







































distraction, SI compression, sacral thrust and Gaenslen's. When patients whose pain centralized or peripheralized with repetitive end range testing (based on McKenzie's assessment) were excluded, the positive likelihood ratio increased to potentially as high as 6.97. It should be noted that the patients in this study had chronic low back pain and were off work an average of 18 months. Whether these likelihood ratios can be generalized to milder or more acute cases is not known.

A subsequent study of the same five tests on 60 patients with chronic pain below the L5 level reached similar results. When three or more of the tests were positive, the probability of a positive SIJ double block injection study ranged between 65-93%. With less than 3 positive tests, the negative probability was between 72-99%, depending on how many were negative. (van der Wurff 2006)

### **Follow-up Testing**

To increase the likelihood that the sacroiliac joint is the pain generator, the practitioner should attempt to rule out lumbar involvement. One evidenced-based protocol utilized a directional preference approach based on repetitive spinal loading (see CSPE "The [McKenzie Protocol: Centralizing Low Back and Leg Pain](#)") followed by looking for three positive tests out of the following five: thigh thrust, sacral thrust, Gaenslen's, SI distraction and SI compression (Laslett 2005). Other sacroiliac tests recommended based on current evidence and expert opinion tests are the active SLR (Vleeming 2004); Patrick's FABERE test (Albert 2000, Vleeming 2004); and palpating the long dorsal sacroiliac ligament (Vleeming 2004).

Additional orthopedic tests including the belt test or Yeoman's may also be performed based on biomechanical logic, although there is little published evidence to support these procedures. Joint and soft tissue palpation findings may be used to help determine selection of manual therapy.

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Vleeming A, Albert HB, Ostgaard HC, Stuge B, Struesson B. WG4 Pelvic girdle pain, concept version European Guidelines on the Diagnosis and Treatment of Pelvic Girdle Pain, 2004.

### Indications for Testing

The test is used when evaluating patients with low back pain, posterior pelvic pain, or suspicion of sacroiliac problems.

### Procedure

The patient is positioned in a side lying posture, with the hips and knees bent for stability. The examining hands are then placed one over another and placed on the patient's ilium. Using body weight, a compressive force is then placed through the ilium directed towards the floor. In cases of a high table or a smaller practitioner, the practitioner should kneel on the edge of the table and lean over the patient. It is important to maintain a broad contact and to stabilize the patient.

An alternative method is to manually compress the patient's ilia toward each while the patient is supine. It is doubtful, however, whether sufficient compressive force can be generated using this method.

### Mechanism

The sacroiliac joints are forced together potentially re-creating the patient's pain. If the load is directed more through the anterior aspect of the ilium, a distractive force may be created across the posterior joint and ligaments.

### Procedural Errors

Unless sufficient force is generated, the procedure may result in a false negative. A broad contact must be used by the examiner so as not to place too much force on one spot creating local pressure pain on the soft tissue.

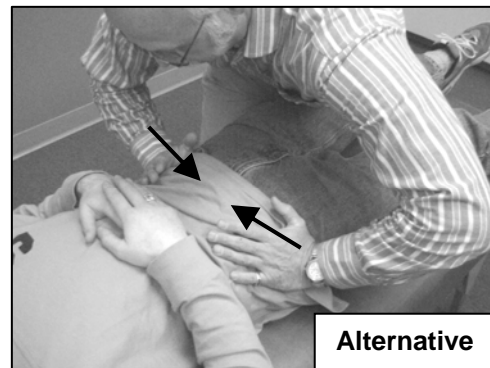
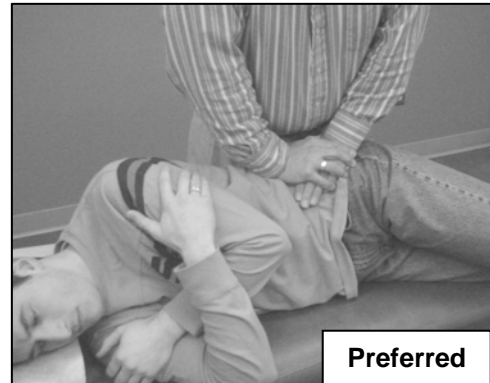
### Interpretation

A positive test is one which either reproduces the patient's pain or is localized to either sacroiliac joint. A positive suggests an SI sprain, mechanical dysfunction or pathological lesion. It may also be positive in the case of a fracture of the wing of the ilium.

### Charting

Describe the location of pain (e.g., "local left posterior pelvic pain in the region of the sacroiliac joint"). Reproduction of the patient's familiar pain can also be charted. For other options, see Appendix A: Charting the Results of Pain Provocation Tests.

Sample language for use in a narrative report: "Compression of the pelvis produced the patient's characteristic pain over the right sacroiliac joint."



## Reliability and Validity

### Reliability

There is disagreement concerning the reliability of this procedure.

Authors	Agreement	Conclusion
Streder (1997)	79%	unreliable
Potter (1985)	76%	unreliable
Laslett (1994)	91%	reliable
McCombe (1989)	n/a	unreliable

In a study of 2269 pregnant women, the sacroiliac compression test scored among the highest in inter-examiner reliability with high kappa values (Albert 2000).

### Validity

Authors	Sensitivity	Specificity
Rantanen (1989)	19%	n/a
Blower (1984)	0%	100%
Russell (1981)	7%	90%

Laslett (2005) reported on a battery of sacroiliac provocation tests as compared to double block diagnostic injections in 48 patients thought likely to have a sacroiliac lesion. A positive likelihood ratio of 4.29 was calculated for a combination of three or more of the following tests: thigh thrust, SI distraction, SI compression, sacral thrust and Gaenslen's. When patients whose pain centralized or peripheralized with repetitive end range testing (based on McKenzie's assessment) were excluded, the positive likelihood ratio increased to potentially as high as 6.97. It should be noted that the patients in this study had chronic low back pain and were off work an average of 18 months. Whether these likelihood ratios can be generalized to milder or more acute cases is not known.

A subsequent study of the same five tests on 60 patients with chronic pain below the L5 level reached similar results. When three or more of the tests were positive, the probability of a positive SIJ double block injection study ranged between 65-93%. With less than 3 positive tests, the negative probability was between 72-99%, depending on how many were negative. (van der Wurff 2006)

### **Follow-up Testing**

To increase the likelihood that the sacroiliac joint is the pain generator, the practitioner should attempt to rule out lumbar involvement. One evidenced-based protocol utilized a directional preference approach based on repetitive spinal loading (see CSPE "The [McKenzie Protocol: Centralizing Low Back and Leg Pain](#)") followed by looking for three positive tests out of the following five: thigh thrust, sacral thrust, Gaenslen's, SI distraction and SI compression (Laslett 2005). Other sacroiliac tests recommended based on current evidence and expert opinion tests are the active SLR (Vleeming 2004); thigh thrust test (Albert 2000, Cattley 2002, Laslett 2005, Vleeming 2004); Patrick's (FABERE) test (Albert 2000, Vleeming 2004); and palpating the long dorsal sacroiliac ligament (Vleeming 2004).

Additional orthopedic tests including the belt test or Yeoman's may also be performed based on biomechanical logic, although there is little published evidence to support these procedures. Joint and soft tissue palpation findings may be used to help determine selection of manual therapy.

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# NOTES

### Indications for Testing

The test is used when evaluating patients with low back pain, posterior pelvic pain, or suspicion of sacroiliac problems.

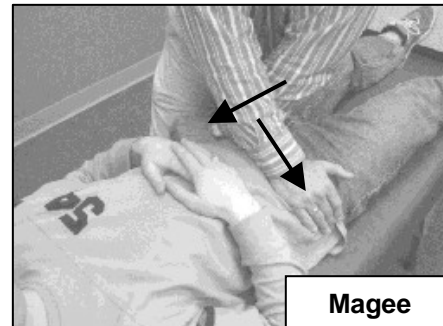
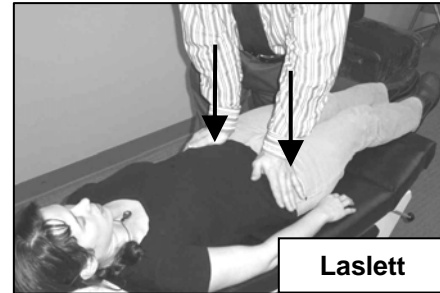
### Procedure

The patient is instructed to lie in a supine position and the practitioner cups his/her hand over each ASIS. There are a number of alternating descriptions of how to direct the force. The one method with some evidence of validity has the line of force direct straight down producing more of a shear effect than true distraction (Laslett 2005). In most other sources, the doctor crosses his/her arms and directs a downward and outward force (Magee 1997).

Proper communication with the patient is important before contacting the anterior portion of the pelvis.

### Mechanism

Simultaneous pressure on the ASIS in a downward direction will primarily cause a shear load across the SI joints bilaterally, stressing the joint surfaces and posterior ligaments. A more outward force will distract the anterior structures of the joints, while compressing the posterior.



### Procedural Errors

Unless sufficient force is generated, the procedure may result in a false negative. A broad contact must be used by the examiner so as not to place too much force on one spot creating local pressure pain on the soft tissue.

### Interpretation

A positive test is one which either reproduces the patient's pain or is localized to either sacroiliac joint. A positive test suggests an SI mechanical or pathological lesion (e.g., inflammatory arthropathy).

### Charting

Describe the location of pain (e.g., "local left posterior pelvic pain in the region of the sacroiliac joint"). Reproduction of the patient's familiar pain can also be charted. For other options, see Appendix A: Charting the Results of Pain Provocation Tests.

Sample language for use in a narrative report: "Downward force through the ASIS produced the patient's characteristic pain over the right sacroiliac joint."

### Reliability and Validity

There is disagreement concerning the reliability and validity of this procedure.

## **Reliability**

<b>Authors</b>	<b>Agreement</b>	<b>Conclusion</b>
Potter (1985)	94%	unreliable
Laslett (1994)	91%	reliable
McCombe (1989)	n/a	unreliable

## **Validity**

<b>Authors</b>	<b>Sensitivity</b>	<b>Specificity</b>	<b>Conclusion</b>
Rantanen 15%		n/a	not valid
Blower 21%		100%	valid
Russell 11%		90%	not valid
Maigne n/a		n/a	not valid

Laslett (2005) reported that this test, when taken in combination with thigh thrust, SI compression, sacral thrust and Gaenslen's, correlated with double block diagnostic injections of the sacroiliac joint in a series of 48 patients. A positive likelihood ratio of 4.29 was calculated for a combination of three or more positive orthopedic tests. When patients whose pain centralized or peripheralized with repetitive end range testing (based on McKenzie's assessment) were excluded, the positive likelihood ratio increased to potentially as high as 6.97. It should be noted that the patients in this study had chronic low back pain and were off work an average of 18 months. Whether these likelihood ratios can be generalized to milder or more acute cases is not known.

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## **Follow-up Testing**

To increase the likelihood that the sacroiliac joint is the pain generator, the practitioner should attempt to rule out lumbar involvement. One evidenced-based protocol utilized a directional preference approach based on repetitive spinal loading (see CSPE "The [McKenzie Protocol: Centralizing Low Back and Leg Pain](#)") followed by looking for three positive tests out of the following five: thigh thrust, sacral thrust, Gaenslen's, SI distraction and SI compression (Laslett 2005). Other sacroiliac tests recommended based on current evidence and expert opinion are the active SLR (Vleeming 2004); Patrick's (FABERE) test (Albert 2000, Vleeming 2004); and palpating the long dorsal sacroiliac ligament (Vleeming 2004).

Additional orthopedic tests including the belt test or Yeoman's may also be performed based on biomechanical logic, although there is little published evidence to support these procedures. Joint and soft tissue palpation findings may be used to help determine selection of manual therapy.

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# NOTES

### **Indications for Testing**

This test is used to evaluate the sacroiliac joint in a patient with a complaint of low back or posterior pelvic back pain. It is used to help differentiate between pain arising in the SI joint versus the lumbar spine.

### **Procedure**

The patient is prone. The joint can be tested in flexion and extension and for inferior and superior glide. Joint play and pain are assessed.

**To challenge the joint into flexion**, the doctor places one hand (thenar or hypothenar) on the sacral base while the other hand reaches in front and cups the patient's anterior ilium at the anterior superior iliac spine (ASIS). To execute the procedure, pull posteriorly with the ASIS contact while pushing anteriorly on the sacral base. Alternatively, keep the one hand on the sacral base and place the other hand (thenar or hypothenar) on the ischial tuberosity. While stabilizing the sacrum, push the ischial tuberosity toward the table (pressing the ilium into flexion).

**To challenge the joint into extension**, place one hand (thenar or hypothenar) on the PSIS and the other (thenar or hypothenar) on the sacral apex and apply anterosuperior pressure against the PSIS and anterior-inferior pressure against the sacral apex.

**To evaluate superior sacral glide**, the examiner places the hypothenar of one hand at the apex of the sacrum and pushes cephalad while the other hand pushes caudad against the iliac crest.

**To evaluate inferior sacral glide**, the examiner places the hypothenar of one hand on the sacral base and pushes caudad while the other hand pushes cephalad against the ischium.

Other hand positions may also be used to assess these vectors.

### **Mechanism**

Loads are placed along a variety of vectors creating sheer and tensile stress across the SI joint and associated soft tissues.

### **Procedural Errors**

Accurate placement of the hands is important to avoid inadvertent contact with peri-anal soft tissues. A false positive may result from poor placement of contacts resulting in direct compression of periarticular SI tissues which are tender or inflamed.

### **Interpretation**

In a normal SI joint there will be minimal movement and that movement will be painless. In the case of SI joint pathology or dysfunction, there may be decreased or increased movement and the patient will experience pain located near the SI joint. Due to the small amount of movement possible, the production or absence of pain is more significant than the doctor's ability to evaluate motion. This test cannot be used alone to determine sacroiliac dysfunction nor to identify the SI joint as the source of the pain (see Follow-up Testing). Pain may result from the associated soft tissue or from adjacent joints (e.g., the lumbosacral joint). Pain relief caused by challenging the joint in a particular vector may also be used to suggest a therapeutic loading strategy (e.g., manual therapy or exercise).

## Charting

The examiner should note whether s/he perceives a difference in mobility between SI joints (e.g, restricted or exaggerated) and whether the patient experiences pain or pain relief during these provocative maneuvers. For other options on charting, see Appendix A, Charting the Results of Pain Provocation Tests. In cases of abnormal findings, the direction of load (i.e., sacral flexion vs. extension) must also be charted.

## Reliability and Validity

Unknown

## Follow-up Testing

To increase the likelihood that the sacroiliac joint is the pain generator, the practitioner should attempt to rule out lumbar involvement. One evidenced-based protocol utilized a directional preference approach based on repetitive spinal loading (see CSPE “The [McKenzie Protocol: Centralizing Low Back and Leg Pain](#)”) followed by looking for three positive tests out of the following five procedures: thigh thrust, sacral thrust, Gaenslen’s, SI distraction and SI compression (Laslett 2005). Other sacroiliac tests recommended based on current evidence and expert opinion are the active SLR (Vleeming 2004); Patrick’s (FABERE) test (Albert 2000, Vleeming 2004); and palpating the long dorsal sacroiliac ligament (Vleeming 2004).

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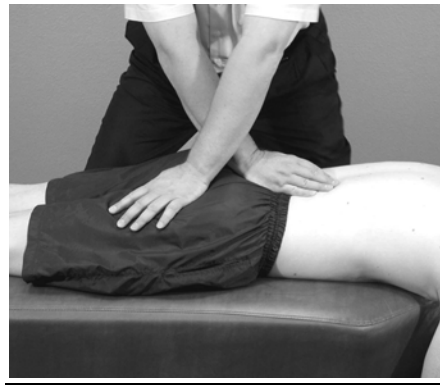
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Sacral nutation with ilial flexion  
(SI joint flexion)

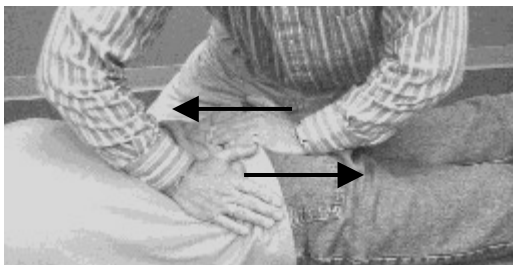


Sacral counternutation  
Iliac extension

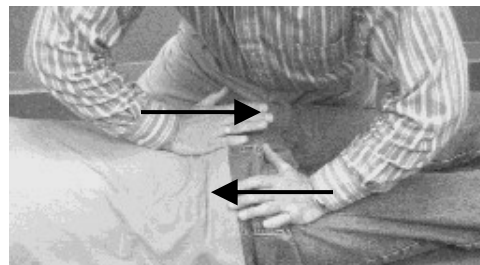


Sacral nutation  
Iliac flexion alternative

(SI joint extension)



Sacrum cephalad



Sacrum caudad

# NOTES

## **Thigh Thrust** (*aka* Femoral Shear test, Posterior Pelvic Pain Provocation test, P4 test)

10/12/05 (revised 1/30/06)

### **Indications for Testing**

The test is used when evaluating patients with low back pain, posterior pelvic pain, or suspicion of sacroiliac problems.

### **Procedure**

The patient is supine. The evaluator pre-positions the hip in about 90 degrees of flexion and slight adduction (approximating the angle of the SI joint), then applies gradual downward pressure along the axis of the femur. Alternatively, the practitioner can slip his or her indifferent hand underneath the sacrum, forming a ledge to accentuate the shear force across the SI joint. Alternatively, Magee (2005) suggests starting with the hip flexed 45° and adding axial compression at that angle. If this method is chosen, the final testing position should still be 90 degrees.

### **Mechanism**

The starting position helps to stabilize the hip joint so that when pressure is applied it tends to shear the sacroiliac joint from anterior to posterior. Local pain at the sacroiliac joint suggests local pathology in the joint.

### **Procedural Errors**

Some authors caution about too much adduction causing patient discomfort. As with most pain provocation orthopedic tests, insufficient loading of the joint may result in false negatives (Laslett 2005).

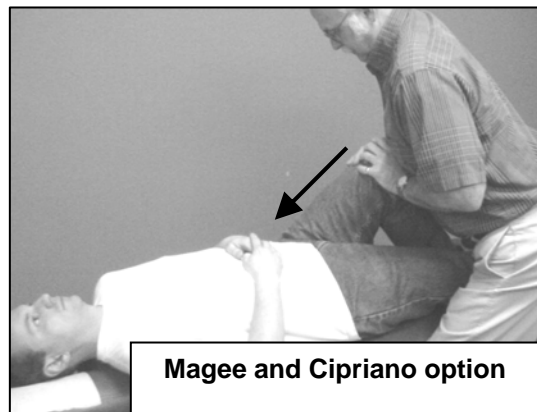
### **Interpretation**

Pain produced in the region of the sacroiliac joint suggests pathology or joint dysfunction. The test is thought to be most strongly positive for sacroiliac involvement if the pain provoked is localized to the area of the sacroiliac joint or the test reproduces the patient's familiar pain (Laslett 2005). The test may also be positive in cases of hip pathology.

### **Charting**

Chart location and any radiation of pain (see Appendix A, Charting the Results of Pain Provocation Tests).

Sample language for use in a narrative report: "Anterior to posterior shear stress directed through the femur to the left SI joint (thigh thrust) reproduced the patient's posterior pelvic pain."



## Reliability and Validity

This is one of the few sacroiliac tests where there is general agreement about an established validity. (Cattley 2002) Sensitivity is reported to be 80% (Broadhurst 1998, Ostergaard 1994). A specificity of 100% was reported in one study (Broadhurst 1998) and 81% in another study on pregnant patients (Ostergaard 1994). These studies were considered to have acceptable methodology (van der Wuff 2000). On the other hand, one more poorly designed study (Dreyfuss 1996) reported poor sensitivity and specificity of exams by MD's and DC's (42 to 36% sensitivity and 45 to 55% specificity) yielding a positive likelihood ratio of only 0.7.

In a study published in 2000, Albert correlated positive orthopedic tests with their ability to correlate with specific pelvic pain locations (sacroiliac, symphysis, or pelvic girdle in general) reported by 535 pregnant women. The thigh thrust test had high inter-examiner agreement (.70) and 99% specificity (based on a pool of 1734 pregnant women patient without pelvic pain.) Sensitivity was 84% for women with one-sided SI syndrome and 93% for double-sided SI syndrome.

Based on a review of the literature and the consensus of the panel, the work group creating the draft European Guidelines on the Diagnosis and Treatment of Pelvic Girdle Pain has recommended the use of this test (Vleeming 2004).

Laslett (2005) reported on a battery of sacroiliac provocation tests as compared to double block diagnostic injections in 48 patients thought likely to have a sacroiliac lesion. A positive likelihood ratio of 4.29 was calculated for a combination of three or more of the following tests: thigh thrust, distraction, sacral thrust and Gaenslen's. When patients whose pain centralized or peripheralized with repetitive end range testing (based on McKenzie's assessment) were excluded, the positive likelihood ratio increased to potentially as high as 6.97. It should be noted that the patients in this study had chronic low back pain and were off work an average of 18 months. Whether these likelihood ratios can be generalized to milder or more acute cases is not known.

A subsequent study of the same five tests on 60 patients with chronic pain below the L5 level reached similar results. When three or more of the tests were positive, the probability of a positive SIJ double block injection study ranged between 65-93%. With less than 3 positive tests, the negative probability was between 72-99%, depending on how many were negative. (van der Wurff 2006)

## Follow-up Testing

To increase the likelihood that the sacroiliac joint is the pain generator, the practitioner should attempt to rule out lumbar involvement. One evidenced-based protocol utilized a directional preference approach based on repetitive spinal loading (see CSPE "The [McKenzie Protocol: Centralizing Low Back and Leg Pain](#)") followed by looking for three positive tests out of the following five: thigh thrust, sacral thrust, Gaenslen's, SI distraction and SI compression (Laslett 2005). Other sacroiliac tests recommended based on current evidence and expert opinion are the active SLR (Vleeming 2004); Patrick's (FABERE) test (Albert 2000, Vleeming 2004); and palpating the long dorsal sacroiliac ligament (Vleeming 2004).

Additional orthopedic tests including the belt test or Yeoman's may also be performed based on biomechanical logic, although there is little published evidence to support these procedures. Joint and soft tissue palpation findings may be used to help determine selection of manual therapy.

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# **APPENDIX A: CHARTING THE RESULTS OF PAIN PROVOCATION TESTS**

## **Recording positive results**

When recording the results of orthopedic pain provocation tests, there are a few basic principles that should always be followed and a number of optional notations that can also be made. *A test should NEVER be simply noted as being positive!*

### **Basic principles**

- Record pain location including any radiation pattern.
- If the procedure reproduces the symptoms exactly, this should be recorded. This may be marked as "CC" for chief complaint. However, there will be situations when it is important to note more specifically which chief complaint or which part of the chief complaint has been aggravated (e.g., if the patient has both headache and neck pain, which portion of the chief complaint was affected?).
- If a procedure is designed to be sustained for a certain length of time (e.g., Roos test), note when the symptoms were reproduced/aggravated.

### **Optional**

- Record the quality of the pain if it is noteworthy (e.g., sharp, burning, electrical).
- Record the intensity of the symptoms (any verbal scale is acceptable as long as the denominator is recorded, e.g., 3/5 or 6/10).
- Record whether the symptoms were aggravated at end range only.

## **Recording negative results**

Sometimes the test is technically negative for what it is primarily designed to test, but yields other useful information. For example, a SLR may be negative as a nerve tension test but may reveal that the hamstrings are tight at 70 degrees. On WSCC exam forms, circle the item and describe the finding. In narrative formats, likewise, describe the finding. For example, "SLR on the right was negative for nerve involvement but aggravated the patient's back pain."

All negative tests must be recorded. Do not leave them off an exam form or out of a SOAP note just because they are negative. The fact that the test was performed must be part of the chart.

## **Record inability to perform a test**

Cases in which an attempt is made to perform a pain provocation test, but the patient cannot tolerate it, record "not performed due to pain." This can be abbreviated "NP d/t P." Sometimes procedures are not performed for other reasons. In these cases, line out the procedure on the exam form and write NA (not applicable) or NP (not performed).