Why You Should Include the Single-Leg Stance Test in Every Patient Assessment

By Perry Nickelston, DC, FMS, SFMA

The single-leg stance (SLS) test, also known as the single-limb stance test, unipedal stance test or one-legged stance / balance test, is often used in the geriatric population to assess static postural and balance control. The test can provide valuable information regarding increased risk of falling in the elderly. However, I contend it should be included as a standardized test in every patient assessment, regardless of age.

Why? Because 40 percent of human gait movement occurs on one leg – single-leg stance. Every time we take a flight of stairs, we are in single-leg stance. Some may argue that gait is dynamic and single-leg stance is static, so how can one be relevant to the other? If you think about it, there is no such thing as static balance / posture. Something is always moving; you just can’t see it.

The act of respiration and breathing is movement. The rib cage / diaphragm / lungs are continuously moving. If they weren’t, you would be dead. Fascial attachments of the diaphragm and rib cage during breathing / respiration cause activation patterns in surrounding muscles, and the dance of movement begins.

Let’s revisit the SLS, review some of the basic information it shows you and take a closer look at underlying dysfunctions it may reveal.

The Test: What to Watch

The very act of a patient getting into position for the SLS can show you many things. Have patient remove their shoes and socks before the test. How do they remove them? Is the process labored or efficient movement? Which side do they remove first? Watch for ease of movement, and pay close attention to range of motion in the hips and lumbar spine.

Observe the patient getting up from a seated position. Do they stand with equal weight on both feet? Do they rely more on one side for weight-bearing? They will most often use the more stable leg. When standing, is weight shifted to one leg? Are they standing that way to escape pain or is it their natural
position?

Keep in mind that pain changes the movement game. The presence of pain instills "threat" in the body, and that threat will change movement patterning.

Have the patient stand with their feet together. This narrows the base of support, adding to increased neural demand for core stabilization. Is there a change in rotational position of the shoulders or pelvis? Forward rotation at the shoulder or pelvis may indicate poor stabilization in the anterior oblique sling / posterior oblique sling movement subsystem.

Poor rotational patterning may lead to musculoskeletal pain syndromes in the extremities. Gait patterning is rotation. An elevated shoulder may indicate dysfunction in the lateral subsystem of movement via inhibition of the quadratus lumborum.

Assess breathing patterns during every phase of the SLS pattern. Ask the patient to take a deep breath and exhale. Is the patient elevating the shoulder and rib cage during inhalation? This may indicate poor intrinsic core stabilization; diaphragm therapy and breathing mechanics should be added to the course of treatment.

Any cervical spine head tilt or rotation? The neck will compensate for dysfunction and inhibition lower in the kinetic chain, especially the abdominal obliques. The neck rules the movement road.

Cue the patient to look straight ahead and keep their arms by their sides (relaxed grip). Ask them to raise one leg off the ground and balance on one foot. Do not tell them which leg to begin with and do not tell them how high to bring the leg. Why? Patients will most often begin standing on the more stable side.

Watch for breath holding. They should be able to breathe normally. Holding breath during a simple movement pattern usually indicates poor core stability. Regressed corrective exercise patterns will most likely need to be implemented to ensure good form.

Observe the foot / toes on the stance leg. Are the toes gripping the ground? Are they turning white? Is the foot searching for stability in and out of eversion / inversion? Increased gripping with the foot / toes is another sign of poor stability.

What about the foot in the air? Is the ankle dorsiflexed or plantar flexed or neutral? How high is the leg off the ground? Does it break waist level? Is it externally rotated? Are the toes flexed or extended? Is the tibia
externally rotated? Are the patient’s eyes looking straight ahead or glancing in a particular direction?

Watch for Trendelenburg’s sign: stance-leg hip "pops out" and the pelvis drops on the opposite side, indicating gluteus medius weakness on the stance-leg side. Are they able to stand erect or do they flex forward at the waist?

Have the patient return to the starting position and then repeat the test on the same side. Now tell them where and how high you want the lifting leg to go. Observe any changes and what they must do to obtain that position. These changes indicate possible compensation patterns they will use when high-threshold strategies of movement stability are required in activities of daily living.

Next, repeat the test with the patient’s eyes closed. Holding with good form for 20 seconds with eyes closed is an acceptable range (40 seconds with eyes open).

Correlating Test Results With Patterns of Dysfunction

Here is a quick and easy recap of the most common dysfunctions revealed by the SLS test and what they might mean.

- Elevating the rib cage when breathing / holding breath during test at any stage = poor intrinsic core stabilization. Assess the diaphragm for dysfunction.
- Stance-leg toes gripping the ground = instability of the foot; poor stability in the stance leg / glute max inhibition.
- Rotated shoulder or pelvis = poor patterning in the AOS and POS.
- Flexion at the waist = decreased extension in the stance-leg hip or inhibition of the contralateral psoas.
- Trendelenburg sign = inhibition of the stance-leg glute medius or contralateral quadratus lumborum.
- Eyes look anywhere other than straight ahead = eye muscle facilitation (very common in post-traumatic neck injuries).
- Head tilt / rotation = sternocleidomastoid / scalene dysfunction.

You can add difficulty to the test by having the patient raise their hands overhead while balancing on one leg. This increases stabilization requirements and adds more interplay of the thoracic spine and upper extremity. A decrease in thoracic spine extension is the most likely contributor to a poor hands-over-head position.
Using the SLS for post-rehabilitation assessment is a great way to note progress. Do the SLS test at each re-evaluation and note any changes, positive or negative. Patients get objective feedback from the test at each stage of therapy, helping to increase compliance.

Take more time in your assessment process to eliminate wasted time in your treatment program. Adding the single-leg stance test to your foundational program can make all the difference.

Resources


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