

Photo courtesy University of Louisville Sports Information.



Structural balance training is required in sports such as field hockey, which requires exceptional levels of lateral quickness to reach the highest levels. Demonstrating her skills is Janelle Avila, who was a scholarship athlete at the University of Louisville and was on the Under 21 National Team.

## *Structural Balance* and Auxiliary Exercises

Tips on how to individualize the BFS program

BY **KIM GOSS, MS**

**F**or reasons that include trying to win college scholarships, many parents have been encouraging their sons and daughters to specialize in one sport. The theory is that year-round specialization will lead to higher performance, but instead, the result is often a dramatic increase in injuries that can lead to an early exit from athletic competition. This article will discuss one way to address this problem.

The idea of playing multiple sports, or cross training, is not solely an American idea, but in fact may have been European in origin. According to Dr. Mel Siff, co-author of *Supertraining*, “For many years the Russians and Eastern Europeans have

supplemented the training of their competitive athletes with systematic supplementary training in other sports. For instance, Olympic weightlifters and field athletes have included volleyball or basketball in their overall training regimens.” So, even the highest-level athletes use such cross-training methods.

Obviously, the challenge to make a sports team in high school can be tough, especially at larger schools that cannot afford to have junior varsity programs due to budget cuts. And even then, schools that do have programs may discourage multi-sport participation with “pay to play” policies that, unfortunately, appear to be here to stay. But if playing multiple sports during

the school year is not possible, at the very least athletes need to lift year-round to avoid injury.

I say this because even if an athlete plays multiple sports, seldom does any secondary sport correct muscle imbalances caused by their primary sport. Swimming doesn’t correct any muscle imbalances caused by wrestling – in fact, it can make the round shoulders that wrestlers often display even worse. Cycling won’t resolve the imbalances in leg development caused by volleyball, and playing golf will not do much to help strengthen the lower back muscles that can be weak in a baseball player.

I would say that probably the best cross-training activity to help correct

muscle imbalances for most high school athletes would be ballet, but this is an idea that many male athletes would have a hard time buying into. In fact, when I was a strength coach for the Air Force Academy, one year the head football coach insisted our players participate in an aerobic dance class. It was a sad day when I stood on the sidelines and watched the proud and mighty Falcons football team awkwardly mimic the enthusiastic female aerobics instructor with her carefully choreographed cardio-funk kicks, hops and hip gyrations. Adding to their shame, the hockey team made it a point to amuse themselves by watching the spectacle – and if you’ve ever been around hockey players, you know they milked this for all it was worth.

One of the reasons for the success of the BFS program is the focus on trying to develop all aspects of strength and conditioning: speed, power, strength, flexibility and agility. And to help deal with potential muscle imbalances caused by training on a specific sport, the program also has built into it the opportunity to perform auxiliary exercises. The question is which auxiliary exercises are best?

## A Brief History of Structural Balance Testing

Nearly two decades ago, Canadian strength coach Charles Poliquin came up with a concept he called *structural balance*, which has formed the core of the first two levels of his advanced certification program for coaches and personal trainers. Essentially, the idea is that for optimal athletic performance, you have to address specific ratios of strength imbalances in development.

If you’re trying to improve your performance in the bench press, or if your progress in this lift has stagnated, the limiting factor may not be

a weakness in the chest and shoulders but in the upper back. If the opposing muscles (antagonists) are not strong enough, a message is sent to the brain to shut down the prime movers (agonists) of the exercise, which in this case would be the chest and shoulders.

It sounds strange to try to improve your bench press with chin-ups, but Poliquin has found in working with over 600 Olympians and several hundred pro athletes, this is indeed the case. For example, Poliquin found that with one specific rotator cuff exercise he uses the strength ratio should be about 9.8 percent of what can be performed in the bench press. As proof, one season Poliquin trained pro hockey player Jim McKenzie, who improved his 14-inch, close-grip bench by 51 pounds in 12 weeks, from 280 to 331 pounds. He did this by focusing on rotator cuff strength – in fact, Poliquin said he did not have McKenzie do any benching at all during this training program! What’s more, six weeks later McKenzie did a close-grip bench press of 380 pounds.

Poliquin came up with the idea of structural balance by studying the workout systems of European weightlifters. Olympic lifters often use formulas to determine what areas they need to work on. For example, athletes who want to clean and jerk 200 pounds probably should be able to back squat between 255 and 280 pounds. These formulas can apply in determining such ratios as back squat to front squat, snatch to power snatch, and clean to power clean. Such ratios can yield valuable information about how to modify your training: If your back squat greatly exceeded your snatch, that would indicate that you probably needed more work on relatively lighter weights to improve speed and technique.

Structural Balance: Close-Grip Bench Press

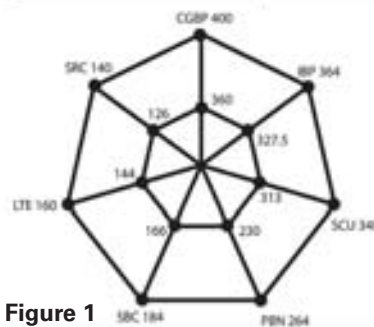


Figure 1

CGBP – Close-Grip Bench Press  
IBP – Incline Bench Press  
SCU – Supinated Chin-up  
PBN – Press Behind Neck  
SBC – Scott Barbell Curl  
LTR – Lying Triceps Extension  
SR – Standing Reverse Curl

This radar graph shows the weights that should be used based upon the results of a 1-repetition close-grip bench press.

## Putting Theory into Practice

For the upper body, Poliquin summarizes his structural balance research with a radar graph – so-named because it resembles a radar screen, displaying values that revolve around a central point. The central point is zero, and increasing values are represented farther out from the center. Unlike popular bar graphs or pie charts, radar graphs enable you to display values that are on different scales and therefore can easily illustrate symmetry.

Figure 1 shows the example of the strength ratios using the close-grip bench press as the central lift. Knowing what an athlete could perform in this exercise, Poliquin could determine how much weight that athlete should be able to use in many other exercises relevant to achieving structural balance. As you can see, the points around the graph are perfectly symmetrical, meaning this athlete has achieved structural balance in the close-grip bench press. The graph provides precise information on the lifts the subject would need in each of these seven exercises to achieve a 360- and a 400-pound close-grip bench press.

For the lower body, Poliquin looks at ratios of such lifts as the back squat in relation to the front squat. But he also

uses some special tests, such as the Klatt test. The Klatt test was designed by Lois Klatt, PhD, the director of the Physical Performance Laboratory at Concordia College, River Forest, Illinois. The primary purpose of the test is to determine weakness in the muscles of the knee, but Charles expanded the evaluation to help determine weaknesses in the knee, hip, pelvis and lower back.

The test is performed barefoot while standing on a low platform (for rehabilitation and for the elderly, the height can be as low as 2 centimeters). It is performed in bare feet, with both arms extended in front and one leg extended at a 15-degree angle. This is shown in the first photo at right. The athlete hops off the platform about three to four inches directly in front of the platform, as shown in the other two photos. As this is performed, the evaluator looks at how the knee, hips and trunk react to the landing. Only one rep is performed per height, and the test is repeated until two weaknesses are detected.

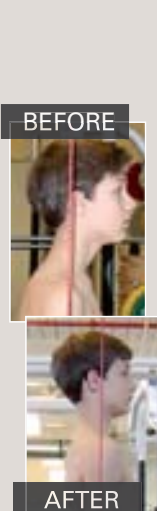


At left is the start position for the Klatt test, and the right two photos show the finish position. These finish positions suggest no structural imbalances.

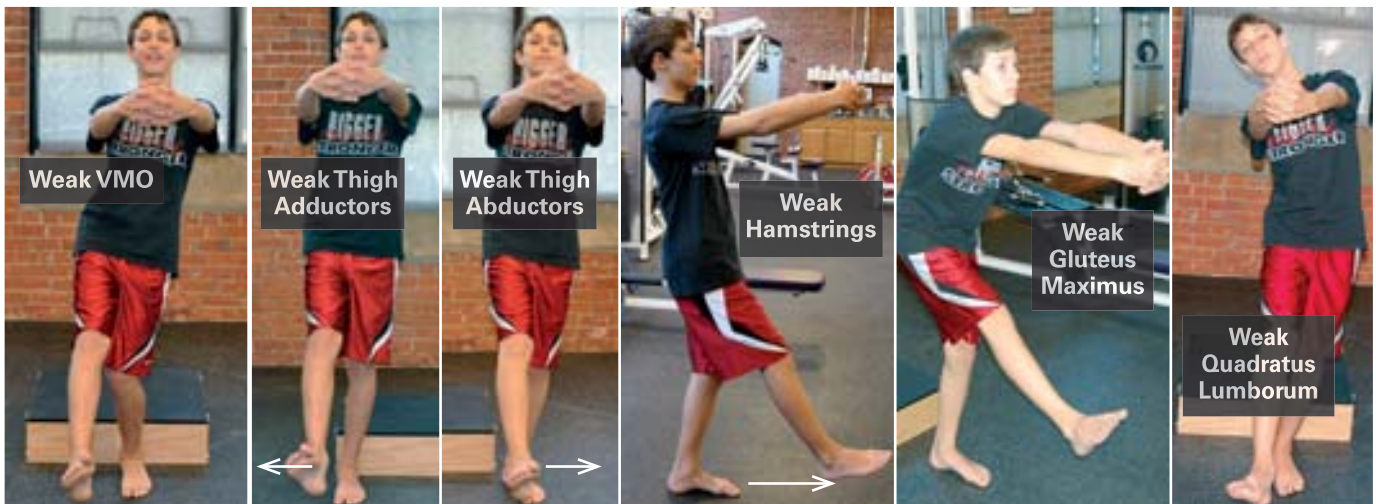


For example, if an athlete hops medially (towards the inside), the adductors of the thigh may be weak, and the auxiliary exercise needed would be some form of lunge. If there is a forward bend at the hips, the glutes

are weak, and exercises such as back extensions and reverse back extensions are recommended. The accompanying photos show several possible results from the Klatt test, and on page 37 are the auxiliary exercises that can be used







These results in the Klatt test show muscle weaknesses based upon performance during the finish position.

to correct the structural imbalances that caused them.

By looking at an athlete's lifting maxes, and also regularly performing simple evaluations such as the Klatt test, coaches will be better able to determine what auxiliary exercises are best for each athlete. More information on Charles Poliquin's structural balance program is on his website, [charlespoliquin.com](http://charlespoliquin.com).

A chain is only as strong as its

FAULT	MUSCLE WEAKNESS	AUXILIARY EXERCISE
Knee Buckles	Vastus Medialis Oblique (VMO)	High Step-ups
Hop Medially	Thigh Adductors	Lunges
Hop Laterally	Thigh Abductors	Glute-Ham Raises
Hop Forward	Hamstrings	Leg Curls
Lean Forward	Gluteus Maximus	Reverse Back Extension
Side Bend	Quadratus Lumborum	Side Bends

weakest link, right? So whether an athlete plays several sports or decides to concentrate on just one, it pays to

use these simple evaluation tools to maximize performance and minimize the risk of injury. **BFS**



David Kandel is a 12-year-old baseball player who is currently being coached by the author. Shown are the before-and-after results of one month of structural balance training.

