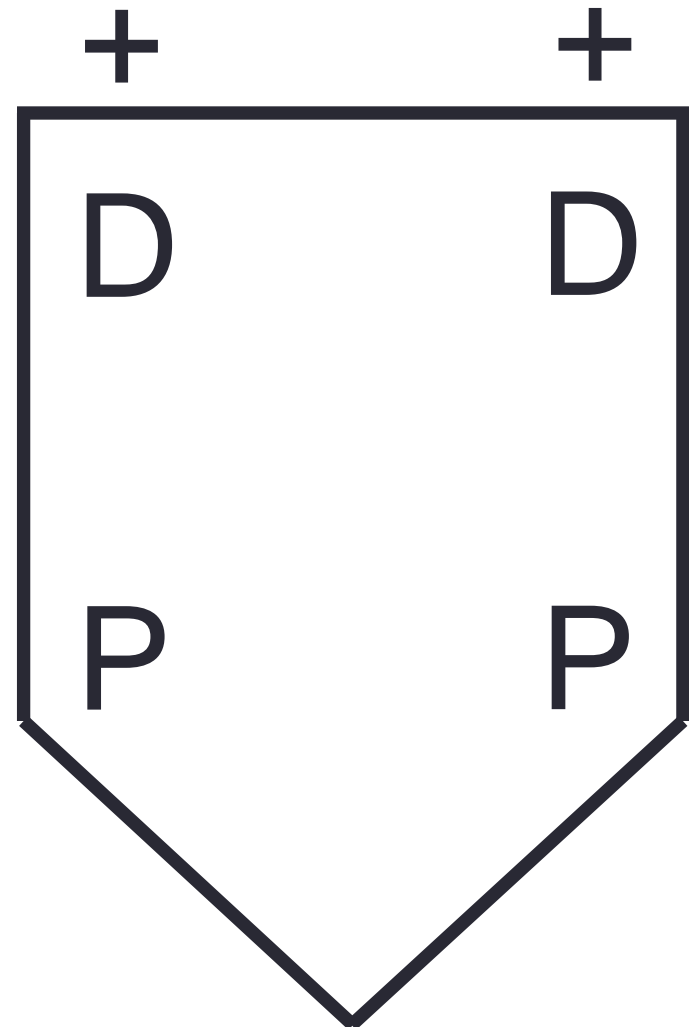
- R & L sacral sulci **deep**
- R & L ILA **posterior**

3. **Osteopathic finding**

- **Bilateral** sacral **flexion**

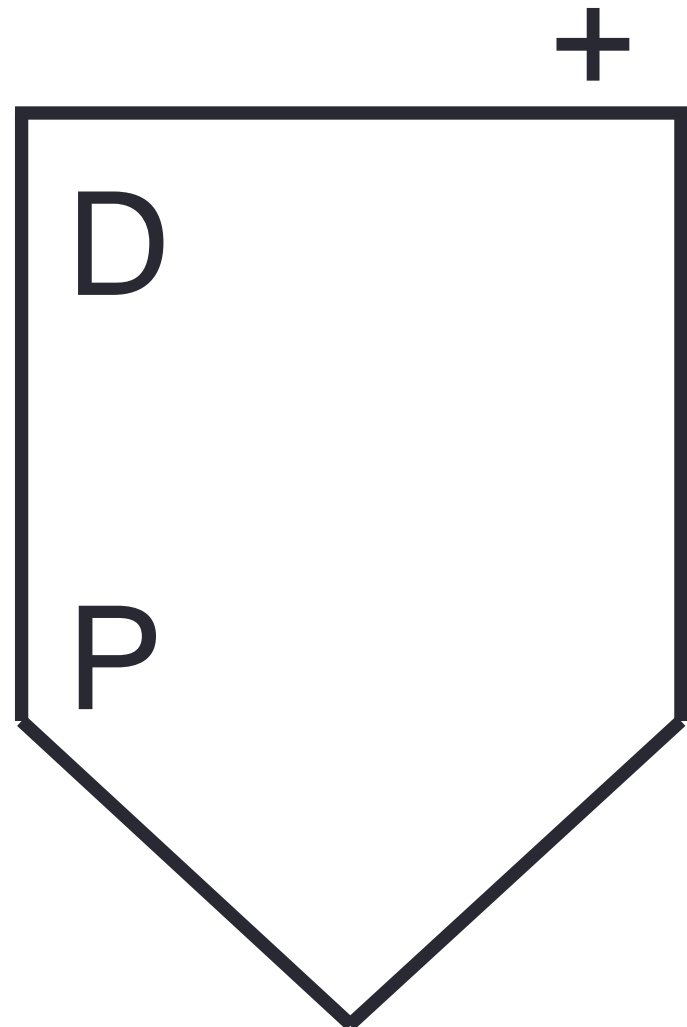
4. **Diagnosis**

- M99.04 Segmental and somatic dysfunction of sacral region



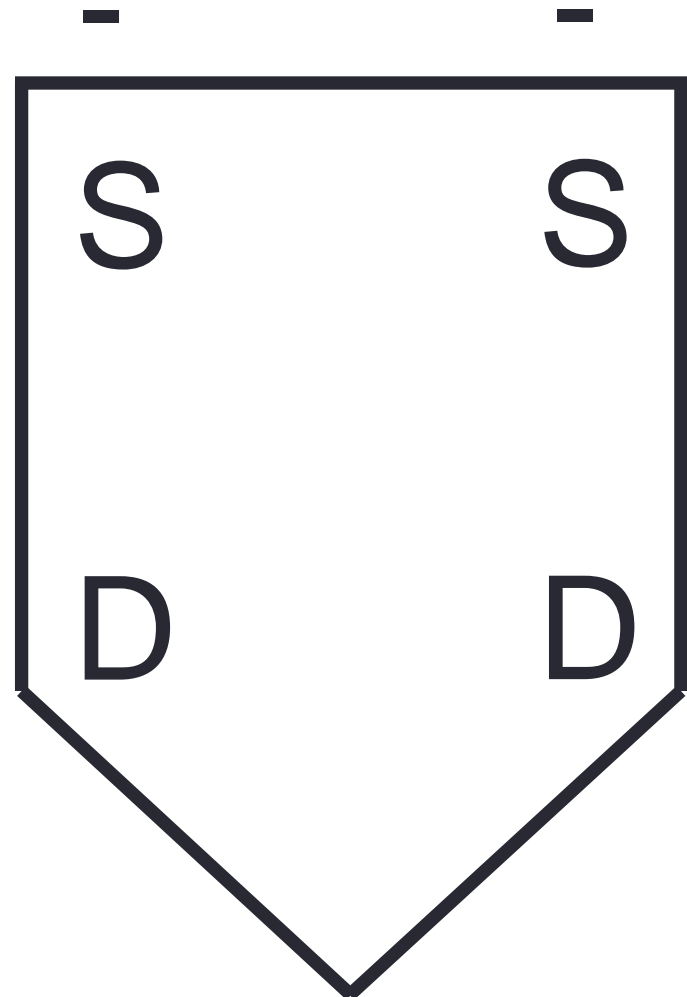
Unilateral Sacral Extension

1. Positive **RIGHT** seated flexion test
2. Palpation
 - L sacral sulcus **deep**
 - L ILA **posterior**
3. Osteopathic finding
 - **Right unilateral** sacral **extension**
4. **Diagnosis**
 - M99.04 Segmental and somatic dysfunction of sacral region



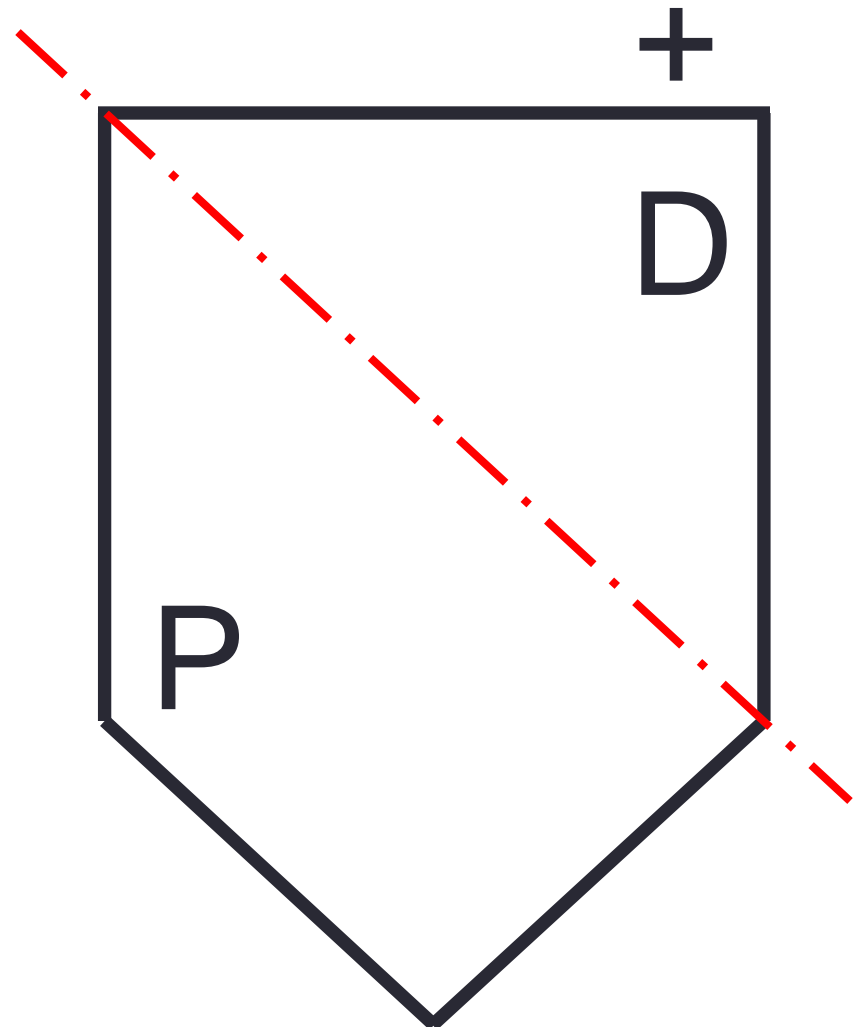
Bilateral Sacral Extension

1. Negative **RIGHT & LEFT** seated flexion test
2. Palpation
 - R & L sacral sulci **shallow**
 - R & L ILA **deep**
3. Osteopathic finding
 - **Bilateral** sacral **extension**
4. **Diagnosis**
 - M99.04 Segmental and somatic dysfunction of sacral region



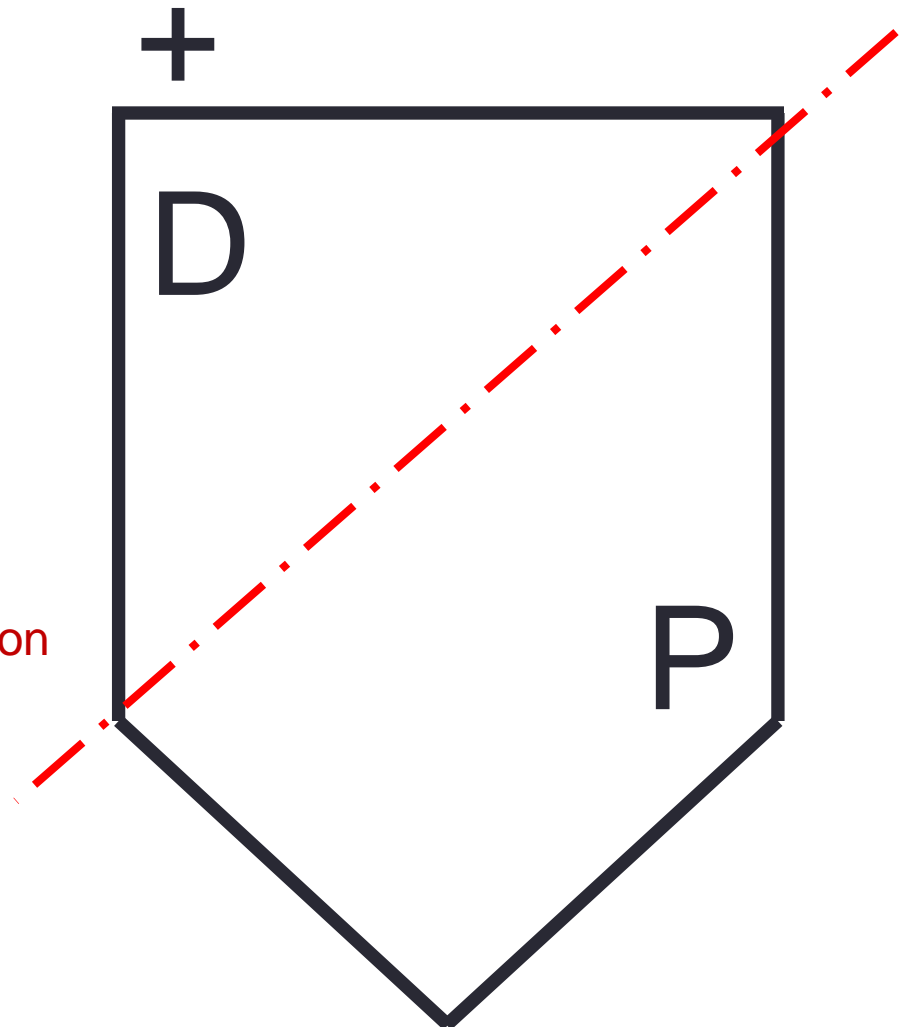
L/L Forward Sacral Torsion

1. Positive **RIGHT** seated flexion test
2. Palpation
 - R sacral sulcus **deep**
 - L ILA **posterior**
3. **Osteopathic finding**
 - **Left on left forward sacral torsion**
 - The sacrum is rotated left about a left axis
4. **Diagnosis**
 - M99.04 Segmental and somatic dysfunction of sacral region



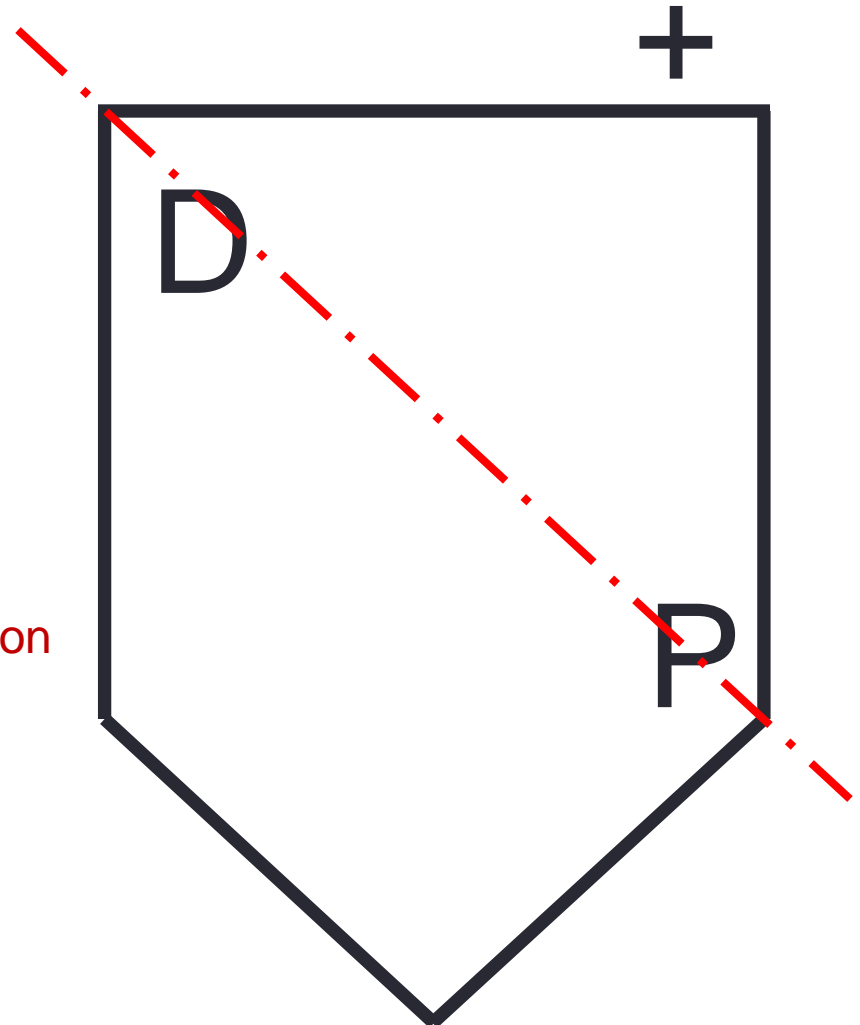
R/R Forward Sacral Torsion

1. Positive **LEFT** seated flexion test
2. Palpation
 - L sacral sulcus **deep**
 - R ILA **posterior**
3. Osteopathic finding
 - **Right on right forward sacral torsion**
 - The sacrum is rotated right about a right axis
4. **Diagnosis**
 - M99.04 Segmental and somatic dysfunction of sacral region



R/L Backward Sacral Torsion

1. **Positive RIGHT seated flexion test**
2. **Palpation**
 - L sacral sulcus **deep**
 - R ILA **posterior**
3. **Osteopathic finding**
 - **Right on left backward sacral torsion**
 - The sacrum is rotated right about a left axis
4. **Diagnosis**
 - M99.04 Segmental and somatic dysfunction of sacral region



L/R Backward Sacral Torsion

1. Positive **LEFT** seated flexion test

2. Palpation

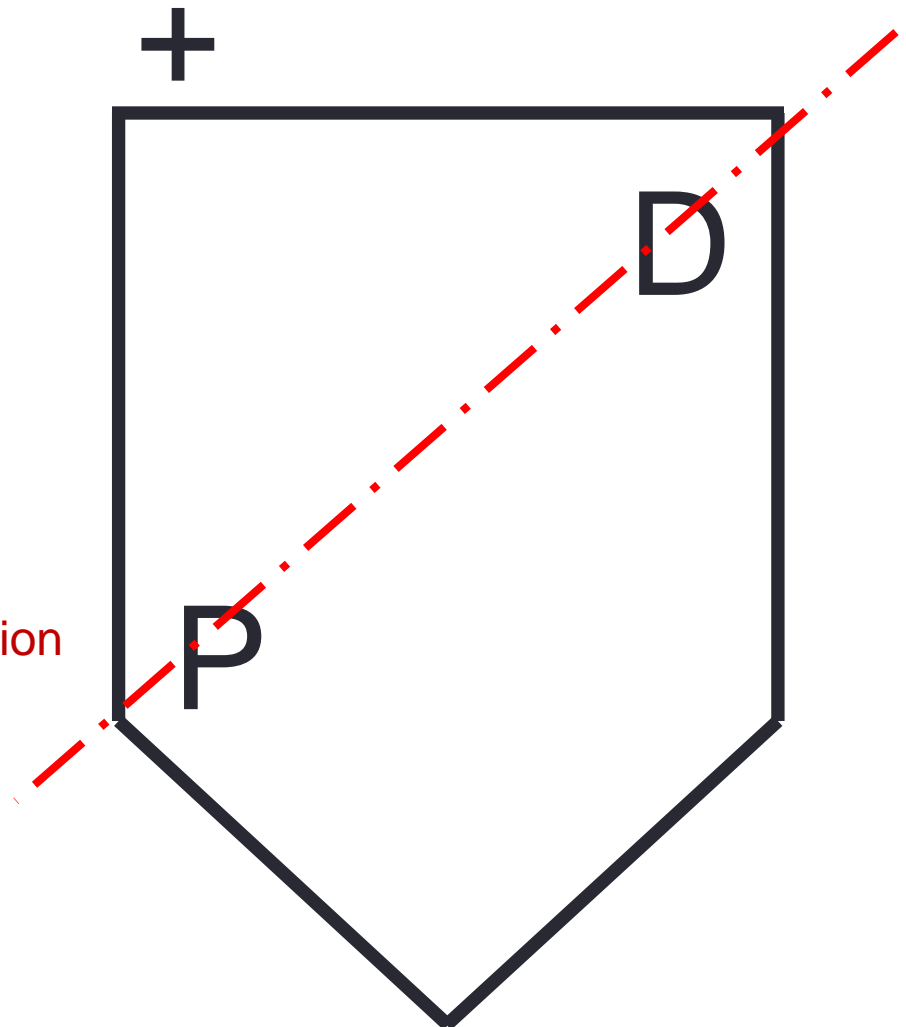
- R sacral sulcus **deep**
- L ILA **posterior**

3. **Osteopathic finding**

- **Left on right backward sacral torsion**
 - The sacrum is rotated left about a right axis

4. **Diagnosis**

- M99.04 Segmental and somatic dysfunction of sacral region



Anterior Innominate Rotation



- Stand on same side
- Right hand on pt.'s knee
- Fully flex knee and hip and abduct/ext. rotate
- Left hand applies clockwise rotating force to ischial tub.
- Pt. extends hip meeting Dr.'s force for 3-5 sec.
- Engage new barrier and repeat 3-5 times
- Retest

Posterior Innominate Rotation



- Affected side hip off table
- Right hand supports oppos. ASIS
- Left hand on distal femur
- Left Leg & hip extended
- Pt. Flexes hip meeting Dr.'s force for 3-5 sec.
- Engage new barrier and repeat 3-5 times
- Retest

L/L Forward Torsion: MET

*L5NR_RS_L

① Prone Patient

Lie Face down for all Forward torsions!

② Flex knees to 90° to roll onto Left hip

Lie Axis down for ALL torsions!



L/L Forward Torsion: MET

*L5NR_RS_L

③ Monitor L5

④ Use patient's Right shoulder to induce trunk rotation to the left to L5 restriction barrier



L/L Forward Torsion: MET

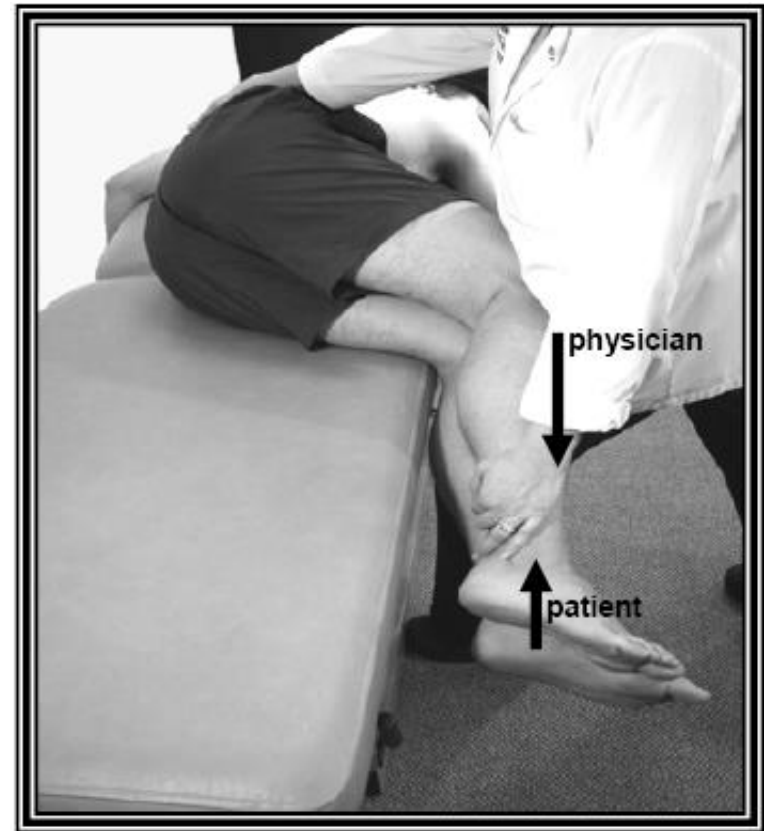
* $L5NR_R S_L$ so sacrum $R_L S_R$

- ⑤ Monitor L-S
- ⑥ Doctor extends the patient's **legs off table**, causing **left sidebending** of sacrum into the restriction



L/L Forward Torsion: MET

- ⑦ Patient **raises feet toward ceiling** against doctor's counterforce for 3-5 seconds then **fully** relaxes
- ⑧ Reengage using legs and repeat 3-5x
- ⑨ Final stretch
- ⑩ RETEST!



Retest for Forward Sacral Torsions

- **Evaluate Sacral Landmarks**
 - Sacral sulcus
 - ILA
- **Repeat Seated Flexion test**

R/L Backward Torsion: MET

*L5 R_L S_L



Lie back down for backward torsions!

- ① Patient lies on Left
Lie Axis down for ALL torsions!
- ② Monitor L-S
- ③ Pull Axis arm anterior and slightly **superior** to induce **Right rotation** into **L5** restriction

R/L Backward Torsion: MET

*L5 R_L S_L



- ④ Extend both legs until sacral base moves anterior
- ⑤ Flex top leg to 90° to engage piriformis as aBductor
- ⑤ Doctor places hand on distal femur

R/L Backward Torsion: MET

*L5 R_L S_L



- ⑦ Patient **raises feet toward ceiling** against doctor's counterforce for 3-5 seconds then **fully** relaxes
- ⑧ Reengage using leg and repeat 3-5 times
- ⑨ Final stretch
- ⑩ Retest

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