

Explanation of High Performance Movement Screen Evaluations

Test	What it evaluates	Why is it important?
<ul style="list-style-type: none"> • Y-Balance 	<p>Performance: ankle mobility, movement and “spring” Injury risk: soft tissue ankle injuries The Y-balance assesses ankle mobility in three directions: anterior (reaching directly in front), posteromedial (reaching behind and to the inside of the foot), and posterolateral (reaching behind and to the outside of the foot). Asymmetrical performance on these tests has been associated with an elevated risk of injury.</p>	<p>Boot stiffness is sometimes thought of as supporting more advanced skating technique and older/heavier athletes. However, when skaters become reliant on the boot stiffness, rather than enhancing ankle mobility and strength, issues can occur. Skaters often focus on increasingly stiff boots and overly-tight lacing (or even taping) the boot at the ankle, which perpetuates weakness and immobility. Evaluating mobility and symmetry helps identify if athletes would benefit from ankle strengthening and mobilization.</p>
<ul style="list-style-type: none"> • Single Leg Squat 	<p>Performance: alignment, carriage, force transmission through the kinetic chain in the lower extremities, jump landings Injury risk: acute and overuse injuries related to repeated or sub-optimal transmission of landing impact forces, ACL injury (less common in skating) The squat is a common assessment to visually examine lower extremity alignment during movement. This movement requires proper mobility and stability at the ankle, knee, hip, and trunk for optimal performance.</p>	<p>The single leg squat translates directly to figure skating movements from basic stroking to jump landings. Ability to correctly perform the single leg squat is positively associated with hip strength and ankle range of motion. Without sufficient hip strength to keep the knee in line with the toes, the knee collapses medially (toward the midline). This medial collapse increases risk of anterior knee pain. Additionally, when a skater lands with suboptimal mechanics, greater landing impact forces are transmitted upwards through the body, increasing risk of hip and low back injury.</p>
<ul style="list-style-type: none"> • Rotary Stability 	<p>Performance: ability to stabilize the body in all skating movements Injury risk: acute and overuse injuries related to sub-optimal force transmission The rotary stability movement pattern tests the coordination and stability in the rotational plane, which requires contribution of the muscles of the pelvis, abdominals, shoulders, and spine.</p>	<p>This movement pattern has direct correlation to various figure skating skills and helps identify skaters who lack coordination and/or stability in the transverse plane. Increased rotary stability will support technically correct jump performance, from takeoff to rotation to landing. Furthermore, individuals tend to increase abdominal activation when fatigued, relying on core endurance to maintain posture and stability.</p>
<ul style="list-style-type: none"> • Thomas Test 	<p>Performance: anterior and posterior hip movement Injury risk: hip overuse injuries including impingement and labral injury Identifies tightness and asymmetric movement in the hip flexors</p>	<p>Hip impingement, caused by chronic anterior hip tightness and sometimes acutely by a blow to the anterior hip (commonly referred to as a “hip pointer”), puts the skater at increased risk for pain, decreased mobility, and in advanced cases, labral tear. Hip tightness arises from failure to routinely train hip mobility, overuse, and repeated landing impact. Once hip tightness is chronic, demanding positions, such as the Biellmann spin, can place abnormal stresses on these tissues further increasing injury risk.</p>
<ul style="list-style-type: none"> • Shoulder Mobility 	<p>Performance: check and “snap” in jumping; holds and lifting in pairs, dance and synchro Injury risk: impingement, symmetry and structural stability Mobility in abduction, adduction, internal and external rotation of the shoulder</p>	<p>Testing shoulder mobility is important for pair skaters and ice dancers who are expected to complete demanding lifts, and for singles skaters moving from checked to rotational back to checked positions with quickness and force. Lack of mobility in the shoulders may also result in increased involvement of the spine muscles.</p>
<ul style="list-style-type: none"> • BESS 	<p>Performance: proprioception and balance Injury risk: concussion baseline The Balance Error Scoring System (BESS) is an established test to quantify balance. This test serves as a straightforward way to create a performance-based concussion baseline. Completing a BESS provides information for clinicians evaluating return to play progress following concussion or suspected concussion.</p>	<p>A concussion is a potentially serious brain injury and should be treated as such. While not every blow to the head <i>is</i> a concussion, and every fall on the butt is <i>not</i> a concussion, when a skater sustains a concussion or suspected concussion, it is up to a qualified sports medicine provider to work with athlete, coach, etc. to create an appropriate return to play plan taking into account the unique movements and forces in skating. The scores from the BESS can provide some insight to a medical care provider in determining if an athlete is appropriately recovering from concussion.</p>