



## orthopedic assessment of the sacroiliac joint

Low back pain is probably one of the most common problems you see as a massage therapist. Before an effective and appropriate plan of care can be determined, it's necessary to assess the cause of the client's pain.

One of the most common causes of low back pain—perhaps the most common cause—is irritation of and/or injury to the sacroiliac joint (SIJ). The SIJ is one of the most important joints in the human body, but also one of the most controversial and least understood, with authorities often disagreeing on its function and role in low back pain.

### THE SIJ

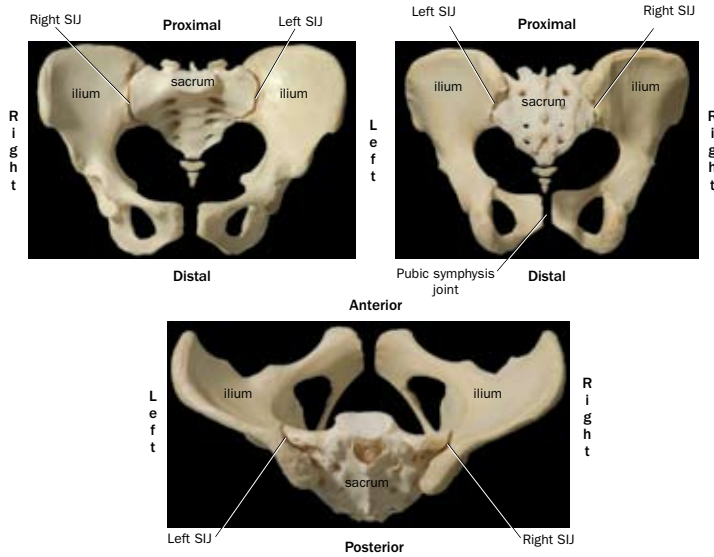
There are two SIJs, paired left and right. As the name implies, each SIJ is located between the sacrum and the iliac portion of the pelvic bone on that side of the body (**Figure 1**). Therefore, the SIJs are located at the heart of the core of the body, also known as the powerhouse.

The SIJs are unusual in that they begin as synovial joints, but gradually transition into fibrous joints with the physical stresses placed upon them as we age, causing the deposit of fibrous fascial tissue within the joint cavity. These physical forces come from both above and below (**Figure 2**). From above, all of the weight of the trunk, neck, head and upper extremi-



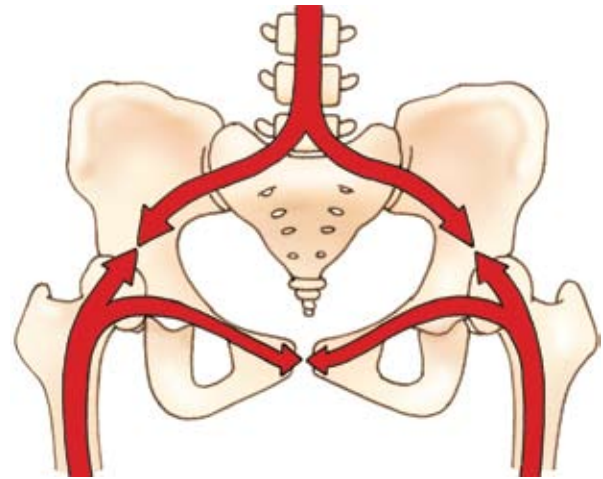
For more information on the powerhouse, see the “Body Mechanics” column “How Pilates can Benefit Your Body Mechanics” in the Summer 2007 issue of *mtj*.





**FIGURE 1.** THERE ARE TWO SACROILIAC JOINTS (SIJS). EACH ONE IS LOCATED BETWEEN THE SACRUM AND THE ILIUM OF THE PELVIC BONE ON THAT SIDE OF THE BODY.

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**FIGURE 2.** THE SACROILIAC JOINTS ARE SUBJECTED TO PHYSICAL STRESS FORCES FROM ABOVE AND BELOW.

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ties is transferred through the spine and borne through the SIJs. From below, each footfall when we walk, run or jump is transferred into the SIJ through the lower extremity on that side of the body.

Thus SIJ function is intimately involved in weight bearing and spinal function within the axial body, as well as motion and propulsion of the body by the lower extremities within the appendicular body. Located within the pelvic girdle, the SIJs are the key transition joints between the axial body/spine and the lower extremities. With these multiple and varied stresses placed upon the SIJs, it's no wonder they are so often overly stressed and injured.

**STABILIZATION**

Another peculiarity of the SIJ is its lack of stabilizing musculature. As

a rule, one of the major stabilizing factors of a joint is the musculature that crosses it, attaching from one bone of the joint to the other. However, in the case of the SIJ, no musculature attaches directly from the sacrum to the ilium; the piriformis and gluteus maximus do attach from the sacrum to the femur, thereby crossing the SIJ, but their stabilization influence is lessened by their additional role at the hip joint. To compensate, the SIJ is copiously endowed with ligaments, both anteriorly and posteriorly.

**INJURY**

Because of this lack of stabilizing musculature and its reliance on fibrous ligamentous tissue, injury to the SIJ often causes a stretching and/or tearing of ligament—in other words, a sprain. Unfortunately, a sprain usually creates a chronic, hypermobile joint dysfunction that is unstable and can be difficult to resolve.

If the physical stress to the joint is less in degree and does not cause an actual stretching or tearing of the ligamenture, the joint may simply be irritated and inflamed. If the musculature linked to the SIJ tightens and/or the fascial tension of its ligaments increases, then a hypomobile joint dysfunction can occur. Accurate assessment of SIJ pain and dysfunction requires a familiarity with its typical clinical presentation pattern of signs and symptoms, as well as knowledge of hands-on orthopedic assessment tests.



**Superolateral view**

**FIGURE 3.** SACROILIAC JOINT PAIN IS PALPATED IMMEDIATELY MEDIAL TO THE POSTERIOR SUPERIOR ILIAC SPINE (PSIS). PALPATION OF THE PSIS TO LOCATE THE SACROILIAC JOINT IS DEMONSTRATED.

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### CLINICAL PRESENTATION

SIJ pain tends to be dull in quality, but can be moderate or severe in degree. It's usually located directly over the joint and is often increased with digital compression, especially over the upper aspect of the joint. To palpate the SIJ, first find the posterior superior iliac spine (PSIS), and then drop off it medially (**Figure 3**). Referral of pain into the lower extremity, especially along the distribution pathway of the sciatic nerve, is also common.

Sitting places greater weight bearing stress through the low back than does lying or standing. Therefore, pain with prolonged sitting is usually the hallmark feature of SIJ dysfunction. Time spent sitting before the onset of pain varies based on severity of the condition; 20 minutes is typical, but it may be longer or shorter. Sitting and driving a car is often especially painful. Pain is also common with prolonged standing. Because forces are transmitted upward from the lower extremities, pain usually occurs on the side of weight bearing when walking or running.

Joint pain tends to result in localized muscle splinting for stabilization via the pain-spasm-pain cycle, especially when a joint is sprained and unstable, as is often the case with the SIJ. Therefore, SIJ problems usually involve muscular spasming.

The muscles that most commonly tighten are the same-side piriformis, upper fibers of the gluteus maximus, and the lumbar paraspinal (erector spinae and transversospinalis) musculature. Muscle spasming can change a

sprained and unstable hypermobile SIJ into a hypomobile joint that exhibits decreased motion. If one SIJ is hypomobile due to muscle splinting, then the other SIJ is often forced to compensate by moving more.

This excess motion can result in hypermobility on that side, which can then cause overuse, irritation and pain. For this reason, it is common for SIJ pain and dysfunction to shift from hypermobility to hypomobility, and to switch from SIJ pain experienced on one side of the body to pain experienced on the other side; or for the pain to be present across both SIJs.

### ORTHOPEDIC ASSESSMENT

Ranges of motion of the low back, especially into flexion or same-side lateral flexion from a standing position, often elicit SIJ pain. However, for proper assessment of a SIJ irritation or injury, special orthopedic assessment tests should also be performed. Three useful orthopedic assessment tests are straight leg raise (SLR), Nachlas and Yeoman's. In all three of these assessment procedures, the mechanism is similar: a movement force is placed into one or both SIJs, and if the joint is irritated/injured, localized pain may occur, indicating dysfunction.

#### *Straight Leg Raise (SLR) test.*

SLR test is performed by raising the supine client's thigh into flexion at the hip joint with the knee joint fully extended (hence "straight leg"). This may be done actively by the client or passively by the therapist; passive SLR assesses a sprain and joint dysfunction, while active SLR assesses a sprain, joint dysfunction and a strain (**Figure 4**).

Whether performed actively or passively, as the thigh moves farther





**Given how often clients experience problems with the SIJ, being able to assess the health of this joint is extremely valuable.**

into flexion, the same-side pelvic bone begins to posteriorly tilt to facilitate raising the foot higher into the air. Because the client's other pelvic bone is stabilized by their body weight against the table, motion must occur at one or both of the SIJs, causing movement and therefore a physical stress to the joint(s). If an SIJ is irritated or injured, localized pain will likely occur, and the SLR test is considered to be positive. Pain can occur at the SIJ on either side. SLR is then performed on the other side of the body.

**Nachlas test.** For Nachlas test, the client is prone and the therapist passively brings the client's heel to the buttock on the same side (**Figure 5**). The client's foot is returned to the table and Nachlas is then repeated on the client's other side.

Nachlas test is considered to be positive if pain is reproduced over either SIJ. The mechanism is that bringing the heel to the buttock requires full flexion of the knee joint. This places a stretch on the rectus

femoris muscle of the quadriceps femoris group, which then places an anterior tilt pull on the same-side ilium (the rectus femoris, being a hip joint flexor, is an anterior tilter of the pelvis at the hip joint).

Similar to the mechanism of the SLR test, if the same-side ilium is moved (anteriorly tilted in this case), and the opposite-side ilium is not moved because it is stabilized by the client's body weight against the table, then a movement/physical stress is placed on one or both SIJs. This can cause pain if the joint is irritated or injured.

**Yeoman's test.** The mechanism of Yeoman's test is very similar to Nachlas, but more assertive in nature. With the client prone, the therapist lifts the client's thigh up into extension, with the knee joint flexed (**Figure 6**). At the same time, the therapist pushes down on the client's same-side PSIS with the other hand.

Lifting the thigh into extension stretches hip joint flexors, which causes an anterior tilt force on the same-side pelvis; this is augmented by pressing down on the PSIS. Because the other pelvic bone is stabilized by the client's body weight on the table (as well as by the therapist's hand on the client's PSIS), motion is placed into one or both SIJs, thereby yielding localized SIJ pain if the joint is irritated or injured.

Because Yeoman's test places a greater torque into the joint(s) than SLR and Nachlas tests do, it will assess a mild SIJ irritation/injury, whereas the other two tests are usually negative unless the degree of the condition is moderate or marked.

Given how often clients experience problems with the SIJ, being able to assess the health of this joint is extremely valuable. Armed with an understanding of its clinical presentation and an accurate assessment by performing SLR, Nachlas and Yeoman's tests, an appropriate and effective treatment plan of clinical orthopedic massage, stretching and perhaps joint mobilization can be implemented.

So, the next time a client comes to your office complaining of low back pain, assess the SIJs and see if focusing your treatment to the musculature and ligaments of this joint yields greater client improvement and satisfaction—and more client referrals! ■



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For more information on joint mobilization of the sacroiliac joint, see the "Body Mechanics" column "Joint Mobilization of the Low Back" in the Winter 2009 issue of **mtj**.



**FIGURE 4.** PASSIVE STRAIGHT LEG RAISE. THE CLIENT'S THIGH IS FLEXED WITH THE KNEE JOINT FULLY EXTENDED.



**FIGURE 5.** NACHLAS TEST. THE CLIENT'S HEEL IS PASSIVELY BROUGHT TO THE SAME-SIDE BUTTOCK.



**FIGURE 6.** YEOMAN'S TEST. THE CLIENT'S THIGH IS PASSIVELY LIFTED INTO EXTENSION AS PRESSURE IS PLACED UPON THE SAME-SIDE POSTERIOR SUPERIOR ILIAC SPINE (PSIS).

## More about Nachlas and Yeoman's tests:

For both Nachlas and Yeoman's tests, it is common for the client to report tightness in the front of the thigh/hip joint region, but this is not considered to be positive for SIJ dysfunction.

If the client's quadriceps femoris and hip joint flexor musculature is very tight, it may limit the ability to move the client's leg and/or thigh into the procedure position for Nachlas and Yeoman's, but will usually not greatly diminish the assessment value of the tests.

However, an unhealthy knee joint that cannot be moved into flexion can make it impossible to perform the Nachlas test, obviating its assessment value.

Nachlas and Yeoman's tests may also be positive when a client has a lumbosacral joint sprain.

## More about the SLR test:

If active SLR is performed by a client who has weak anterior abdominal wall musculature, because of their inability to stabilize the core, they may anteriorly tilt their entire pelvis at the lumbosacral joint instead of posteriorly tilting only the same-side pelvis. This minimizes movement at the SIJ(s) and therefore diminishes the assessment value of the test. For this reason it is preferred to use passive SLR to assess the SIJ.

SLR test can also show positive for lumbar strains and sprains, as well as lumbar pathologic disc and degenerative joint disease. With SIJ injury, pain with SLR test usually occurs at approximately 30 degrees of leg-raise, whereas pain with a lumbar condition, whether it is local in the low back or referred into the lower extremity, usually occurs with a leg-raise of more than 30 degrees (because as the thigh is raised progressively higher, the tension force is transferred up into the lumbar spine).