Hawkin

TRUSTRENGTH DYNAMOMETER

THE SHOULDER TESTING SOLUTION

THE IMPORTANCE OF

SHOULDER ASSESSMENT AND MONITORING

Shoulder injuries are extremely common in overhead sports such as basketball, water polo, javelin and volleyball due to the high forces required for sport specific tasks. Shoulder strength, particularly the rotator cuff, provides stability and mobility to the shoulder[1-3], reduces injury risk, improves athletic performance in overhead sports[4], enhances posture, and facilitates everyday functional movement.

Several modifiable risk factors have been identified for shoulder injuries, including weakness in abduction[5-8], underdeveloped external rotators[4], imbalances in external and internal rotation[2], age[8], heaviness of labor [8], and history of trauma[8].

As shoulder strength and symmetry are key to keeping athletes in competition, regular assessment and monitoring of shoulder strength is essential.

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

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

- ***The Athletic Shoulder (ASH) Test***
- ***Supine Internal / External Rotation Test***

THE ASH TEST

Equipment checklist

- ✓ TruStrength
- ✓ Floor Mount
- ✓ Small Paddle x1
- ✓ Pad (not provided)

TEST SETUP INSTRUCTIONS

The Athletic Shoulder Test or 'ASH Test' is used to assess and monitor shoulder isometric strength of athletes [9].

The test was designed with athletes who play contact sports and those who perform a lot of overhead actions in mind, however this ASH assessment can be applicable for all athletes and general populations.

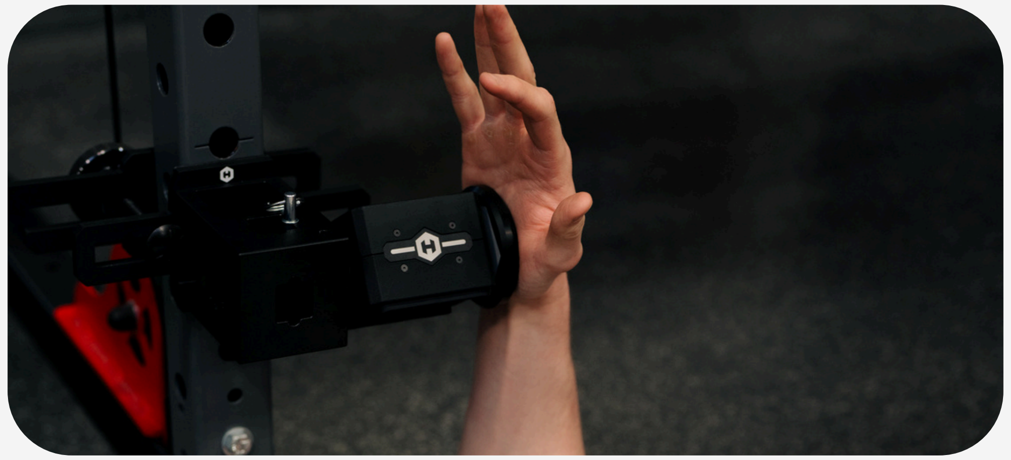
The test is designed to assess the activity of the shoulder girdle in three different positions:

- I-test: arm is directly extended overhead at a shoulder angle of 0°
- Y-test: arm is directly extended at a shoulder angle of 45°
- T-test: arm is directly extended to the side at a shoulder angle of 90°

SUPINE INTERNAL/ EXTERNAL ROTATION

Equipment checklist

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



TEST SETUP INSTRUCTIONS

Shoulder internal and external rotation is a common assessment performed by therapists, generally via manual muscle testing and hand-held dynamometers. These methods of assessment can come with some variability due to the nature of the assessments [10,11].

Strong internal and external rotation in the shoulder joint is crucial for both athletes and general population. It aids in shoulder stability and mobility[12-14], injury prevention[13], improved athletic performance in overhead sports[14], improved posture and aids in everyday functional movement.

The supine internal and external shoulder rotation protocol offers a standardised assessment that has been shown to positively correlate with throwing velocity[15]. The protocol places the athlete in 90° of shoulder abduction and 90° elbow flexion with a large base of support. By testing strength in this supine position, coaches and clinicians gain valuable insight into the shoulders' ability to produce force when it matters most.

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 Athletic Shoulder (ASH) test. Accurate tags are essential for insightful data analysis, so you know HOW you tested when it comes to analysis.

TEST NAME: **ASH I-POSITION**
TEST LIMB: **RIGHT**

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] Coinceicao, A., et al. Assessment of isometric strength of the shoulder rotators in swimmers using a handheld dynamometer: a reliability study. Acta of Bioengineering and Biomechanics, 2018. 20(4): p. 113-119.

[2] Cools, A.M., et al. Age-related, sport-specific adaptions of the shoulder girdle in elite adolescent tennis players. Journal of Athletic Training, 2014. 49(5): p. 647-653.

[3] Tytherleigh-Strong, G., A. et al. Rotator cuff disease. Current Opinion in Rheumatology, 2001. 13(2): p. 135-145.

[4] Cools, A.M.J., et al. Eccentric and isometric shoulder rotator cuff strength testing using a hand-held dynamometer: reference values for overhead athletes. Knee Surgery, Sports Traumatology, Arthroscopy, 2016. 24(12): p. 3838-3847.

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ENDNOTES

[8] Yamamoto, A., et al. Prevalence and risk factors of a rotator cuff tear in the general population. Journal of Shoulder and Elbow Surgery, 2010. 19(1): p. 116-120.

[9] Ashworth, B., et al., The Athletic Shoulder (ASH) test: reliability of a novel upper body isometric strength test in elite rugby players. British Medical Journal Open Sport and Exercise Medicine, 2018. 4(1): p. e000365.

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[11] Stone, C.A., et al., Hand-held dynamometry: tester strength is paramount, even in frail populations. Journal of Rehabilitation Medicine, 2011. 43(9): p. 808-811.

[12] Coinceicao, A., et al., Assessment of isometric strength of the shoulder rotators in swimmers using a handheld dynamometer: a reliability study. Acta of Bioengineering and Biomechanics, 2018. 20(4):113-119.

[13] Cools, A.M., T. et al. Age-related, sport-specific adaptions of the shoulder girdle in elite adolescent tennis players. Journal of Athletic Training. 2014;49(5): 647-653.

ENDNOTES

[14] Cools, A.M.J., et al., Eccentric and isometric shoulder rotator cuff strength testing using a hand-held dynamometer: reference values for overhead athletes. Knee Surgery, Sports Traumatology, Arthroscopy, 2016. 24(12): p. 3838-3847.

[15] Job III, Trey DW., et al., Relationship of shoulder internal and external rotation peak force and rate of force development to throwing velocity in high school and collegiate pitchers. Journal of Biomechanics, 176, 112339.