Unstable Surface Training for Hockey: Valuable Addition or Waste of Time?

By: Eric Cressey, MA, CSCS

Originally, unstable surface training (UST) was utilized almost exclusively in rehabilitation programs; however, in recent years, unstable surface training's popularity has dramatically increased in both strength and conditioning and general exercise scenarios. With this rapid growth in popularity has arisen a great need for scientific evidence to validate or refute its use. Although unstable surface training has proven valuable in clinical settings (most notably the rehabilitation of functional ankle instability), little research has been performed to determine if positive effects can also be noted in healthy populations in athletic contexts.

In spite of this lack of concrete date to support or refute the use of unstable surface training, several companies have capitalized on this trend by marketing dozens of UST products. Additionally, numerous prominent strength and conditioning professionals have promoted this training initiative as a useful means of improving athletic performance. As you're surely aware as a hockey enthusiast, unstable surface training has become a new "flavor of the week" in the off-ice hockey training realm.

My original research – which was published in the *Journal of Strength and Conditioning Research* in 2007 – demonstrated that replacing as little as 2-3% of total training volume with unstable surface training interfered with improvements in peak power, sprinting speed, and agility in soccer players. However, UST for hockey remains a bit of a conundrum, as the blade of a hockey skate on ice is certainly different than a regular foot and sneaker on a flat surface.

Fortunately, there is some research to which we can turn. In 2005, Behm et al. (1) examined the correlation between hockey skating speed and performance on a 30-second wobble board (an unstable surface) test. Interestingly, they found a significant correlation in players under the age of 19. However, no such correlation existed with players age 19 and older. So, how does this occur?

Here's an analogy: go to a little league park, and find the kids who have the best fastball velocity. Chances are that they are also the kids who run the fastest, jump the highest, do the most chin-ups – or dominate any other physical test that you throw at them. Very simply, this difference can easily be attributed to different levels of motor development in young skaters. Heck, with just a quick internet search for "youth hockey," I came across this picture.

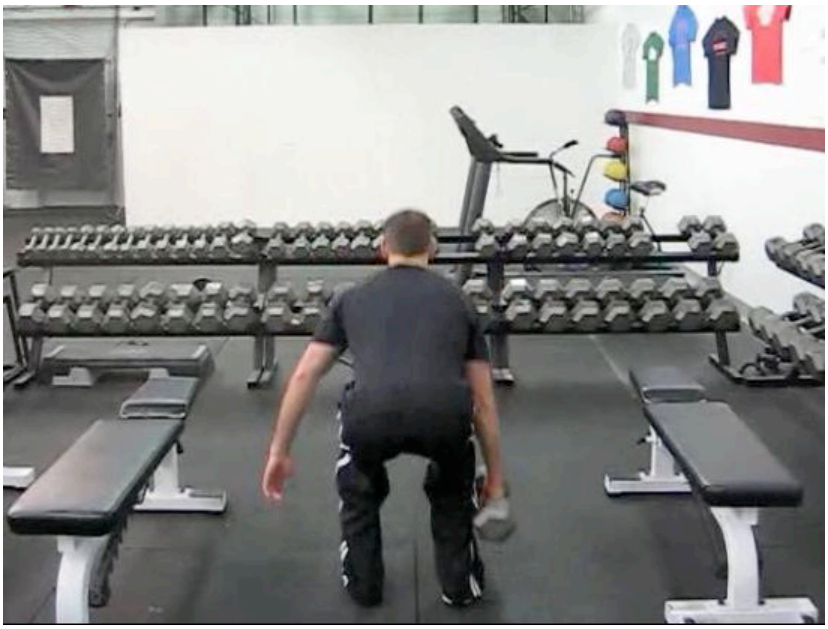
You'll notice that the physical development is markedly different across the board. In fact, the 6-4, 230-pound goalie probably drove all the other 11-year-olds to the game, taught them how to shave, and then hit on all the hockey moms after the game at the local bar!

Moving back to the aforementioned Behm et al. study, the researchers noted, "The complex skills associated with skating would necessitate a more refined balance that would improve with maturity and perhaps training. Since skating is performed on a very small surface area (blade) in contact with a low friction surface, younger individuals with greater stability may have an advantage in executing the specific skating skills" (1).

So, in reality, we're comparing physical development and not necessarily performance on a specific test – until we level the playing field and physical maturity is roughly equal for everyone (after the age of 18). At that point, according to the same research, you *don't* see a correlation, so I'd be very reluctant to endorse lower-body unstable surface training as a useful training implement for hockey outside of specific rehabilitation situations.

And, I'm not just hesitant to endorse UST for hockey because it doesn't seem to correlate with performance; I'm also reluctant to back it because it simply isn't specific to the sport. In just about every sport you watch, you'll see destabilizing torques. Maybe it's a running back trying to fend off a tackler; his feet are fixed while the destabilizing torque (the force applied to his body by that tackler) occurs further up the kinetic chain.

Or, maybe it's an athlete doing a suitcase deadlift. The load in his hand is a destabilizing torque that attempts to shift him into lateral flexion as opposite side's core musculature fires to keep him erect. Again, the feet are on stable ground.



You're probably getting my point by now. Our lower extremities operate in predominantly closed-chain motion on stable surfaces in the real world – and the destabilizing torques we encounter further up the kinetic chain are truly functional instability training.

Conversely, when was the last time you saw the ground move on a fixed athlete? Never.

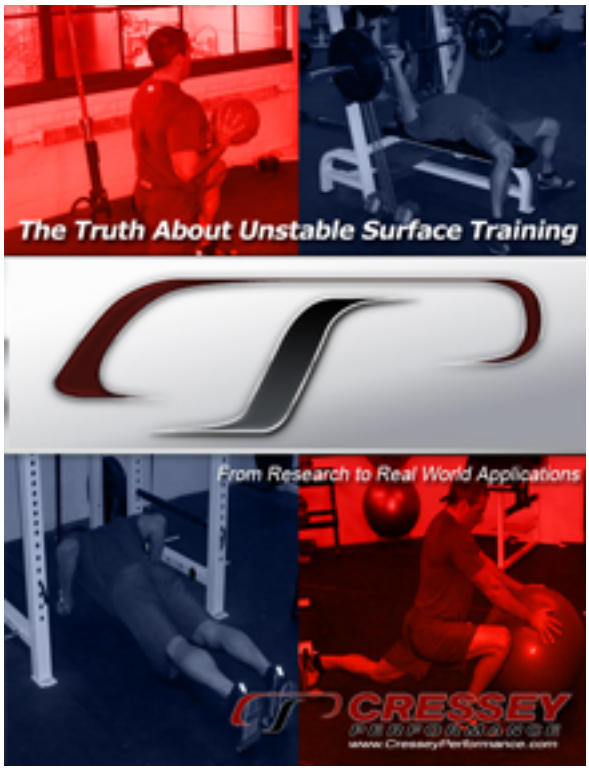
With that in mind, we simply can't accept unstable surface training in the lower extremity for hockey players. We know it has merit in the rehabilitation of functional ankle instability, but to assume that benefits would also be conferred on a healthy population is a dangerous.

Also, to take this a step further, the truth is that nobody has really verified the incremental benefit of such training in healthy ankles (no previous history of injury) with a truly functional outcome measure.

The long-term studies examining the issue have been poorly controlled in the sense that they've looked at ankle sprains over the course of an extended period of time with an unstable surface training intervention, but haven't taken into account previous history of injury. So, the athletes engaged in the unstable surface training group may simply have been rehabilitating previous ankle injuries with longstanding functional deficits rather than "fortifying" already healthy ankles to prevent injuries. Interestingly, in one study of elite female soccer players, balance board training did not decrease the rate of traumatic lower extremity injuries. The frequency of major injuries – including four of five anterior cruciate ligament tears – was actually *higher* in the intervention (unstable surface training) group than the control group (2).

The take home messages? If you're a healthy athletes and you're going to incorporate unstable surface training, make sure it's with upper body exercises exclusively.

For a much more detailed background on the topic – along with detailed progressions for functional instability training – check out my e-book, **The Truth About Unstable Surface Training**.



References

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2. Soderman, K, Werner, S, Pietila, K, Engstrong, B, and Andredson, H. Balance board training: prevention of traumatic injuries of the lower extremities in female soccer players: a prospective randomized intervention study. Knee Surg Sports Traumatol Arthrosc. 8(6):356-63. 2000.

About Eric Cressey

Eric Cressey, MA, CSCS is president and co-founder of Cressey Performance, a facility located just west of Boston, MA. A highly sought-after coach for healthy and injured athletes alike, Eric has helped athletes at all levels - from youth sports to the professional and Olympic ranks - achieve their highest levels of performance in a variety of sports. Behind Eric's expertise, Cressey Performance has rapidly established itself as a go-to high performance facility among Boston athletes - and those that come from across the country and abroad to experience CP's cutting-edge methods. Eric is perhaps best known for his extensive work with baseball players.

Cressey received his Master's Degree in Kinesiology with a concentration in Exercise Science through the University of Connecticut Department of Kinesiology, the #1 ranked kinesiology graduate program in the nation. At UCONN, Eric was involved in varsity strength and conditioning and research in the human performance laboratory.

Eric holds several state, national, and world powerlifting records. Formerly a mainstay in the *Powerlifting USA* Top 100 lifts the 165-pound weight class, Cressey has competition bests of 540 squat, 402 bench, 650 deadlift, and 1532 total. He is a coach who can jump, sprint, and lift alongside his best athletes to push them to higher levels - and keep them healthy in the process.

An accomplished author, Cressey has authored hundreds of articles, five books and co-created four DVD sets that have been sold in over 50 countries around the world. Eric's writing and his work with athletes have been featured in such local and national publications as *Men's Health, Men's Fitness, ESPN, Yahoo Sports, NESN, T-Muscle, The Boston Globe, The Boston Herald, Baseball America, Perform Better, Oxygen, Experience Life, Triathlete Magazine, Collegiate Baseball, Active.com,* and *EliteFTS*. As a guest speaker, Eric has lectured in five countries and more than 20 U.S. states.

Cressey publishes a free daily blog and weekly newsletter at www.EricCressey.com.