Balance Control:
A Critical Component of Sport

A breakthrough in science is helping today's athletes increase their physical and athletic fitness

Timeless Images Photography, www.timelessimages.com.

Chloe Van Tussenbroek displays the degree of balance control needed to perform at the elite level in gymnastics.

As we guide our athletes along the road to optimal performance, we coaches emphasize power, strength, speed, quickness and agility. However, if we do not include stability, which is another word for balance control, our athletes will not have the ability to perform any of those necessary components.

A young man can be the strongest player on a high school football team, power cleaning 300 pounds and squatting 450, but if he lacks stability and is out of balance, there is no way he can transfer that strength and power effectively to the gridiron. The same condition applies to speed. If the fastest soccer player on the team lacks balance control, there is no way to display that speed effectively on the soccer field.

When an athlete lacks stability, it's usually quite obvious. If a player staggers off the field, others run to their attention, supporting them to prevent them from falling. Beyond that scenario, coaches and trainers should consider this question: "Can an athlete be out of balance even when our *perception* is that they are functionally normal?

What we are suggesting is that coaches administer some simple tests to ensure that their athletes are always gaining balance control. Of course, when we see an athlete staggering on the field, we all know it's important to make them stop playing. But how do we determine, on a daily basis, if an athlete is gaining or losing balance control? Losing balance control can be caused by something as simple as twisting an ankle or walking oddly due to a pebble in one's shoe, but we can't overlook the fact that losing balance control could mean something more serious is going on.

To monitor and maximize the progress of our athletes we need to know the status of their balance control. Naturally, proper training will enhance and

Dr. Peter G. Gorman, president of Microgate USA, has teamed with BFS to create protocols that any coach or physical educator can administer to assess the balance control of any athlete quickly and easily.

improve balance control. Injury, whether obvious or subclinical, will deteriorate balance control. This is true whether the injury is anatomical, such as a sprain or strain, or neurological, such as a concussion. At BFS we don't like hearing sports writers, fans or parents use words like "dinger" or "getting his bell rung" to describe a concussion. A concussion is a traumatic brain injury and must be taken seriously. This is why we prefer to measure balance control as part of a

The snatch is a great lift to develop power, strength and flexibility, but these athletic qualities cannot transfer to performance without balance control.

comprehensive program that includes neuropsychological testing when it comes to return-to-play decisions.

A good place to start is the BFS static balance control protocol [see sidebar], in which athletes are put through a series of movements, with eyes open and eyes closed. We are looking for improvements in those movements. And before we allow an athlete to return to play after an injury – no matter the type of injury – we want to see improvement in this protocol. Also, game by game, practice by practice, we should see improvement in this protocol. Any deterioration in ability should send up a red flag to ask questions and understand why, before further play is allowed. Most times the

The BFS Balance Protocol

BFS has worked with Dr. Peter G. Gorman, president of Microgate USA, to create a balance control protocol we can use to assess any athlete quickly and easily. Similar testing has been used by various agencies over the years. The difference is that BFS is using balance control as an indicator of athletic training.

The BFS balance protocol starts with a progressive series of five static balance tests. Each test builds upon the previous one; athletes must master a test before moving on to the next, more advanced, test.

The tests are performed on a flat surface in stocking feet. Shoes are removed because they can affect the results of the tests, sometimes improving the outcome and sometimes making the outcome worse. For example, a weightlifting shoe helps align the foot with the ankle and provides a stable platform for the athlete, providing increased stability for exercises such as squats. If that same athlete were to lift in running shoes, which are designed to encourage pronation of the foot, their stability would be decreased. For these reasons, we prefer that the tests be performed without any outside variables, such as an athletic shoe.

The static balance protocol is as follows:

1. Stand on both legs, facing forward, and with eyes open.
2. Stand on both legs, facing forward, and with eyes closed.
3. Stand on one leg for 15 seconds, with eyes open. If you do not complete the full 15 seconds, note the duration you are able to complete.
4. Repeat on opposite leg.
5. Repeat steps 3 and 4 with eyes closed.

If an athlete is continually improving on these balance tests, then there is probably nothing to worry about. But what happens if an athlete who previously could easily complete steps 4 and 5 can maintain their balance in a later test for only 5 seconds – or not at all? This *may* suggest they are compensating for some type of injury, such as an old ankle or knee injury that never completely healed.

Canadian strength coach and posturologist Paul Gagné, who uses the OptoJump in his work with professional hockey players, is shown performing a simple march-in-place test to measure balance control.

Perhaps, if the athlete is a football player, it could be a result of being hit on the head a bit too hard or too many times. The point is we have a red flag that suggests this athlete needs to be referred to an appropriate health care professional who can determine the anatomical, neurological or metabolic reason or reasons for the regression of this athlete's stability.

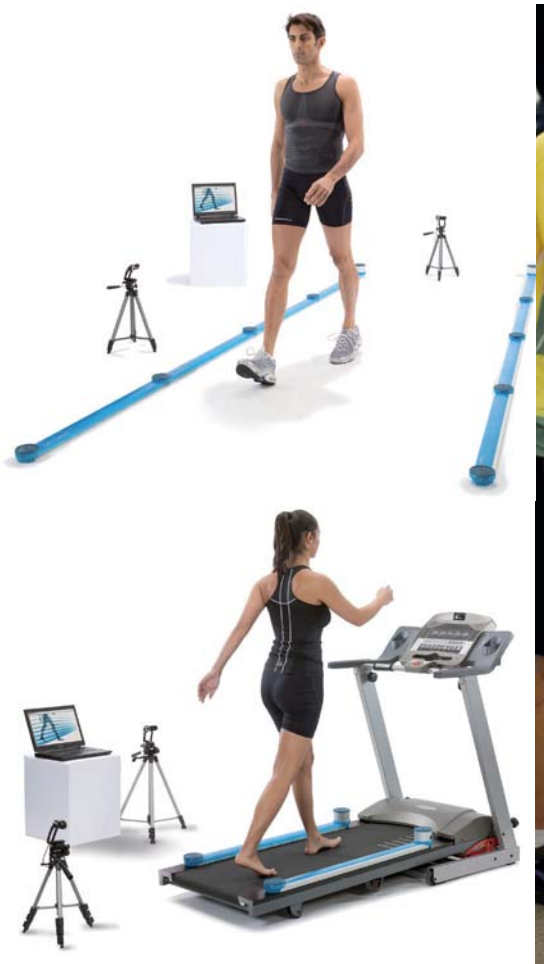
There you have a simple static test to determine balance and control. The next level would be with the OptoJump, as it can give more precise data about how the individual is performing these tests – information that cannot be detected or recorded with the human eye. The OptoJump can then be used for more advanced testing to ensure that the athlete is continuing to progress and to determine weaknesses that could adversely affect performance.

answer is simple, but we need to know.

Compromised balance is sometimes difficult to judge. For starters, we may not be able to even see the full extent of an athlete's loss of balance. Further, the fact that one side of a person's body may be stronger than the other side does not necessarily mean the person is out of control. In fact, there are some sports in which athletes purposefully create dominance on one side of the body; for example, high jumpers.

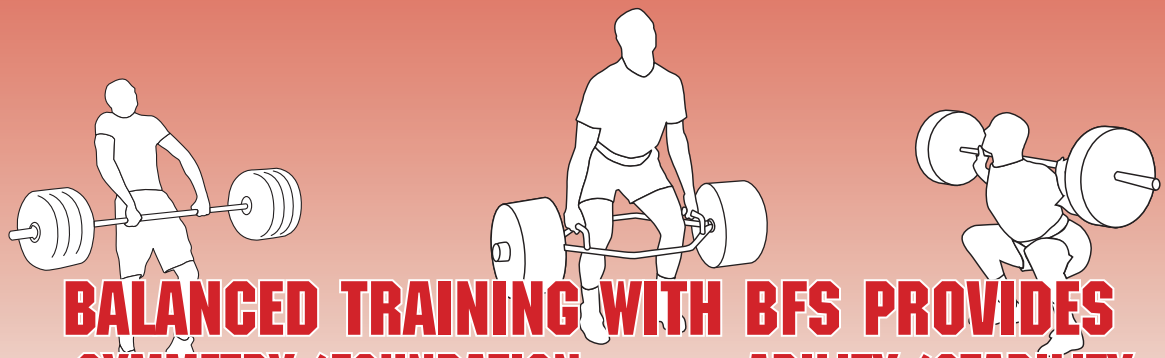
The BFS protocols are designed to evaluate individuals quickly, and we also have dynamic versions of balance control tests, such as performing a march-in-place, with eyes open and eyes closed. The reason we close the eyes is that we know balance is controlled by vision, the inner ear and body awareness (proprioception); by having them also perform the tests with the eyes open we obtain a baseline to see how they can perform. When the individual closes their eyes, they should be able to produce the same result. Sometimes we find that an athlete's vision is compensating for the imbalances in their body. If so, this should make a coach ask, "Why?"

The next step beyond the simple static tests and dynamic balance control tests is to look at the individual with an optical measurement instrument called the OptoJump system. OptoJump is a light system that precisely measures the contact and flight time of each leg to a millisecond when the subject performs a march-in-place test. Now we can objectively detect a loss of balance or coordination before any coach or doctor can see it with their eyes, subjectively. This is very important, as there are foot-long words to describe medical conditions associated with long-term loss of balance control – none of which we want our young athletes to endure. Whether you're a doctor or a coach, you need to be aware of the importance of balance control for achieving not just optimal performance but also quality of life. BFS



The OptoJump can measure balance control whether the individual is walking, walking on a treadmill or performing complex jumping drills.

USSA photo, Park City, Utah, training facility.



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BFS is committed to advancing every coaches and teacher's ability to track the improvement of their students and athletes. On November 1, 2011, BFS opened the "BFS Science Lab" with Dr. Peter Gorman, President of MicroGait USA, at his facility in New York.

"This will be a great addition to the BFS organization," says BFS President Bob Rowbotham. Look for more details about this exciting facility in future issues of BFS and on our website, www.biggerfasterstronger.com

Using top quality BFS equipment and the OptoJump system the BFS Science Lab is developing systems and protocols to continue the advancement of youth training and performance!

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