Deep Squat Movement Pattern Test

Purpose

The deep squat pattern is part of many functional movement patterns. It demonstrates fully coordinated extremity mobility and core stability with the hips and shoulders functioning in symmetrical positions. Full deep squatting may not be used in normal daily life, general exercise and sport moves, however the basic components for the deep squat are required for active individuals. Extremity mobility, postural control, pelvic and core stability are components well represented in the deep squat movement pattern. The deep squat is a test that challenges total body mechanics and neuromuscular control when performed properly. The deep squat is used to challenge bilateral, symmetrical, functional mobility and stability of the hips, knees, and ankles. The dowel held overhead challenges bilateral, symmetrical mobility and stability of the shoulders, scapular region and the thoracic spine. The pelvis and core must establish stability and control throughout the entire movement to achieve the full pattern correctly.

Description

The individual assumes the starting position by placing his/her feet approximately shoulder width apart and the feet aligned in the sagittal plane. The inside of each foot is aligned with the outside of each. The individual then adjusts their hands on the dowel as it is balanced on top of the head. They are then instructed to assume a 90-degree angle of the elbows. Next, the dowel is pressed overhead with the shoulders flexed and abducted, and the elbows fully extended. The individual is then instructed to descend slowly into a squat position as deeply as possible. The squat position should be assumed with the heels on the floor, head and chest facing forward, and the dowel maximally pressed overhead. Knees should be aligned over the feet with no valgus collapse. As many as 3 repetitions may be performed, but if the initial movement fails with in the criteria there is no need to perform another test. If the criterion for a score of III is not achieved, the individual is then asked to perform the test with the FMS kit under the heels. All positions including the foot position should remain unchanged when the heels are elevated.

Tips for testing:

- When in doubt, score it low.
- Try not to interpret the score while testing.
- Make sure to view individual from the front and side.
Implications of the Deep Squat Movement Pattern Test

The ability to perform the Deep Squat requires an optimal body weight squatting pattern. It also requires closed-kinetic chain dorsiflexion of the ankles, flexion of the knees and hips, and extension of the thoracic spine, as well as flexion and abduction of the shoulders. The test also requires static and dynamic control of hip, pelvis, lumbar spine, and shoulder girdle. The test requires core stability in a symmetrical stance position.

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 by poor closed-kinetic chain dorsiflexion of the ankles or poor flexion of the knees and hips may also cause poor test performance as well. Individuals can also perform poorly as a result of poor stabilization and control.
Deep Squat Testing Procedure

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

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

I  
- Tibia and upper torso are not parallel  
- Femur is not below horizontal  
- Knees are not aligned over feet  
- Dowel is not aligned over feet

0 - The athlete will receive a score of zero if pain is associated with any portion of this test. A medical professional should perform a thorough evaluation of the painful area.
Deep Squat

Score of 3

Deep Squat Progression
(maintenance)

Medicine Ball Program
- Lateral Wall Drill
- Deep Squatting Overhead Bounce Pass
- Dead Lifting Progressions

Score of 2

Stretches
Recommended not mandatory

Corrective Exercises
If you do not have a toe touch, perform the Toe Touch progression until you achieve full toe touch and proceed to deep squat progression as above.

Self Stretches
- Wall Sit
- Wall Sit with Shoulder Press (or one arm press if 2 arm is not possible—do this for stretch mob score of 1)
- Dorsiflexion stretch
If you do have a toe touch, proceed to deep squat progression with a heel lift (same size as test, do not remove).
- Abduction Squat
- Overhead Squat with Weight Shift
- Anterior Weight Shift Squat

Score of 1

- Stick or Foam Roll Work

Partner Stretch
- Prone Quad Stretch (Perform Hamstring Curl and Contract/Relax)
- Standing Chop/Lift
Continue this program until a score of 2 is received on the deep squat test (with or without core board).
- Assisted Squat
Deep Squat Corrective Exercise Progressions

Partner Stretch
Prone Quadriceps Stretch

Starting Position- Lying prone with involved side on table and knee extended. The opposite foot is placed on the floor with the hip flexed in order to attain a neutral spine.

Execution at a Glance- The athlete actively flexes his/her knee until a slight stretch is felt in the quadriceps 5-7 times. The partner then places his/her hand on the anterior aspect of the lower leg passively flexing the knee until a stretch is felt. This is held 5-10 seconds. The athlete then extends the knee against slight resistance. This is repeated 3-5 times. Range of motion is increased with each repetition.

Safety Tips and Verbal Cuing- Maintain alignment with the lower extremity and torso. Take special note of right and left asymmetries, focusing on the weakness.
Standing Rectus Stretch

**Starting Position**- The athlete stands on one leg with the foot of the opposite leg resting on a bench or chair at approximately mid-thigh height so that the two thighs are side by side.

**Execution at a Glance**- Flatten the lower back by tilting the pelvis posterior. Flex the stance leg knee and lower to attain a stretch.

**Safety Tips and Verbal Cues**- Maintain an upright spine throughout the movement. Raise the height of the foot in order to increase the intensity of the stretch. Keep both thighs in line and adducted. Take special note of right and left asymmetries, focusing on the weakness.
Self-Stretches
Wall Sit with Dorsiflexion

Starting Position- Seated with the Lumbar Spine/S-I joint flat against a wall. Flex, externally rotate the hips and flex the knees, bringing the feet toward the torso, placing the bottoms of the feet together and ankles dorsiflexed.

Execution at a Glance- The position is maintained for approximately 5-10 minutes; pillows can be placed under the thighs and knees.

Safety Tips and Verbal Cues- Begin slowly and increase time when the person feels comfortable with the activity. Utilize pillows under the thighs and knees to decrease pressure on the knees and hips. Take special note of right and left asymmetries, focusing on the weakness.

Kneeling Dorsiflexion

Starting Position- Athlete assumes a half-kneeling position with feet wider than mid-line. The front foot should be in rotated medially. The hands placed on the dowel with the low back flattened and abdominals drawn inward. The dowel is placed along the lateral aspect of the foot.

Execution at a Glance- Shift forward, taking the front knee over the foot, but in line with the second toe. The heel should remain down.

Safety Tips and Verbal Cues- The stretch may be felt in the front of the ankle or to the rear of the ankle above the heel. To increase the intensity, lessen the distance between the two feet. Keep the heel down and foot in-line. Maintain a tall and erect spine. Take special note of right and left asymmetries, focusing on the weakness.