

FAILED BACK SYNDROME:

WHAT TO DO WHEN SURGERY FAILS?




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WHO Statistics:

- In 2020, low back pain (LBP) affected 619 million people globally and it is estimated that the number of cases will increase to 843 million cases by 2050, driven largely by population expansion and ageing (1).
- LBP is the single leading cause of disability worldwide and the condition for which the greatest number of people may benefit from rehabilitation.
- LBP can be experienced at any age, and most people experience LBP at least once in their life.
- Prevalence increases with age up to 80 years, while the highest number of LBP cases occurs at the age of 50–55 years. LBP is more prevalent in women (2).
- Non-specific LBP is the most common presentation of LBP (about 90% of cases).



U.S. Stats

- LBP is the most common condition seen in pain clinics. Approximately 60%–80% of the US population will experience back pain some time during life. Neurologists are often consulted for the diagnosis and treatment of LBP. **It is critical for clinicians to appropriately examine the patients and make a diagnosis before treatment is rendered.**
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- LBP may be classified as specific or non-specific. Non-specific LBP accounts for about 90% of cases. **Non-specific means that the experience of pain cannot be confidently accounted for by another diagnosis such as an underlying disease, pathology or tissue damage.**
 - Risk factors for non-specific LBP include low physical activity levels, smoking, obesity and high physical stress at work.

Non Mechanical Causes: Must be ruled out...

- Viscerogenic
 - Renal Colic, IBD, Endometriosis, Viscerosomatic reflex
- Vasculogenic
 - Aortic Aneurysm, Ischemic spinal claudication, Epidural venous abnl
- Infection
 - Discitis, Herpes Zoster, Osteomyelitis
- Tumor
 - Primary- Myeloma, Sarcoma, Neural Tumor
 - Secondary- Prostate, Lung, Breast, Kidney
- Rheumatologic
 - HLA B27, Ankylosing Spondylitis, Psoriatic Arthritis, Reiter syn, Behcet syn, Fibromyalgia, PMR, RA
- Metabolic
 - Osteoporosis, Pagets



Mechanical Causes of Low Back Pain:

- Muscle strain, lumbar disk herniation, lumbar radiculopathy, lumbar facet joint syndrome (spondylosis), sacroiliac (SI) joint syndrome, and lumbar spinal stenosis.
 - Other causes spondylolisthesis/spondylolysis
 - Congenital causes: achondroplasia and genetic malformations
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Treatment and Management:

WHO 6/19/2023

- Treatment for LBP depends on the nature of the pain and whether it is non-specific or specific.
- For specific LBP, treatments focus on treating the underlying condition causing the pain.
- Treatments for non-specific LBP include:
 - physical therapies to improve muscle strength and ability to move and resume physical activity and exercise
 - psychological and social support to help people manage their pain and return to doing activities they enjoy
 - reducing strain during physical work
 - lifestyle changes including more physical activity, healthy diet and good sleep habits.
- Medicines can be used to reduce the symptoms of LBP and should ideally be combined with other treatments. Painkillers should not be the first-line treatment for LBP. Older people and those with other medical conditions should speak to a healthcare provider before using medicines.



Reality

- Most episodes resolve spontaneously within the 1st 2 weeks
 - Minority of pts take 6-12 weeks to resolve
 - Only 1-2% of cases require surgical referral
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- **What management is missing from this list????**

Comprehensive Osteopathic Care!!!

- Complete History and PE including OSE (osteopathic structural exam)
- OMT
- Prescribe medication if needed
 - NSAIDS, Muscle relaxers, steroid medications, SSRI, Gabapentin/judicious use of opioids
- Physical Therapy if needed
- Further testing if needed (X-ray, CT/MRI, EMG)
- Consider referral to Orthospine, Neurosurgery, or Pain Mgt if necessary

The cause of nonspecific low back pain identified-

The Dirty 1/2 Dozen

- Pubic Shear
- Innominate Shear
- Unilateral Sacral Dysfunction
- Non Neutral Lumbar Mechanics
- Short Leg Syndrome *not covered at this time
- Muscle Imbalance *not covered at this time
 - Likely will be referring your patients for this one

After obtaining history and performing a MSK exam that includes related neuro and ortho elements

- Looking for any of the following...
- Asymmetry of standing postural landmarks
 - Kyphosis/ Lordosis (incr/decr)
 - Scoliosis (?present)
 - Short leg (present?)
 - Ankle Valgus/Pes Planus (present?)
- Standing Flexion (+/-)
- Seated Flexion (+/-)

Standing Flexion Test

- Sensitive for Iliosacral dysfunction.
- Tells us which innominate is dysfunctional
 - Does not tell us what the dysfunction is
- Patient stands while the examiner places thumbs on inferior aspect of PSIS & asks patient to “bend forward”.
 - Keep thumbs on the PSIS and follow “the pull” the fascia is placing on the boney landmark. Follow the PSIS as it is pulled by the fascia.
- The thumb that moves the most cephalad is the side of the dysfunctional innominate



Innominate diagnosis

Table 17.3 Iliosacral Dysfunctions

Diagnosis		Standing Flexion Test Positive	ASIS Supine	Medical Malleolus Supine	Posterior Superior Iliac Spine Prone	Sacral Sulcus Prone	Ischial Tuberosity Prone	Sacrotuberous Ligament Prone
Anterior rotated	Right	Right	Inferior right	Long right	Superior right	Shallow right	—	—
	Left	Left	Inferior left	Long left	Superior left	Shallow left	—	—
Posterior rotated	Right	Right	Superior right	Short right	Inferior right	Deep right	—	—
	Left	Left	Superior left	Short left	Inferior left	Deep left	—	—
Rotated lateral (outflare)	Right	Right	Lateral right	—	Medial right	Narrow right	—	—
	Left	Left	Medial left	—	Lateral left	Narrow left	—	—
Rotated medial (inflare)	Right	Right	Medial right	—	Lateral right	Wide right	—	—
	Left	Left	Medial left	—	Lateral left	Wide left	—	—
Superior shear (upslip)	Right	Right	Superior right	Short right	Superior right	—	Superior right	Lax right
	Left	Left	Superior left	Short left	Superior left	—	Superior left	Lax left
Inferior shear (downslip)	Right	Right	Inferior right	Long right	Inferior right	—	Inferior right	Tight right
	Left	Left	Inferior left	Long left	Inferior left	—	Inferior left	Tight left

Patient Presentations where you should think of Pubic Dysfcn

- Lower back pain
 - Part of Dr. Greenman's "Dirty 1/2 Dozen" causes for lower back pain.
 - Commonly missed by Chiropractors/PT's/Other Physicians
- Urinary complaints
 - Bladder lies just below symphysis pubis- can contribute to symptoms of cystitis
- Inguinal/groin pain
 - Attachment for adductors
- Post partum
 - Delivery may cause shear or separation.
 - Results in pain severe enough to prevent standing and ambulation.

Be Suspicious for an Innominate Shear..

- Persistent unilateral low back and SI pain without any other known cause.
- Can mimic radicular symptoms with patient complaining of pain in the the glutes or upper aspect of the lateral thigh.
- They have been told they have a short leg and pain persists despite treatment for short leg.
- Innominate shears will cause an apparent leg length discrepancy. The apparent long leg side may cause symptoms of hip pain, trochanteric bursitis or IT band pain.

Superior Innominate Shear

Etiology:

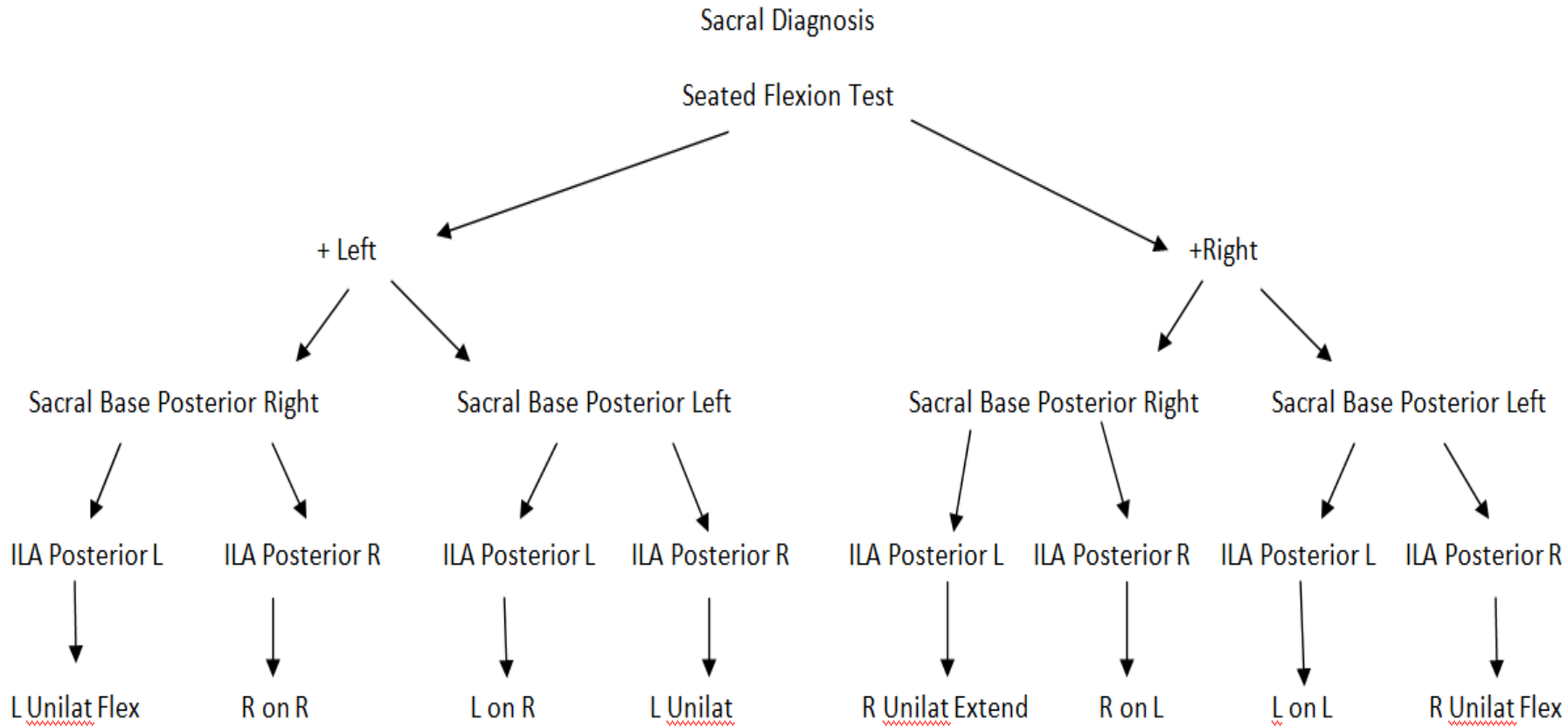
- History
 - Fall onto buttocks
 - Horseback riding fall
 - Pregnancy: ligamentous laxity from relaxin
 - Hockey: Slide into boards
- Symptoms
 - Groin Pain
 - Pubic Pain
 - Low Back Pain/SI Pain

Seated Flexion Test

- Sensitive for iliosacral dysfunction.
- Tells us which side of the sacrum is dysfunctional
 - Does not tell us what the dysfunction is
- Patient sits while the examiner places thumbs on inferior aspect of PSIS & asks patient to “bend forward”.
 - Keep thumbs on the PSIS and follow “the pull” the fascia is placing on the boney landmark. Follow the PSIS as it is pulled by the fascia.
- The thumb that moves the most cephalad is the side of the sacral dysfunction.



Sacral Diagnosis



Positive seated flexion test

YES



Torsion



Are the sacral base and ILA posterior on the same side?



NO

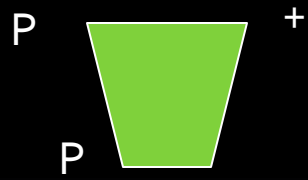


Unilateral

L on L



L on R



L unilat
Extention



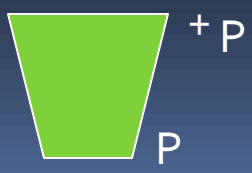
L unilat
Flexion



R on R



R on L



R unilat
Extention



R unilat
Flexion



Still Technique Sacrum: Diagnosis:

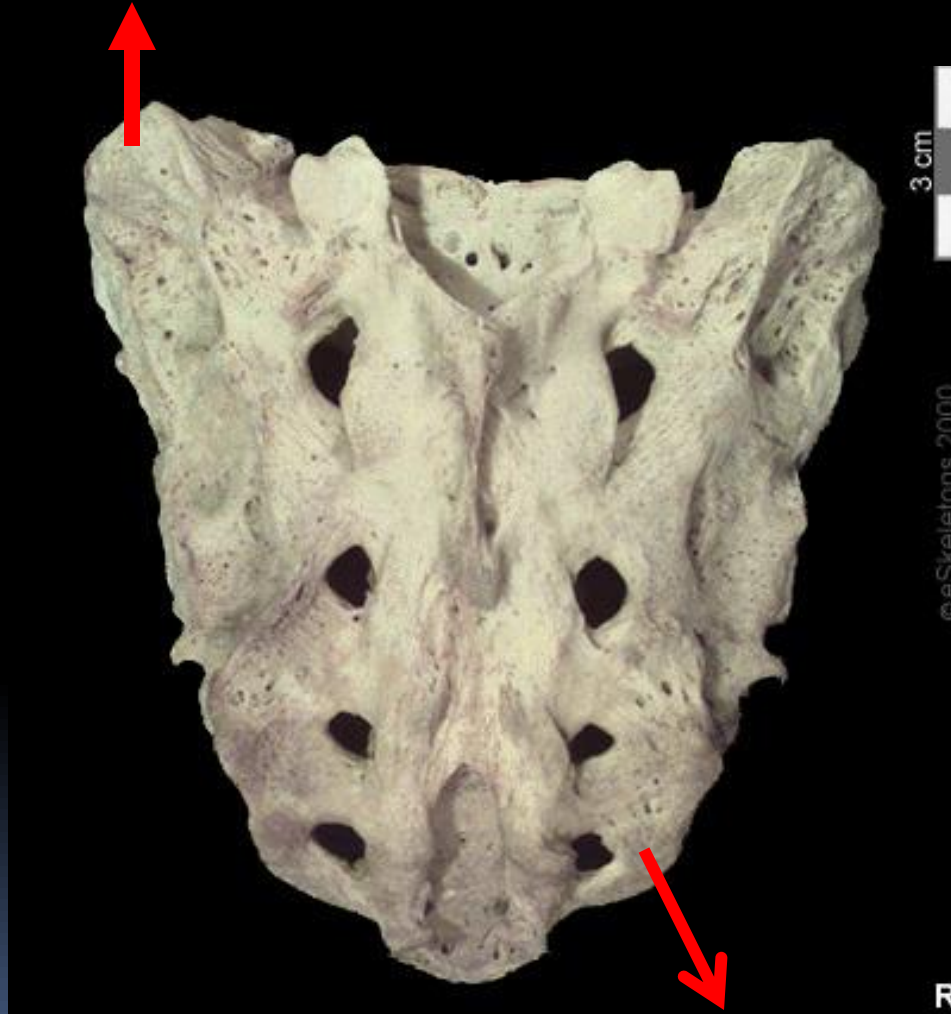
All you need is a + seated flexion test and which side the ILA is posterior/inferior

- It is named for the side of the positive seated flexion test.
- If the seated flexion is positive on the opposite side to the posterior/inferior ILA-the diagnosis is a **diagonal sacrum**.
 - Most of the time when a diagonal sacrum is diagnosed there is also a single segment lumbar neutral dysfunction.
- If the seated flexion is positive on the same side as the posterior/inferior ILA-the diagnosis is a **unilateral sacrum**
- **Do not confuse this with the traditional sacral diagnosis of torsions and unilateral flexion/extension. This is a different model with different nomenclature.**

Diagonal sacrum

Left diagonal sacrum

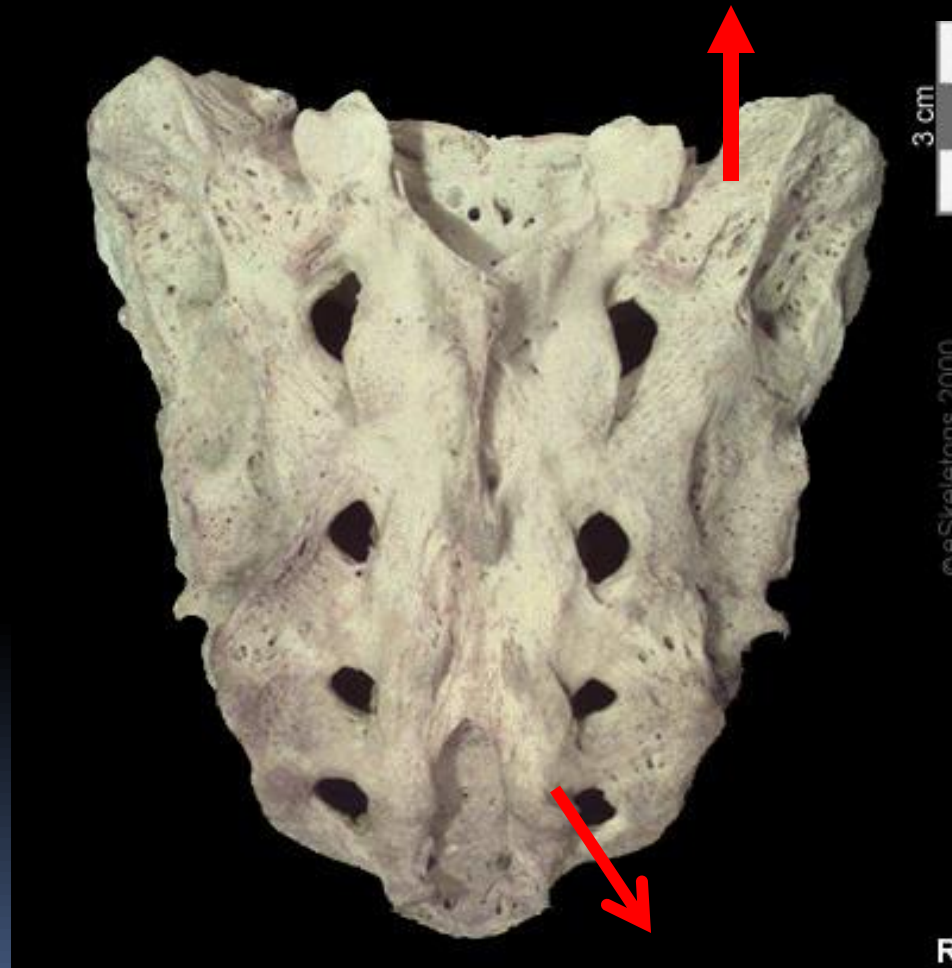
+ Seated flexion



Inferior & tight

Unilateral sacrum diagnosis: Right unilateral sacrum

Inferior ILA is on the same side as the positive seated flexion test



3 cm

©eSkeletons 2000

+ Seated flexion

Inferior ILA

Treatment Order

- Pubic dysfunction
- Innominate Shear
- Lumbar Spine
- Sacroiliac dysfunction
- Iliosacral dysfunction (Innominate rotations/flares- these are NOT classified under the dirty 1/2 dozen)
- Address short leg issues and muscle imbalance ONLY if above does not resolve complaints.
Usually requires referral or ancillary services to help with treatment

Pubic Shear

- Superior
 - Pubic Symphysis more cephalad (elevated) on side of POSITIVE standing flexion test
 - Tension of inguinal ligament on the side of the dysfunction
- Inferior
 - Pubic Symphysis more caudad (lower) on side of POSITIVE standing flexion test
 - Tension of the inguinal ligament on the side of the dysfunction

Tx: Inferior Pubic Shear

- Patient is supine. Place one hand on the Ischial Tuberosity
- Flex hip and knee until resistance is felt. Add slight adduction to “pack the pubes” (focuses tx at the pubic Symphysis)
- Ask the patient to straighten their leg against resistance for the count of 3-5 seconds
- Take up the tension by pushing Ischial tuberosity in a cephalad direction
- Repeat above muscle contraction 3-5 times



Tx: Superior Pubic Shear

- Patient is supine and examiner stands on side of dysfunction.
- Patient's innominate remains on the table as the leg is dangled off the table. Add slight internal rotation to "pack the pubes" and focus tx at the pubic Symphysis.
- Patient is asked to push knee up into the examiners hand against resistance for 3-5 seconds.
- Take up the "slack" by further extending the lower extremity off the table.
- Repeat above muscle contractions 3-5 times



Shotgun Tx



1st pull knees apart



2nd squeeze knees together

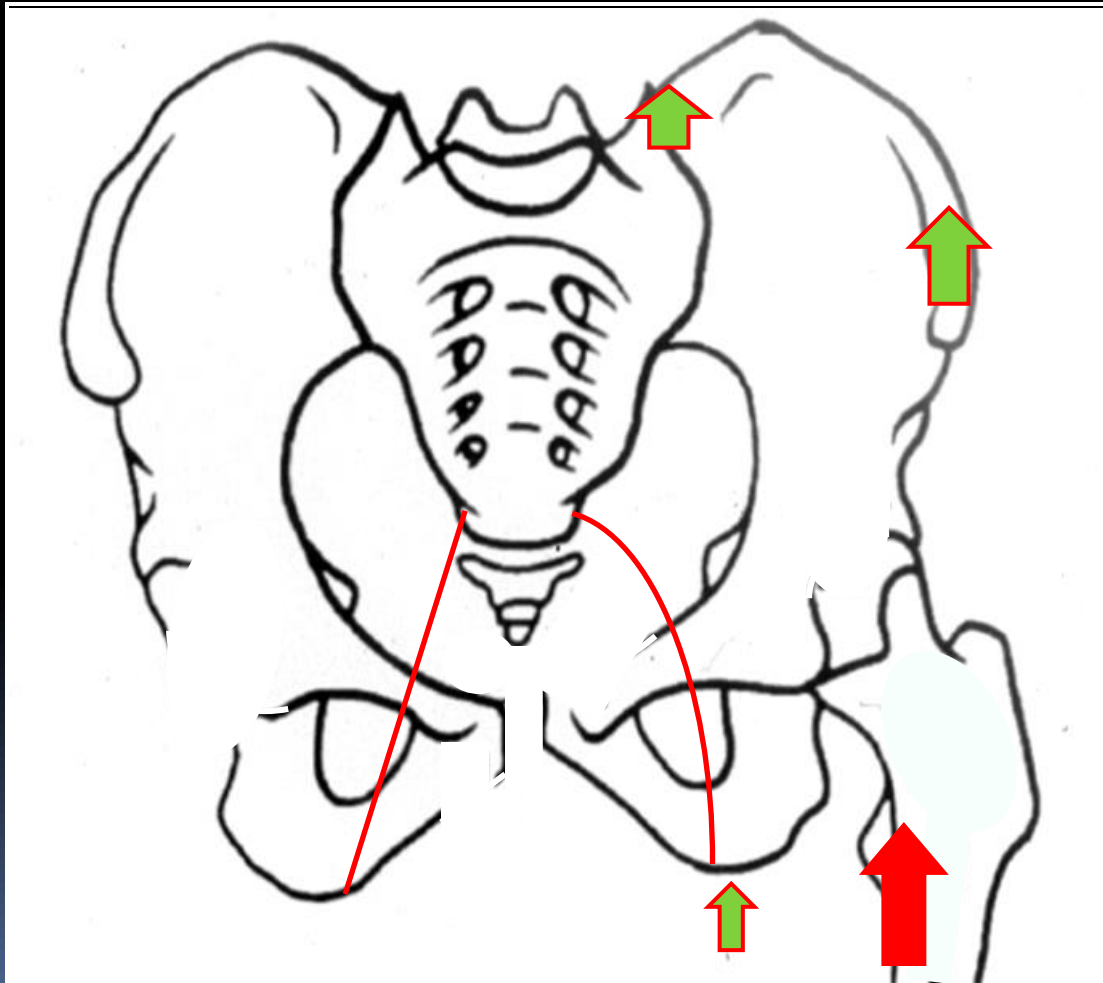
Still Technique Pubic Bone

1. Patient supine with knees and feet together. Apply compressive force vector from knees to pubic bone
2. After applying force gently guide knees apart while maintaining the compressive force vector.
3. As the lower extremities straighten you may release the force vector



*Treats both superior and inferior shears

Superior Innominate Shear Diagnosis



Palpation:

ASIS, PSIS & medial malleolus superior on side of + standing flexion test.

Sacrotuberous ligament: lax on same side

Note pubic bone DOES NOT have to be elevated to diagnose superior innominate shear.

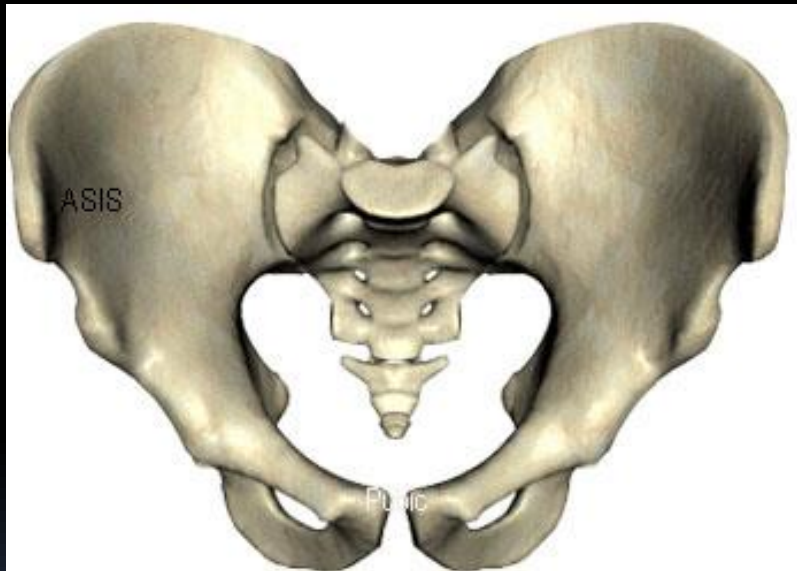
If looking at the patient anteriorly- this is an example of a L superior Innominate shear

Superior Innominate Shear Treatment



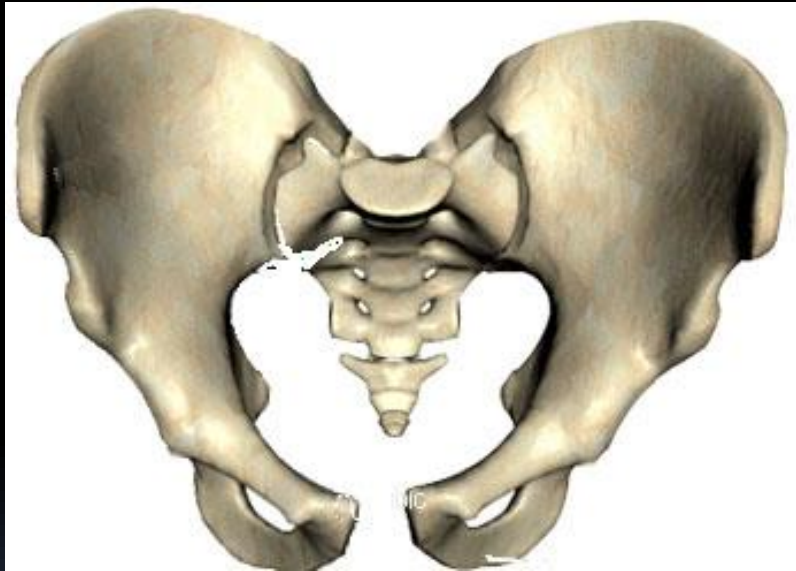
- Pt lies supine
- Tell the patient to slide toward the end of the table so that his/her ankles are hanging off.
- With both hands grasp the tibia and fibula superior to the ankle on the side of dysfunction.
- Place the plantar surface of the opposite foot against your anterior quadriceps muscle for stabilization.
- “Loose pack” the dysfunctional hip by adducting and abducting the leg until you find the point of greatest ease.
- From this position, internally rotate the leg and hip to lock the hip joint.
- Have the patient take a few breaths while you lean back and apply traction by pulling the leg inferiorly with each exhalation.
- Instruct the patient to cough, and simultaneously apply inferior thrust (tug) to the leg.

Still Technique for Innominate Shears:



- Recently we have reconsidered the nature of an upslipped innominate.
- Frequently the shortening of the leg on the Superior shear/"upslipped" side is between $\frac{1}{2}$ and $\frac{3}{4}$ inch.
- There is no way the sacroiliac joint can be sheared by that amount.

Up-slipped Innominate (aka: Superior Shear)



- It now appears the “up-slipped” innominate is a form of innominate sidebending rather than shearing.
- This would bring the ASIS, PSIS & hip greater trochanter relatively superior.

Upslipped Innominate



1. Treatment is to exaggerate by abducting the affected leg.
2. Introduce traction (or longitudinal compression) from the lower leg.

Upslipped Innominate



3. Maintaining the force vector, adduct the leg across the midline.
4. Release traction, return leg to neutral and retest.

Down-slipped Innominate (aka: Inferior Innominate Shear)

- Under the new model for a **down-slipped innominate** the pelvis is sidebent so the iliac crest is tilted out and the ischium is tilted in. The effect is to make the iliac crest, ASIS and PSIS lower on the affected side and the leg longer.
- Treatment for a downslipped innominate involves initial adduction of the leg across the midline.
- Introduction of compression from the lower leg is used to carry the leg into abduction.
- Then retest.

Superior shear Starting Position



Ending Position for
Inferior Shear

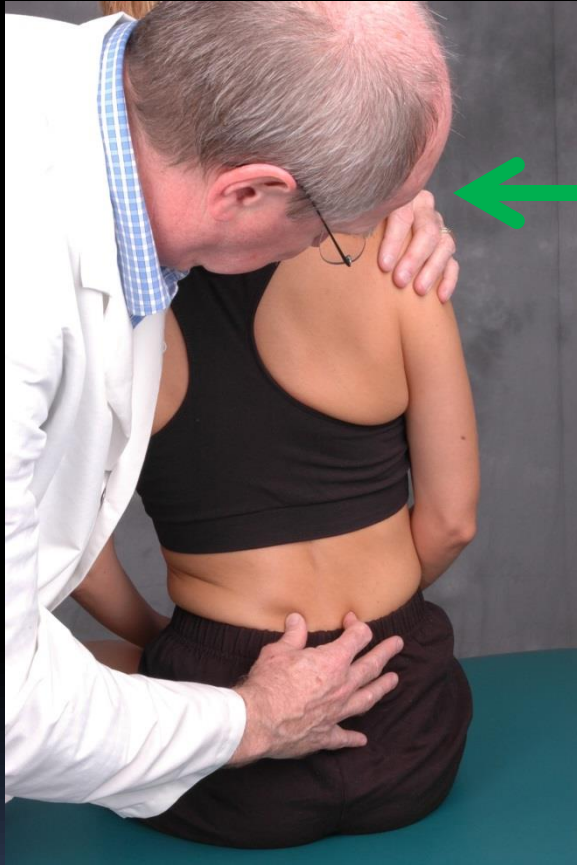
Inferior Shear Starting Position



Ending Position for
Superior Shear



Still Technique Sacrum: Left Diagonal sacrum



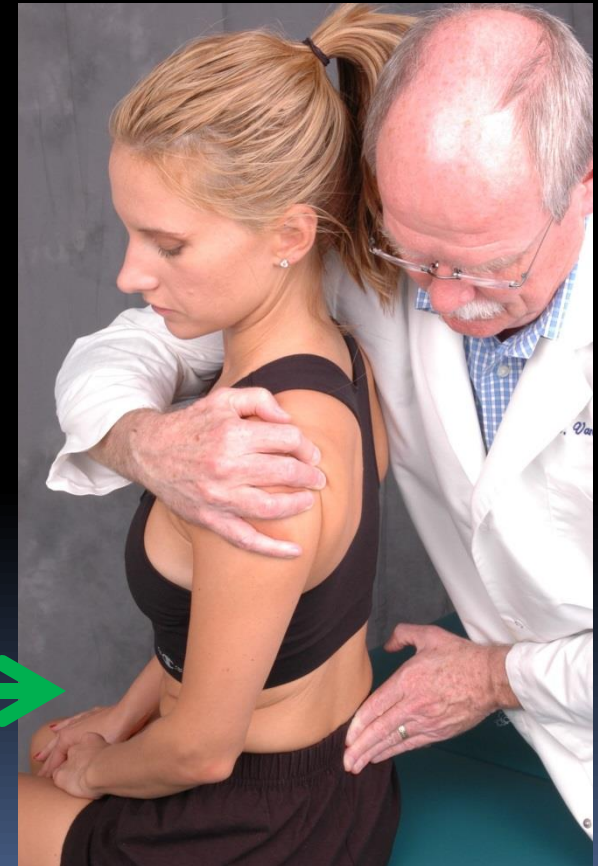
1. Monitor the left sacral sulcus for a left diagonal sacrum.
2. Sidebend toward the side of the restricted sacral base and rotate toward the opposite side (right).
3. Introduce a slight rotation toward the restricted sacral base.
4. Introduce compression toward the restricted sacral base.
5. Rotate the patient to the left and sidebend toward the right.



Unilateral sacrum: Right unilateral sacrum

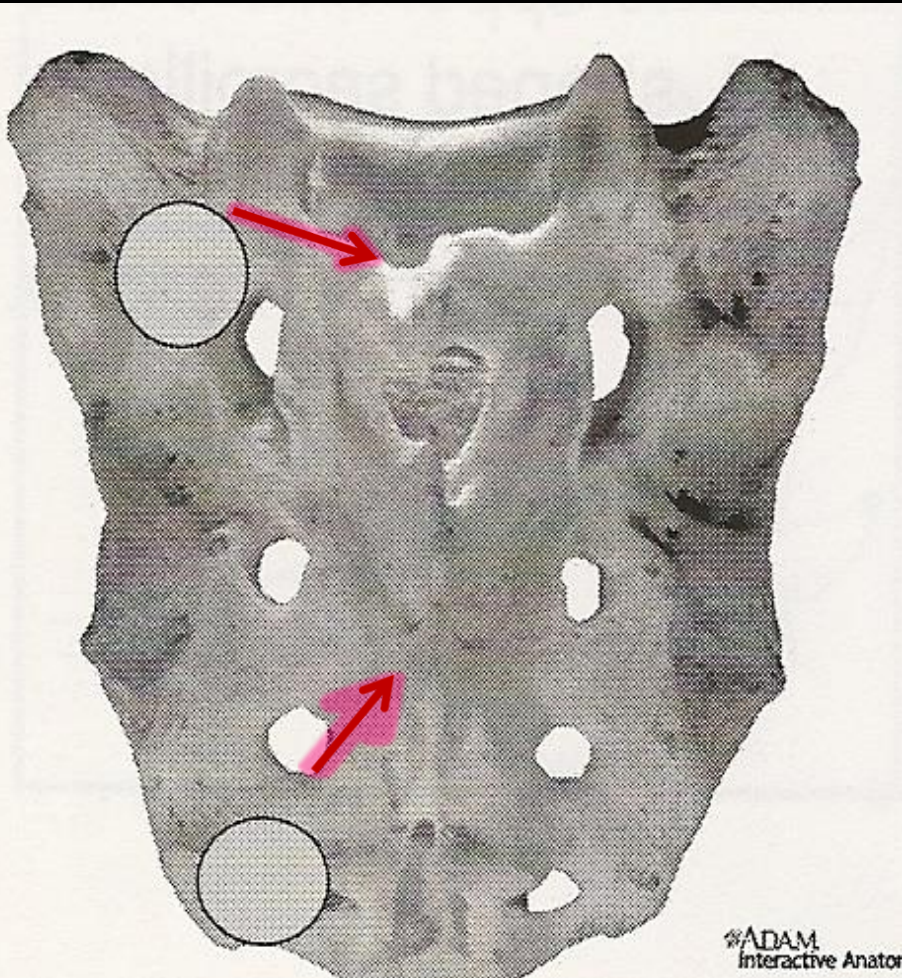


1. Monitor the right sacroiliac joint for relaxation
2. Rotate the patient to the right for a unilateral right sacrum
3. Apply compression to the right sacral base
4. Maintaining compression rotate the patient toward the opposite side.



Arbuckle Tx for Sacrum:

An Indirect Technique



- Patient is Prone
- Place one thumb on base & the other on the apex of same side.
- 1st motion test the base toward the opposite greater trochanter, then motion test apex toward to opposite ASIS.
- Check other side
- On the most mobile quadrant, place thumb with other on top for reinforcement.
- Exaggerate the strain in the direction of ease. Have patient take a deep breath and hold. Sacrum should release

FRS TREATMENT - ROTATION

- Example L_2 FRS_L
- Position: Left Lateral Recumbant
 - Sidebends Patient Right
- *Extend* Knees to L_2
 - Unlock Knees
- Rotate Right
 - Right Shoulder Away
 - Right Innominate Towards
- Patient Engages Rotation
 - Pulls Right Shoulder Forward
 - Pulls Right Innominate Backwards



ERS TREATMENT - ROTATION

- Example L_4 ERS_L
- Position: Left Lateral Recumbent
 - Sidebends Patient Right
- Flex Knees to L_4
 - Unlock Knees
- Rotate Right
 - Right Shoulder Away
 - Right Innominate Towards
- Patient Engages Rotation
 - Pulls Right Shoulder Forward
 - Pulls Right Innominate Backwards



Still Technique Lumbar: diagnosis



Diagnose the lumbar spine in the manner you are most comfortable.

While monitoring the dysfunctional segment a flexed lesion will prefer FABER position of the lower extremity.

An extended lesion prefers a FADIR position.

To treat position the segment in its position of ease. Apply a compressive force through the knee to the monitoring hand. Take the lower extremity through a range of motion opposite the position of ease (if FADIR then compress and move into FABER)



FPR Lumbar Spine

1. Once you diagnose the segment position the segment at its point of ease. That is the pathologic neutral where all the tissues feel equal under your monitoring hand. This example is FRSI.
2. Apply a compressive force from the shoulders to the segment until you feel a change in the tissues under your hand.
3. Maintain that force and position. When you feel tension build up under your hand reposition the patient to remove the tension. Continue treatment until no more tension builds up under your hand.



FPR Lumbar Spine

Note you can also turn this into the Still technique in the seated position using the treatment principles of the Still Technique...

1. Position in the direction of the dysfunction (indirect in this example FRSI).
2. Compress axially from shoulders to monitoring hand
3. Maintain compression and take the patient through a range of motion opposite the dysfunction (move directly through barriers in this example move ERSr)
4. Release force vector and return to neutral.



Short Leg Syndrome (aka: pelvic-tilt syndrome)

- Clinical finding of unleveling of the iliac crest and greater trochanter in the standing position.
- Can be functional or anatomical
 - Anatomical- this is a true short leg due to the patient's anatomy and only can be corrected with lift therapy
 - Functional- caused by muscle spasm/imbalance or somatic dysfunction. Can be corrected with OMT and exercise

Orthotics & Heel Lifts



References

- Greenman's Principles of Manual Medicine 5th edition
- Foundations of Osteopathic Medicine 4th edition
- Pradeep Dinakar
Bradley and Daroff's Neurology in Clinical Practice, 52, 753-775.e2 Chapter: Pain Management
- www.who.int/news-room/fact-sheets/detail/low-back-pain (6/19/2023)
- Treatment Photos from MSU and from Dr. VanBuskirk