INTRODUCTION

One of the biggest areas of concern for me as a strength and conditioning coach is the lack of proper understanding that athletes and coaches have concerning core training. There are many core exercises and training philosophies that have integrated their way into modern sports performance programming that are not biomechanically sound or sport-specific. Fortunately, many coaches, biomechanics and back specialists are part of a growing number of professionals who are creating strategic and intelligent solutions for how we can train the core most effectively.

WHAT IS THE CORE?

For many people, if I were to ask, “what is the core?” most people would point to the area known as the rectus abdominis. It is important to understand that the core is not restricted to this “six-pack” region. This rectus abdominis tissue is responsible for flexing the trunk and because of our limited understanding of the comprehensive nature of the core we often only do exercises that involve focused contraction of this muscle. As a result, this muscle is often overused and has significant “shortness” issues because of the volume of crunches or sit-ups that are in athletes’ programs. Unfortunately, too many sit-ups can promote bad posture position by reinforcing a kyphotic forward leaning spine. This is due to the fact that the rectus abdominis has attachments at the sternum and an opposite insertion at the pelvis. In addition to this negative consequence, too much core flexion training that forces the lumbar spine (low back) to undergo multiple flexion episodes can cause disc damage. Research has begun to support the notion that the spine has a finite number of bending cycles and that exceeding the limit can quicken the onset of disc damage (herniation and prolapse). In particular, Axler and McGill found that a basic crunch variation elicited around 2,000 N of compression, which can leave the lumbar spine particularly vulnerable. With the risks of excessive flexion training in mind, there needs to be a higher emphasis on other aspects of core training. Not only should we focus on other ways to train the core but flexion exercises that are used should include ones like the reverse crunch that limit lumbar flexion.

The restricted model of thinking in regards to core training (flexion only) shows a lack of appreciation for the fact that the core produces movement in multiple vectors. In reality, our body is allowed to perform a variety of movements through the core because of multiple myofascial meridians that exist. These “lines of pull” prove that our current models of anatomy are falling short due to our false idea that muscles are independent and separate from other muscles. In actuality, every “muscle” is part of a larger network of fascia that has distinct roles in allowing human movement. From Thomas Myers book, Anatomy Trains, we see that the core falls into the lateral, spiral and superficial back lines of the body. Therefore, unlike traditional thought and theory, the core has an anterior region and posterior region that contribute to the functions of three different lines of pull. With the core falling into three different lines, it should be noted that these different lines allow the core to take on multiple roles of function.

One of the most important roles for the core is trunk stabilization accomplished through the anterior and posterior core working together. The anterior core consists of the rectus abdominis, internal and external obliques and transverse abdominis. The posterior core surrounding our lower back consists of the deep tissues known as the erector spinae which includes the iliocostalis, longissimus and spinalis. The muscle tissue in the anterior and posterior core work interdependently as a team to allow overall trunk stability. Yes, the core is involved with flexion, extension and rotation, but the most important aspect
of the core that transfers over to sports performance is overall stability.

STABILITY TRAINING
Please check out the video we sent to USA Gymnastics for a practical strategy on how you can start introducing core stability training into your current schedule (www.usagym.org/healthknowledge).

We have beginner, intermediate and advanced progressions so you can begin to implement these at whatever stage of fitness you are currently in. In addition, I give thorough explanations in the video for how to perform these exercises. By putting these into your programming you can re-educate the body on the importance of overall stability of the core. When we perform movements such as running and jumping in which our limbs are in motion, the core is responsible for eliminating any unnecessary energy leaks. As a result, the more effectively the core can engage to stabilize the more efficient our movement is.

You will also notice that the plank series that we have on video for you involves some rotational movements but also some “anti” movements which contribute to core stability. For example, when you are in the prone plank you are trying to maintain a straight line from the shoulders down across the glutes. In order to accomplish this, you need to be in more of posterior pelvic tilt through squeezing the glutes together and maintaining a neutral spine position. Doing these actions in the plank position effectively limits excessive lumbar extension and thus you perform an “anti-extension” component while doing the prone plank.

In conclusion, incorporate core stability in your training to minimize the wasted movements that happen when we don’t have any core control. It should also be noted that the ability to stabilize our core and produce lower back endurance is effective at limiting lower back pain. With these valued benefits of core stability training, you can effectively increase your performance in gymnastics.