**Sahrmann’s Progression**

**Lower Abdominal Assessment**

**Patient Position:** Supine with hips and knees flexed and feet on floor. Contract abdominal muscles by flattening the abdomen and reducing the arching of the lumbar spine, patients can be instructed to place fingers on abdominal muscles and “pull the navel in toward the spine.” The patient’s lumbar spine remains flat against the testing surface during testing.

**Positive Finding:** If the pelvis tilts anteriorly, abdominal control is deficient.

**Level 0.3:** Lift one foot with alternate foot on floor.

- Flex one hip while keeping knee flexed more than 90°. By having the hip flexed more than 90°, the weight of the thigh is assisting the posterior pelvic tilt and maintaining a flat lumbar spine.
- Return LE to start position and repeat with opposite LE.

**Level 0.4:** Hold one knee to chest and lift the alternate foot.

- Flex one hip and hold knee to chest with hands.
- Maintain contraction of abdominal muscles; flex the other hip (lift foot off supporting surface). Hold for 3 seconds and return to start. Repeat on opposite side.
- Repeat 5-6 times keeping back flat and symptom free.

**Level 0.5:** Lightly hold one knee to chest and lift the alternate foot.

- Flex one hip, hold knee to chest with one hand but hold it less firmly than level 0.4. This requires more abdominal activity.
- Maintain contraction of abdominal muscles; flex the other hip (lift foot off supporting surface). Hold for 3 seconds and return to start position. Repeat on opposite side.
- Repeat 5-6 times.

**Level 1:** the patient’s starting position is supine with both hips and knees flexed with feet on the treatment surface, abdominal muscles contracted. The patient should flex one hip toward chest to at least 90°. The patient lifts the other extremity from the supporting surface and then lowers it (march), keeping the lumbar spine flat.

- Repeat by starting the sequence with opposite leg.
- Repeat, alternating legs, correctly 10 times to progress to Level 2.

**Level 2:** the patient assumes the same starting position. Again one hip flexes to 90° while the other leg is completely extended by sliding the heel lightly on the table, keeping the lumbar spine flat.

- Repeat extension motion on opposite LE and return to start position.
- Repeat, alternating legs, correctly 10 times to progress to level 3.
**Level 3:** starting position is assumed. The patient performs level 2, but this time extends the leg with the heel off the table (unsupported) and then lowers it to the supporting surface once the leg is fully extended. After relaxing, the foot slides back to the starting position.

- Repeat extension motion on opposite LE and return to start position.
- Repeat, alternating legs, correctly 10 times to progress to Level 4.

**Most patients have adequate strength and control of their abdominal muscles if they can complete this level successfully. Progression to a higher level is not necessary for remediation of a pain problem. Further increase in the level of difficulty should be primarily for improved levels of fitness.**

**Level 4:** starting position is assumed. After contracting the abdominals with hips and knees flexed, the patient slides both legs along the table into full extension then returns to the starting position.

- Repeat correctly 10 times to progress to level 5.
- Alternative method: Begin in supine position with both legs in extension. Contract abdominal muscles and slide heels along table, flexing both hips and knees while bringing them toward the chest. Once hips and knees are flexed, pause and reinforce abdominal contraction. Slide both legs back into extension.

**Level 5:** starting position is assumed. After contracting the abdominals with hips and knees flexed, the patient slides both legs into extension with heels off the table while keeping back flat. The patient can then lower the feet onto the supporting surface.

- Repeat correctly 10 times to finish the progression.
- Alternative method: begin with LE extended position. Contract abdominal muscles while simultaneously flexing hips and knees, lifting both feet off the table to bring the hips to 90° degrees. Reinforce the contraction of abdominal muscles, extend the knees and lower LEs to table.
Transverse Abdominis strengthening in isolation

Purpose: prevent lumbar spine motion during functional activity

Level 1: Starting position
- Hook-Lying position
- Patient instructed to keep a neutral spine using the drawing-in maneuver. Place 2 fingers on the TA and one hand on superficial abdominal muscles.
- Ask patient to pull the navel in toward the spine without tightening superficial abdominal muscles.

Level 2: Lift one foot to 90° with alternate foot on table.
- Contract TA and flex one hip to 90°, return to start and repeat with other LE.
- Repeat correctly 10 times to progress.

Level 3: Flex hip to 90° and lift other foot
- Contract TA and flex one hip to 90°
- Lift other leg to same position. While maintaining contraction, lower legs one at a time to start positions.
- Repeat, alternating legs, correctly 10 times to progress.

Level 4: Flex one hip to 90°, lift other foot. Extend one leg without touching support surface.
- Flex one hip to 90°, lifting foot from table.
- Maintain contraction of TA and lift other leg up to same position.
- Maintain 90° with one leg and extend one hip and knee while holding foot off table. Return to 90° position
- Maintain contraction and extend other leg and return it to 90°.
- Repeat, alternating legs, correctly 10 times to progress to Level 5

Level 5: Flex hips to 90° and extend both knees without touching surface.
- Flex hips to 90°, lifting foot from table.
- Maintain contraction of TA and lift other leg to same positions.
- Extend both hips and knees while holding feet off table.
- Return to 90° and repeat correctly 10 times.

Multifidus strengthening in isolation

Level 1A: Quadruped
- Maintain neutral lumbar spine.
- Lift right knee from table 1 inch from table.
- Repeat on left.

Level 1B: Quadruped
- Maintain neutral lumbar spine.
- Lift right knee and left hand 1 inch from table.
- Hold 5 seconds.
- Repeat with left knee and right hand.

Level 2: prone, pillow under abdomen
- Maintain neutral lumbar spine.
- Lift right UE and left LE from table.
- Repeat with left UE and right LE.

Level 3: standing on stool, facing wall
- Extend right UE and left LE.
- Repeat with left UE and right LE.
Sources

1. Dekart KQ. Test-Re-test Reliability of Sahrmann Lower Abdominal Core Stability Test for Dil Baseball Athletes. West Virginia University. 2014: 1555074


3. Hoover DL. The concurrent validity of abdominal strength measures using the Sahrmann model and an isoinertial device. University of Kansas, 2002

