How to Develop the *Lower Abdominals:* Part I

How to test lower abdominal strength and coordination

BY **KIM GOSS**

Despite all the cool toys available to develop the abdominals, the fact is an athlete can develop tremendous abdominals without ever performing a sit-up, crunch or anything involving all those fancy circus balls and other gimmicks on the market. Core training, to use the popular buzzword, doesn't have to be complex training.

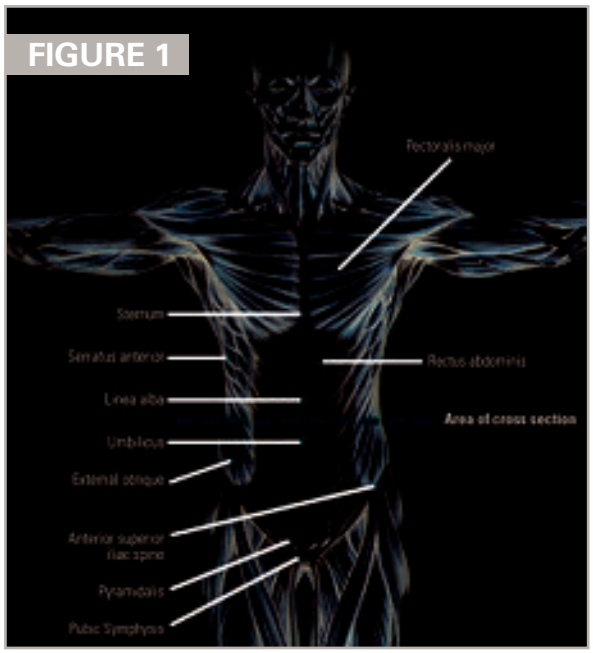
As evidenced by the muscular midsections of powerlifters and weightlifters, simply performing total-body lifts such as squats, power cleans and deadlifts can develop impressive abdominals. The problem is that the lower region of the abdominals often gets neglected, a deficiency that may cause increased risk of injury, back pain and poor athletic performance.

To explain what the lower abdominals are, why they are so important and how to properly train them, I turned to Canadian strength coach and posturologist Paul Gagné. Gagné has recently established quite a reputation in the golf world with his work with a clientele of professional golfers who include teenage phenomenon Michelle Wie and 2005 US Open Champion Michael Campbell. Because golf requires excellent posture and abdominal strength, Gagné's coaching has become highly sought after in this sport due to his expertise in developing exceptional strength in both the upper and lower abdominal muscles.

Gymnast Amanda Johanson shows the type of abdominal development that comes from training hard and smart. A member of the Olympus School of Gymnastics in Sandy, Utah, Amanda will be attending the University of Denver on a gymnastics scholarship this fall.

An Ab Is an Ab Is an Ab…

Many exercise authorities and medical professionals will claim that the rectus abdominis, the muscle responsible for shaping the envied "six-pack," is just one long single muscle that extends from the top of the sternum and rib cage to the pubic bone. So, in light of



The rectus abdominis can be divided into two sections: supraumbilical and subumbilical.

develop specific areas of the pectorals by performing bench presses on an incline or decline.

Gagné says the subumbilical section plays an important function in maintaining proper posture, and he explains that the excessive lumbar curvature displayed by some gymnasts (Figure 2) may in part be due to weakness in the lower abdominals. This unnatural posture may contribute to lower back pain by reducing the shock absorbing qualities of the spine. Further, Gagné says the problem is compounded if one side of the subumbilical muscle is underdeveloped, causing excessive rotation of the spine that can increase the risk of disk injury.

In terms of athletic performance, when the pelvis is rotated forward due to muscle imbalance, the lower abdominals are stretched and become difficult to contract and contribute to sports performance. Thus, a tennis player with weak lower abdominal muscles would not be able to generate as much power on a serve. "All macro movements in sports depend on micro movement," says Gagné. "All this current emphasis on movement training for athletes is fine, provided the segments are strong enough to properly coordinate."

Gagné says there is convincing research to show that an athlete can increase stride length, and therefore running speed, with proper development of the lower abdominal muscles. If weak lower abdominals are causing your pelvis to not rotate properly, every time you drive your rear leg back

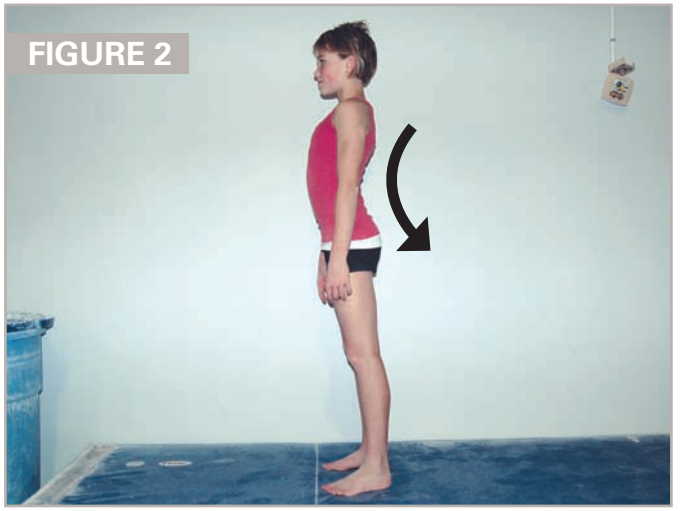
this skepticism, my first question to Gagné was "Just what is meant by the term *lower abdominals*?"

Gagné replied that while it's true the lower abdominals don't really exist from an anatomical standpoint, for training purposes the rectus abdominis can be divided into two sections: supraumbilical and subumbilical. "*Supra* essentially refers to the part of the rectus abdominis area over the bellybutton, and *sub* refers to everything under the bellybutton." This separation is illustrated in Figure 1.

Although Gagné admits that the entire rectus abdominis is activated to some degree in virtually every exercise, it's possible to emphasize specific segments of the muscle, such as by positioning your body differently. This effect, says Gagné, is similar to what happens when bodybuilders attempt to

Canadian strength coach and posturologist Paul Gagné's expertise in abdominal and posture training has put him in high demand among professional golfers. Here he is shown teaching teenage phenomenon Michelle Wie how to perform the split jerk.

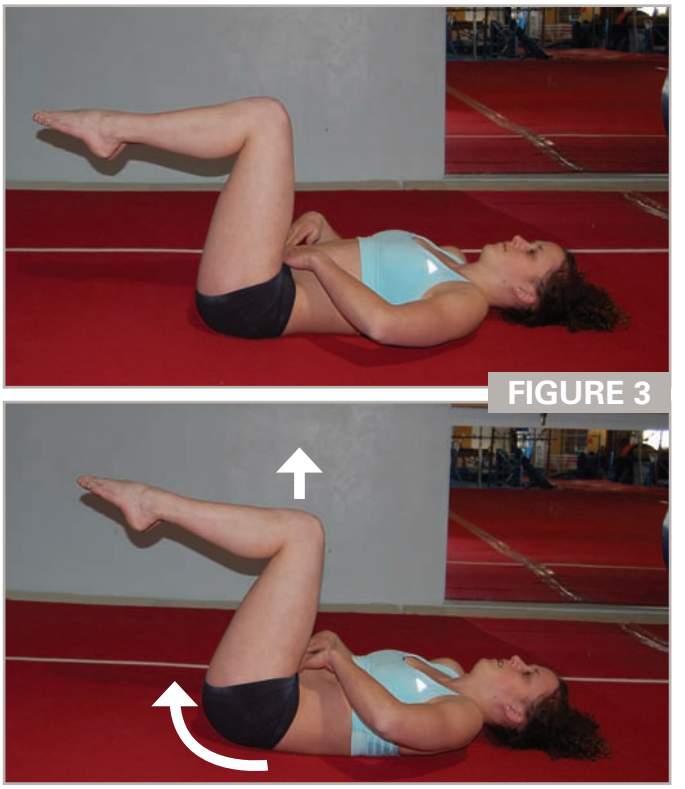
Weak lower abdominals often leads to excessive curvature in the lower back and are common among gymnasts.



into extension, the catch-up phase is compromised. Weak lower abs can also change running mechanics. In fact, when strength coach Charles Poliquin worked with 100-meter sprinter Donovan Bailey prior to his gold medal performance in the 1996 Olympics, one primary focus in his training was the lower abdominals.

How do you know if you have weak lower abdominals? One test is to lie on your back with your knees bent at 90 degrees (as shown in Figure 3). Place your hands just above the hipbone, lift your elbows off the floor and rest your head on the ground. Now try to lift your hips straight up. If you can't perform this test without moving your knees towards your head, or if you have to brace your elbows on the floor or raise your head to perform the movement, then you have weak lower abdominals. "This lower abdominal raise is just about the only one you could say is purely subumbilical," says Gagné.

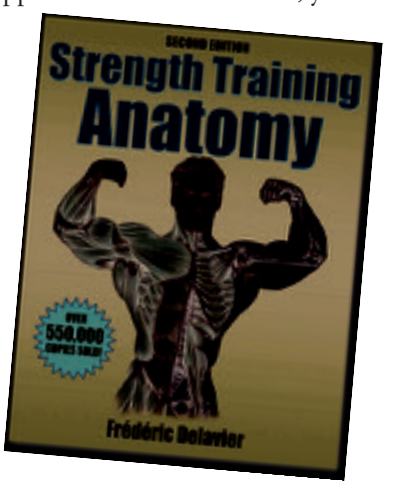
The seated pike is a good test to determine abdominal coordination.



A test to determine lower abdominal strength.

One practical test of abdominal coordination, which is how your lower and upper abdominal muscles work together, is to perform a seated pike (Figure 4). With your legs extended in front of you, feet together, lift your hips and feet off the ground. Hold for one minute. If you don't have good coordination between your upper and lower abdominals, you will not be able to maintain a rigid position – you may hold one leg higher than the other, shift to one side or simply collapse before the minute is up.

In Part II of this series Paul Gagné will explain several specific exercises designed to place maximum emphasis on the lower abdominals – simple exercises, but still extremely effective. Until then, try the two abdominal tests described in this article and see if you are strong to the core. BFS



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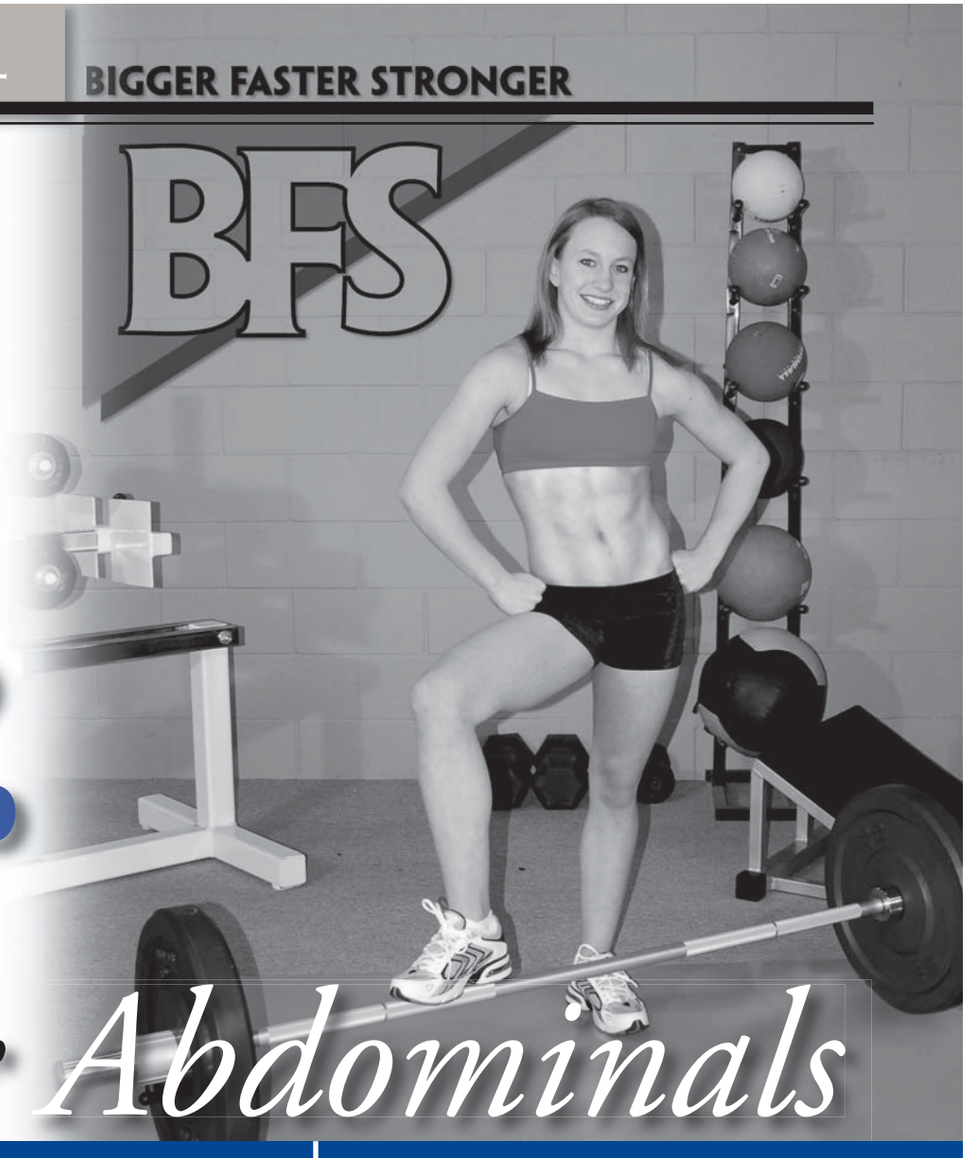


How to Develop the *Lower Abdominals*

Simple but powerful exercises to achieve abdominal strength and coordination

Part II

BY **KIM GOSS**

Do you know someone who suffers from "The Britney Spears Syndrome?" Do you know what causes this condition, how many Americans are affected by it, and how it can be successfully treated? What's that, you say, you've never heard of the Britney Spears Syndrome, and for that matter can't imagine why *BFS* is even discussing this tabloid sensation? Let me explain.

The Britney Spears Syndrome, a term coined by fitness writer Chad Waterbury, occurs if you overly develop the abdominal muscles, because then you will look significantly bulkier in the midsection than you really are – unless you keep your bodyfat at extremely low levels. Waterbury says the reason it's called the Britney Spears Syndrome is that when Britney first started doing music videos she had a very small waist. Then she started working with trainers who had her doing hundreds of reps of abdominal exercises every day. Her waist got thicker, and whenever she gained any bodyfat the tabloids would jump at this and suggest that Britney was becoming obese or perhaps was even pregnant.

Chloe Van Tussenbroek displays excellent abdominal muscles. Chloe is a Level 10 gymnast from the Olympus School of Gymnastics in Sandy, Utah.

The Britney Spears Syndrome aside, it's a matter of course to see athletes performing hundreds of repetitions in such exercises as hanging leg raises, sit-ups and crunches. Core training has become an obsession for everyone, not just pop princesses. Unfortunately, as explained in part I of this series, the bad news about all this emphasis on "core"

training practice is that if you don't pay attention to the lower abdominal musculature, such training may be doing as much harm as good by increasing the risk of injury and inhibiting athletic performance.

The good news is that athletes can quickly develop strong lower abdominals by adding a few sets of a specific exercise to their conditioning programs – an exercise I'll describe that is easy to learn and requires no special apparatus such as those shown in infomercials. Then I will present a follow-up exercise that will help develop coordination between the upper and lower abdominals – coordination that will help improve athletic performance and prevent injures. Do I have your attention?

Testing and Training the Lower Abs

In Part I, I described a test to determine the strength of the lower abdominals. This test is also an effective exercise to train the lower abdominals. Here is how you do it. Lie on your back, with your knees bent at 90 degrees, and place your hands just above your hip bone (Figure 1). Lift your elbows off the floor and rest your head on the ground (Figure 2). Now try to lift your hips straight up, keeping your upper legs perpendicular to the floor (Figure 3). While performing the movement, do not allow your knees to move toward your head or brace your elbows against the floor or raise your head.

After you achieve a base of strength with the lower abdominal raise, you should begin performing exercises that involve coordination between the upper- and lower abdominal muscles.

When you first perform the exercise, your hips may not move; but as long as you feel the muscles contracting, the area is being strengthened. Eventually the lower abdominals will strengthen so that your hips will lift off the floor.

Don't get discouraged! I've tested hundreds of competitive figure skaters on this exercise, several who have competed in the Olympic Games, and only a few could perform this exercise properly the first time they tried. The only gymnast I've tested so far who could pass this test the first time she tried is Maegan Snodgrass, a Level 10 competitor I train who is also an American record holder in weightlifting – so she doesn't count. In fact, the Level 10 gymnast demonstrating this

FIGURE 1

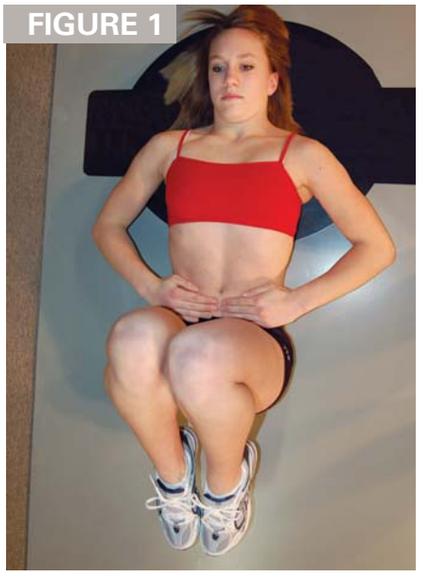


FIGURE 2

The start position of the low ab raise is with the fingers placed just below the bellybutton during, head down and elbows lifted off the floor.

To perform the low ab raise the hips move straight up, keeping the upper legs perpendicular to the floor. Squeezing a medicine ball or a dumbbell between the knees are ways to increase resistance in this exercise, but a spotter should be used with these variations.

FIGURE 3

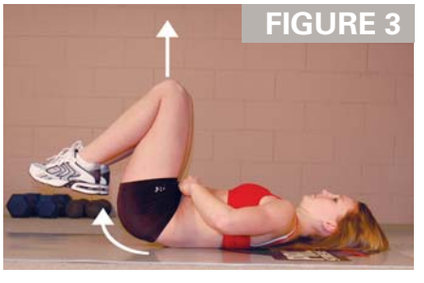


FIGURE 4

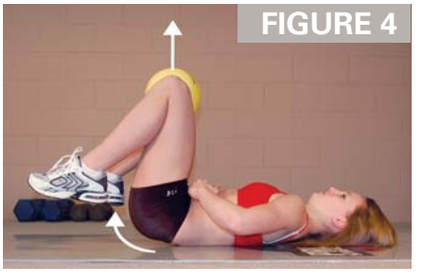


FIGURE 5

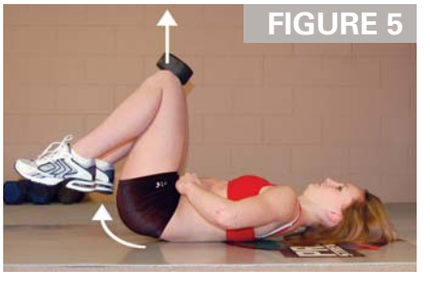
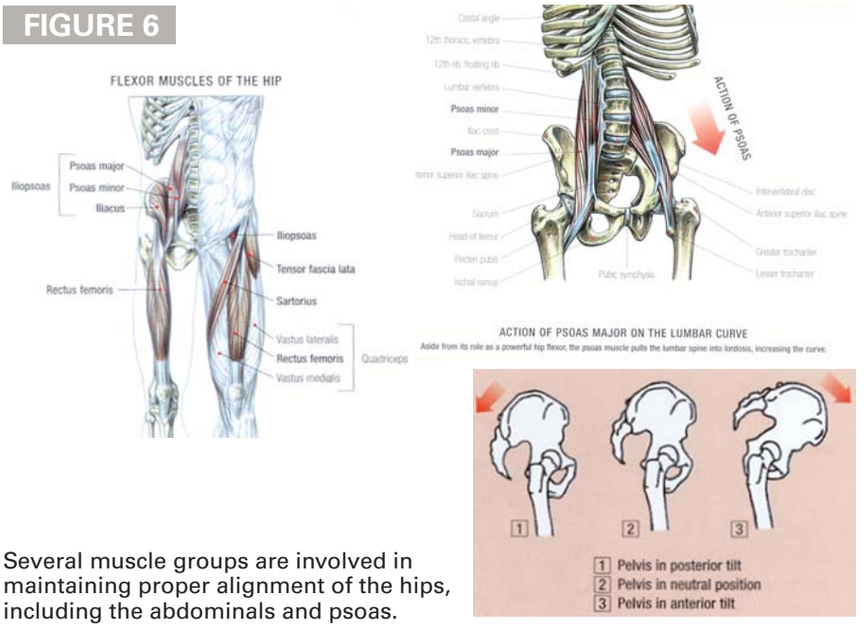


FIGURE 6



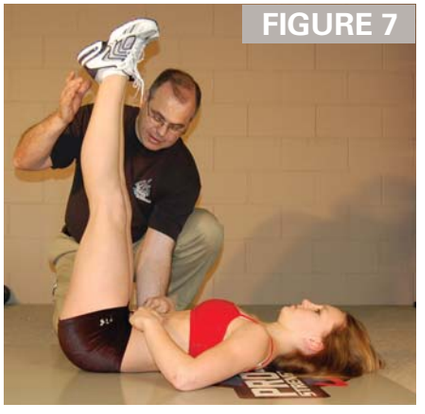
Several muscle groups are involved in maintaining proper alignment of the hips, including the abdominals and psoas.

exercise, Chloe Van Tussenbroek, had to practice this exercise for several weeks to be able to properly perform it.

To make the exercise more difficult, simply squeeze a medicine ball between your knees (Figure 4) or have a partner apply manual resistance to the top of the knees. As shown in Figure 5, you can also place a dumbbell between your knees. Paul Gagné, the Canadian strength coach who told me about these training methods, says he has athletes use up to 100 pounds in this exercise! However, because it's easy for the weight to slip with this method and possibly cause an injury, it would be a good idea to have a training partner lightly hold the ends of the dumbbell to prevent it from dropping on you. The spotter should also assist in placing the weight between your knees and in removing the weight when the exercise is completed.

As far as reps and sets are concerned, regardless of which version of this exercise you perform, you should work the muscles for about 60 seconds per set. Because of the short range of motion of this exercise, you will complete the repetitions relatively quickly. Thus, a workout of 2-3 sets of 15-20 reps could be considered an appropriate exercise prescription for many athletes, and the movement can also be performed before practice as a warm-up. That being said, it's important to avoid jerky movements when performing the exercise; instead, slowly lift your hips up and down, even pausing briefly at the top of the motion.

FIGURE 7



The leg lowering test assesses coordination between the upper and lower abdominals.

FIGURE 8

The Next Step: Abdominal Coordination

After you achieve a base of strength with the lower abdominal raise, you should begin performing exercises that involve coordination between the upper- and lower abdominal muscles, and many of the muscles that anteriorly rotate the pelvis (Figure 6). I first heard about this exercise from the popular physical therapy textbook *Muscles: Testing and Function* (by Florence Kendall and others).

The exercise is essentially a straight-leg raise, the difference being that you'll need to keep the lower back pressed against the floor during the movement. While Kendall's textbook points to using this exercise primarily to test and strengthen the rectus abdominus and external obliques, Gagné says this is a great exercise for testing and training the overall coordination of the abdominal muscles and the muscles that flex the hip.

To perform the test, which will determine how you should be able to use the exercise for strength training, have a partner place their hands underneath your lower back, lightly touching the vertebrae directly under your belly-button. Extend your legs until they are perpendicular to the floor, as shown in Figure 7. Now press your spine against the floor and slowly lower your legs, with your partner holding their hands a few inches away you're your ankles so that your legs don't collapse to the floor (Figure 8).

To score 100 percent on the test,

Canadian strength coach and posturologist Paul Gagnéis one of the foremost authorities in the world on proper abdominal training for athletes.

a male would have to lower their legs all the way down without arching the lower back, and a female to about 15 degrees from the floor. The difference in the two standards is due to the fact that women carry more of their total muscle mass in their lower extremities.

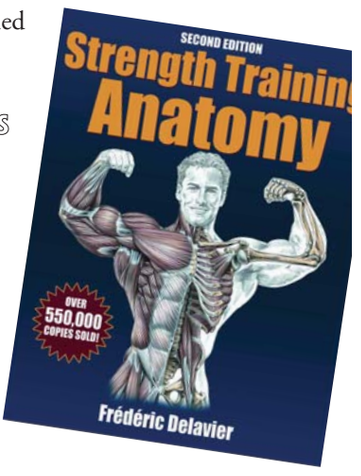
As soon as you start to lift your back, that is approximately the position that you will use to start the exercise. In Figure 9, Chloe is demonstrating the starting position for the exercise for an athlete who can lower her legs approximately 45 degrees before arching. The athlete slowly lowers the legs to the platform (Figure 10), and after the feet touch the platform pulls the knees in (Figure 11) and returns to the start. Of course, if you can only lower your legs a few degrees before arching your lower back, you will need a higher platform (a BFS adjustable 3-in-1 box squat bench is ideal for this exercise, as you can lower the bench in one-inch increments.)

The number of repetitions performed depends upon the range of motion of the exercise; if the platform used is high, then more repetitions can be used than if the exercise is performed with a lower platform. As a general guideline to ensure an adequate training effect, perform the exercise for at least one minute.

As you progress to the position where you would pass the test, you would start performing the straight-leg raises (starting and ending at the top position), lowering to the point just before your back starts to arch. Soon you should be able to perform the exercise properly through the full range of motion. There are many ways to increase the resistance: A partner can apply manual resistance, you can hold a medicine ball between your legs, or you can use ankle weights. If you hold any resistance between your ankles, such as a dumbbell, you MUST use a spotter to prevent the weight from dropping on you.

A word about breathing: For both of the exercises mentioned in this article, to increase the muscle training effect you should slowly release your air as you perform the lifting portion of the exercise. For the leg-lowering version of the coordination exercise, you would exhale as you lower your legs to the platform.

One physical attribute that sets great athletes apart from good athletes is tremendous abdominal development. In fact, many athletes often display chiseled, rock-hard abs that rival those of the best competitive bodybuilders. Go ahead and train the abdominals hard, but be certain to include these two exercises to ensure that you not only look like an athlete (or a *properly* trained celebrity!) but also are strong to the core. BFS



The illustrations for this article were taken from *Strength Training Anatomy 2nd ed.*, available from Human Kinetics, www.humankinetics.com

After an athlete determines their level of abdominal coordination, they can perform the leg lowering exercise by themself.

FIGURE 9

FIGURE 10

FIGURE 11