

UPDATES IN MUSCLE ENERGY TECHNIQUES

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MUSCLE ENERGY TECHNIQUE



- FIRST DEVELOPED BY FRED MITCHELL SR., DO IN THE LATE 1940'S AND THEN SYSTEMATIZED BY HIS SON, FRED MITCHELL JR., DO, FAO

MUSCLE ENERGY: A DIRECT TECHNIQUE

THE CLASSICAL METHOD:

- PLACE THE TISSUE AT THE BARRIER OR RESTRICTION.
- HAVE THE PATIENT PUSH AWAY FROM THE RESTRICTION FOR UP TO 10 SECONDS AGAINST THE RESISTANCE OF THE OPERATOR AND THEN RELAX. THE PATIENT EFFORT SHOULD BE ISOMETRIC AND NOT INVOLVE ANY ACTUAL MOVEMENT.
- MOVE THE TISSUE BEYOND THE BARRIER TO THE NEW BARRIER.
- REPEAT 2 MORE TIMES.

MUSCLE ENERGY TECHNIQUE

- PRIMARY ISSUE IS TRYING TO KEEP THE TISSUE FROM ACTUALLY MOVING (ISOMETRIC) DURING THE PATIENT MOVEMENT PHASE. IN MANY CASES THE PATIENT TRIES TO OVERCOME THE OPERATOR'S RESISTANCE REQUIRING INCREASED EFFORT BY THE OPERATOR.

MUSCLE ENERGY TECHNIQUE

MANY VARIATIONS OVER THE YEARS:

- ALLOW SOME ACTUAL MOVEMENT AWAY FROM THE BARRIER WHILE THE OPERATOR MAINTAINS RESISTANCE.
- HAVE THE PATIENT ATTEMPT TO MOVE AWAY FROM THE BARRIER 3 TIMES WITHOUT ANY OPERATOR INDUCED MOVEMENT TO DISARM AND RELAX A MUSCLE.
- PATIENT EYE MOVEMENTS AWAY FROM THE BARRIER RATHER THAN ACTUAL BODY MOVEMENTS.
- HAVE THE PATIENT ATTEMPT TO MOVE AWAY FROM THE BARRIER FOR APPROXIMATELY A SECOND THREE TIMES THEN THE OPERATOR MOVES THE TISSUE BEYOND WHERE THE BARRIER HAD BEEN (SOMETIMES TERMED “MUSCLE IMPULSE”).

MUSCLE ENERGY AND THE UPSLIPPED INNOMINATE

- AS EARLY AS THE FIRST MUSCLE ENERGY MANUAL BY MITCHELL, MORAN & PRUZZO ONE OF THE KEY INNOMINATE DYSFUNCTIONS IDENTIFIED WAS WHAT THEY TERMED AN UPSLIPPED INNOMINATE. THE SITE OF THE DYSFUNCTION IS AT THE SACROILIAC JOINT.
- HISTORICALLY REFERENCES TO A UNILATERAL SHEARING OF THE INNOMINATE CAN BE FOUND IN MCCONNELL AND HUELLET FROM THE EARLY 20TH CENTURY.

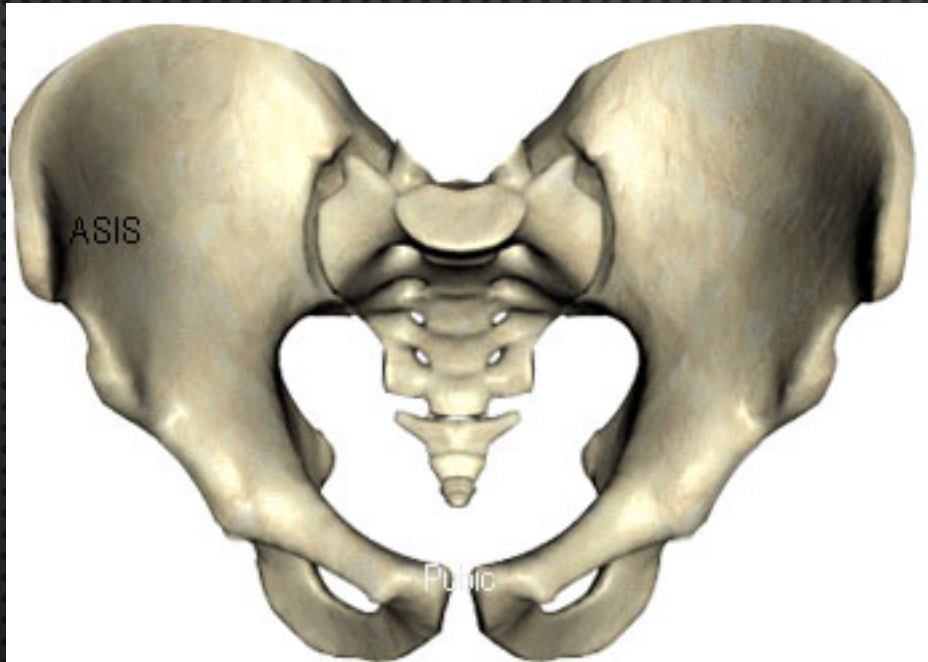
SUPERIOR SHEARED INNOMINATE, DIAGNOSIS

- THE CURRENT ACCEPTED TERM FOR AN “UNSLIPPED INNOMINATE” IS A SUPERIOR SHEARED INNOMINATE
- FOR A SUPERIOR SHEARED (UNSLIPPED) INNOMINATE DYSFUNCTION
 - STANDING FLEXION TEST IS POSITIVE ON THAT SIDE.
 - PELVIC TRANSLATION WILL NOT MOVE THE PELVIS TOWARD THAT SIDE.
 - THE PSIS IS SUPERIOR ON THAT SIDE.
 - THE ASIS IS SUPERIOR ON THAT SIDE.
 - GENERALLY AN UNSLIPPED INNOMINATE IS ACCOMPANIED BY A SHORT LEG ON THE SAME SIDE.

SUPERIOR SHEARED INNOMINATE, DIAGNOSIS

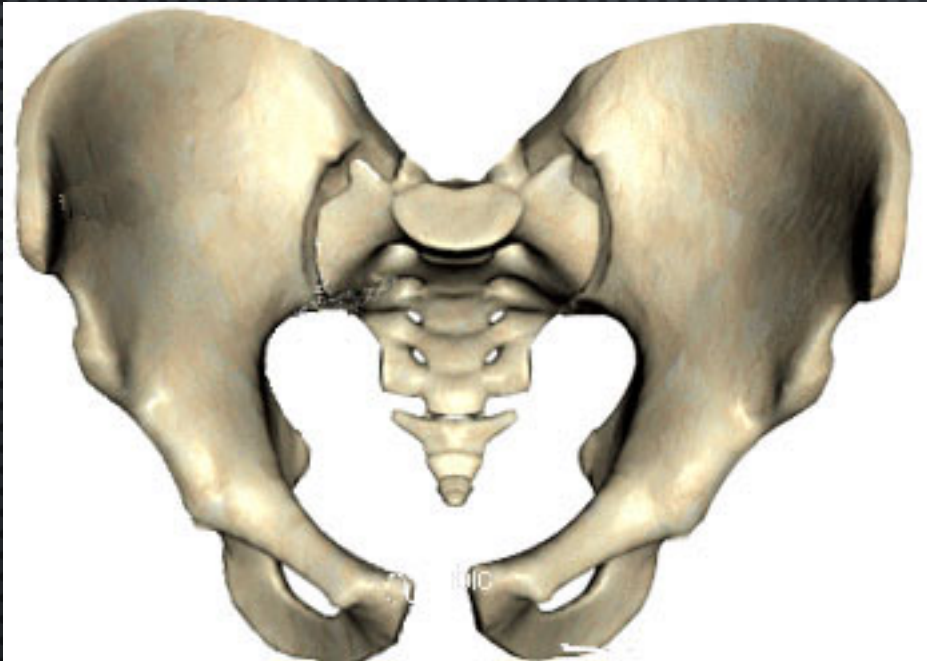
- SOMETIMES WE ARE ABLE TO IDENTIFY THE CAUSE OF A SUPERIOR SHEARED INNOMINATE:
 - A SUDDEN TRANSFER OF WEIGHT ONTO AN OUTSTRETCHED LEG (STEPPING DOWN A STEP UNEXPECTEDLY).
 - PROLONGED WEIGHT BEARING TOWARD ON SIDE (EITHER SEATED OR STANDING).
 - PICKING UP SOMETHING IN A FASHION THAT SUDDENLY TRANSFERS WEIGHT TO ONE SIDE.
 - A VISCERAL DYSFUNCTION IN THE ABDOMEN OR PELVIS ON ONE SIDE.

SUPERIOR SHEARED INNOMINATE



- OVER THE PAST 7 YEARS WE HAVE BEEN RETHINKING THE CONCEPT OF A SUPERIOR SHEARED INNOMINATE.
- FREQUENTLY THE SHORTENING OF THE LEG ON THE SUPERIOR SHEARED SIDE IS BETWEEN $\frac{3}{8}$ AND $\frac{3}{4}$ INCH (6 TO 15 MM).

USSLIPPED INNOMINATE



- IT NOW APPEARS THE “USSLIPPED” IS A FORM OF INNOMINATE SIDEBENDING RATHER THAN SHEARING.
- WHEN THE ILIUM SIDEBENDS TOWARDS THE MIDLINE THIS BRINGS THE ASIS, PSIS & HIP GREATER TROCHANTER RELATIVELY SUPERIOR.
- THE LEG ON THAT SIDE WOULD APPEAR TO BE SHORTER.

WHAT PROMPTED US TO COME UP WITH NEW EXPLANATION FOR PELVIS SHEARS?

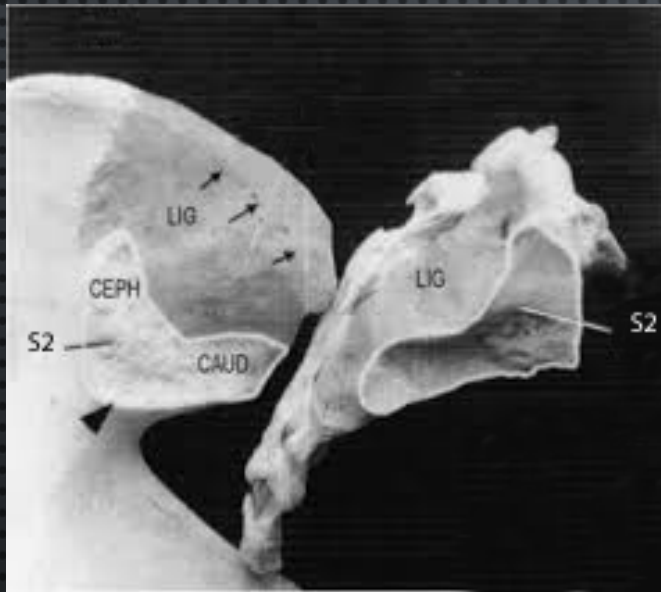
- SINCE THE PROVEN JOINT PLAY IN THE SACROILIAC JOINT IS NO MORE THAN $\frac{1}{4}$ INCH (4 MM) A SHEAR GREATER THAN $\frac{3}{8}$ INCH (6 MM) WOULD BE A SURGICAL EMERGENCY.
- RESEARCH INTO SACROILIAC JOINT ANATOMY, STABILITY AND GAIT MECHANICS FROM GRACOVETSKY AND VLEEMING ALSO SUGGESTED THAT MINIMAL SIGNIFICANT SUPERIOR OR INFERIOR INNOMINATE DISPLACEMENT CAN OCCUR WITHOUT SEVERE BONY AND LIGAMENTOUS INJURY TO THE PELVIS.



VLEEMING'S RESEARCH

- VLEEMING ET AL PROPOSED THE CONCEPTS OF *FORM CLOSURE* AND *FORCE CLOSURE* TO EXPLAIN THE STABILITY OF THE SACROILIAC JOINTS PROVIDING LOWER BACK STABILIZATION AND ALLOWING NORMAL GAIT MECHANICS.
 - FORM CLOSURE IS CREATED BY FRICTION BETWEEN THE ARTICULAR SURFACES OF THE SACROILIAC JOINT AND BY THE ANATOMICAL ARRANGEMENT OF THE JOINTS.
 - FORCE CLOSURE IS A DYNAMIC PROCESS ACHIEVED BY THE WEIGHT OF THE BODY IN COMBINATION WITH LIGAMENT FORCE AND ACTION OF MUSCLE GROUPS.
- IF THE BODY DEPENDS ON AND ENGAGES MANY LIGAMENTOUS AND MUSCULAR STRUCTURES TO GUARANTEE SACROILIAC STABILITY IT WOULD TAKE EXTRAORDINARY FORCES TO DISRUPT SUCH STABILITY.

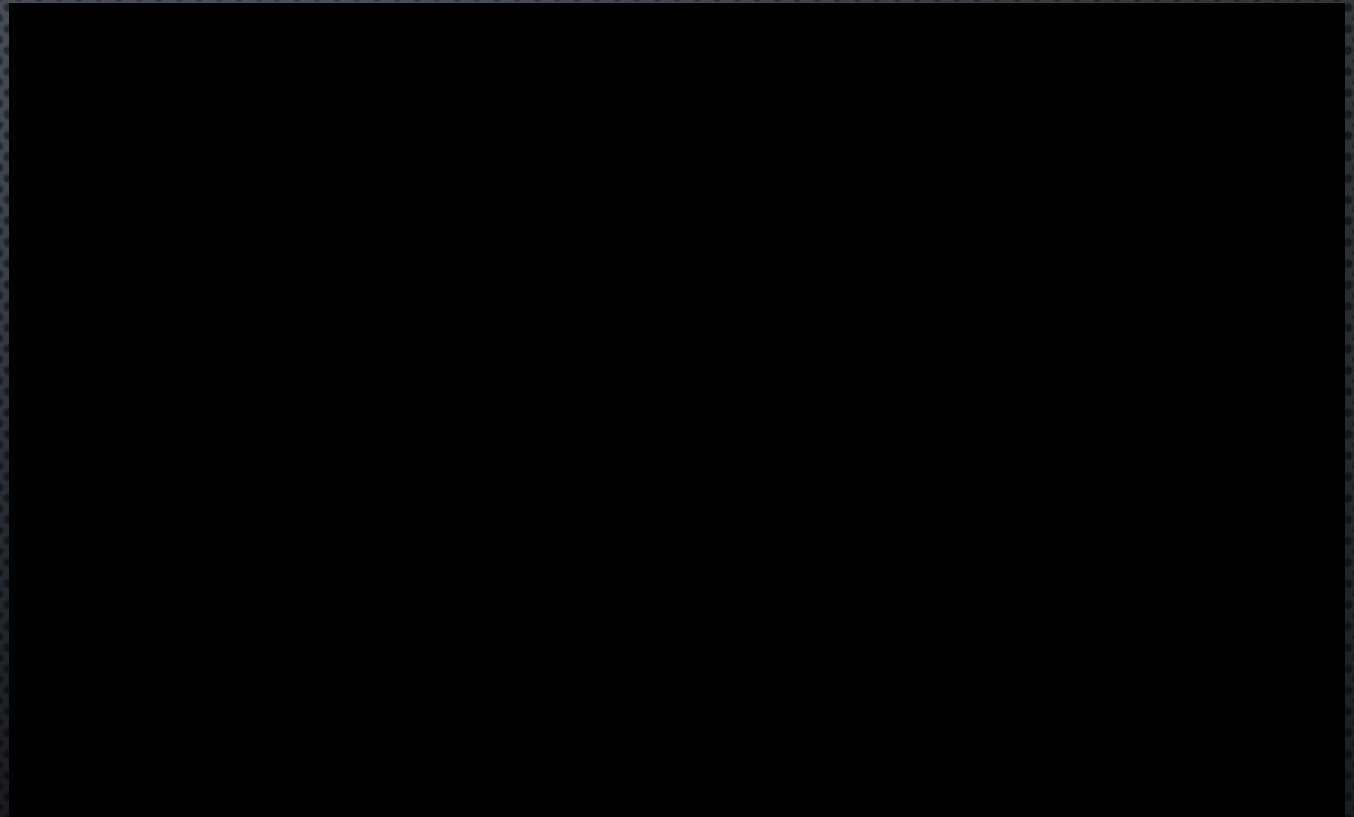
GRACOVETKY'S RESEARCH



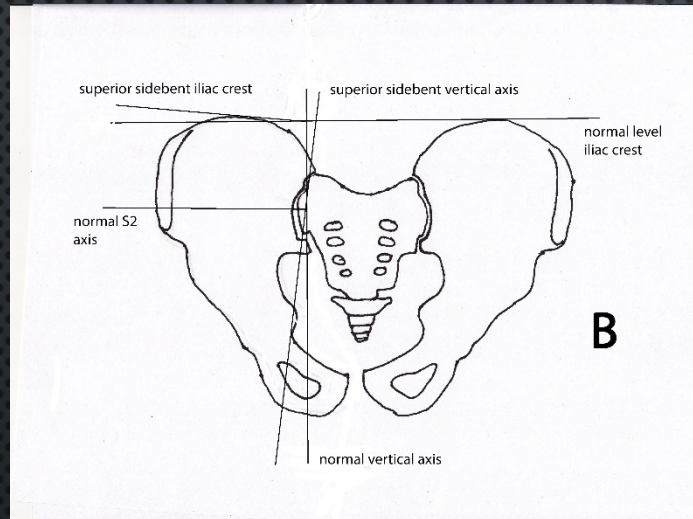
- ACCORDING TO GRACOVETSKY, THE SACROILIAC JOINT IS SHAPED WITH REVERSE ANGULATION, CREATING A WARPED SURFACE THAT LIMITS SLIDE. IRREGULAR SURFACES OF THE SI JOINT CREATE HIGH LEVELS OF FRICTION.
- GRACOVETSKY DEMONSTRATED PRESENCE OF A BONY RIDGE WITHIN THE SI JOINT AT THE LEVEL OF S2 WHICH HE NAMED THE SG RIDGE WHICH HELPS PREVENT DISLOCATION OF THE JOINT. HE SUGGESTS THIS IS A BONY BUTTRESS THAT PREVENTS SUPERIOR AND INFERIOR DISLOCATION.
- THE HIGH FRICTION SURFACES OF THE SI JOINT AND THE SURFACE IRREGULARITIES ARE DESIGNED FOR BONY COMPRESSION AND SEVERELY LIMIT SHEAR.

SO, IF THE SI JOINT CANNOT “SHEAR” ...

- OUR PROPOSED MECHANISM FOR WHAT IS TRADITIONALLY TERMED INNOMINATE SHEARING IS THAT LONGITUDINAL FORCES PRODUCE MEDIAL OR LATERAL *SIDEBENDING OF THE INNOMINATE ON THE SACRUM.*



SO, IF THE SI JOINT CANNOT “SHEAR” ...



- FOR A “SUPERIOR INNOMINATE SHEAR” THE SIDEBENT MODEL SUGGESTS **THE ILIAC CREST WOULD BE CLOSER TO THE MIDLINE.** THE JOINT IS CLOSED SUPERIORLY AND OPEN INFERIORLY WITH A PIVOT AT S2. THE ACETABULUM AND FEMUR GREATER TROCHANTER ARE DISPLACED LATERAL. THE ANTERIOR SUPERIOR ILIAC SPINE (ASIS), POSTERIOR SUPERIOR ILIAC SPINE (PSIS) AND THE ILIAC CREST ARE SUPERIOR RELATIVE TO THEIR NON-DYSFUNCTIONAL STATES.
- **THE LEG ON THE AFFECTED SIDE APPEARS TO BE SHORTER.** IT IS RELATIVELY ADDUCTED IN ORDER REMAIN PARALLEL WITH THE OTHER LEG.
- THIS IS CALLED A **SUPERIOR SIDEBENT INNOMINATE.**

SO IF THE SI JOINT CANNOT "SHEAR"...

- AN "INFERIOR INNOMINATE SHEAR" (TERMED A "DOWNSLIPPED INNOMINATE IN THE MUSCLE ENERGY MANUAL) IS THE RESULT OF A FORCE SIDEBENDING THE INNOMINATE TOWARD THE INFERIOR PART OF THE SACROILIAC JOINT. THE SUPERIOR PART OF THE JOINT IS GAPPED AND THE INFERIOR PART COMPRESSED. THE PELVIC BRIM IS SHIFTED OUTWARD PRESENTING MORE LATERAL RELATIVE TO THE MIDLINE AND THE LOWER PART OF THE INNOMINATE IS SHIFTED INWARD OR CLOSER TO THE MIDLINE. THE ILIAC CREST PRESENTS INFERIOR TO ITS NORMAL PRESENTATION AS DO THE ASIS AND PSIS. THE ACETABULUM AND GREATER TROCHANTER BECOME RELATIVELY MEDIAL AND INFERIOR TO THEIR NORMAL POSITIONS.
- *THE LEG WILL APPEAR TO BE LENGTHENED.* IN ORDER TO REMAIN PARALLEL TO THE OTHER LEG, THE LEG ON THE INFERIOR SHEARED INNOMINATE WILL BE SLIGHTLY ABDUCTED.
- THIS IS CALLED AN **INFERIOR SIDEBENT INNOMINATE.**

HOW DO YOU FIX A SIDEBENT INNOMINATE?

- AN INTERESTING SIDE NOTE IS THAT EVEN THOUGH THE MUSCLE ENERGY MODEL DISCUSSED THESE SHEARED INNOMINATE DYSFUNCTIONS EXTENSIVELY, IT HAD NO TREATMENT FOR A SUPERIORLY SHEARED INNOMINATE (UPSLIPPED) EXCEPT THE HVLA TRACTION TUG.
- THIS NEW MODEL ALLOWS AN EFFECTIVE MUSCLE ENERGY TREATMENT FOR BOTH SUPERIOR AND INFERIOR SIDEBENT INNOMINATES.

WANT MORE DETAIL?

- A MORE DETAILED EXPLANATION OF THE CURRENT RESEARCH AND ANATOMY CAN BE FOUND IN OUR ARTICLE:
 - GOLDMAN, S. I. & VAN BUSKIRK, R. L. RETHINKING SUPERIOR AND INFERIOR SACROILIAC SHEAR: A NEW APPROACH TO DIAGNOSIS AND TREATMENT. AMERICAN ACADEMY OF OSTEOPATHY JOURNAL, 28 (2018), PP. 21-28.

SUPERIOR SIDEBENT INNOMINATE

- IF THE HYPOTHESIS IS CORRECT THIS SHOULD BE AS SPECIFIC A TREATMENT FOR AN “UPSLIPPED INNOMINATE” AS THE CLASSICAL HVLA TRACTION TUG.
- THAT HAS BEEN MY EXPERIENCE OVER THE PAST SEVEN YEARS.

MUSCLE ENERGY TECHNIQUE

- TO TREAT WE WILL BE USING THE MUSCLE IMPULSE VARIANT IN PART BECAUSE IT TYPICALLY REQUIRES MINIMAL RESISTANCE FROM THE OPERATOR

SUPERIOR SIDEBENT INNOMINATE



1. TREATMENT IS TO PLACE THE INNOMINATE AT THE RESTRICTION BARRIER BY ADDUCTING THE AFFECTED LEG.
2. HAVE THE PATIENT PUSH THE LEG TOWARDS YOU WHILE YOU RESIST. A RAPID METHOD IS TO HAVE THE PATIENT MOUNT 3 BRIEF PUSHES WITHOUT ANY ACTUAL MOVEMENT. THEN YOU ADDUCT THE LEG FURTHER THROUGH WHERE THE BARRIER HAD BEEN.
3. RETURN THE LEG TO NEUTRAL AND RETEST.

INFERIOR SIDEBENT INNOMINATE

- UNDER THE NEW MODEL FOR A **DOWNSLIPPED 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 APPEAR TO BE LONGER.
- ALTHOUGH THE MITCHELL MODEL CLEARLY IDENTIFIED THE DOWNSLIPPED INNOMINATE AS A POSSIBLE RESTRICTION IT GAVE NO EXPLICIT TREATMENT.
- THE NEW MODEL ALSO CLARIFIES WHY A DOWN SLIPPED INNOMINATE IS NOT REDUCED BY SIMPLY STANDING WITH WEIGHT ON THE INFERIOR SIDEBENT SIDE AS MIGHT HAVE BEEN EXPECTED FROM THE OLDER MODEL THAT TERMED IT AN INFERIOR SHEAR OR “DOWNSLIPPED INNOMINATE.”

INFERIOR SIDEBENT INNOMINATE

- TREATMENT FOR AN INFERIOR SIDEBENT INNOMINATE INVOLVES ABDUCTION OF THE LEG AWAY FROM THE MIDLINE.
- HAVE THE PATIENT PUSH THE ABDUCTED LEG TOWARD THE OTHER LEG IN 3 BRIEF PULSES WHILE YOU RESIST MOVEMENT.
- THEN FURTHER ABDUCT THE LEG AND THE RETURN TO NEUTRAL AND RETEST.



FLEXED CERVICAL DYSFUNCTION

FOR A TYPICAL CERVICAL SEGMENT FLEXED DYSFUNCTION ($FS_R R_R$)

- EXTEND, SIDEBEND AND ROTATE THE NECK DOWN TO THE SEGMENT BRING THE SEGMENT TO ITS MOVEMENT BARRIER.
- HAVE THE PATIENT TURN THEIR HEAD TOWARD THE EASE BRIEFLY 3 TIMES.
- FURTHER SIDEBEND AND ROTATE THE SEGMENT THROUGH WHERE THE BARRIER HAD BEEN.
- RETURN TO NEUTRAL AND RETEST.



ELEVATED FIRST RIB

- SIDEBEND AND SLIGHTLY EXTEND THE HEAD AND NECK TOWARDS THE ELEVATED FIRST RIB UNTIL THE BARRIER IS ENGAGED.
- HAVE THE PATIENT PRESS THEIR HEAD TOWARD THE OPPOSITE SIDE 3 TIMES BRIEFLY WHILE YOU RESIST THE MOVEMENT.
- NOW FURTHER EXTEND AND SIDEBEND THE NECK THROUGH WHERE THE BARRIER HAD BEEN.
- RETURN TO NEUTRAL AND RETEST.



EXTENDED THORACIC SEGMENTAL DYSFUNCTION



FOR AN ESR SEGMENT

- FLEX, SIDEBEND AND ROTATE THE THORAX DOWN TO THE RESTRICTED SEGMENT, ENGAGING THE SEGMENT AT ITS RESTRICTION BARRIER
- ON THE SIDE OF THE RESTRICTION HAVE THE PATIENT PUSH FORWARD AT THE SHOULDER AGAINST YOUR RESISTANCE, PUSHING AND THEN IMMEDIATELY STOPPING. DO THIS 3 TIMES.
- NOW FURTHER FLEX, SIDEBEND AND ROTATE THE SEGMENT. THERE SHOULD BE NO SENSE OF RESISTANCE.
- BRING THE PATIENT BACK TO NEUTRAL AND RETEST.

L5 NEUTRAL DYSFUNCTION



FOR AN L5 SIDEBENT RIGHT, ROTATED LEFT DYSFUNCTION ($NS_R R_L$)

- SIDEBEND THE PATIENT LEFT AND ROTATE RIGHT DOWN TO THE L5 SEGMENT UNTIL THE BARRIER TO MOTION IS PALPABLE.
- HAVE THE PATIENT PUSH FORWARD WITH THE RIGHT SHOULDER 3 BRIEF TIMES WHILE YOU RESIST.
- MOVE THE SEGMENT THROUGH WHERE THE RESISTANCE HAD BEEN
- RETURN TO NEUTRAL AND RETEST.

PECTORALIS RESTRICTION

- BRING THE PATIENT'S ARM INTO FLEXION UNTIL THE MOVEMENT BARRIER IS PALPATED. FOR PECTORALIS MINOR THE POSITION IS STRAIGHT FLEXION. FOR PECTORALIS MAJOR THE POSITION IS FLEXION AND SOME ABDUCTION.
- HAVE THE PATIENT TRY TO BRING THE ARM DOWN TOWARDS THE FRONT FOR 3 BRIEF PULSES WHILE YOU RESIST.
- STRETCH THE MUSCLE BY FURTHER FLEXING THE SHOULDER. RETEST.



ANTERIOR INNOMINATE



- FLEX AND SLIGHTLY ADDUCT THE HIP ON THE SIDE OF THE DYSFUNCTION.
- HAVE THE PATIENT BRIEFLY PUSH DOWN 3 TIMES WHILE YOU RESIST.
- FURTHER FLEX THE HIP.