

The Case Against

Stability Training

Research is exposing many fallacies about the value of Swiss balls and other types of unstable exercise equipment



Elite athletes such as 2002 WPKA World Kickboxing Champion Mike Foley can stand on a Swiss ball, but for what purpose?

In one of his trips to Moscow, the late sports scientist Dr. Mel Siff visited the Sport Psychology Institute. Having done his master's thesis on brain waves, Siff was excited to find some of the most advanced and innovative medical equipment in the world for conducting brain research. When Siff asked why the Russians were so concerned with such research, he was told that during the Communist regime the Russian state felt it necessary to "process" dissidents by sending them to special institutions. "If you questioned Communism, the government figured that you had to be psychologically disturbed, neurotic or schizophrenic," says Siff.

Although probing rebellious brains may not seem to have much to do with throwing a baseball or improving your

blocking or tackling, neuroscience has much to offer the athlete. One example is using neuroscience research methods to determine the effectiveness of specific types of exercise. In this regard, one area of controversy in the field of strength training is the value of Swiss balls, rocker boards and other equipment athletes use in hopes of improving athletic ability.

One fact that cannot be denied is that the media love stability exercises. Watching an elite athlete trying to get an edge over the competition by performing Cirque du Soleil movements on a Swiss ball simply makes good TV much more exciting than watching power cleans and deep squats. And what modern gym would be complete without half-moon-shaped BOSU® balls, balance disks and rocker boards?

"If you want to train for stability, you have to train on unstable equipment," those who market this equipment will claim. But is this true?

The Science of Stability

Michael Jonathan Wahl is co-owner of Definitions Fitness Company and holds a master's in kinesiology science from Memorial University in Newfoundland. In his master's thesis, "The Effectiveness of Instability Resistance Training Devices for Training," Wahl took a different approach to most of the studies performed on instability exercises.

"A lot of the previous research out there on this subject, from squatting on disks to doing unilateral presses on Swiss balls, never used elite athletes,"

says Wahl. “The whole point of science is that you investigate specific things so you can use them for specific audiences. When you look at data from recreationally trained subjects, applying the data to elite athletes doesn’t make sense.”

In Wahl’s stability study, which was performed under the guidance of the School of Human Kinetics and Recreation at Memorial University, Wahl selected 16 athletes who were all competitive athletes who played at the college level or higher. A variety of sports were represented, including elite hockey players and a world-champion kickboxer. “We used the ACSM guidelines for exercise prescription, making certain that all the subjects were in the top 10 percentile for strength, for both upper body and lower body.” For objectivity, the exercise performance on the various apparatus used in the study was monitored by sophisticated computer analysis equipment, such as an electromyogram (EMG), which can precisely record electrical activity in muscles.

What Wahl discovered during the study was that the brain motor patterns exhibited in performing unstable exercises were exactly the same as those seen in performing exercises on a stable surface. Because the motor patterns are the same, the conclusion is that unstable

exercises would be inferior methods of training because they do not allow the exerciser to use as much resistance, and therefore develop comparable strength, as in conventional exercises.

“What you have to consider is that free-weight training is unstable by nature,” says Wahl. “Remember the first time you did a bench press and your arms went everywhere and you had trouble stabilizing your joints? Sure, a Swiss ball exercise can be taxing for someone who has never done any exercise before; but get a first-year physics student to explain the disrupted torque on the body that occurs when someone squats 500 pounds and you’ll see that the entire muscle system has to work tremendously hard to handle that type of weight. When an athlete turns their ankle, it’s often because they are not strong enough to handle the

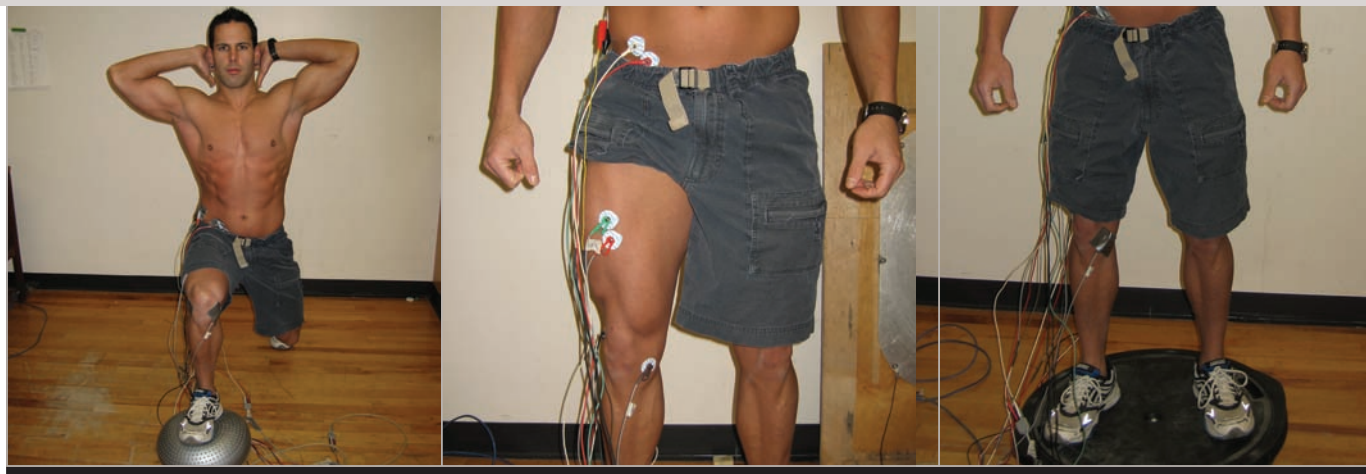
disrupted force of the activity, so why not train to get used to that excessive force using the principle of progressive resistance?”

You can easily make stability exercises harder, Wahl acknowledges, but that doesn’t mean it’s better. He cites the experience of a strength coach who had produced several popular videos on Swiss ball exercises and was demonstrating his proficiency at a seminar; the coach tried to stand on the ball and fell off and tore his ACL! “If this instructor, who was an elite athlete with a competitive background in Olympic lifting, cannot achieve stability on a ball, what makes a coach think the average high school kid can? It’s not safe.”

Another popular form of unstable exercise involves exercising on unstable platforms such as rocker boards and rubber disks full of air. They are often

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Coach Mike Wahl’s study on the value of unstable exercise used sophisticated computer analysis equipment that can precisely record electrical activity in muscles. Here Coach Wahl shows how two exercises were evaluated.



used to develop ankle stability and strength and therefore prevent injury. Dr. Siff, whose PhD was in exercise physiology and who had taught many graduate-level classes in biomechanics, said that the problem with these devices is that they do not duplicate the athlete's motion on the playing field. Wahl agrees.

"If any movement deviates 2.5 percent or more from the original motor program, the skills are not going to transfer," says Wahl. "Baseball players and javelin throwers both throw implements, but EMGs show that these movements are not similar, and therefore the skills from performing one of these activities does not transfer to the other." Likewise, balancing on a rocker board while juggling tennis balls might not necessarily improve your footwork in tennis, but it is certainly the best way to get better at balancing on a rocker board while juggling tennis balls!

Acceptable Risks?

It's possible you may not know anyone personally who has been injured on a Swiss ball; nevertheless, many such injuries do happen.

Dr. Marc Rabinoff, a full professor in the Department of Human Performance and Sport at Metro State College in Denver, Colorado, has been an expert witness in nearly 300 litigated cases involving fitness and sports training injuries. In one recent case, a clinically obese woman in her late 50s signed up for a weight-loss class at a hospital. The class used Swiss balls, and there were only two people in this class a 2-to-1 student-to-instructor ratio.

Says Dr. Rabinoff, "The instructor tells the woman to sit on the ball and has her do exercises in which she has to lift her legs off the floor to work her 'core.' Within the first five minutes the woman falls off the ball and breaks her

hip game over! My first question in the litigation was 'What was the point?'

"This woman has balance issues already and is extremely overweight, so we're going to put a product under her that makes it even more difficult for her to retain balance? How dumb can you be? Interestingly, the instructor's testimony was that the Swiss ball class is good for anyone in any condition for any exercise anytime. She could not conceive that someone might not benefit from the ball class."

As for the potential legal ramifications of Wahl's findings, Dr. Rabinoff says that such research could come up in a case in which someone has been injured while performing stability exercises. "If any athlete got hurt performing these unstable exercises and there is data to support that there is not much value in these exercises anyway, then in a court of law this question would be raised: Is this good practice for a weight training and conditioning coach?"

"The importance of good practice," continues Dr. Rabinoff, "unfortunately is overlooked by many sport-training practitioners eager to try new fads in exercise, and I am always amazed at how many claim to know the research. It's dangerous to not understand what each fad can and cannot do. In teaching our students many approaches to training and weight conditioning – because the truth is that 'one size does *not* fit all' – we must also make sure they know both the value and the risks in each approach. The fact is, many times the best exercises are simple free-weight exercises that have been around for more than 100 years."

While the jury may still be out about the value of unstable exercises, the scientific research suggests that this type of exercise has little practical value for an elite athlete and by its very nature these exercises have a high risk

Coach Wahl works with many elite athletes who agreed to participate in the study. Nationally-ranked Kenpo karate athlete Kyle Hickey is shown performing glute-ham raises while Reg Lawrence, ranked #3 in Canada for Tae Kwon Doe, demonstrates that he can just about jump on Coach Wahl's shoulders.



of injury. Today's athletes are bigger, faster and stronger, more so than ever before. And they get this way by not just training harder but by training *smarter*. **BS**