

Current Status of Leg Length Inequality

A HYPOTHESIS OF CHRONIC BACK PAIN: LIGAMENT SUBFAILURE INJURIES LEAD TO MUSCLE CONTROL DYSFUNCTION

Manohar M. Panjabi, PhD
 European Spine Journal
 2006; 15:668-676



REVIEW OF METHODS USED BY CHIROPRACTORS TO DETERMINE THE SITE FOR APPLYING MANIPULATION

Triano, Budgell et al.
 Chiropractic & Manual Therapies
 2013, 21:36



THE CURRENT RESEARCH SAYS:

There is **HIGH QUALITY EVIDENCE** supporting the use, with limitations, of static and motion palpation, and measures of leg length inequality.

Triano, Budgell et al., Chiropractic & Manual Therapies 2013, 21:36

FAVORABLE RECOMMENDATION:

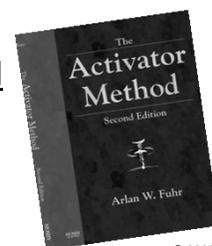
Using leg length inequality measures to localize to the site of care has the **same favorable recommendation** as static and motion palpation.

Triano, Budgell et al., Chiropractic & Manual Therapies 2013, 21:36

For a Summary of the Reliability of Leg Length Evaluations:

The Activator Method 2nd Edition

- Box 6-1 (pp.131-132)
- Table 6-1 (pp. 134-135)



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NOTE: All page numbers referenced in these notes refer to this textbook.

The Activator Method Basic Scan Protocol

Module 1: Conducting the
Initial Leg Check

p 112-117

Objectives

- ◆ Activator Method Protocol *p 112*
- ◆ Footwear and Clothing *p 113*
- ◆ Patient Placement *p 115*
- ◆ Visual Observation *p 116*
- ◆ Position #1 Procedures *p 117*

Activator Methods Protocol

- ◆ Description
- ◆ Significance
- ◆ Research and Clinical Experience
- ◆ Functional Short Leg

What is the AM protocol?

- ◆ The central feature of the Activator Method protocol is Leg Length Analysis (LLA)
- ◆ LLA is a series of repeated, systematic measures of prone extended and flexed Leg Length Inequality (LLI)

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What is the significance of the AM protocol?

LLA enables the practitioner to identify neuroarticular dysfunction **confidently** and **consistently** even when a patient suffers from atypical (or no) symptoms.

p 112

Measures of LLI using the AM protocol enable the practitioner to:

- ◆ Isolate neuroarticular dysfunction of the axial skeleton and extremities
- ◆ Determine the direction of misalignment
- ◆ Confirm the direction of adjustment
- ◆ Confirm post-adjustment assessment

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keypoint

The AM Leg Length Analysis (LLA) is used to help determine:

- ◆ WHERE to adjust
- ◆ WHEN to adjust
- ◆ WHEN NOT to adjust

What does the research and clinical experience show?

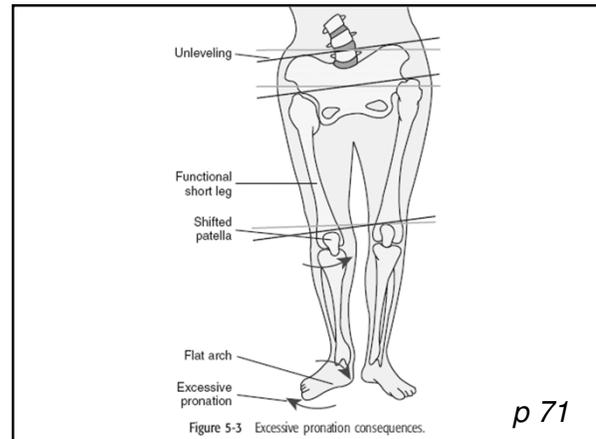
Proficiency-rated doctors who use Activator methodology have **good to very good** intra-examiner reliability when evaluating Pelvic Deficiency (PD), or Leg Length Inequality (LLI).

See Table 6-1 (p 134) of *The Activator Method*, Second Edition

What is a functional short leg?

- ◆ While not anatomically shorter, the functional short leg appears shorter during analysis and treatment
- ◆ Traditionally designated as the Pelvic Deficient, or PD leg
 - Also referred to as the **reactive leg**

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Proper footwear should:

- ◆ Have a back or a strap that maintains contact with the heel and helps prevent gripping of the toes by the patient
- ◆ Allow access to the bones of the feet
- ◆ Be low cut, fit the foot tightly, not be badly worn, and slip on and off easily when needed

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Activator® Adjusting Shoes



Adjusting shoes help with accuracy of the LLA.

Clothing and other Considerations



Instruct patient to remove any bulky pocket objects, and any heavy or restrictive clothing.

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Proper Adjusting Table



Wide enough to support patient's arms
Tall enough to reduce stress on doctor
Long face slot to accommodate short and tall but leave ankles in proper position

Tilt table preserves and enhances standing, weight-bearing postural distortions and compensations

Lloyd Activator® Hylo

Proper Patient Placement



Instruct the patient:

- Lean into the table
- Face centered in the slot
- Arms at the sides
- Back of each hand contacting and resting on the table
- Do not move or adjust your weight

Place a hand firmly over patient's lower back

Lower the table

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Proper Patient Placement



The patient's legs need to extend past the bottom of the table far enough to allow ankles and feet to move freely

p 115

Patient Positioning: portable table

1. Place a stepstool very close to the foot of the table
2. Instruct the patient to stand on the stepstool facing the table
3. Instruct the patient to place shins as close to the foot of the table as possible

Patient Positioning: portable table

4. Instruct the patient to kneel on the adjusting table:
 - Patient's knees come to the same point on table and are parallel
 - Patient's legs extend past the bottom of the table far enough to allow ankles and feet to move freely

Patient Positioning: portable table

5. Instruct the patient to place both hands on the table, and lower body to the table in a prone position
6. Once the patient is in the prone position, ask them to relax on the table without moving or shifting

Doctor positioning: stance

The position in which you stand is also important.

- ◆ Stand at the foot of the table with a stance that permits a clear line of sight to the plantar surfaces of the patient's feet
- ◆ Place one foot forward in an in-line, or scissor stance
- ◆ Keep an upright posture



AM step-by-step procedure



Proper patient placement for conducting the initial leg check.

keypoint

Unless otherwise noted we will use a **Left PD** as our example on these slides and in the textbook.

Leg Length Analysis: Position #1 Procedures



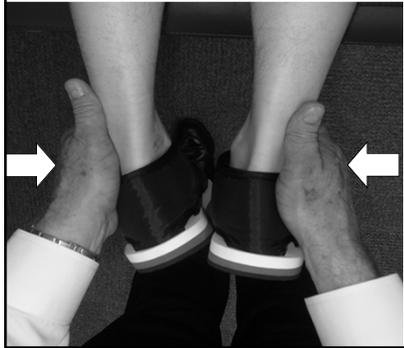
1. Look, DON'T TOUCH!



Before touching the feet, visually observe for asymmetrical inversion or eversion, and excessive toe-out or toe-in foot flare

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2. Bring the Legs TOGETHER



Cup the palms of the hands over the lateral malleoli, and bring the legs together until the heels approximate, without forcing the heels together

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keypoint

In most cases, the short leg revealed by visual inspection is the Pelvic Deficient, or reactive, leg.

3. SIX-Point Landing



Remove inversion or eversion
Gently dorsiflex the feet
Flare feet 10°
Apply gentle headward pressure

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Look at the welt of the shoes at the heels, and observe/measure the PD (Pelvic Deficient) leg.



Identify the PD leg

- ◆ Identify whether the PD leg is RIGHT or LEFT
- ◆ Measure the amount leg length inequality (LLI)

For example: Left leg ½" short

Tips for Minimizing Error

- ◆ Use a **light touch**
- ◆ Do not wiggle or “play” with the feet or legs
- ◆ Keep your index finger **off** the Achilles tendon in Position #1
- ◆ Remove inversion (supination) and plantar flexion

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keypoint

From this point on, the short leg identified in this initial leg check is considered the PD leg, or reactive leg.

The Activator Method Basic Scan Protocol

Module 2: Interpreting Results
of Initial Leg Check

p 116-122

Objectives

- ◆ Position #2 Procedures *p 119*
- ◆ Minimizing Error *p 121*
- ◆ Interpreting Results of the Initial Leg Check *p 121*

The 4 Essential Steps of the Initial Leg Check

1. Patient placement
2. Visual observations
3. Position #1 procedure
 - Identify the PD leg
4. Position #2 procedure
 - Identify the starting point for analysis

Leg Length Analysis: Position #2



Position #2 Procedures

1. Stand in an in-line, scissor stance
2. Contact the dorsal aspect of the patient's feet at the **MTP* junction** with the middle fingers
3. Plantar flex the feet until slack is taken up, **before** lifting the legs

**MTP: metatarsal-phalangeal*

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Position #2 Procedures

4. **Slowly** lift the legs by raising the feet and flexing the knees
5. At ~30° of knee flexion, slide the index fingers into the welt of the shoe, and position the thumbs on the soles near the ball of each foot

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Position #2 Procedures

6. Continue to raise feet until knees are flexed to **no more than 90°**
7. Site an imaginary mid-line on the patient (*2nd sacral tubercle to EOP*)
8. At 90°, abduct the feet to a 10° toe-out foot flare

p 119

Look at the welt of the shoes at the heels, and measure any change in the relative length of the PD leg.



Tips for Minimizing Error

- ◆ Move the legs **deliberately** from Position #1 toward Position #2
- ◆ Keep your **elbows tucked into the sides** while raising the legs toward Position #2
- ◆ Lower the legs **slowly** from Position #2 back down to Position #1

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Tips for Minimizing Error

- ◆ Let the feet form a “V” in Position #2, **keeping the heels from touching**, with the toes flared out
- ◆ **Do not force dorsiflexion** of the feet in Position #2

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Interpreting the Results of the Initial Leg Check

- ◆ Raise the legs to Position #2, observe for the PD leg to lengthen or shorten **relative** to its length in Position #1
- ◆ Determine the starting point for AM assessment protocol based on the **relative** change

keypoint

The results of the initial leg check reveal the starting point for the AM assessment protocol:

1. Knees and Feet
2. Fourth Lumbar (L4)
3. Symphysis Pubis

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Possibility One

PD leg appears to have **lengthened** in Position #2



Legs uneven in Position #1



AM testing procedure starts with the **knees and feet**

Possibility One Examples

Position #1	Position #2
Left leg 1" short	Left leg 1/4" short
Left leg 1/2" short	Left leg 1/2" long

Possibility Two

PD leg appears to have **stayed short** or becomes **shorter** in Position #2



Legs uneven in Position #1



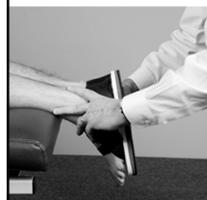
AM testing protocol starts with **fourth lumbar (L4)**

Possibility Two Examples

Position #1	Position #2
Left leg 3/4" short	Left leg 1" short
Left leg 1/4" short	Left leg 1/2" short

Possibility Three

Legs **even** in Position #1 and Position #2



Legs are even in Position #1



AM testing protocol starts with the **symphysis pubis**

Possibility Three Example

Position #1 **Position #2**

Legs even Legs even

NOTE: This occurs very rarely in new patients – even asymptomatic patients typically have an identifiable PD leg

keypoint

Possibility One occurs **much more frequently** during the initial LLA than Possibility Two and Possibility Three.

Protocol for Proper Use of Activator Adjusting Instruments (AAI)

Holding the Activator IV

- ◆ Hold between 2nd and 3rd digits
 - May need 3rd and 4th digits
- ◆ Handle rests on thenar eminence
- ◆ Always **maintain a neutral wrist**

Holding the Activator IV



It is important to maintain a neutral wrist.

Incorrect Wrist Angles i.e. not neutral



Hand may need to be turned palm up for correct LOD.



Example: hand turned palm up for PI ilium adjustment

Holding the Activator V

◆ Grip Styles

- The Classic Grip
- The Modified Grip
- The Inverted Grip

The Classic Grip



The Modified Grip



The Inverted Grip



Holding the Activator V

◆ Trigger finger

- 1st finger vs. 2nd finger (or thumb)

◆ Grip Pressure

- Light vs. Firm
- Holding vs. Squeezing

Instrument Patient Contact

Maintain a firm, steady contact with the instrument to the patient throughout the duration of the thrust.

NOTE: In order to maintain a firm, steady contact, "It is better to hold the instrument more perpendicular to the patient than being as particular to the exact LOD."

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Ensure Effective Adjustment

For some adjustments, you will need to use the thumb or fingers of the free hand to:

- ◆ Take a **tissue pull** over the contact point in the recommended LOD
- ◆ **Stabilize the tip of the instrument** on the contact point

Add pain provocation upon palpation to Activator tests

Like all other diagnostic methods, AM is meant to be used in conjunction with other clinical skills of differential diagnosis, e.g. pain provocation upon palpation is another a reliable and valid way to verify where to adjust.

Triano, Budgell et al., Chiropractic & Manual Therapies 2013, 21:36

The Activator Method Basic Scan Protocol

Module 3: Pressure/Stress Testing;
Knees and Feet

p 142-150

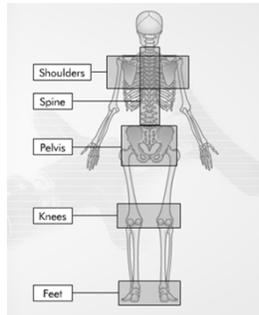
Objectives

- ◆ Describe the verification tests used to confirm involvement of an area
- ◆ Identify the appropriate testing procedures for the knee joint
- ◆ Select appropriate adjustments for:
 - the talus and medial knee
 - the cuboid and lateral knee

Basic Scan: Clinical Rationale

- ◆ A **systematic** clinical approach for identifying and treating a wide variety of common complaints
- ◆ A sequence of various tests and adjustments most frequently seen in **new and returning** patients

Basic Scan: Clinical Rationale



The majority of dysfunctions of consequence tend to occur at biomechanical stress points.

keypoint

Verification tests use LLA (leg length analysis) as part of their performance and assist in determining where and when to appropriately adjust.

Verification Tests

Three types of tests are used to confirm involvement of an area of the body:

1. **Pressure Tests**
2. Stress Tests
3. Isolation Tests

WHAT are Pressure Tests?

- ◆ **Tests performed by the doctor** to identify a specific component suspected of subluxation
- ◆ A gentle manual pressure applied at the point of suspected involvement into the **direction of adjustment**

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WHY do you use Pressure Tests?

- ◆ They indicate **WHERE** and **WHEN** to appropriately adjust to improve joint neurology and biomechanics
- ◆ They confirm the **need for** and the **direction of** the adjustment of an axial or appendicular joint

p 123

keypoint

Pressure Tests are only performed when the legs are **imbalanced** or uneven in Position #1.

HOW do you use Pressure Tests?

- ◆ Apply a gentle manual force to a vertebral segment or extremity joint in the **direction of adjustment**
- ◆ Recheck for the legs to balance or become more even in Position #1

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Verification Tests

Three types of tests are used to confirm involvement of an area of the body:

1. Pressure Tests
- 2. Stress Tests**
3. Isolation Tests

WHAT are Stress Tests?

- ◆ **Tests performed by the doctor** to isolate a specific component suspected of subluxation
- ◆ A gentle manual force applied at the point of suspected involvement in the **direction of neuroarticular dysfunction**

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WHY do you use Stress Tests?

- ◆ They **help confirm** whether a joint is dysfunctional
- ◆ To identify and evaluate neuroarticular dysfunction in the spine, and the upper and lower extremities

p 124

keypoint

Stress Tests are only performed when the legs are **balanced** or even in Position #1.

HOW do you use Stress Tests?

- ◆ Apply a gentle manual force to a vertebral segment or extremity joint in the **direction of neuroarticular dysfunction**
- ◆ Recheck for the legs to imbalance or become less even in Position #1

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Three Possibilities Summary

Possibility	Finding	Testing/Adjustment
Possibility One	PD leg lengthens going from Position #1 to Position #2	Begin with knees and feet
Possibility Two	PD leg shortens going from Position #1 to Position #2	Skip knees and feet, and pelvis; begin with fourth lumbar vertebra
Possibility Three	Legs are even/balanced in Position #1 and Position #2	Skip knees and feet, and pelvis; begin with pubic symphysis

NOTE: These results apply ONLY to the Initial Leg Check

Possibility One

PD leg appears to have **lengthened** in Position #2



Legs uneven in Position #1



AM testing procedure starts with the **knees and feet**

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What does Possibility One indicate?

- ◆ The PD leg lengthening in Position #2 is **more frequently associated with pelvic involvement** than the knees and feet
- ◆ However, the knees and feet should be tested prior to testing the pelvis for involvement

Adjusting the Knees and Feet

- ◆ Adjustment of the knees and feet involve elements of the kinetic chain of the lower extremity
- ◆ Consequently, the Basic Scan Protocol calls for adjustment of two different elements when adjusting a Medial or Lateral knee pattern



Pressure Test

of Medial Knee

- ◆ Apply a firm but gentle pressure by stroking over the medial collateral ligament
- ◆ Apply the pressure in lateral and inferior direction
- ◆ Stroke across the knee joint

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Pressure Test of Medial Knee



keypoint

If the legs become even, or if the difference between them decreases following a Pressure Test, the need for correction is indicated.

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Nonreactive Pressure Test of Medial Knee



Leg lengths are uneven
in Position #1

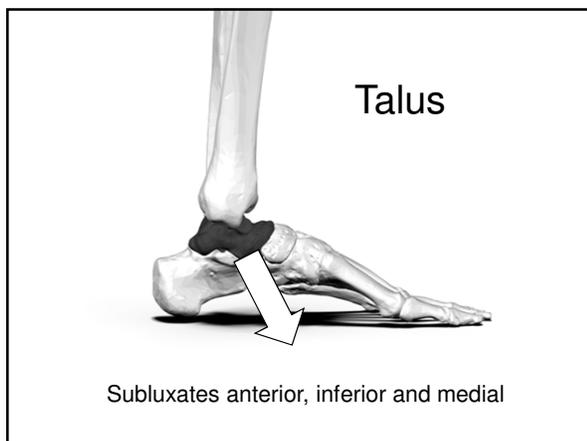
Leg lengths stay uneven
in Position #1

Reactive Pressure Test of Medial Knee



Leg lengths are uneven
in Position #1

Leg lengths balance or
become more even
in Position #1



Medial Knee | Step 1 Adjusting the Talus

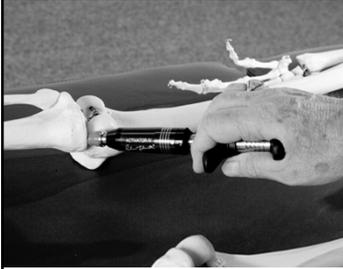


CP: Medial
border of talus,
anterior-inferior
to the medial
malleolus

LOD: Posterior,
superior and
lateral

Medial Knee | Step 2

Adjusting the Knee



CP: Knee above tibial plateau, on medial collateral ligament

LOD: Lateral and inferior

Knees | Clinical Tip

To ensure proper placement of the tip of the instrument, flex and extend the knee while palpating for the joint space. Locate the bony prominence of the tibial plateau. The contact is slightly above the tibial plateau.

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Pressure Test

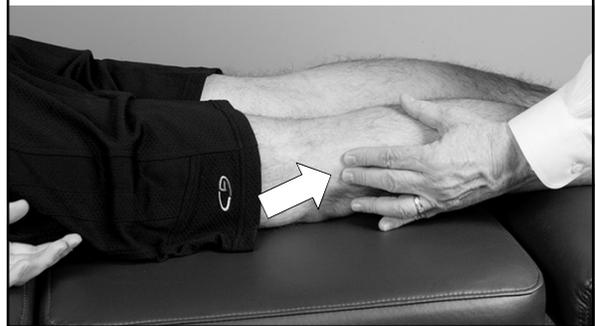
of Lateral Knee

- ◆ Apply a firm but gentle pressure by stroking over the lateral collateral ligament; avoid the fibula
- ◆ Apply the pressure in medial and inferior direction
- ◆ Stroke across the knee joint

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Pressure Test

of Lateral Knee



Nonreactive Pressure Test

of Lateral Knee



Leg lengths are uneven in Position #1

Leg lengths stay uneven in Position #1

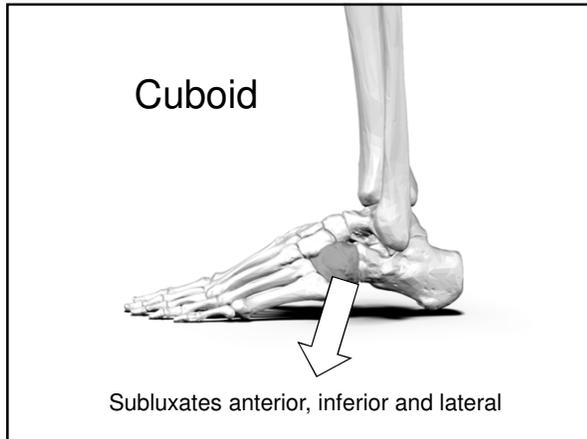
Reactive Pressure Test

of Lateral Knee



Leg lengths are uneven in Position #1

Leg lengths balance or become more even in Position #1



Lateral Knee | Step 1

Adjusting the Cuboid

CP: Inferior and lateral aspect of the cuboid

LOD: Posterior, superior and medial

Lateral Knee | Step 2

Adjusting the Knee

CP: Knee above tibial plateau, on lateral collateral ligament

LOD: Medial and inferior

Correct order for testing and adjusting the knees and feet

Pressure Test	Adjust
Medial Knee on side of PD	Talus/Medial Knee
Medial Knee on side Opposite PD	Talus/Medial Knee
Lateral Knee on side of PD	Cuboid/Lateral Knee
Lateral Knee on side Opposite PD	Cuboid/Lateral Knee

See Table 7-2 (p 144) of **The Activator Method**, Second Edition

keypoint

After any or all of the medial and lateral knee tests and adjustments, it is common for the leg lengths to be improved but not balanced in Position #1 and Position #2, indicating the need for tests of the pelvis.

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Knees | Clinical Tip

If upon the first two or three visits, you observe the knees and feet are not involved, it is not necessary to continue assessing them upon subsequent visits for that patient.

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What is the proper Activator instrument setting?

Extremities (healthy adult):

- Activator II: 3 rings
- Activator IV: setting 2
- Activator V: setting 2

The Activator Method Basic Scan Protocol

Module 4: Pelvis

p 150-156

Objectives

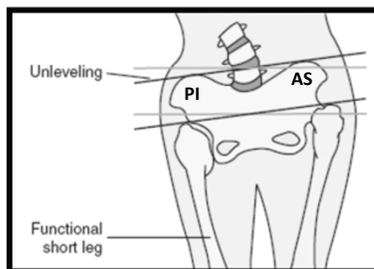
- ◆ Identify the appropriate testing and adjustment procedure for an AS (Anterior-Superior) ilium
- ◆ Identify the appropriate testing and adjustment procedure for a PI (Posterior-Inferior) ilium

Pelvic Tests

If the legs are not balanced in Position #1 and Position #2, after testing and adjusting the knees and feet, proceed to the pelvic Pressure Tests:

- AS (Anterior-Superior) ilium
- PI (Posterior-Inferior) ilium

e.g. Left Pelvic Deficiency



P-A schematic of pelvic misalignment

AS Ilium Procedure **Step 1**



Apply a gentle inferior and medial pressure to the crest of the ilium on the side opposite PD in a plane parallel to the plane line of the SI joint.

AS Ilium Procedure **Step 2**

Recheck the legs in Position #1

- ◆ If the legs balance or become more even, adjust the AS ilium
- ◆ If the legs DO NOT balance or become more even, pressure test for a PI ilium on the side of PD

AS Ilium Procedure **Step 3**

Adjustment of an AS ilium requires a single (1) thrust on each of the three (3) contact points (CP) with the Activator Adjusting Instrument as follows:

keypoint

It is advisable to **maintain a firm, steady contact** with the instrument to the patient throughout the duration of the thrust.

p 131, 142

AS Ilium Adjustment **#1 of 3**



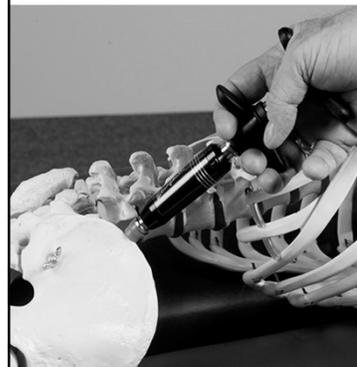
1st CP:
Base of the sacrum about 1/2 inch lateral to the first sacral tubercle

AS Ilium Adjustment **#1 of 3**



LOD: Anterior and inferior

AS Ilium Adjustment **#2 of 3**



2nd CP: Crest of the ilium about 1 inch superior to the PSIS

AS Ilium Adjustment #2 of 3



LOD: Inferior and medial parallel to the plane line of the sacroiliac articulation

AS Ilium Adjustment #3 of 3



3rd CP: Superior aspect of the ischial tuberosity

AS Ilium Adjustment #3 of 3



LOD: Anterior and inferior

AS Ilium Procedure Step 4

Recheck the legs in Position #1



If the legs are still not balanced, perform Pressure Test for PI ilium on the side of PD.

PI Ilium Procedure Step 1



Apply a **firm** superior, lateral and posterior pressure under the sacrotuberous ligament on the side of PD in a plane parallel to the plane line of the SI joint.

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PI Ilium Procedure Step 2

Recheck the legs in Position #1

- ◆ Look for the legs to balance; this indicates the necessity for PI ilium adjustment on the side of PD

PI Ilium Procedure **Step 3**

Adjustment of a PI ilium requires a single (1) thrust on each of the three (3) contact points (CP) with the Activator Adjusting Instrument as follows:

PI Ilium Adjustment **#1 of 3**



1st CP:
Spine
of the
ischium

PI Ilium Adjustment **#1 of 3**



Position the tip of instrument in the soft tissue of the gluteus maximus just medial to the ischial tuberosity

LOD: Posterior, superior and lateral

PI Ilium Adjustment **#2 of 3**



2nd CP:
Under the
sacrotuberous
ligament

PI Ilium Adjustment **#2 of 3**



Place the tip of the instrument under the sacrotuberous ligament in the sciatic notch

LOD: Posterior, superior and lateral

PI Ilium Adjustment **#3 of 3**



3rd CP:
Iliac fossa

PI Ilium Adjustment #3 of 3



Contact the iliac fossa just lateral to the sacroiliac joint in the soft tissue of the gluteus medius

LOD: Anterior and superior

keypoint

The PI ilium on the side of PD is most commonly involved.

What is the proper Activator instrument setting?

Pelvis (for most body types):

- Activator II: 6 rings
- Activator IV: setting 4
- Activator V: setting 4

The Activator Method Basic Scan Protocol

Module 5: Isolation Testing, the Short/Long Rule, and Pelvis cont'd

p 123-125

Objectives

- ◆ Define and interpret the results of an Isolation Test *p 123*
- ◆ Explain the Short/Long Rule *p 125*
- ◆ Overview of the Isolation Tests included in the Basic Scan

Verification Tests

Three types of tests are used to confirm involvement of an area of the body:

1. Pressure Tests
2. Stress Tests
- 3. Isolation Tests**

WHAT are Isolation Tests?

Specific active movements performed by the patient that assist in the location and evaluation of neuroarticular dysfunctional motion segments of the spine and extremities

p 123

WHY do you use Isolation Tests?

- ◆ They **help confirm** whether a joint is dysfunctional
- ◆ To identify and evaluate neuro-articular dysfunction in the spine, and the upper and lower extremities

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keypoint

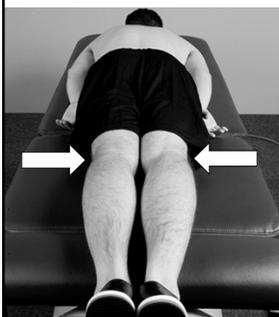
Isolation Tests (like Stress Tests) are performed when the legs are **balanced** or even in Position #1.

HOW do you use Isolation Tests?

- ◆ **Patient performs an active motion** that facilitates neurological pathways and increases tension in the musculature or other soft tissues
- ◆ Recheck for the legs to imbalance or become less even in Position #1

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e.g. Symphysis Pubis



Isolation Test:
Instruct the patient to squeeze the knees together, then relax

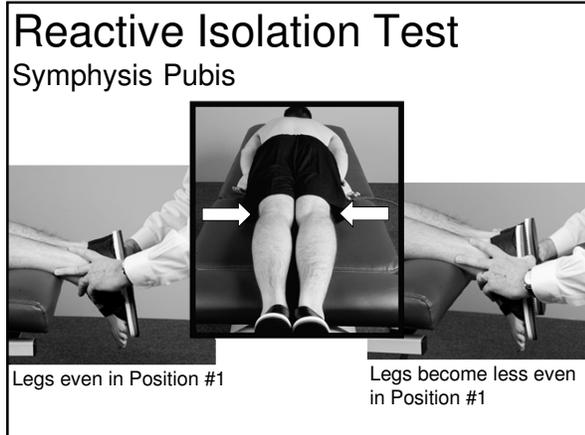
p 154

Nonreactive Isolation Test Symphysis Pubis



Legs even in Position #1

Leg lengths stay even in Position #1



Isolation Test Summary

After an Isolation Test is performed, one of these three things occurs:

1. There is no reactivity in Position #1 or Position #2
2. The PD leg shortens in Position #1 and **lengthens** in Position #2
3. The PD leg shortens in Position #1 and **shortens** in Position #2

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The Short/Long Rule

WHAT is the Short/Long Rule?

- ◆ If the PD leg relatively **lengthens** when taking it to Position #2, involvement is **on the PD side**
- ◆ If the PD leg relatively **shortens** when taking it to Position #2, involvement is **on the OPD side**

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HOW is the Short/Long Rule used?

- ◆ As a general guideline to determine the side of involvement of neuroarticular dysfunction
- ◆ As a guide to the adjustments necessary to improve dysfunction

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WHEN is the Short/Long Rule applied?

- ◆ When an affected segment or extremity is isolated, and the PD leg shortens in Position #1
- ◆ Position #2 is used to determine the side of involvement based on the Short/Long Rule

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The Short/Long Rule



Adjust on the PD side

If the PD leg relatively **lengthens** in Position #2

The Short/Long Rule



Adjust on the PD side

If the PD leg **relatively lengthens** in Position #2

The Short/Long Rule



Adjust on the OPD side

If the PD leg relatively **shortens** in Position #2

Symphysis Pubis

Follows testing and adjustment of the pelvis



keypoint

At this point the leg lengths should be even or considerably improved in Position #1 and Position #2 before proceeding to the symphysis pubis.

Three Possibilities Summary

Possibility	Finding	Testing/Adjustment
Possibility One	PD leg lengthens going from Position #1 to Position #2	Begin with knees and feet
Possibility Two	PD leg shortens going from Position #1 to Position #2	Skip knees and feet, and pelvis; begin with fourth lumbar vertebra
Possibility Three	Legs are even/balanced in Position #1 and Position #2	Skip knees and feet, and pelvis; begin with pubic symphysis

NOTE: These results apply **ONLY** to the Initial Leg Check

Possibility Three

Legs **even** in Position #1 and Position #2



AM testing protocol starts with the **symphysis pubis**

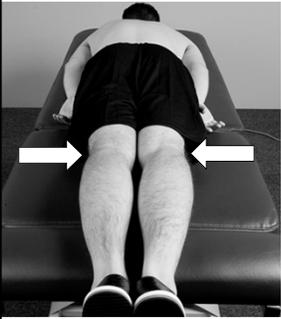
Legs are even in Position #1

What does Possibility Three indicate?

- ◆ This third possibility occurs rarely during the **initial leg check**
- ◆ After a patient has received AM adjustments, the appearance of the legs being even in Position #1 and Position #2 can be a more common finding on subsequent visits

p 122

Symphysis Pubis



Isolation Test:
Instruct the patient to squeeze the knees together, then relax

p 154

Nonreactive Isolation Test

Symphysis Pubis



Legs even in Position #1

Leg lengths stay even in Position #1

Reactive Isolation Test

Symphysis Pubis



Legs even in Position #1

Legs become less even in Position #1

keypoint

Keep in mind when using Isolation Tests, the indications for adjustments are a **significant change observed** in the leg length reactivity.

p 130



Issues of Sensitivity

- ◆ Inform the patient of the involvement and your intent to adjust the front of the pelvis, i.e. pubic bone
- ◆ Keep in mind issues of sensitivity and sexual boundaries
- ◆ Consider having an assistant present

p 153-154

The Short/Long Rule



Adjust on the PD side

If the PD leg relatively **lengthens** in Position #2

Superior Pubic Bone



CP: Superior aspect of the pubic bone on PD side

LOD: Inferior

p 154

The Short/Long Rule



Adjust on the OPD side

If the PD leg relatively **shortens** in Position #2

Inferior Pubic Bone



CP: Inferior aspect of the pubic bone on OPD side

LOD: Superior

p 154

What is the proper Activator instrument setting?

Symphysis pubis (healthy adult):

- Activator II: 4 rings
- Activator IV: setting 2
- Activator V: setting 2

Basic Scan Protocol

Overview of Isolation Tests

Pubic Symphysis - Squeeze knees together, then relax
 L5 – PD forearm on the low back
 L4 – Opposite PD forearm on the low back
 L2 – Both forearms on the low back
 T12 – PD forearm superior and lateral to the head
 T8 – Both forearms superior and lateral to the head
 T6 – Arms back down, and turn the face to the PD side

Basic Scan Protocol

Overview of Isolation Tests

Keep the face turned to the PD side and:

T4 – Lift the PD shoulder back, then relax
 T1 – Shrug the shoulders toward the ears, then relax
 T1 Rib – Roll the shoulders up-back-down, then relax
 LEFT Scapula - squeeze (L) elbow against the body
 RIGHT Scapula - squeeze (R) elbow against the body
 C7 – **Turn the head to neutral (face-down) position**
 C5 – Slightly raise the head off the table, then relax
 C2/C1 – Tuck the chin toward the chest, then relax
 Occiput - Gently push the face into the table, then relax

The Activator Method Basic Scan Protocol

Module 6: Lumbar Spine

p 154-162

Objectives

- ◆ Review Activator Testing procedure
- ◆ Identify the appropriate testing procedures and adjustment procedures for L5, L4, and L2

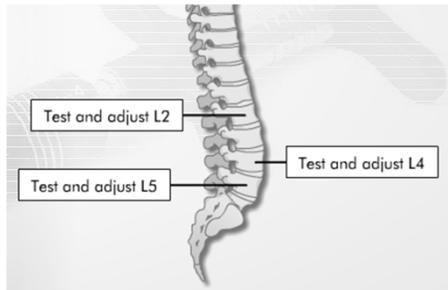
Activator Testing Procedure

1. Perform an Isolation Test.
2. Look for reactivity of the PD leg in Position #1.
3. Observe relative changes of the PD leg in Position #2.
4. Pressure Test to confirm (optional).
5. Make necessary adjustments.

NOTE: You may re-perform an Isolation Test post-adjustment in order to confirm correction.

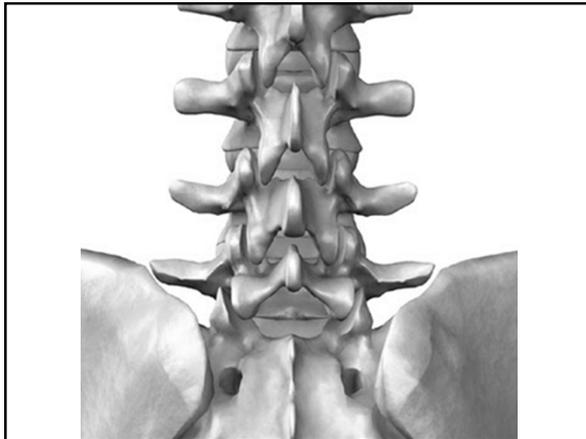
Lumbar Spine

Follows testing and adjustment of the symphysis pubis



Lumbar Spine Introduction

- ◆ In the Basic Scan protocol, only L5, L4, and L2 are routinely tested
- ◆ The line of drive for all standard lumbar adjustments is anterior and superior through the plane line of the facet, i.e. not the disc



General Spine Evaluation

Isolation Tests

- Use as primary test
- Use Stress Tests if patient cannot perform Isolation Test
- Take legs to Position #2, and use the Short/Long Rule
- Interpret results

Pressure Tests

- Use to clarify results of an Isolation Test
- Correctly applied pressure will cause legs to balance in Position #1 and Position #2
- If legs balance, adjust the involved vertebral motor unit on the side indicated by the Short/Long Rule

Testing the Lumbar Spine

- ◆ Verify that the leg lengths are even in Position #1 and Position #2
- ◆ Have patient perform Isolation Test
 - Use a Stress Test if patient is unable to properly perform Isolation Test
- ◆ Use Short/Long Rule in Position #2 to determine side of involvement

Adjusting the Lumbar Spine

- ◆ **Adjustment procedure:** same for all of the lumbar spine
- ◆ **Contact Point:** inferior articular process
- ◆ **Line of Drive:** anterior and superior through the plane line of the facet

Fifth Lumbar (L5)



Isolation Test:
Instruct the patient to place the forearm on the side of PD on the low back

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Fifth Lumbar (L5)



CP: Inferior articular process of L5
LOD: Anterior and superior

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Three Possibilities Summary

Possibility	Finding	Testing/Adjustment
Possibility One	PD leg lengthens going from Position #1 to Position #2	Begin with knees and feet
Possibility Two	PD leg shortens going from Position #1 to Position #2	Skip knees and feet, and pelvis; begin with fourth lumbar vertebra
Possibility Three	Legs are even/balanced in Position #1 and Position #2	Skip knees and feet, and pelvis; begin with pubic symphysis

NOTE: These results apply ONLY to the Initial Leg Check

Possibility Two

PD leg appears to have **stayed short** or becomes **shorter** in Position #2



Legs uneven in Position #1



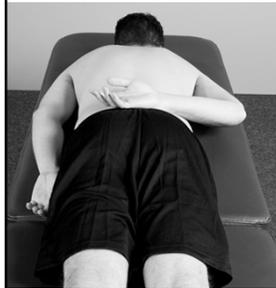
AM testing protocol starts with **fourth lumbar (L4)**

What does Possibility Two indicate?

- ◆ The PD leg shortening in Position #2 **occurs much less frequently**
- ◆ A small percentage of patients will present as a Possibility Two, and usually, their conditions are of a chronic nature

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Fourth Lumbar (L4)



Isolation Test:
Instruct the patient to place the forearm on the side Opposite PD on the low back

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Fourth Lumbar (L4)

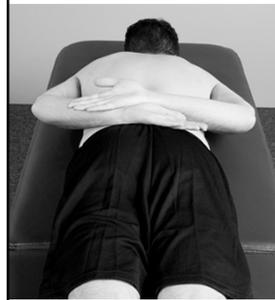


CP: Inferior articular process of L4

LOD: Anterior and superior

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Second Lumbar (L2)

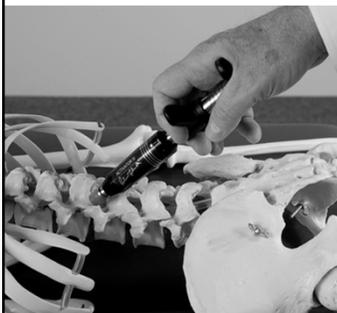


Isolation Test:

Instruct the patient to place the forearms of both arms on the low back

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Second Lumbar (L2)



CP: Inferior articular process of L2

LOD: Anterior and superior

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What is the proper Activator instrument setting?

Lumbar spine (most body types):

- Activator II: 6 rings
- Activator IV: setting 4
- Activator V: setting 4

The Activator Method Basic Scan Protocol

Module 7: Thoracic Vertebrae and Ribs

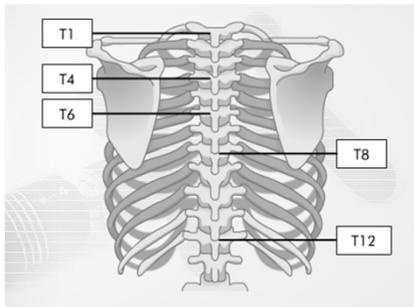
p 161-173

Objectives

- ◆ Identify the appropriate testing and adjustment procedures for the thoracic vertebrae
- ◆ Identify the appropriate testing and adjustment procedures for the thoracic ribs

Thoracic Spine

Follows testing and adjustment of the lumbar spine



Thoracic Spine Introduction

- ◆ Involves evaluation and treatment of:
 - T12 and T8 (lower thoracic spine)
 - T6, T4 and T1 (upper thoracic spine), and first ribs
- ◆ Includes adjustment of corresponding rib for each segment from T10 – T2

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Testing the Thoracic Spine

- ◆ Verify that the leg lengths are even in Position #1 and Position #2
- ◆ Have patient perform an Isolation test
 - Use a Stress test if patient is unable to properly perform isolation test
- ◆ Use Short/Long Rule in Position #2 to determine side of involvement

Adjusting the Thoracic Spine

- ◆ **Adjustment procedure:** same for all of the thoracic spine
- ◆ **Contact Point:** transverse process
- ◆ **Line of Drive:** anterior, superior and slightly medial through joint plane line of the facet

Twelfth Thoracic (T12)



Isolation Test:

Instruct the patient to abduct the shoulder on the side of PD and rest that forearm on the table superior and lateral to the head

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Twelfth Thoracic (T12)

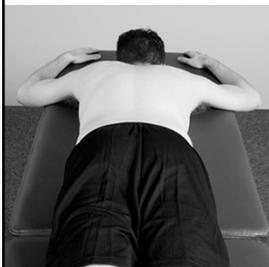


CP: Transverse process T12

LOD: Anterior, superior, and slightly medial

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Eighth Thoracic (T8)



Isolation Test:

Instruct the patient to abduct both shoulders and rest that forearms on the table superior and lateral to the head

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Eighth Thoracic (T8)



CP: Transverse process of T8

LOD: Anterior, superior, and slightly medial

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keypoint

For T10 – T2 vertebral segments, the ribs are routinely adjusted on the side OPPOSITE vertebral adjustment.

Eighth Thoracic (T8) Rib



CP: Body of rib ½ inch lateral to transverse process of T8

LOD: Lateral and inferior

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Sixth Thoracic (T6)



Isolation Test:

Instruct the patient to turn the face to the PD side and rest the head on the table

p 166

Sixth Thoracic (T6)



CP: Transverse process of T6

LOD: Anterior, superior, and slightly medial

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Sixth Thoracic (T6) Rib

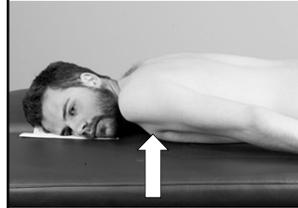


CP: Body of rib
1/2 inch lateral
to transverse
process of T6

LOD: Lateral
and inferior

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Fourth Thoracic (T4)



Keep the arms at the sides with
the head turned to the PD side.

Isolation Test:

Instruct the patient
to lift the shoulder
on the side of PD
off the table toward
the ceiling, then put
it back down

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Fourth Thoracic (T4)



CP: Transverse
process of T4

LOD: Anterior,
superior, and
slightly medial

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Fourth Thoracic (T4) Rib



CP: Body of rib
1/2 inch lateral
to transverse
process of T4

LOD: Lateral
and inferior

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First Thoracic (T1)



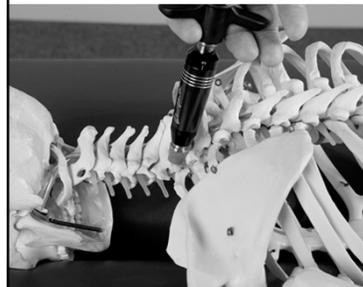
Keep the arms at the sides with
the head turned to the PD side.

Isolation Test:

Instruct the patient
to shrug both
shoulders toward
the ears and then
relax

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First Thoracic (T1)



CP: Transverse
process of T1

LOD: Anterior,
and slightly
medial

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keypoint

After completion of the adjustment for T1 as indicated, test for elevation involvement of the first (T1) rib.

First Thoracic (T1) Ribs



Isolation Test:
Instruct the patient to roll both shoulders superior, posterior, and inferior in a circular motion, and then to relax

Keep the arms at the sides with the head turned to the PD side.

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Apply the Short/Long Rule

- ◆ If the PD leg relatively **lengthens** when taking it to Position #2, involvement is **on the PD side**
- ◆ If the PD leg relatively **shortens** when taking it to Position #2, involvement is **on the OPD side**

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First Thoracic (T1) Rib



CP: Body of rib
1/2 inch lateral to transverse process of T1

LOD: Inferior

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First Thoracic (T1) Rib



NOTE: Have the patient turn the head to the neutral, face-down position. For patient comfort, use your free hand to take a posterior-inferior tissue pull.

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Bilateral Rib Involvement

- ◆ If leg lengths are unimproved after first rib testing/adjustment, Pressure test on the side opposite PD for involvement
- ◆ If the legs balance in Position #1, bilateral rib involvement is indicated

What is the proper Activator instrument setting?

- T12 – T7 (for most body types):
- Activator II: 6 rings
 - Activator IV: setting 3
 - Activator V: setting 3

What is the proper Activator instrument setting?

- T6 – T1 (for most body types):
- Activator II: 6 rings
 - Activator IV: setting 2
 - Activator V: setting 2

The Activator Method Basic Scan Protocol

Module 8: Shoulder Involvement–
Medial and Lateral Scapulae

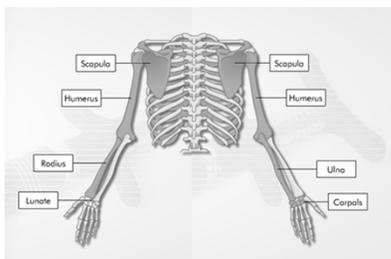
p 173-183

Objectives

- ◆ Identify the appropriate testing and adjustment procedures for:
 - Medial/Lateral scapula on the side of PD
 - Medial/Lateral scapula on the side opposite PD

Medial and Lateral Scapulae

Follows testing and adjustment of the thoracic spine



Keypoint #1

Before testing the scapulae, make sure the patient's face is turned to the side of Pelvic Deficiency.

NOTE: This is the same position for testing all the upper thoracic segments from T6 and above.

Keypoint #2

Test the scapula on the side of PD first and perform adjustments as indicated before testing and adjusting the scapula on the side opposite PD.

Keypoint #3

The scapular Isolation test introduces a variation of the Short/Long Rule in the interpretation of Position #2: **the longest leg in Position #2 indicates the *direction* of involvement of the scapula being tested.**

Scapular Short/Long Rule



Example of RIGHT leg **longest** in Position #2

The **longest** leg in Position #2 indicates the direction of involvement of the scapula being tested

Scapular Short/Long Rule



Example of LEFT leg **longest** in Position #2

The **longest** leg in Position #2 indicates the direction of involvement of the scapula being tested

Keypoint #4

The reference point for scapular testing is the inferior angle of the scapula. The inferior angle of the scapula subluxates toward the longest leg side in Position #2.

Testing the Scapulae

- ◆ Verify that the leg lengths are even in Position #1 and Position #2
- ◆ Have patient perform Isolation Test
 - Use a Stress Test if patient is unable to properly perform Isolation Test
- ◆ Use variation of the Short/Long Rule to determine direction of involvement

Adjusting the Scapulae

- ◆ Adjustment of the scapulae involve elements of the kinetic chain of the whole upper extremity
- ◆ Consequently, the Basic Scan Protocol calls for adjustment of four different elements when adjusting a Medial or Lateral scapular pattern

Medial Rotation:

Direction of subluxation

- ◆ Medial ala of the scapula
- ◆ Inferior humerus
- ◆ Posterior-superior radius
- ◆ Anterior lunate

Lateral Rotation:

Direction of subluxation

- ◆ Lateral ala of the scapula
- ◆ Superior humerus
- ◆ Inferior-lateral ulna
- ◆ Posterior distal carpals

Scapula Test (Left)

Isolation Test:
Instruct the patient to squeeze the elbow of the arm on the PD side against the body; this stresses the shoulder girdle

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Medial Scapula | Step 1

Adjusting the Scapula

CP #1: Lower third of the ala of the scapula

LOD: Straight lateral

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Medial Scapula | Step 2

Adjusting the Humerus

CP #2: Lateral aspect of the shaft of the humerus, just distal to the deltoid tubercle

LOD: Superior

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Medial Scapula | Step 3

Adjusting the Radius



CP #3: Posterior, superior aspect of the head of the radius

LOD: Anterior and inferior

Swing the patient's arm up along side the head and rest the forearm –palm down– on the table.

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Medial Scapula | Step 4

Adjusting the Lunate



CP #4: anterior (volar) aspect of the lunate

LOD: Straight posterior

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Shoulders | Clinical Tip

The shoulders seem to fall into a pattern:

- ◆ The Medial scapula is usually found on the side of PD
- ◆ The Lateral scapula is usually found on the side opposite PD

NOTE: When deviation to this pattern occurs, trauma is usually involved.

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Scapula Test (Right)

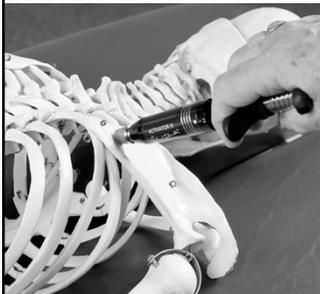


Isolation Test:

Instruct the patient to squeeze the elbow of the arm on the side opposite PD against the body; to stress the shoulder girdle

Lateral Scapula | Step 1

Adjusting the Scapula



CP #1: Lower third of the ala of the scapula

LOD: Straight medial

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Lateral Scapula | Step 2

Adjusting the Humerus



CP #2: Proximal third, lateral aspect of the humerus on the deltoid muscle

LOD: Inferior

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Lateral Scapula | Step 3

Adjusting the Ulna



CP #3: Anterior aspect proximal head of the ulna

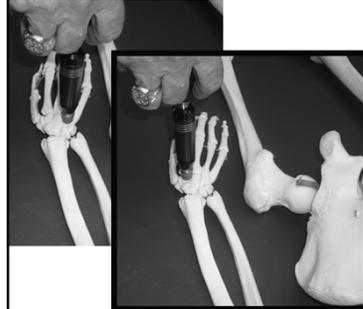
LOD: Superior and medial

Direct the thrust in a superior to lateral direction toward the olecranon process.

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Lateral Scapula | Step 4

Adjusting the Carpals



CP #4 and #5: Posterior distal carpal row

LOD: Straight anterior

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What is the proper Activator instrument setting?

Extremities (for most body types):

- Activator II: 3 rings
- Activator IV: setting 2
- Activator V: setting 2

The Activator Method Basic Scan Protocol

Module 9: Cervical Vertebrae and Occiput

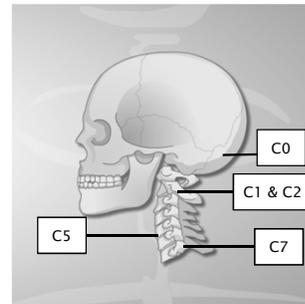
p 185-190

Objectives

- ◆ Identify the appropriate testing and adjustment procedures for the cervical vertebrae
- ◆ Identify the appropriate testing and adjustment procedures for the occiput

Cervical Spine

Follows testing and adjustment of the scapulae



Cervical Spine Introduction

Involves evaluation and treatment of:

- Seventh cervical (C7)
- Fifth cervical (C5)
- Axis (C2)
- Atlas (C1)
- Posterior occiput (C0)

Testing the Cervical Spine

- ◆ Verify that the leg lengths are even in Position #1 and Position #2
- ◆ Have patient perform Isolation Test
 - Use a Stress Test if patient is unable to properly perform Isolation Test
- ◆ Use Short/Long Rule in Position #2 to determine side of involvement

Adjusting the Cervical Spine

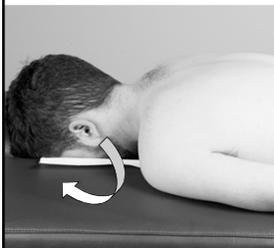
- ◆ **Adjustment procedure:** essentially the same for C7 – C2
- ◆ **Contact Point:** pedicle-lamina junction on side of involvement
- ◆ **Line of Drive:** anterior, superior and slightly medial through joint plane line of the facets at 45°

keypoint



Recall that during the testing of the upper thoracic spine and scapulae, the head is turned to the side of PD.

Seventh Cervical (C7)



Isolation Test:

Instruct the patient to turn the head back to a face-down, neutral position

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Seventh Cervical (C7)



CP: Pedicle-lamina junction of C7

LOD: Anterior, superior, and slightly medial

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Fifth Cervical (C5)



Isolation Test:
Instruct the patient to extend the neck slightly by raising the head from the table, and then relax

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Fifth Cervical (C5)



CP: Pedicle-lamina junction of C5

LOD: Anterior, superior, and slightly medial

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Upper Cervical (C2-C1)



Isolation Test:
Instruct the patient to slightly tuck the chin toward the chest, and then relax

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keypoint

Axis-Atlas (C2-C1) testing involves a variation of the Short/Long Rule:

- If the PD leg **shortens** in Position #2, proceed to C2 on the side opposite PD
- If the PD leg **lengthens** in Position #2, proceed to C1 on the side of PD

The Short/Long Rule



Adjust C2 on the OPD side

If the PD leg relatively **shortens** in Position #2

Second Cervical (C2)



CP: Pedicle-lamina junction of C2

LOD: Anterior, superior, and slightly medial

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The Short/Long Rule



Adjust C1
on the
PD side

If the PD leg relatively
lengthens in Position #2

First Cervical (C1)



CP: Lateral
aspect of the
transverse
process of C1

LOD: Straight
medial

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USE CAUTION!

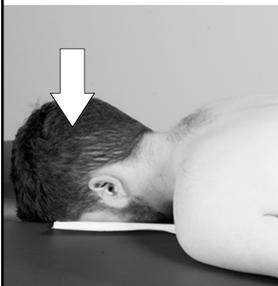
Do NOT contact the transverse process of the atlas (C1) too anterior. It creates discomfort for the patient, with the possibility of adjusting the stylus of the mastoid.

C1/C2 | Clinical Tip

Post-adjustment of C1 or C2, instruct the patient to re-perform the Isolation Test. If there is PD leg reactivity in Position #1, it may indicate both C1 and C2 are involved.

Pressure Test to confirm.

Occiput (C0)



Isolation Test:

Instruct the patient to gently push the face into the table, and then relax

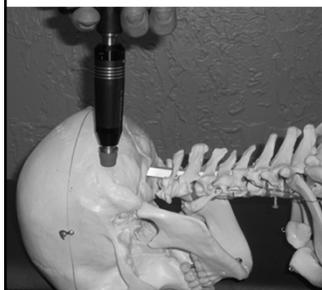
p 187

Apply the Short/Long Rule

- ◆ If the PD leg relatively **lengthens** when taking it to Position #2, involvement is **on the PD side**
- ◆ If the PD leg relatively **shortens** when taking it to Position #2, involvement is **on the OPD side**

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Occiput (C0)



CP: Inferior nuchal line of the occiput

LOD: Anterior

Occiput (C0)



NOTE: Stabilize the tip of the instrument with the thumb

LOD: Anterior

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What is the proper Activator instrument setting?

C7-C2 (for most body types):

- Activator II: 2-3 rings
- Activator IV: setting 2
- Activator V: setting 2

What is the proper Activator instrument setting?

C1-C0 (for most body types):

- Activator II: 1 ring
- Activator IV: setting 1
- Activator V: setting 1

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