

EQUICISION

Understanding “The Core” of Athletic Performance

Equestrian athletes understand a strong “Core” is critical to maximize seat stability and overall riding performance. Unfortunately many incomplete definitions of what the “core” really is and how it relates performance **prevents** the equestrian athlete from maximizing strength and function of what is really *a system*.

This excerpt from an article by Wilkerson in *The Journal of Athletic Training* 2012;47(3):264–272, offers excellent insight into what the Core is and what can affect it. References are inset for those wishing more information:

Quote: In recent years, the concept of core stability has been advocated as an important consideration for maintaining dynamic joint stability throughout the kinetic chain that extends from the foot to the lumbar spine.^{12–18} The core has been defined as the lumbopelvic-hip complex, which is composed of the lumbar vertebrae, pelvis, and hip joints and the active and passive structures that either produce or restrict movements of these segments.¹⁹ Core stability has been defined as “the ability to control the position and motion of the trunk over the pelvis and leg to allow optimum production, transfer, and control of force and motion to the terminal segment in integrated kinetic chain activities.”¹⁷(p190). The abdominal, paraspinal, and gluteal muscles are the focus of core stability training programs, which are believed to enhance performance capabilities and reduce injury risk.²⁰ Poor core stability could be either the cause or the result of low back dysfunction.^{22–24} Furthermore, weakness and alteration of neuromuscular activation patterns in the lumbopelvic-hip complex and the lower extremity have been documented in patients with joint injuries that are distant from the affected musculature.^{25–30} The injury-related neural effect on muscle activation can apparently occur in either a distal-to-proximal or proximal-to-distal direction. Lower extremity dysfunction increases susceptibility to low back injury,³¹ and susceptibility to lower extremity injury appears to be increased by low back dysfunction.^{30,32–34} A history of low back injury at the beginning of a sport season has been reported to present a 6-fold increase in the risk for sustaining another low back injury during participation in collegiate sports.³⁵ Traditional strength training may be inadequate for optimal development of neuromuscular control of the core,²³ and rapid fatigue of the core musculature appears to indicate poor core stability.^{36,37} Thus, the amount of time an individual can maintain a static body position that involves loading of the core musculature may be valuable for quantifying the risk for injury to either the core or the lower extremity. End Quote

What does this mean to the equestrian athlete from a functional perspective?

1. Stability of the core starts at the foot/stirrup interface.

Creating the most stable base for the lower extremity (and rest of the body) to function from involves a balanced foot position in the stirrup. The most balanced foot position is cavalry foot.

2. Rotating the lower leg inward, as reflected by pointing the toe forward, decreases the efficiency of lower extremity mechanics. This posture promotes knee pinching and bias's the use of the thigh over the calf when utilizing the leg aid.

3. With little exception, spinal arthritis and pain are part and parcel of riding. Equestrian athletes utilize a wide array of postures to compensate for this problem and maintain use of the seat aid; unfortunately, they only temporarily address the problem and in fact feed into the pain/dysfunction cycle all spinal arthritis patients must manage.

4. Weight/Resistance training is NOT utilized as much as other methods of strength training such as yoga. This is unfortunate as weight/resistance training is necessary to maximize core function.

5. The quality of the rein aid is influenced by Core's capacity to transmit the stability generated at the foot out to the hand.

Testing Core Strength:

Professionals utilize many tests by to determine core strength. Fortunately, there are several that can be performed at home. Please remember your performance on these tests provides only an overview of your strength (or weakness) and not necessarily how that strength (or weakness) translates during activity. A modified test position is noted to accommodate for injury. If the test can't be performed in the modified position, please consult your local fitness or sports medicine professional for advice. Use a stopwatch to keep time. Unless otherwise stated, 30 seconds is considered normal. Test both sides where appropriate.

1. Side plank in knee/elbow position for abductors/lateral torso stability and static shoulder strength
 - Top leg out straight for both positions
 - Bottom leg hip straight and 30 degrees of flexion
 - Torso parallel to ground and over the shoulder
 - Shoulder/upper arm in line, elbow 90 degrees, forearm flat on floor
 - Shoulder hip and knee in straight line
 - Top arm rest on body
 - Stop Criteria
 - a. Torso rotates forward/backward over shoulder
 - b. Hip Flexes
 - c. Torso drops below parallel
 - d. Onset of shoulder or back pain
 - e. Top leg drops below parallel

2. *Front Plank in Push-up Position for anterior torso stabilizers, hip flexors and shoulder complex.
 - Head, shoulder, hip, knee ankle straight line-Eyes in neutral position
 - Stop Criteria
 - a. Onset pain in any joint
 - b. Head dropping/looking down
 - c. Hip extension/dropping/flexing
 - d. Elbows bending
 - e. Shoulder blades popping off back

*Can go on elbow if wrist/forearm a problem.

3. Sorensen Test for Hip and Spinal Extensors
 - Lay face down on a padded bench and use a strap to hold down the lower leg and pelvis
 - Have a second bench in front in case of emergency.
 - Use a clock or stopwatch to keep time
 - Arms folded at chest
 - Lift and hold
 - Normal Criteria in Seconds (Normal/Prior LBP/Active LBP)
 - a. Male (198/176/163)
 - b. Female (197/210/177)
 - Stop Criteria
 - a. Onset of or increase in back pain
 - b. Torso dips below 10 degrees off parallel
 - c. Failure to achieve parallel torso
 - d. Arms move off chest

4. Bilateral single leg heel raise test in straight and bent knee position
 - Lundsford
 - Set metronome for 60 beats per minute. Warm up for 60 seconds by stepping up and down on a 4-inch high platform. When ready, place both feet on the platform. Place the hand opposite the leg being tested on the rail for support (R. hand L. Foot). Flex the hip and knee on the same side as the support hand 45 degrees, holding the foot off the floor, and keeping the knee locked straight, perform a straight knee heel raise until told to or voluntarily stop. Then rests 3 minutes, and then repeats the process with the test knee and torso forward flexed 20-30 degrees. Normal is 25 reps.
 - Stop Criteria
 - a. Failure to keep pace
 - b. Loss of 50 percent heel height
 - c. Pushing down with stability hand
 - d. Falling around leg (Torso Twist)
 - e. Bringing up other hand
 - f. Failure to hold knee in start position

“The Test Becomes the Exercise” – What to do if you don’t perform the test to established norms; the above battery of tests can also be used as a Core strengthening program.

Conclusion:

Maximizing Core strength and function and hence riding stability involves a deeper understanding of many components and how they work together. This article presents a basic albeit complete over view of what the core is and a way to test its strength at home.

Please contact Equicision if you have questions or are interested on how it can help you maximizing your Core strength, function and riding stability.

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