



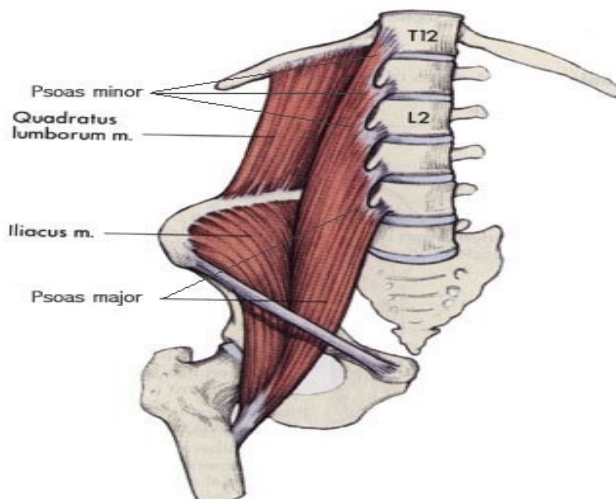
Core Training for Lacrosse (Death of the Crunch)

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The core is a very overused and misunderstood term. It is often just used interchangeably with abs. While your abdominals are part of your core, there are many more muscles involved in your core. The core is the most important area for a lacrosse player to develop. It is responsible for the transfer of force from your lower body to your upper body, and it is also a major part of body control during multi-directional movements. The core also helps to develop rotational power while shooting. I spend a lot of time in commercial gyms and hear a lot of people talking about training their core. Inevitably they go to the 'core area' and begin to do sit-ups/crunches or some variation of them. On some occasions I have seen people spend upwards of 15 minutes solely performing crunches and other variations of it, probably performing well over 500 reps of virtually the same exercise. It pains me to watch because not only do crunches only work one of the muscles of which your abs are comprised, but they are actually doing more harm than they are good. That's right, I said it. Crunches/sit-ups are old school and should no longer be done!!!

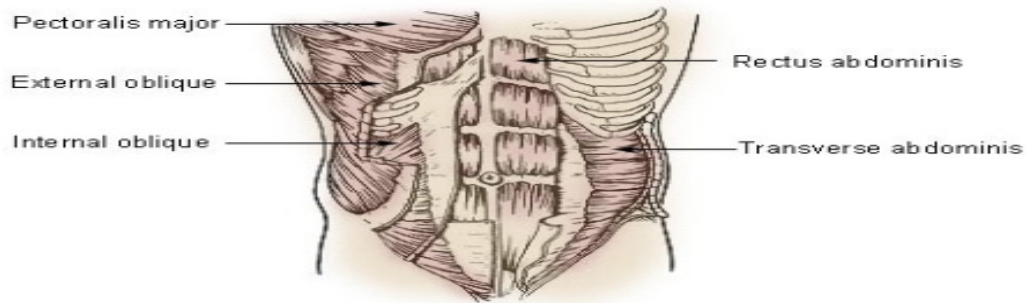
So if we shouldn't do crunches anymore, how do we train the core? I hear this question all the time from athletes (although from teenage guys I also hear 'how do I get a six pack then?'). Before I explain how to properly train the core or why crunches are bad I will first explain the abdominals. Your abs are made up of four anterior (front) muscles and many small but important posterior (rear) muscles.

Posterior Abdominals 1



While the anterior abdominals should not be considered more important than the posterior abs (since they work together they are only as strong as the weakest link), they do receive the bulk of attention in training due to their larger size. The rectus abdominis is the outer most anterior muscle and it runs vertically from the ribs down to the pelvis. This is the muscle that is being strengthened by doing crunches. Under the rectus abdominis is the external oblique. It is on the side of the body and runs diagonally from the outside in and down from the ribs towards the pelvis. Immediately below that is the internal oblique which runs opposite to the external oblique, running diagonally from the inside out from the ribs down to the pelvis. Lastly, buried under the other three is the transverse abdominis, which runs horizontally around the waist like a belt.

Anterior Abdominals 1



It is important to understand the direction the muscle fibre runs because when the muscle is contracted that is the direction the muscle shortens. For example, the rectus abdominis runs vertically, which means when it is flexed it pulls the ribs and pelvis closer together exactly as it occurs while performing a crunch. The problem with this method of training is that although the rectus abdominis is being strengthened, the spine is undergoing flexion with every single repetition. The action of bending over is the flexing of the spine. I am sure everyone has heard of lifting a heavy box with the legs and not the back and that you should have a flat back whenever you are lifting something to prevent a back injury. Dr. Stuart McGill, the leading researcher in the world on the spine, has stated that to herniate a disc excessive load is not needed and that repeated forward flexion of the spine is a much more potent mechanism to cause back injury. He has shown that a single sit-up puts 730 pounds of compression on the spine. If you performed 300 reps of sit-ups or variations of it in a training session that would add up to 219 000 pounds of compression. Of note is that The National Institute of Occupational Safety and Health has set the action limit for low back compression at 3300 N (or 730 pounds). Repetitive loading around this level is linked with higher injury rates in workers, yet this is imposed on the spine with each repetition of the sit-up! McGill's research has shown that every spine only has a certain number of flexions or extensions in it before it will break down, that if you lived forever eventually your spine would give out. Some people can live without ever getting a back injury, but for many back pain will become a part of life. The question then becomes if we only have so many flexions in our spine before it breaks down, do we want to waste up to 500 of them per day doing crunches? My answer is no. Some people will say that spinal flexion happens all the time in our everyday life, and also occurs a lot while playing lacrosse and they are right. That is even more reason to not perform them in our training. A good analogy for it is boxing. A boxer gets hit in the face hundreds of times in a single match, does that mean I should train him by punching him in the face? That's absurd, and damaging the spine is even worse in my opinion because once it's damaged, it does not heal.

So if we shouldn't do crunches because they will lead to damage of the spine, what should we be doing to train this very important area? We should be training the core first and foremost to stabilize our spine. While individually the four anterior abdominal muscles perform different tasks, together they work as stabilizers. Imagine there is an open window and you wanted to prevent someone from getting through it by nailing pieces of 2x4 wood over it. You would take some pieces and put them vertically from top to bottom. Then you might take some pieces of wood and put them on a diagonal across the window. After that you might take some more wood and put them on a diagonal running the opposite way as the previous pieces. Lastly, you would take some and put them horizontally from side to side. That would be the most stable structure you could build. As previously shown, that is exactly the design of your anterior core. Therefore, we need to train our abs to be stabilizers first and foremost. Dr. Shirley Sahrmann, DPT, states that the most important aspect of abdominal muscle performance is obtaining the control that is necessary to 1) appropriately stabilize the spine, 2) maintain optimal alignment and movement relationships between the pelvis and spine, and 3) prevent excessive stress and compensatory motions of the pelvis during movements of the extremities.

We've now established the anatomy of the core, explained its function, and shown why crunches/sit-ups should no longer be performed. Now it's time to discuss how having a nice, strong, stable core will make us perform better while playing lacrosse. Even though I've stated the core is an often overused term, its importance cannot be downplayed. As mentioned by Dr. Sahrmann in point three above, the core is important to stabilize during movements of the extremities. It is the core that enables us to transfer force from our lower body to our upper body. A weak core will result in energy leaks and therefore some of the force produced by our legs will be lost on the way up to the arms while we are shooting the ball or cross-checking our opponent. The core is also very important for helping create rotational power while shooting. As well, a strong stable core allows us to maintain proper body position and keep a good centre of gravity. This will help prevent an opponent from knocking us off balance during the play. Also, if you sprint straight ahead and then try to change directions immediately, the core helps to keep a nice athletic position so that you can change direction as quickly as possible. A weak core in this scenario would cause more of a forward lean changing the centre of gravity and therefore making it take longer for you to make that cut. As I've stated in a previous article, the faster you can decelerate the more likely you are to gain an advantage on your opponent.

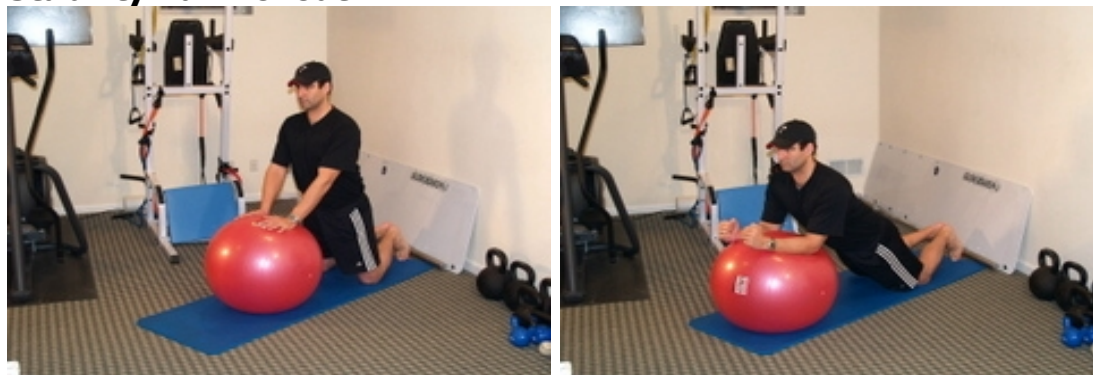
A good strength training program should start out with the basic core stabilizing exercises, then progress to more difficult progressions as you get stronger and more proficient at the basics. However, the basics must not be skipped, even if you have been training for awhile now and think your abs are strong enough to proceed to the advanced progressions. Gradually, medicine ball throws should be added to help train the power aspect of the core. A good beginners program should include planks, rollouts, chops, and medicine ball throws.

Front/Side Planks



Keys: Brace your abs (as if you are getting ready to be punched in the stomach) and make sure to keep breathing. Start initially with 30 second holds and gradually increase time until you can hold for 1 minute. Then move on to more difficult progressions.

Stability Ball Rollout



Keys: Again brace your abs, keep spine in natural curve and extend out with arms as far as you can without overextending the spine. A good cue (from Physical Therapist Gray Cook) is to try to "stay tall" through your spine throughout the movement, then return to starting position. Begin doing sets of 6 reps and once you can do 12 then you can graduate to a smaller ball or an ab wheel.

Half Kneeling Cable Chop



To do the half-kneeling chop, kneel at the cable column on the inside knee with the outside knee up. Grasp the handle with hands approximately 14 inches apart, pull to the waist with the outside hand and then press down with the inside hand. This should be a distinct push-pull action and should be performed without altering the position of the torso. Watch for hips shifting right or left or for inability to stabilize the scapula. A big key in the half-kneeling exercises is to fire the glute on the inside leg. Firing the glute and drawing in the abs will create a stable “tall” kneel.

Lateral Medicine Ball Rotational Throw

For this exercise you need either a concrete wall or a partner to go along with the medicine ball. You stand perpendicular to the wall/partner in an athletic stance. Bracing your stomach you rotate away from the wall and then reverse directions as quickly as you can and throw the ball as hard as possible against the wall. Begin with 8 reps each side with a light ball and gradual progress to a higher weight. However you do not want the ball to be too heavy as speed of the throw is more important than weight as you are trying to develop power, which means the exercise must be performed explosively.

Hopefully you now have a much better understanding of the anatomy of the core and why its primary job is to stabilize the spine. From that knowledge you should understand why crunches are not a good idea. They pull the ribs toward the pelvis resulting in poor posture and produce extremely high compression forces on the spine with every repetition. But from a functional viewpoint with respect to the sport of lacrosse, the crunch only strengthens one of the four anterior core muscles while virtually ignoring all the others. During game play all the muscles in the core, including those in the posterior abdominals work together, so that is how we should train them. By performing the planks/side planks, ab rollout, and lateral medicine ball throws you will engage all the muscles of the abdominals at the same time, increasing their strength and ability to transmit and produce force making you a better, more physically fit and injury resilient lacrosse player.

Sources

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