

Gimmicks or Game Changers?

6/13/2017

The fitness and rehab world is full of toys, tools and techniques that promise faster, stronger and out of pain. There is always a new _____ that every fitness pro or therapist NEEDS to have if they want the best for their clients. *enter some great marketing skills*

Some of these supposed game-changers are the plethora of unstable training surfaces that promise to make your core stronger, improve your 'functional strength' and decrease recovery time from a multitude of injuries. You will recognize these tools as thick foam pads, wooden platforms attached to a rounded base, and the cousin of this wood tool made of plastic and resembling half a large exercise ball. There are many, many, many more variations of these rehab/exercise tools. What they all have in common, is that they are often used to treat conditions that just don't respond to these tools with the intended result. Do they have a place in some rehab and training goals? Absolutely, but it may not be what you think. In order to understand the role these tools CAN play in training and rehab, lets investigate the basics of balance and proprioception.

Balance & Proprioception: same same?

Balance relates to our ability to control our center of gravity. Proprioception involves "the central nervous system processing limb and trunk movements while balancing." This delineation is important, but is often not made. Here is why it is important.

When you train on an unstable surface, you are training balance NOT proprioception. In order to train proprioception you must be on a surface that stimulates the receptors sensitive to vibration. Lets look at the abbreviated physiology of proprioception for a second. We will discuss the feet since we are bipedal, and most applications for proprioceptive training involve standing.

The feet are primarily innervated by the tibial nerve, and the tibial nerve has way more branches associated with sensory information than motor. Since proprioception relies on sensory feedback, this must mean that the feet are pretty darn important. Of these sensory nerves, there are way more small vs. large nerves. What are small and large nerves? Small nerves respond very rapidly to movement, and thus play an important role in both proprioception and balance, while large nerves have a relatively slower response time. The key here is that small nerves are sensitive to VIBRATION. "Many of the unstable surfaces we associate with proprioceptive training are actually examples of large nerve (or slower) proprioceptive training." This is usually because these tools dampen vibration, and therefore don't allow small nerve receptors to play a role in the intervention.

A Little Research

In 2007, a paper called "The effects of ten weeks of lower body unstable surface training on markers of athletic performance." was published in the Journal of Strength and Conditioning Research. This study compared the affect of unstable surface to stable surface training to improvements in jumping, and 40-yard sprint. The findings demonstrated that the unstable training group had no significant improvements in jumping, and actually got slower in the 40-yard run.

In 2000, a study looking at elite soccer players found that balance board training did not reduce lower limb injuries, and was actually associated with increased incidence of major injuries, like ACL tears.

What research has been able to demonstrate, is that training using unstable surfaces can improve performance in those who have had previous injuries related to balance and proprioception. BUT... and this is a BIG ONE... use of unstable surface training in HEALTHY athletes may actually have a negative effect on performance by training them to have slower response times. (Take a look at this article for some more info)⁵

What if I'm Not an Athlete?

Fair enough. Not all of us are NBA hopefuls (well hopeful maybe, but likely no). This still tells us that if the regular fit fam gym goer and weekend athlete wants to improve their performance and make sure they can continue to do what they love then they are better off just putting the time into the basics of solid strength and conditioning. Us regular folk likely do not have the allotted training time that an elite athlete does so why spend time doing drills that actually won't give us gainz?

In the rehab world, we need to reconsider WHY we are using a tool. Do we want to improve balance or proprioception? If the answer is both, then we must also include drills that allow our small nerves to be more sensitive to vibration since that is the only way to amp up this physiological mechanism. How do we do this? Get your clients off the cushy pads and wobbly wood things and get their BARE feet on the ground.

GET YOUR SHOES OFF WHEN YOU TRAIN, at least for some of your training. It only makes sense, especially for older populations who lose sensitivity to vibration through degeneration of small nerves. NO MORE SHOES IN GYMS! I may have a specific preference surrounding the use of footwear. Can you guess what it is? ;)

References

<http://www.ptonthenet.com/articles/Rethinking-proprioceptive-training-and-ankle-instability-3639>

<http://news.meyerdc.com/chiropractors/the-future-of-proprioceptive-training/>

Cressey, E. et al. The effects of ten weeks of lower-body unstable surface training on markers of athletic performance. *J Strength Cond Res.* 21(2):561-7. 2007.

Soderman, K. et al. 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.

<https://www.t-nation.com/training/bosu-ball-the-good-bad-and-ugly>