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The Truth on Fitness:
Developing Better Balance

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Balance training has become a staple of most exercise programs, and rightly so. Balance is an important component of daily function, and is also a key element in athletic skills. More importantly, balance becomes more precarious with aging, which increases one's susceptibility to falls and injuries.

When one thinks of balance training, one may first envision someone standing on a wobbling disk or air-filled rubber pillow, because these techniques have become vogue in current fitness practices. These moving and distorting objects are referred to, by researchers, as labile surfaces. In fact, it is a rare occasion indeed when one can walk into any gym and not see someone exercising atop a labile device.

The question that you might ask yourself is, "do I really need to stand on one of those things in order to improve my balance?" Well, maybe, but before we answer that, we should first understand how balance is controlled.

Balance control involves two functions. First, we must detect a change in body position (referred to as sway) that might disrupt balance. Then, we must produce some type of corrective action, involving force, which re-establishes a stable position. There are many systems in the body that contribute to balance control, but the legs may play the most prominent role. According to Butler and colleagues (2008), the muscles in the legs are the primary source of sensory information detecting sway, and the main producers of the force that corrects postural sway.

So, will exercising on an unstable surface improve balance by enhancing the legs' ability to sense postural changes and produce force? The answer is, only marginally.

Studies have shown that wobble boards and rubber cushions do improve the sensory function (proprioception) of the leg muscles (Mattacola and Lloyd; Myer, et al; Hoffman and Payne). But there is very little supporting evidence that these devices can help build the strength necessary for postural adjustments, especially when a lot of force is required.

Wahl and Behm (2008), for example, discovered that placing highly strength-trained subjects on a rubber ball did little to increase leg muscle activation. In fact, recent findings suggest that unstable devices account for 44% less muscle activity and 70% less muscle force output than stable surfaces (Behm, et al., 2002). How do these measures translate into performance in tasks requiring dynamic balance control?

Yaggie and Campbell (2006) discovered that while unstable balance training improved quiet standing on an inflated half-dome ball, it did not improve performance on a vertical jump or shuttle run, both of which required strength, power, and balance. Cressey and colleagues (2007), on the other hand, demonstrated that a group which was strengthened on stable surfaces, performed significantly better in athletic measures than a comparable group doing the same exercises on inflated rubber disks. The authors conclude that "using inflatable rubber disks attenuates performance improvements in athletes."

One could argue that not everyone is required to perform athletic skills. This is absolutely true. But the key variable is not athletic prowess, rather it is the strength required to execute those skills. After all, how many of us suddenly fall from a position of quiet standing? How often are we placed in a situation in which we must remain still while standing unsupported on one foot? The real challenges to our equilibrium occur when we're moving, whether it be walking, running, jumping, hopping, or leaping, or when our foot or ankle is suddenly perturbed when stepping off a curb or stepping in a hole. These are tasks that require significant strength and power in order to respond with the appropriate level of force.

It has been fairly well documented that muscle weakness and fatigue are significant contributors to postural instability (Horlings et al, 2008; Santos and Liu, 2008; Wilkins, et al, 2004). Butler and associates (2008) even suggest that muscle weakness leads to proprioceptive deficits, which in turn, promote instability. In other words, not only does a lack of strength affect one's ability to make postural corrections, it also influences one's ability to sense postural changes. But in reality, do we fall because we can't sense that we're falling, or do we fall because when we do sense it, we can't correct it?

So, how do we develop better balance? The truth is that the first step towards better balance control is strength development. Strong leg muscles will help to ensure that we can produce adequate force for both simple and complex movement skills. Practically any exercise, performed on a stable surface, will promote the kind of strength that can be applied to dynamic balance tasks. In fact, any exercise, including leg press, leg extension, or calf raise, which strengthens leg muscles, will ultimately contribute to dynamic postural control.

Does this mean that we should never exercise on unstable surfaces? No, because evidence suggests that a combination of stable and unstable conditioning will create the best overall results (Myer, et al., 2006). The key, however, is to apply these modalities in the right proportions. In their four-week training study, for instance, McKeon and colleagues (2008), demonstrated significant improvements in both static and dynamic balance control, using a combination of approximately 75% stable and 25% unstable exercises. This type of program will effectively build strength and sensory acuity.

So which modality should come first? The answer to that question should be obvious. Intelligent progression is the basis for any effective strength and conditioning program. Begin balance programs with fundamental strength-building exercises, such as leg press, squats, lunges, and calf raises. Next, progress to stable, single-limb stance challenges, eventually working towards hopping and leaping skills. Lastly, apply that new strength and power to tasks involving postural control on labile surfaces.

If we really want to make changes that last throughout our lifetimes, then we must dispense with trendy applications, and begin to understand, and apply, the scientific truths that influence human function. In this way, we'll all achieve better balance.

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