

RIPPS

Repeated Incremental Predictable Perturbations in Standing BALANCE METHOD



BALANCE METHOD *Blending Research Innovation With Clinical Practice*

Congratulations and thank you for selecting the **RIPPS® Balance Method** for your fall risk management toolbox. Designed by a clinician for the clinician, the RIPPS method is simple to learn and administer. The RIPPS method can be used in any clinical setting and is completely portable, providing objective, quantitative postural response measures.

Please review the enclosed DVD and this instructional literature before using the **RIPPS Balance Method**.

RIPPS Method, Inc.
www.rippsmethod.com

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RIPPS Mission

The RIPPS mission is to provide physical and occupational therapist clinicians and educators, as well as wellness and health-related exercise professionals, with an evidenced-based fall risk assessment and intervention tool and to establish the RIPPS percent of total body weight (% TBW) performance measure as a standard, best practice clinical measurement of balance and fall risk.

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About the RIPPS Balance Method

Developed by a physical therapist, the RIPPS Balance Method is a novel, innovative, quantitative perturbation based fall assessment tool. Predicated on L. De-Pasquale and L. Toscano's 2009 article "The Spring Scale Test (SST): A Valid and Reliable Tool for Explaining Fall History" in *The Journal of Geriatric Physical Therapy*, RIPPS is an evidenced-based, safe, reliable and valid clinical tool.

Published research findings support the use of the RIPPS percent of total body weight performance measure (% TBW) to quantify stepping and non-stepping postural responses to measured loading and unloading waist-pull perturbation forces, for the purpose of identifying fall group membership.

Evidence suggests that the RIPPS 10% TBW performance measure is highly discriminant to fall history, making it a valuable clinical tool for identifying stepping strategy deficits in active, independent community living, older adults that are at a higher risk of a fall with no prior fall history.

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Description

RIPPS is a single-trial, first-attempt, manual waist-pull perturbation balance assessment method that stresses the limits of available reactive and proactive non-stepping and stepping postural stability responses utilizing repeated incremental predictable perturbations in standing. The RIPPS performance measure is expressed as percent of total body weight (% TBW) as determined by RIPPS performance criteria. In addition, the RIPPS method has clinical balance intervention applications as an induced-stepping treatment paradigm.

RIPPS is comprised of repeated rounds of incremental predictable manual waist-pull perturbations in standing, quantified by a linear spring scale strain gauge attached to a padded five-inch belt secured around the user's waist. The RIPPS method is performed on a firm unpadded or minimally padded support surface, in normal stance position, normal footwear, without any assistive device.

A preliminary single round of gentle progressive waist-pull loading to the limits of available non-stepping postural stability precedes rounds of coupled loading and unloading. Rounds of coupled loading and unloading of manual waist-pull forces administered in one-pound increments, with each successive loading/unloading round, start at one-pound and progressively increase by an additional one-pound. Each round of one-pound incremental loading/unloading seeks to additively stress available postural stability limits in response to 1) a spring scale loading force and 2) an unloading of the spring scale loading force. RIPPS loading is administered in a predictable, gentle and accommodative fashion. RIPPS unloading is administered at the discretion of the examiner, without warning, in a quasi-random fashion, within a silent, subjective one- to five-count window.

RIPPS is administered in two separate directions, anterior followed by posterior. **Anterior direction limit testing** is performed with the examiner facing the client to assess **rear stepping** limits. **Posterior direction limit testing** is performed with the client's back to the examiner to test **forward stepping** limits. Progressive rounds of coupled loading and unloading of waist-pull forces are delivered to the limits of postural stability or RIPPS end point defined by the RIPPS performance criteria.

RIPPS Setup



The RIPPS belt is secured at the waist without over-tightening the waist belt to allow easy transition from anterior to posterior testing without unfastening the waist belt closures. The safety tether strap should be securely affixed to the examiner in slackened orientation to the client.

The examiner assumes a stable stance in close proximity to the client grasping the spring scale pull handle maintaining the spring scale instrument and client's feet in clear view. Depending upon leg length and height, clients should stand approximately three feet from a compliant support surface such as a bed, sofa or cushioned arm chair with cushions stacked, a padded treatment table or other suitable support surface.

Anterior RIPPS is administered with the client facing the examiner and posterior RIPPS is administered with the client facing a compliant support surface.

Preliminary Continuous Loading

RIPPS testing is preceded by a single round of progressive loading waist-pull forces to the limits of available non-stepping, foot-flat (heel/sole) floor contact postural strategy. This preliminary round of continuous waist pull loading familiarizes the client with RIPPS loading waist-pull forces and provides the examiner with an estimate of available non-stepping postural stability limits. Preliminary continuous loading precedes both RIPPS direction limit tests. No score is assigned.

RIPPS Direction Limit Testing

RIPPS anterior direction limit testing precedes RIPPS posterior direction limit testing.

RIPPS testing starts with a round of loading and unloading at one-pound waist-pull force. All subsequent rounds of coupled loading and unloading of waist-pull forces start at one-pound waist-pull force and are increased by an additional one-pound of waist-pull force. RIPPS loading accommodation must be achieved prior to quasi-random unloading. RIPPS proceeds until a loading or unloading RIPPS performance criteria is not achieved.

Loading waist-pull forces are administered in a gentle, slow, continuous, predictable and accommodative fashion.

Unloading occurs suddenly, without warning, in a quasi-random manner at the discretion of the examiner, within a subjective five-second window following successful foot flat accommodation to loading waist-pull forces.

Examiners repeatedly provide verbal cues to clients during testing regarding waist-pull force magnitude and direction as well as reminding clients of the RIPPS performance criteria. Clients are continuously reminded to withstand as much waist-pull loading force as possible maintaining heel/sole foot contact with floor support surface and to step when necessary, with the fewest steps required to maintain postural stability within the RIPPS three-step limit unloading performance criteria.

Performance Criteria

RIPPS performance criteria are simple, involving clearly discernable observations during the loading and unloading phases of RIPPS testing as follows:

Loading: Each round of one-pound incremental loading waist-pull forces requires a heel-sole (foot flat) contact with support surface, non-stepping postural strategy. This is known as **accommodation**.

Unloading: Each round of one-pound incremental quasi-random unloading requires a postural response within a zero to three-step limit.

RIPPS End Points

The RIPPS Balance Method typically is a single-trial procedure. Second chances to allow clients to achieve RIPPS loading and unloading performance criteria should be uncommon practice. Exceptions to this are discussed below.

RIPPS end points occur for each RIPPS direction limit test. A RIPPS end point denotes the round of waist-pull force where failure to achieve either a RIPPS loading or a RIPPS unloading performance criteria occurs.

RIPPS anterior direction limit end points:

Loading - loss of heel contact with floor surface or forward-step response

Unloading - four rear step response or contact with support surface

RIPPS posterior direction limit end points:

Loading - loss of sole contact with floor surface or rear-step response

Unloading - four forward step response or contact with support surface

A step is defined as: loss of complete foot contact with floor surface or change in foot position.

Direction Limit Scores

RIPPS testing is performed in two directions, anterior followed by posterior for the purposes of quantifying available strategy limits. RIPPS anterior direction limit testing stresses rear stepping strategy limits, while RIPPS posterior direction limit testing stresses forward stepping strategy limits.

The RIPPS % TBW direction limit score represents the maximum loading/unloading force exhibiting effective non-stepping and stepping postural strategies in accordance with RIPPS loading (foot flat) and unloading (zero - three step limit) performance criteria. The RIPPS % TBW directional limit score always reverts to the round immediately preceding the RIPPS end point round. **RIPPS direction limit scores denote maximum success force values, not end point failure force values.**

RIPPS direction limit scores are calculated by dividing the maximum success force in pounds by obtained body weight. RIPPS % TBW direction limit scores are obtained for both the anterior and posterior directions, yielding two RIPPS % TBW direction limit scores. A RIPPS direction limit score for an individual weighing 150 pounds displaying a RIPPS direction limit end point force of 15 pounds would be calculated by dividing 14 pounds by 150 pounds resulting in a RIPPS % TBW direction limit score of 9.3%.

RIPPS direction limit notes: shuffle steps/examiner technique

The RIPPS method is predicated on predictable perturbations. In response to RIPPS unloading, non-fallers typically display well-defined steps and fallers frequently exhibit poorly defined, quick shuffle steps.

A RIPPS direction limit test end point occurs in the presence of multiple, quick, poorly defined, shuffle-based steps in response to unloading of waist-pull forces. The examiner has the option of administering a second chance round at the identical waist-pull force before identifying a RIPPS direction limit end point. Administration of second chance rounds should be limited to the following:

- RIPPS direction limit end point determination is compromised by poorly defined, shuffle-based step response
- Examiner technique results in loading RIPPS end point

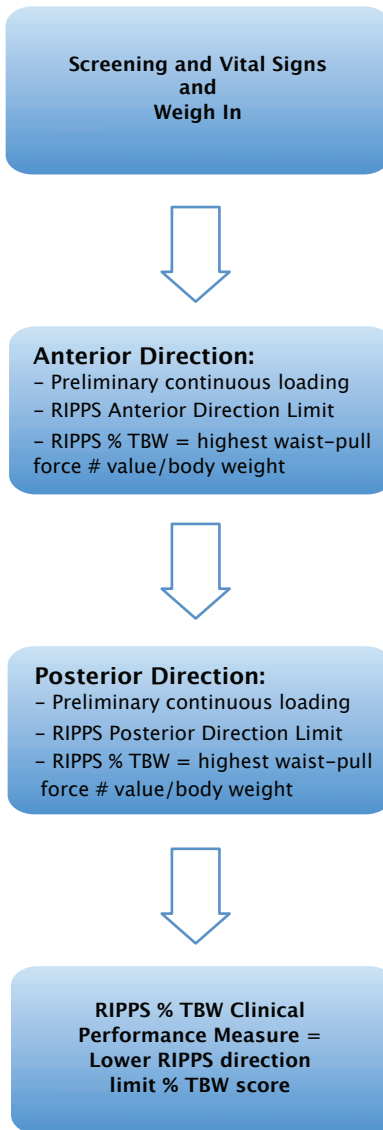
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Performance Measure

The RIPPS TBW % performance measure of clinical relevance is the **lower of the RIPPS % TBW directional limit scores.**

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RIPPS Flow Chart



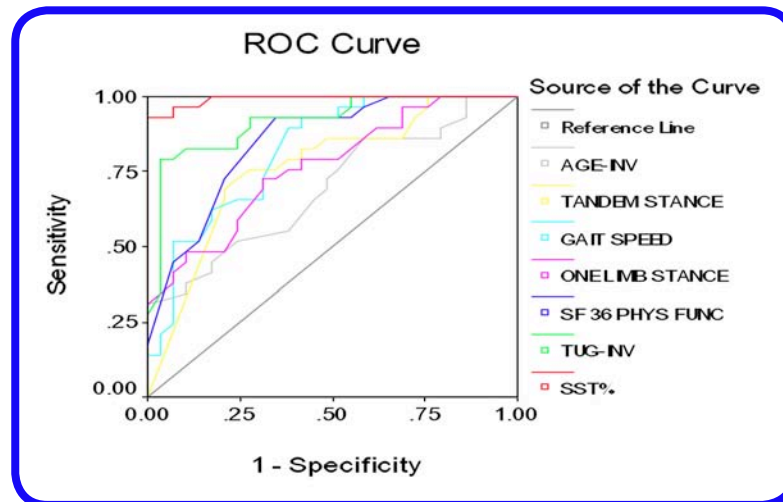
DePasquale, L, Toscano, L. The Spring Scale Test (SST): A Valid and Reliable Tool for Explaining Fall History. *The Journal of Geriatric Physical Therapy*, 2009, 32(4), 159-167.

Results summary:

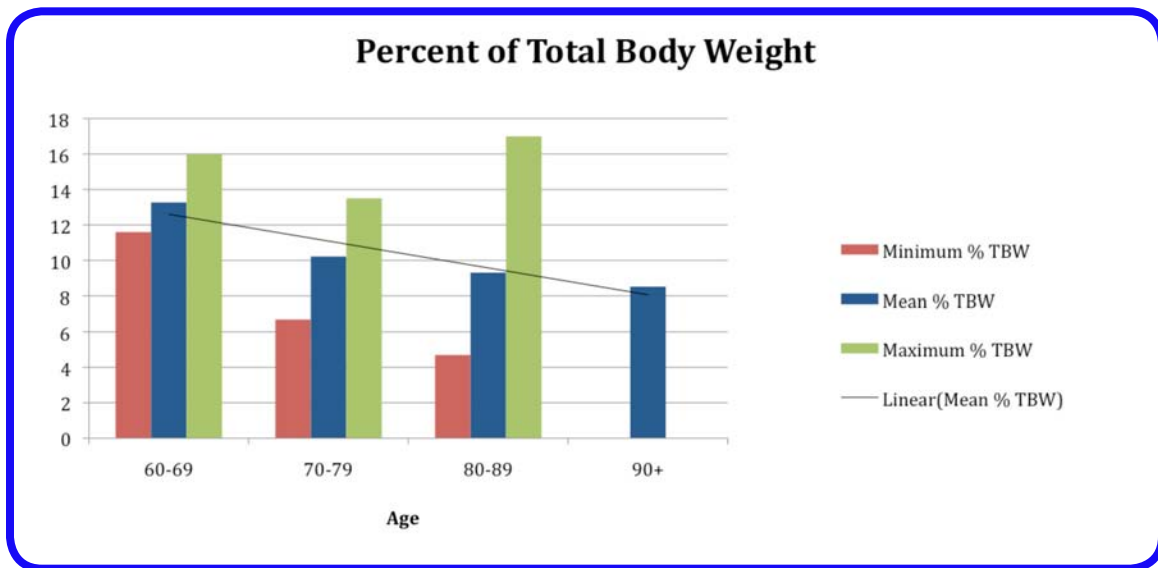
- Excellent same-day test-retest reliability (ICC = 0.94)
- Method error (ME = .74), Coefficient of variation (MEcv = 7.25%), which confirms a change of one pound is real change
- A change of one pound is significant and clinically meaningful for body weight values up to 140 pounds. A change of two pounds would be meaningful for body weight values > 140 pounds.

Spring Scale Test® (SST®) 10% TBW performance value:

- Sensitivity (93%), Specificity (96.6%)
- ROC Area Under the Curve (AUC = 0.992)
- Highest level of discrimination to fall status compared to the TUGT, gait speed, single limb stand test and tandem stand test
- Logistic regression supports the efficiency of the RIPPS 10% TBW performance measure for identifying fall history in the sample studied
- **Faller mean % TBW 7.5 (1.4)**
- **Non-faller mean % TBW 12.3 (1.7)**



Receiver Operating Characteristic (ROC), Area Under the Curve (AUC)
Cut Points: SST (10%), TUG (7.4s), SLS (6.5s), Vel. (1.2m/s), TS (22s)



Combined Fallers and Non-Fallers; (n=58)

The RIPPS Balance Method has both assessment and treatment applications. Individuals with RIPPS % TBW scores below 10% could benefit from an induced-stepping treatment paradigm using the RIPPS Balance Method.

RIPPS induced-stepping treatment would target RIPPS direction limit % TBW deficits < 10%.

Induced-stepping skill acquisition would be evident in three consecutive treatment sessions over a span of two to three weeks.

The RIPPS 10% TBW performance measure:

- Should be considered as a minimum baseline cutoff score when addressing community integration and fall risk issues in active community living older adults
- Is highly discriminant to fall status with sensitivity and specificity > 90% supporting use as a diagnostic or screening tool
- Is an evidenced-based, domain-specific and quantitative-balance performance measure
- Is a universal measure without decade specific cutoff scores for individuals aged 65+
- Is an innovative, pragmatic and a clinically practical balance measure
- Meets best practice, performance-based documentation requirements

Important Safety Precautions

RIPPS is a safe waist-pull perturbation method. Take the following precautions when administering the test.

RIPPS should not be administered within three months of:

- any spine, pelvic, upper or lower limb fracture
- any spine, thoracic, abdominal, upper or lower limb surgery

RIPPS should not be administered:

- in the presence of active spine, pelvic or lower limb pain restricting movement or limb loading
- when an unstable medical condition requires frequent medication adjustment
- when obtained vital signs are outside of published ACSM or facility parameters.

Cautious administration of RIPPS is recommended with individuals exhibiting or verbalizing non-proportional anxiety.

Safety tether strap should be employed with all RIPPS unloading.

Maximal control of unloading stepping responses is achieved by examiner stepping with forward foot towards client while grasping safety tether strap with free hand.

Safety tether strap should not restrict client's postural responses.

Use of the safety tether strap and compliant support surface recommendations ensures safe administration of the RIPPS Balance Method.

RIPPS Protocol Advantages

- Single test efficiency
- Single examiner administration in multiple settings
- Safe and predictable methodology
- Portable, economic and quantitative evidenced-based device
- Evidence-based, peer-reviewed publication support
- Quantitative, objective and clinically relevant % TBW performance measure
- Most discriminant to fall status compared to other tests of balance examined
- High levels of combined sensitivity and specificity > 90%
- Stepping response limits quantified
- Appropriate for the active, independent community living, older adult
- Appropriate for various older adult population sub-groups
- Provides an innovative and safe induced-stepping treatment paradigm

Product Care

Scale Calibration

Spring scale strain gauge calibration is achieved by suspending a known weight attached to the spring scale instrument, reconciling pointer value with known weight by adjusting the round locking calibration knob. Scale calibration should be performed on a weekly basis depending on usage.

Always store your RIPPS spring scale instrument and tether strap inside the provided zippered case when not in use. The RIPPS components have been designed for durable use. Prior to use, ensure that the waist belt closures, spring scale and tether strap hooks are properly fastened.

Additional or replacement spring scale instruments are available at:
www.rippsmethod.com

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Disclaimer

This product is sold “as is” and seller disclaims all warranties expressed, implied, or statutory, including any implied warranty of merchantability or fitness for a particular purpose. In no event shall RIPPS Method, Inc. be liable for any incidental, special, indirect, or consequential damages, whether resulting from the use, misuse, or inability to use this product or from defects in the product. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations may not apply to you.

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Contact Information

For sales and service, please contact the distributor.

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Thank you again for selecting the RIPPS Balance Method.

www.rippsmethod.com