



TRUSTRENGTH DYNAMOMETER

THE HIP TESTING SOLUTION



THE IMPORTANCE OF HIP ASSESSMENT AND MONITORING

Hip and groin injuries are common in sports that require rapid deceleration, cutting, and repeated changes of direction. Groin injuries alone account for 14–18% of all injuries in soccer ¹ and represent 39% of hip-related injuries in NCAA football ². Because of this high burden, profiling hip strength is essential for both performance and injury prevention.

Assessing adductor strength provides important insight into risk and readiness. In youth male soccer players, bilateral adductor strength has been shown to identify prior injury risk ³, and in rugby league and ice hockey athletes, bilateral adductor strength is an efficient way to monitor fatigue status ^{4,5}.

Hip flexor strength is also performance-relevant. Improvements in isometric hip flexor force production of +12% have been associated with faster 10-yard and 40-yard sprint times ⁶.

Hip extension strength is essential for acceleration, sprinting, and powerful change-of-direction actions. Together, assessing hip flexion, extension, abduction, and adduction gives practitioners a complete picture of lower-limb capacity.

The Hawkin team has designed and validated several reliable testing protocols, giving coaches and clinicians confidence in their hip strength assessments.

Although the TruStrength dynamometer device can be used to assess hip force capabilities using a variety of protocols, our team recommends the following tests, which are described in this guide:

- **Groin Squeeze**
- **Unilateral Hip Abduction**
- **Standing Hip Extension**
- **Unilateral Hip Adduction**
- **'A' Standing Hip Flexion**

THE GROIN SQUEEZE

Equipment checklist

- ✓ TruStrength
- ✓ Small Paddle x2



TEST SETUP INSTRUCTIONS

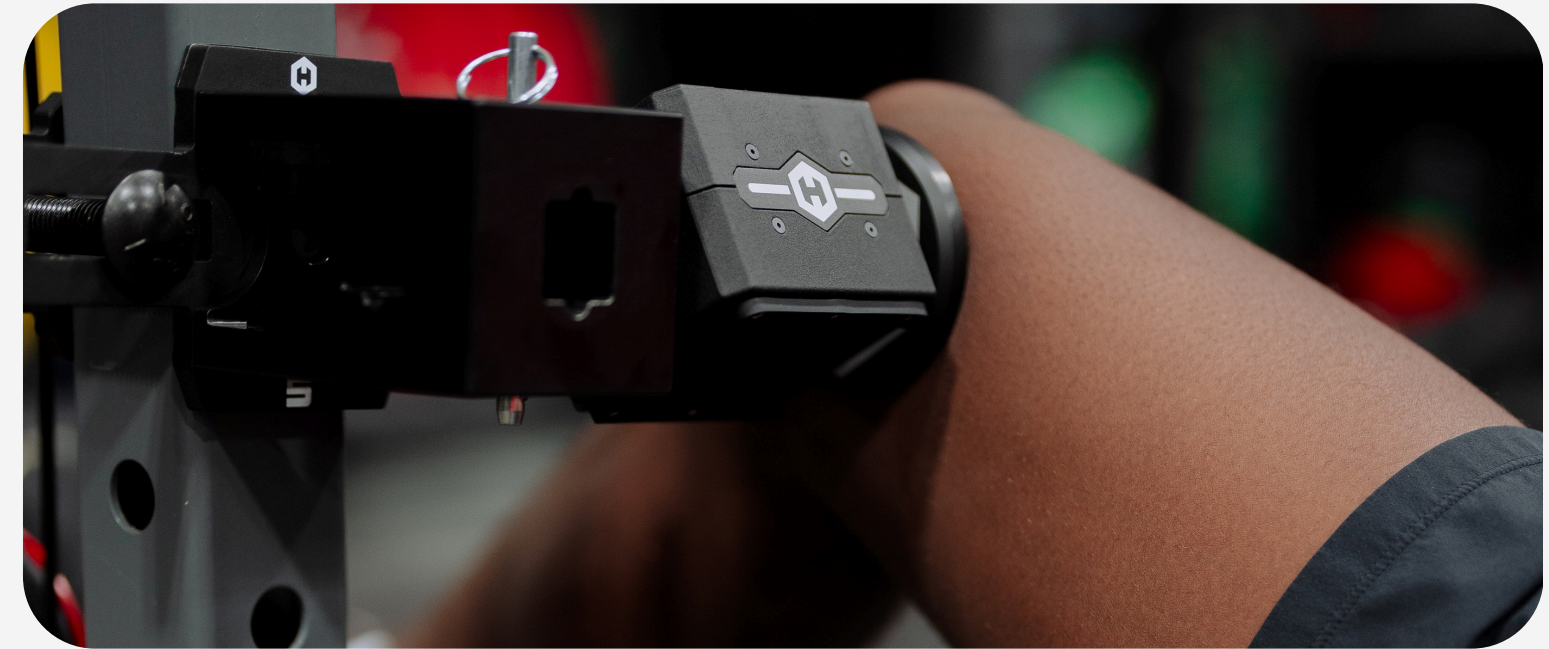
The “groin squeeze” (bilateral hip adduction) has been suggested as a primary test consideration for monitoring fatigue ⁷ and has also been used to profile team sport athletes at risk of in-season adductor strain ⁸. As a time efficient triage assessment, any reduction in performance beyond the minimum detectable change threshold can then be followed up by a unilateral assessment to identify which limb is causing any reduction.

The adductors produce more force when the hips are flexed to 45 degrees ⁹, which supports the use of the supine position due to the simpler standardisation and more appropriate workflow for large group testing.

UNILATERAL ADDUCTION

Equipment checklist

- ✓ TruStrength
- ✓ Multiplanar Clamp Mount or the Pivot
- ✓ Small Paddle x1
- ✓ Gym Rack (not provided)



TEST SETUP INSTRUCTIONS

To determine the force capabilities of unilateral hip adductors, utilize the clamp mount, which transforms any gym rack into a standardised and reliable fixed testing solution. The TruStrength can be mounted at any height, ensuring you can choose the joint angle specific to your testing needs. This will identify inter-limb asymmetries based on the individual limb force production capabilities more accurately than a bilateral setup would permit.

Simply fix the TruStrength with small paddle attachment both medial to and aligned with the athlete's lower thigh when they are in the desired test position (e.g., supine with their hips flexed to 45 degrees). Then create and apply the correct tags to ensure that you are able to review the data with clarity to inform the athlete's training process.

UNILATERAL ABDUCTION

Equipment checklist

- ✓ TruStrength
- ✓ Multiplanar Clamp Mount or the Pivot
- ✓ Small Paddle x1
- ✓ Gym Rack (not provided)



TEST SETUP INSTRUCTIONS

To determine unilateral hip abductor force capabilities, as with unilateral adduction testing, the clamp mount transforms any gym rack into your fixed isometric testing solution. The TruStrength can be mounted at any height ensuring you can choose the joint angle specific to your testing needs. This will identify inter-limb asymmetries based on the individual limb force production capabilities more accurately than a bilateral setup would permit.

Simply fix the TruStrength with small paddle attachment both lateral to and aligned with the athlete's lower thigh when they are in the desired test position (e.g., supine with their hips flexed to 45 degrees). Then create and apply the correct tags to ensure that you are able to review the data with clarity to inform the athlete's training process.

‘A’ STANDING HIP FLEXION

TEST SETUP INSTRUCTIONS

Replicating the ‘A’ position, the athlete’s involved hip and knee are flexed to 90°, with the ankle dorsi-flexed. The TruStrength orientated vertically with the small paddle (or large paddle, if preferred) attached and placed on the anterior thigh, proximal to the knee cap. The uninvolved limb is in an extended position, with arms folded across the chest.

This variation positions the hip in a flexed posture, bringing the iliopsoas and rectus femoris into a shortened muscle length. Testing in this position reflects the high-force demands of early sprint acceleration, where the thigh is driven upward rapidly. The iliopsoas has the highest relative contribution in this shortened position ¹⁰.

Equipment checklist

- ✓ TruStrength
- ✓ Multiplanar Clamp Mount or the Pivot
- ✓ Small Paddle x1
- ✓ Gym Rack (not provided)



STANDING HIP EXTENSION

Equipment checklist

- ✓ TruStrength
- ✓ Ankle Strap
- ✓ Multiplanar Clamp Mount or the Pivot
- ✓ Eyebolt x1
- ✓ Carabiner x2
- ✓ Gym Rack (not provided)

TEST SETUP INSTRUCTIONS

For the standing hip extension test, the athlete stands tall with the involved limb positioned slightly behind the body and kept fully extended at the knee. An ankle strap is secured just above the malleoli, attaching the athlete to the TruStrength device in tensile mode. The stance leg remains fixed and slightly raised (use a mat or plate), the pelvis level, and the torso upright with one arm folded across the chest and the other in 90-degrees, lightly resting three fingers on the rack for support. The athlete is instructed to drive the extended leg straight backward without bending the knee or rotating through the hips ⁹.

This position places the gluteus maximus and hamstring musculature under moderate muscle-length tension, requiring the athlete to generate hip-extension force from a neutral-to-extended hip posture. This test is valuable for identifying asymmetries or deficits related to posterior-chain strength, sprint performance, and overall hip stability.



DATA & METRICS

Every TruStrength test is processed the same way, every time. Removing human error and inconsistency ensure results reflect real changes, not differences in how the data was handled.

PEAK NET FORCE

Peak Net Force provides insight into an athlete's maximal strength. This metric is great to track during mid-stage rehabilitation and/or pre-season, and early in-season.

NET IMPULSE / AVERAGE FORCE

The average force or impulse can give you insight into an athlete's ability to sustain force over the entire contraction duration.

RAPID FORCE / RFD

Net force at 50-200 ms and rate of force development (RFD) during the repetition can give you insight into the athlete's explosive strength capability.

The TruStrength system makes strength testing quick, reliable and repeatable, empowering practitioners with real-time data that supports decision making and elevates client outcomes.

TAG SELECTION

This example represents a tag workflow for the Groin Squeeze test. Accurate tags are essential for insightful data analysis, so you know HOW you tested when it comes to analysis.

TEST NAME: **GROIN SQUEEZE**
TEST LIMB: **NOT APPLICABLE**



Protocol Considerations

LONGER DURATIONS

10+ seconds

Recommended if
muscle endurance is of
interest

MODERATE DURATIONS

3-5 seconds

Recommended if
maximal strength is of
interest

SHORT DURATIONS

1 second

Recommended if rapid
force expression is of
interest

VERBAL CUES

"fast" and "hard"

Recommended for any
test duration (assuming
uninjured athlete)

*Whether you are profiling, screening or monitoring
your athletes, TruStrength brings precision and
confidence to strength testing.*

Join leading professionals who are using Hawkin data to drive smarter decisions.

ENDNOTES

¹ Hägglund, M., et al. Injuries among male and female elite football players. *Scandinavian Journal of Medicine & Science in Sports*. 2009;19(6): 819-827.

² Makovicka, J.L., et al. A decade of hip injuries in national collegiate athletic association football players: an epidemiologic study using national collegiate athletic association surveillance data. *Journal of Athletic Training*. 2019;54(5): 483-488.

³ Moreno-Pérez, V., et al. Adductor squeeze test and groin injuries in elite football players: A prospective study. *Physical Therapy in Sport*. 2019;37:54-59.

⁴ Naughton, M., et al. Defining and quantifying fatigue in the rugby codes. *PLoS one*. 2023;18(3): p.e0282390

⁵ Sánchez-Migallón, V., et al. Effects of consecutive days of matchplay on maximal hip abductor and adductor strength in female field hockey players. *BMC Sports Science, Medicine and Rehabilitation*. 2022;14(1):3.

⁶ Deane, R.S., et al. Effects of hip flexor training on sprint, shuttle run, and vertical jump performance. *The Journal of Strength & Conditioning Research*. 2005;19(3):615-621.

⁷ Naughton, M., et al. Defining and quantifying fatigue in the rugby codes. *PLoS one*. 2023;18(3): p.e0282390

ENDNOTES

⁸ Sánchez-Migallón, V., et al. Effects of consecutive days of matchplay on maximal hip abductor and adductor strength in female field hockey players. BMC Sports Science, Medicine and Rehabilitation. 2022;14(1):3.

⁹ Delahunt, E., et al. The thigh adductor squeeze test: 45 of hip flexion as the optimal test position for eliciting adductor muscle activity and maximum pressure values. Manual Therapy. 2011;16(5):476-480.

¹⁰ Kumazaki, T., Takahashi, T., Nakano, T., & Sakai, T. (2022). Action and contribution of the iliopsoas and rectus femoris as hip flexor agonists examined with anatomical analysis. Juntendo Medical Journal, 68(4), 352-362.