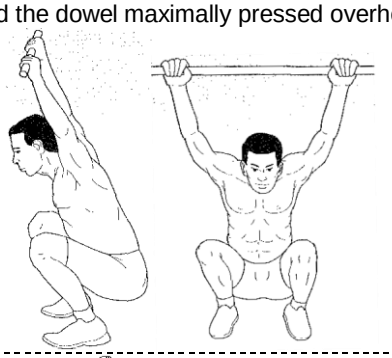
Functional Movement Screen (Cook, 2001)

TEST 1 DEEP SQUAT

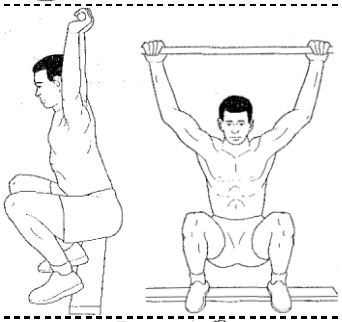
Purpose - The Deep Squat is used to assess bilateral, symmetrical, mobility of the hips, knees, and ankles. The dowel held overhead assesses bilateral, symmetrical mobility of the shoulders as well as the thoracic spine.

Description - The individual assumes the starting position by placing his/her shoulder width apart. The individual then adjusts their hands on the dowel to assume a 90-degree angle of the elbows with the dowel overhead. Next, the dowel is pressed overhead with the shoulders flexed and abducted, and the elbows extended. The athlete is then instructed to descend slowly into a squat position. As many as 3 repetitions should be performed. The squat position should be assumed with the heels on the floor, head and chest facing forward, and the dowel maximally pressed overhead.



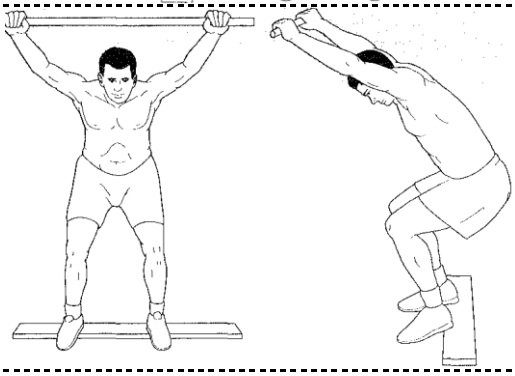
3 Points

- Upper torso is parallel with tibia or toward vertical
- Femur is below horizontal
- Knees are aligned over feet
- Dowel is aligned over feet



2 Points

- Upper torso is parallel with tibia or toward vertical
- Femur is below horizontal
- Knees are not aligned over feet
- Dowel is aligned over feet



1 Point

- Upper torso is not parallel with tibia
- Femur is not below horizontal
- Knees are not aligned over feet
- Lumbar flexion is noted

0 Points

- Pain is associated with any part of the test.
- Sports Medicine follow up.

Clinical Implications for Deep Squat

The ability to perform the Deep Squat requires closed-kinetic chain dorsi-flexion of the ankles, flexion of the knees and hips, extension of the thoracic spine, as well as flexion and abduction of the shoulders.

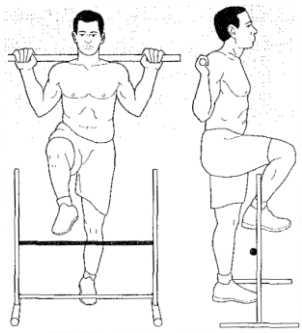
Poor performance of this test can be the result of several factors. Limited mobility in the upper torso can be attributed to poor glenohumeral and/or thoracic spine mobility. Limited mobility in the lower extremity including poor closed-kinetic chain dorsi-flexion of the ankle and/or poor flexion of the hip may also cause poor test performance.

When an athlete achieves a score less than **3**, the limiting factor must be identified.

TEST 2 HURDLE STEP

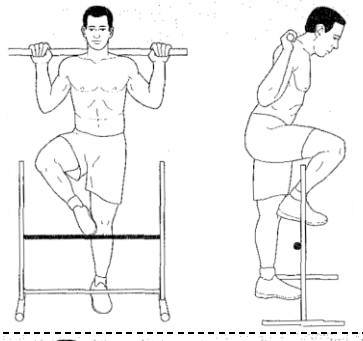
Purpose - The Hurdle Step is used to assess bilateral mobility and stability of the hips, knees, and ankles.

Description - The individual assumes the starting position by placing his/her feet shoulder width apart. The hurdle is then adjusted to the height of the athlete's tibial tuberosity. The dowel is positioned across the athlete's shoulders below their neck. The individual then aligns their toes directly beneath the hurdle. The athlete is then asked to step over the hurdle and touch the heel while maintaining his/her stance leg in an extended position. Finally, the athlete is instructed to return to the starting position. The Hurdle Step should be performed slowly and as many as 3 times bilaterally. If one repetition is completed bilaterally meeting the below criteria a **3** is given.



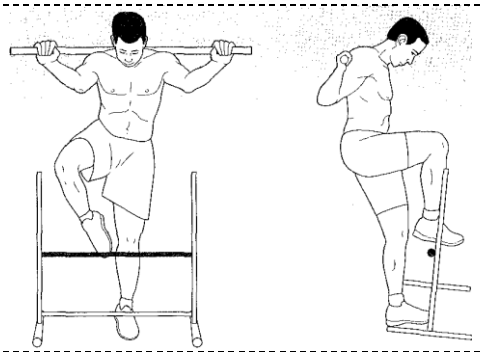
3 Points

- Hips, knees and ankles remain aligned in the sagittal plane.
- Minimal to no movement noted in lumbar spine.
- Dowel and hurdle remain parallel.



2 Points

- Hip, knee and ankle alignment lost.
- Movement noted in lumbar spine.
- Dowel and hurdle do not remain parallel.



1 Point

- Contact between foot and hurdle occurs.
- Loss of balance is noted.

0 Points

- Pain is associated with any part of the test.
- Sports Medicine follow up.

Clinical Implications for Hurdle Step

The ability to perform the Hurdle Step test requires both stance leg stability of the ankle, knee, and hip as well as maximal closed-kinetic chain extension of the hip. The Hurdle Step also requires leg open-kinetic chain dorsi-flexion of the ankle and flexion of the knee and hip. The athlete must also display adequate single leg stance balance during this test.

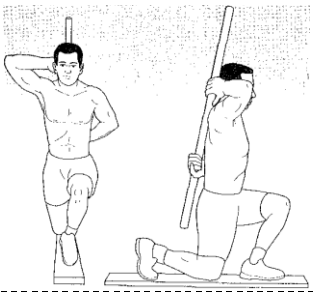
Poor performance of this test can be the result of several factors. It may simply be due to poor stability of the stance leg or poor mobility of the step leg. However, imposing maximal hip flexion of one leg while maintaining apparent hip extension of the opposite leg requires the athlete to demonstrate relative, asymmetric hip mobility.

When an athlete achieves a score less than **3**, the limiting factor must be identified.

TEST 3 IN-LINE LUNGE

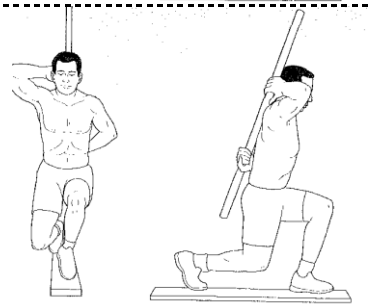
Purpose - The In-Line Lunge is used to assess bilateral mobility and stability, as well as ankle and knee stability.

Description - The tester measures the individual's tibial length with a tape measure. The athlete then places one foot on the end of the 2" x 6" board. The athlete places the dowel behind their back touching the head, thoracic spine, and sacrum. The hand ipsi-lateral to the back foot should be the hand grasping the top of the dowel; the contra-lateral hand grasps the bottom. The tester then measures the tibial length from the end of the individual's toes and a mark is made on the board. The athlete is then asked to take a step and place their heel on the mark. The athlete then lowers their back knee enough to touch the board behind the front foot. The feet should be on the same line and pointing straight throughout the movement. The lunge is performed up to three times bilaterally in a slow controlled fashion. If one repetition is completed successfully then a three is given.



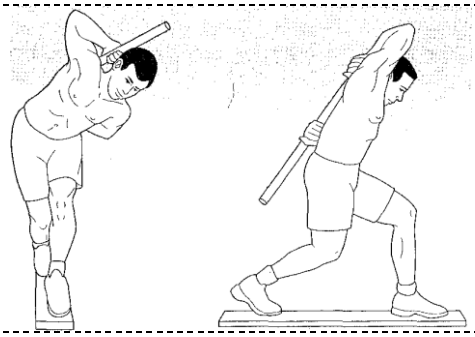
3 Points

- Minimal to no torso movement is noted.
- Feet remain parallel in sagittal plane on board.
- Knee touches board behind heel of front foot.



2 Points

- Torso movement is noted.
- Feet do not remain parallel in sagittal plane.
- Knee does not touch board behind heel of front foot.



1 Point

- Loss of balance is noted.

0 Points

- Pain is associated with any part of the test.
- Sports Medicine follow up.

Clinical Implications for In-Line Lunge

The ability to perform the In-Line Lunge test requires stance leg stability of the ankle, knee, and hip as well as closed-kinetic chain hip abduction. The In-Line Lunge also requires step leg mobility of the hip adduction and ankle dorsi-flexion. The athlete must also display adequate balance during this test.

Poor performance of this test can be the result of several factors. First of which is inadequate hip mobility of either the stance or step leg. Secondly, the stance leg knee or ankle may not have the required stability as the lunge is performed. Thirdly, an imbalance may be present between adductor weakness and abductor tightness about one or more hips. Finally, tightness of the rectus femoris on the stance leg may be the cause for poor performance.

When an athlete achieves a score less than **3**, the limiting factor must be identified.

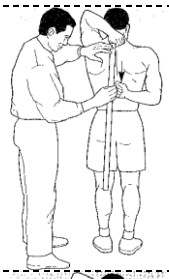
TEST 4 SHOULDER MOBILITY

Purpose - The Shoulder Mobility test is used to assess bilateral shoulder range of motion combining internal rotation with adduction and external rotation with abduction.

Description - The tester first determines the athlete's hand length by measuring the distance from the distal wrist crease to the tip of the third digit. The athlete is instructed to make a fist with each hand, placing the thumb inside the fist. They are then asked to assume a maximally adducted and internally rotated position with one shoulder, and a maximally abducted and externally rotated position with the other. During the test the hands should remain in a fist and they should be placed on the back in one smooth motion. The tester then measures the distance between the two fists. Perform the Shoulder Mobility test as many as 3 times bilaterally.

3 Points

- Fists are within one hand length.

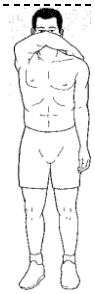


2 Points

- Fists are within one and a half hand lengths.

1 Point

- Fists are not within one and a half hand lengths.



** A shoulder stability screen should be performed even if the athlete scores a **3**. The athlete places his/her hand on the opposite shoulder and then attempts to point the elbow upward. If there is pain associated with this movement, a score of **0** is given. It is recommended that a thorough evaluation of the shoulder be done. This screen should be performed bilaterally. If the athlete does receive a score of **0** both scores should be documented for future reference.*

Clinical Implications for Shoulder Mobility

The ability to perform the Shoulder Mobility test requires shoulder mobility in a combination of motions including abduction/external rotation and adduction/internal rotation.

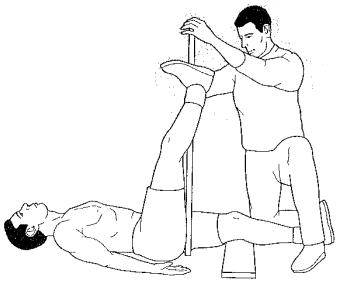
Poor performance of this test can be the result of several factors. One of which is the widely accepted factor that increased external rotation is gained at the expense of internal rotation in overhead throwing athletes. There can also be postural changes of forward or rounded shoulders caused by excessive development and shortening of the pectoralis minor and/or latissimus dorsi muscles. Finally a scapulothoracic dysfunction may be present resulting in decreased glenohumeral mobility.

When an athlete achieves a score less than **3**, the limiting factor must be identified.

TEST 5 ACTIVE STRAIGHT LEG RAISE

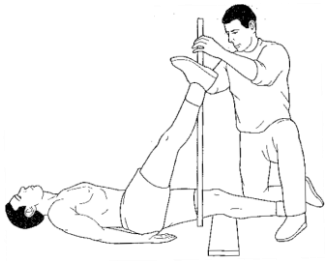
Purpose - The Active Straight Leg Raise test is used to assess active hamstring and gastroc/soleus flexibility, while maintaining a stable pelvis.

Description - The individual first assumes the starting position by lying supine with his/her arms at their sides, palms up and head flat on the floor. The 2" x 6" is placed under the knees of the athlete. The tester then identifies the athlete's anterior superior iliac spine (ASIS) and mid-point of the patella. Next, the athlete is instructed to lift the test leg with a dorsi-flexed ankle and an extended knee. During the test the opposite knee should remain in contact with the 2" x 6" and head should remain flat on the floor. Once the athlete has achieved their end range position, a dowel is aligned along the medial malleolus of the test leg, perpendicular to the floor. The Active Straight Leg Raise test should be performed as many as 3 times bilaterally.



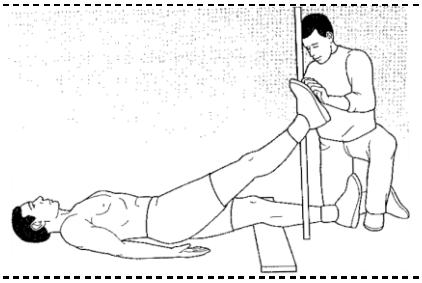
3 Points

- Dowel resides between mid thigh and ASIS.



2 Points

- Dowel resides between mid thigh and the joint line.



1 Point

- Dowel resides below the joint line.

0 Points

- Pain is associated with any part of the test.
- Sports Medicine follow up.

Clinical Implications for Active Straight Leg Raise

The ability to perform the Active Straight Leg Raise test requires functional hamstring flexibility. This flexibility is the true flexibility an athlete has available during training and competition, as opposed to passive flexibility, which is most often assessed. The athlete is also required to demonstrate adequate passive iliopsoas flexibility of the opposite leg as well as lower abdominal stability.

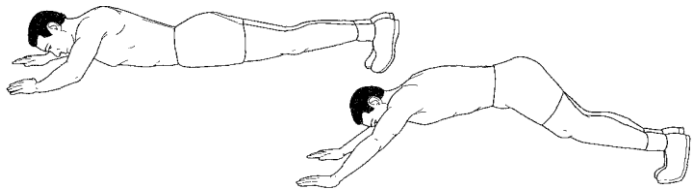
Poor performance during this test can be the result of several factors. First, the athlete may have poor functional hamstring flexibility. Secondly, inadequate passive mobility of the opposite hip may be the result of iliopsoas tightness associated with an anterior tilted pelvis. If this limitation is gross, true active hamstring flexibility will not be realized. A combination of both these factors will demonstrate an athlete's relative bilateral, asymmetric hip mobility. This is similar to the relative hip mobility revealed by the Hurdle Step, however, this test is more specific to the limitations imposed by the muscles of the hamstrings and the iliopsoas.

When an athlete achieves a score less than **3**, the limiting factor must be identified.

TEST 6 TRUNK STABILITY PUSH-UP

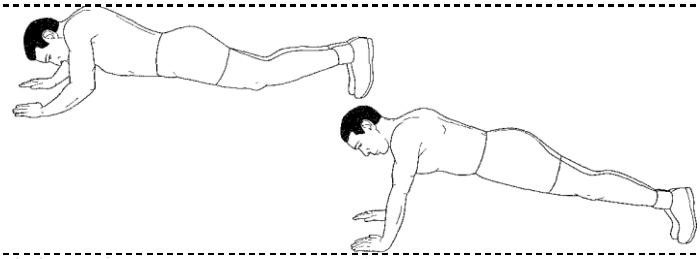
Purpose - The Trunk Stability Push-Up is used to assess trunk stability in the sagittal plane while a symmetrical upper extremity motion is performed.

Description - The individual assumes a prone position. The hands are then placed shoulder width apart at the appropriate position per the below criteria, knees fully extended. The individual is asked to perform one push-up in this position. The body should be lifted as a unit; there should be no "lag" in the lumbar spine when performing this push-up. If the individual cannot perform a push-up in this position, the hands are lowered to the appropriate position per the below criteria, and a push-up is performed. The Trunk Stability Push-Up can be performed as many as 3 times.



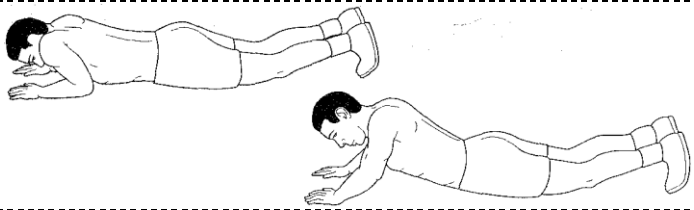
3 Points

- Males perform one repetition with thumbs aligned with top of head.
- Females perform one repetition with thumbs aligned with the chin.



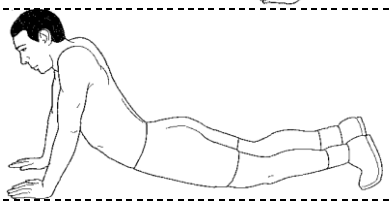
2 Points

- Males perform one repetition with thumbs aligned with top of head.
- Females perform one repetition with thumbs aligned with the chin.



1 Point

- Males are unable to perform one repetition in modified position.
- Females are unable to perform one repetition in modified position.



** Lumbar extension should also be cleared after this test, even if a score of **3** is given. Spinal extension can be cleared by performing a press-up in the push-up position. If there is pain associated with this motion, a **0** is given and a more thorough evaluation should be performed*

0 Points

- Pain is associated with any part of the test.
- Sports Medicine follow up.

Clinical Implications for Trunk Stability Push-Up

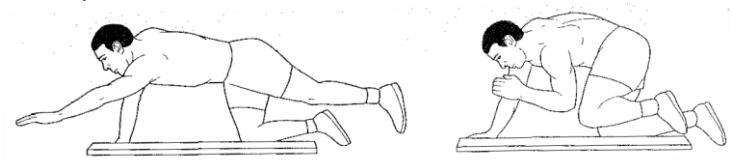
The ability to perform the Trunk Stability Push-up requires symmetric trunk stability in the sagittal plane during a symmetric upper extremity movement. Many functional activities in sport require the trunk stabilizers to transfer force symmetrically from the upper extremities to the lower extremities and vice versa. Movements such as rebounding in basketball, overhead blocking in volleyball, or pass blocking in football are common examples of this type of energy transfer. If the trunk does not have adequate stability during these activities, kinetic energy will be dispersed, leading to poor functional performance as well as increased potential for micro-traumatic injury.

Poor performance during this test can be simply attributed to poor symmetric stability of the trunk stabilizers. When an athlete achieves a score less than **3,** the limiting factor must be identified.

TEST 7 ROTATIONAL STABILITY

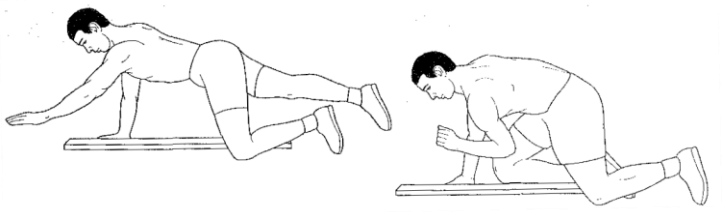
Purpose - The Rotational Stability test is used to assess multi-planar stability while a combined upper and lower extremity motion is performed.

Description - The individual assumes the starting position in quadruped with their shoulders and hips at 90 degrees relative to the upper torso. The knees are positioned at 90 degrees and the ankles should remain dorsi-flexed. The 2" x 6" is the placed between the knees and hands so they are in contact with the board. The individual then flexes the shoulder and extends the same side hip and knee. The leg and hand are only raised enough to clear the floor by approximately 6 inches. The elbow, hand, and knee that are lifted should all remain in line with the 2" x 6". The torso should also remain in the same plane as the 2" x 6". The same shoulder and knee are then flexed enough for the elbow and knee to touch. This is performed bilaterally for up to 3 repetitions.



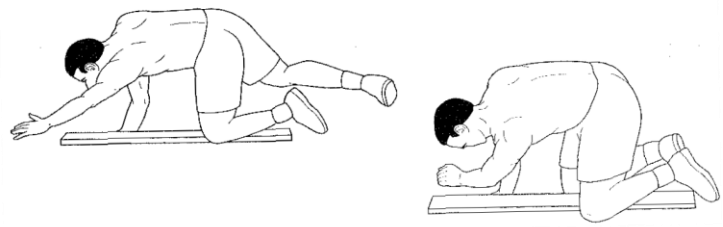
3 Points

- Athlete performs one correct repetition while keeping torso parallel to the board and elbow and knee in line with the board.



2 Points

- Athlete performs one correct diagonal flexion and extension lift while keeping torso parallel to board and floor.



1 Point

- Athlete unable to perform diagonal repetition.

** Lumbar flexion should also be cleared after this test, even if a score of **3** is given. Spinal flexion can be cleared by assuming a quadruped position, rocking back and taking the buttocks to the heels and the chest to the thighs. The hands should remain in front of the body, reaching out as far as possible; feet and toes should be plantar flexed. If there is pain associated with this motion, a **0** is given and a more thorough evaluation should be performed.*

0 Points

- Pain is associated with any part of the test.
- Sports Medicine follow up.

Clinical Implications For Rotational Stability

The ability to perform the Rotational Stability test requires asymmetric trunk stability in both sagittal and transverse planes during asymmetric upper and lower extremity movement. Many functional activities in sport require the trunk stabilizers to transfer force asymmetrically from the lower extremities to the upper extremities and vice versa. Running and accelerating out of a down stance in track and football are common examples of this type of energy transfer. If the trunk does not have adequate stability during these activities, kinetic energy will be dispersed, leading to poor performance as well as increased potential for micro-traumatic injury.

Poor performance during this test can be simply attributed to poor asymmetric stability of the trunk stabilizers. When an athlete achieves a score less than **3**, the limiting factor must be identified.

Reference

Cook, G. (2001) Baseline Sports-Fitness Testing. In: B. Foran, ed.*" High Performance Sports Conditioning".* Human Kinetics, Champaign.

Name	1	2	3	4	5	6	7	Total