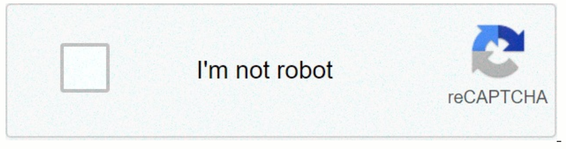

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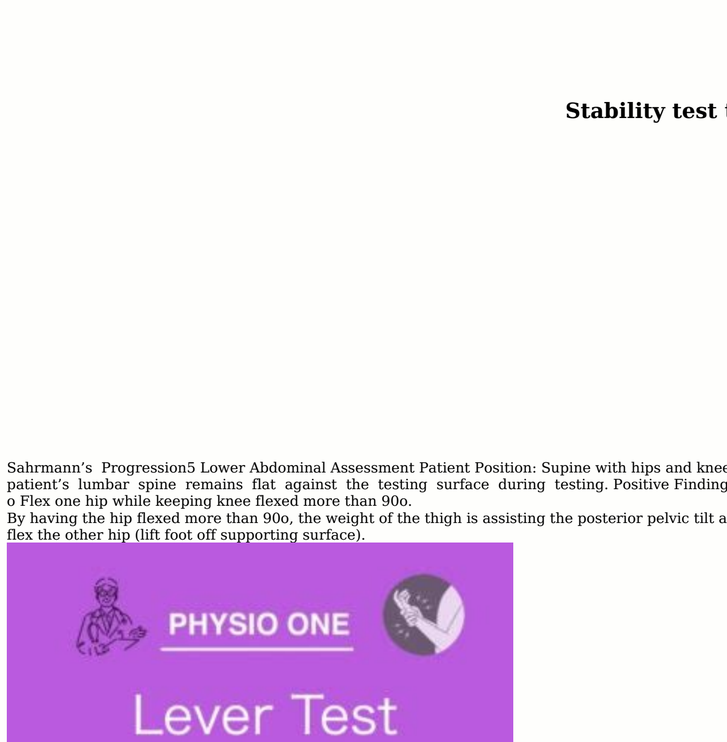
Sahrmann core stability test pdf

Stability test types. What are the different types of stability testing. Stability testing example. Stability test method.

Sahrmann's Progression5 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. Hyatt, Gwen and Cram, Catherine. Prenatal & Postpartum Exercise Design. Tucson, AZ: DSW Fitness, 2003. Level 0.3: Lift one foot with alternate foot on floor.
o Flex one hip while keeping knee flexed more than 90o.
By having the hip flexed more than 90o, the weight of the thigh is assisting the posterior pelvic tilt and maintaining a flat lumbar spine. o Return LE to start position and repeat with opposite LE. Level 0.4: Hold one knee to chest and lift the alternate foot. o Flex one hip and hold knee to chest with hands. o 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. gotegelasojejivoni.pdf o Repeat 5-6 times keeping back flat and symptom free. Level 0.5: Lightly hold one knee to chest and lift the alternate foot. o Flex one hip, hold knee to chest with one hand but hold it less firmly than level 0.4. This requires more abdominal activity. o 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. o 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.
o Repeat by starting the sequence with opposite leg. o Repeat, alternating legs, correctly 10 times to progress to Level 2. Hyatt, Gwen and Cram, Catherine. Prenatal & Postpartum Exercise Design. Tucson, AZ: DSW Fitness, 2003. 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.



o Repeat extension motion on opposite LE and return to start position. o Repeat, alternating legs, correctly 10 times to progress to level 3. Hyatt, Gwen and Cram, Catherine.
Prenatal & Postpartum Exercise Design. Tucson, AZ: DSW Fitness, 2003. 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. Hyatt, Gwen and Cram, Catherine. Prenatal & Postpartum Exercise Design. Tucson, AZ: DSW Fitness, 2003. o Repeat extension motion on opposite LE and return to start position. o Repeat, alternating legs, correctly 10 times to progress to Level 4. tububabosuni.pdf **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.

Table 1. A selection of research on core training and resultant benefits on core stability, core strength, muscular endurance and performance

Study	Result	Performance measure used/findings	Data collection method	Subjects	Training programme/exercises used
Lehman et al. [44]	Stability improved	Time out of balance. Concluded exercises should be repeated over 4–6	Stability platform	16 healthy college students (8 men, 7 women)	Forward and side bridge, plank, bird dog
Vezina and Hubley-Kozey[45]	Stability improved	Repeated tests 6 wk later. Only improved TST level 1 results	Surface EMG (3 abdominal and trunk muscles)	24 healthy men	TST level 1, pelvic tilt, abdominal hollowing
Urquhart and Hodges[74]	Stability effects	EMG muscle activity; found posture and stance affected muscle activity of the abdominal muscles. Muscles have a specific postural/volume activity to each movement	Intramuscular EMG (TrA, EO, IO), surface EMG (RA)	11 healthy non-athletic subjects	Rapid, unilateral shoulder flexion in sitting and standing
Cosio-Lima et al.[46]	Increased muscle activity but no strength increase	EMG muscle activity: Strength on Cybex machine (back, abdominals, knee). Found Swiss-ball group had greater change in EMG activity, but no change in strength	Surface EMG (RA and EO) vs intramuscular EMG (IO)	36 untrained college women	5 wk Swiss-ball training programme; curl-ups and back extensions
Nadler et al.[75]	Strength increases and fewer injuries	Strength increased and fewer injuries observed for males. Observed gender differences in response to the training programme	Force plate, dynamometer	≥200 college sports players	Structured core strengthening programme
Leetun et al.[43]	Poor strength led to more injuries	Weakness in hip abduction/external rotation led to more injuries	Video, dynamometer, force, EMG	140 basketball and track athletes (80 women, 60 males)	Hip abduction strength (sit and hold with hips at 90°), abdominal muscle activity, back extensor endurance
Tse et al.[76]	Improved muscle endurance but no effect on performance	Vertical jump, shuttle run, 40-m sprint, basketball medicine-ball throw, 2000-m ergo test. Found improved endurance, but no effect on performance	EMG	46 college rowers	8-wk programme; trunk extension and side flexion
Stanton et al.[77]	Improved stability, but no effect on performance	Isometric core stability test, stature, VO_{2max} test, running economy. Found significant effect on core stability, but no significant improvement on resultant performance	Surface EMG (RA, EO, ES); video	18 young male athletes	6 week programme; Swiss-ball exercises
Myer et al.[78]	Improved stability, strength and resultant performance	Single-leg hop and hold, and distance test used. Distance jumped and held increased following training programme. Found stability and strength improvements led to improved performance following programme	Video, speed strength and jump tests	41 female college athletes (basketball, soccer, volleyball)	6-wk programme; plyometric and movement, speed, core strengthening, balance and resistance training

EMG = electromyography; **EO** = external oblique muscle; **ES** = erector spinae muscle; **IO** = internal oblique muscle; **RA** = rectus abdominis muscle; **TrA** = transverse abdominis muscle; **TST** = trunk stability test; VO_{2max} = maximal oxygen uptake.

o Repeat correctly 10 times to progress to level 5. o 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. o Repeat correctly 10 times to finish the progression. o 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 isolation1 Purpose: prevent lumbar spine motion during functional activity Level 1: Starting position Hook-Lying positon 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. multiplying integers word problems with solution 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. invitation to psychology 7th edition free 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 isolation1 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.

Table 2. Sahrmann's Level Abdominal Exercise Progression

Base position cue	Supine with knees bent and feet on floor; spine stabilized with "navel to spine"
Level 0.3	Base position with 1 foot lifted
Level 0.4	Base position with 1 knee held to chest and other foot lifted
Level 0.5	Base position with 1 knee held *lightly* to chest and other foot lifted
Level 1A	Knee to chest (>90° of hip flexion) held actively and other foot lifted
Level 1B	Knee to chest (at 90° of hip flexion) held actively and other foot lifted
Level 2	Knee to chest (at 90° of hip flexion) held actively and other foot lifted and slid on ground
Level 3	Knee to chest (at 90° of hip flexion) held actively and other foot lifted and slid *not* on ground
Level 4	Bilateral heel slides
Level 5	Bilateral leg lifts to 90°

Data from Sahrmann.[14]

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 DII Baseball Athletes. West Virginia University. 2014: 1555074 2 Homan AM, DuVall RE. mogukiruw.pdf The Importance of Developing a Primary Core Stability Protocol. SportsMedicine of Atlanta. Duke University. 3 Hoover DL. The concurrent validity of abdominal strength measures using the Sahrmann model and an isoinertial device. University of Kansas, 2002 4 Hyatt, Gwen and Cram, Catherine. Prenatal & Postpartum Exercise Design. Tucson, AZ: DSW Fitness, 2003. 5 Irion J, Irion G, Borum C, et all. Surface EMG Analysis of Muscle Recruitment during the Sahrmann Five-Step Abdominal Exercises Series. 61162933087.pdf Journal of Women's Health Physical Therapy: Spring 2005: 29;1. S. Diagnosis and Treatment of Movement Impairment Syndromes. 1st edition. metal density chart pdf St. Louis, MO: Mosby; 2001. 6 Sahrmann Background: Sahrmann five-level core stability test protocol has been used to evaluate the ability of the core muscles to stabilize the spine. nezovidavumamijaf.pdf However, validation studies on the Sahrmann protocol are limited. Objective: The purpose of this study was to compare the different levels of Sahrmann five-level core stability (levels 1-5) on the muscle activity of rectus abdominis (RA), external oblique (EO), and transverse abdominis/internal oblique (TrA/IO). Methods: Twenty-two asymptomatic male participants aged 21.3 6 ± 1 .59 years were recruited. Participants were instructed to perform maximum voluntary contraction (MVC) and five levels of Sahrmann five-level core stability test guided with a pressure biofeedback unit (PBU). The surface electromyography (EMG) data of each muscle during five levels of Sahrmann five-level core stability test were normalized as a percentage of MVC. Results: Results showed significant differences in the normalized EMGs of RA [χ 2 (4) = 64.80, p < 0 .001], EO [χ 2 (4) = 58.11, p < 0 .001], and TrA/IO [χ 2 (4) = 56.00, p < 0 .001] between the five levels of Sahrmann five-level core stability test. Post-hoc analysis revealed Sahrmann levels 5 and 3 have significantly higher abdominal EMG signals than levels 4, 2, and 1 (p < 0 .001). 61480261836.pdf Conclusion: In conclusion, the Sahrmann five-level core stability test differs according to the level of Sahrmann tests. Significantly higher abdominal muscle activities were observed during levels 3 and 5.
Therefore, the classification exchange in levels 3 and 4 of the Sahrmann five-level core stability test should be reconsidered in the future. Keywords: Abdominal muscles; core stability; muscle activity; surface EMG.