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A DIAGNOSTIC SIGN IN EXAMINATION OF AFFECTIONS OF THE SACRO-ILIAC JOINT; CHAIR TEST

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The following clinical test is suggested as an examination for sacro-iliac conditions, particularly when there is a question of injury or the actual existence of pathology.

The patient, who is standing before an ordinary chair firmly held, with the surgeon extending the hand for the patient to grasp, is asked to step up into the chair. It is surprising how many patients accomplish this act with the attention centered on the up-stepping leg which naturally seems to be the one in which the examiner is interested. With the direction then to step down, the surgeon, still holding the hand, exercises a slight push through the forearm so that the patient steps down unexpectedly, producing a very slight jar which is transmitted upward through the weight-receiving extremity. The surgeon then changes his hand upon the chair and extends the other, repeating the procedure with the opposite leg of the patient.

The test has several interesting features. Patients who are uncooperative in many tests seem to have an interest in this. The chair being large and firm gives a sense of security and the aid given by the surgeon's hand adds to the feeling of confidence. Practically all patients can accomplish this effort and, without instructions, the patient invariably puts the best foot forward, which means he steps up with the leg which has the best hip joint, the best psoas, or the best glutei. Further, the patient's attention is concentrated on the up-stepping leg and without attention to the after-coming extremity.

In this test, when the patient stands upon one foot, the muscles of the leg and the thigh are engaged in maintaining balance. The abductors and extensors of the hip joint (the glutei and the hamstrings), inasmuch as their insertions are fixed and their origins are movable, act very powerfully in this reverse direction to fix the pelvis in respect to the femur and even incline it somewhat so as to bring the center of gravity nearer to the weight-bearing hip. The spine assumes a balancing scoliosis position, convex toward the weight-bearing side, which is accomplished in part by the opposite psoas which is acting to flex the opposite thigh. Since the Y-ligament is a sufficient antagonist for the glutei, the psoas on the weight-bearing side is comparatively relaxed.

In this position, all the weight of the body, including that of the opposite lower extremity, is transmitted to the weight-bearing leg through the sacro-iliac joint on the weight-bearing side. It is under such conditions that only minimal, if any, musculature is available as a protective medium to the ligaments of the sacro-iliac joint.

Until the up-stepping foot is placed upon the chair, the weight-bearing sacro-iliac joint is under condition of pressure and of shear. This sheering stress is greatest when the pelvis is nearest to the horizontal plane, and lessens with corresponding increase of the factor of pressure the more the pelvis is inclined, for this position makes the weight-bearing more direct from the sacrum to the ilium. The muscles of the up-stepping extremity are at a complete disadvantage, and, before they can be of assistance, a definite upward push must be made by the weight-bearing leg. When the push occurs, considerable inertia of the body is overcome, but not without definite pulsion of the ilium upward, increasing the sacro-iliac shear. Until the after-coming foot has risen several inches from the floor, the up-stepping extremity has done no real propulsive work, but is in the status of recovery in readiness for the effort. It then assumes all the work and the relaxed after-coming extremity returns to its usual hemi-weight-bearing function and the sacro-iliac joint is then relieved of the unusual mechanical stress.

If the patient steps down with the foot which was last placed in the chair, the weight is received by that extremity with a slight but definite shock, which increases the sheering stress of the sacro-iliac joint on that side,—a down-coming shock, wholly passive, whereas the up-going one is due to muscular effort.

With *bona fide* joint trouble, the patient can hardly be expected to perform this test without complaint. If the surgeon will keep in mind the above outlined physiological mechanisms, he will discover that the sacro-iliac malingerer will step down hard on the foot of the "affected side" without pain.