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## Keeping Your Adductors Strong

Knees rolling in on squats and pulls? Bill Starr explains how you can fix the problem by working on your adductors, which will translate to more weight on the bar.

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By Bill Starr

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C. Worden/CrossFit Journal

Any program designed to build greater strength must be constantly monitored to ensure the various muscles that make up a particular body part are worked proportionally. In order to continue to gain strength, the athlete (or his coach) must pay close attention to the less-obvious groups because they are integral to the successful development of the more prominent ones. The adductors are a set of muscles that is often overlooked in the total scheme of things.

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***When the knees roll in on a squat, weak adductors are the cause. That's the reason many new CrossFitters learn to squat properly and wake up with very sore inner thighs the next day.***

All strength improvement emanates from the center of the body—hips, glutes, upper leg—then radiates upward and downward. Those on a mission to get stronger recognize the importance of leg strength and know the back squat is the very best exercise for the job. In addition to heavy squats, many strength athletes also add in leg extensions and leg curls to ensure they're keeping their quads and hamstrings plenty strong. But few do anything specific for their adductors. They're sort of the forgotten leg muscles. Even those with experience generally fail to take the adductors into consideration when setting up their programs.

Of all the athletes, both male and female, that I started on strength routines, at least a third of them displayed a weakness in their adductors right away. I attributed this to the fact that they had all been doing a great deal of running, which works the quads and hams a lot more than the adductors. So they start in squatting with a slight handicap that needs to be corrected as soon as possible. Then there are those who are fine at the beginning, but after the poundages in the squat start to be considerable, weak adductors reveal themselves.

How? When an athlete's knees turn inward when he's squatting or pulling heavy weights, his adductors are relatively weaker than his quads and hams. It's easy to spot once you know what you're looking for, and the nice thing about working the adductors is that they respond to direct attention rather quickly.

### **Wide Squats and Machines**

The adductors comprise four separate muscles: adductor brevis, adductor longus, adductor magnus and the gracilis. They originate closely together high up in the groin on the pubis bone, then swing down and arc over to attach to various parts of the femur, running from the top to the bottom of the long leg bone until the magnus finally attaches to the medial condyle at the knee. This last part is most important. Strong adductors are critical to the stability of the knee joint, and their primary function is to pull the upper leg inward.

This is why the athlete's knees turn inward during a heavy squat or pull. The adductors are not strong enough to hold the knees in the correct position. More than a few athletes that I've coached have trouble differentiating between the adductors and abductors. A way to remember the two groups is to think about a kidnapping. The victim is taken away, abducted. Not adducted. The abductors pull the leg away from the center while the adductors pull it toward the center.

One of the main reasons why many strength athletes end up with relatively weak adductors is they don't go low enough in the squat. Some coaches in high schools and colleges have their athletes do partial squats, believing the shorter movement will be less risky to the knees. Actually, half and quarter squats are much more stressful to the knees than a full-range movement. When an athlete does only partial squats, he develops the quads but neglects the adductors and also the hamstrings to some extent. And all the pressure of the downward movement has to be handled by the knees. However, when he goes deep, well below parallel, all the muscles and attachments that surround the knee, including the adductors and hams, get stronger and help support that large joint. Plus, in a full squat, the powerful hips do most of the halting of the descending bar, taking the stress away from the knees.

Whenever I have an athlete switch from partial squats to full ones, he always gets extremely sore in his adductors, and usually hams, because they have been neglected previously. So the very first step in regards to making the adductors stronger is to do full squats—the deeper the better. Front squats are excellent as well because the athlete must go very low in order to do that exercise correctly.

Yet, I've had some athletes who did go into a deep bottom position in both their front and back squats but started showing a weakness in their adductors. Again, I think this came from all the running they were doing while practicing and playing their chosen sport. As soon as a weakness is revealed, steps need to be taken to correct the problem.

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Staff/CrossFit Journal

***For correcting weak adductors, extra work is often needed. Most CrossFit gyms don't have cable stations, so it might be necessary to try another of Bill Starr's adductor exercises. If you do have a cable station, Starr recommends 3 sets of 20 reps.***



As many readers know, I'm not big on machines, but I do like a few: seated and standing calf machines and the adductor machine. I've had athletes just starting out on a strength program who had glaring weaknesses in their adductors. After three or four weeks of working that group on the machine, the problem was resolved.

I had them do 1 set of 20 prior to squatting, which they did at every workout, then 2 more sets of 20 at the end of their sessions. Even when they have corrected the relatively weak area, I still have them do no less than 2 sets of 20 at the end of their workouts twice a week. The warm-up set on the adductor machine doesn't have to be hard, but the 2 work sets need to be taxing. When you get to the 14th or 15th reps, your adductors should be screaming. Work right on to the last rep. That's how you force them to get stronger. Merely teasing doesn't get the job done because the adductors are potentially a powerful group.

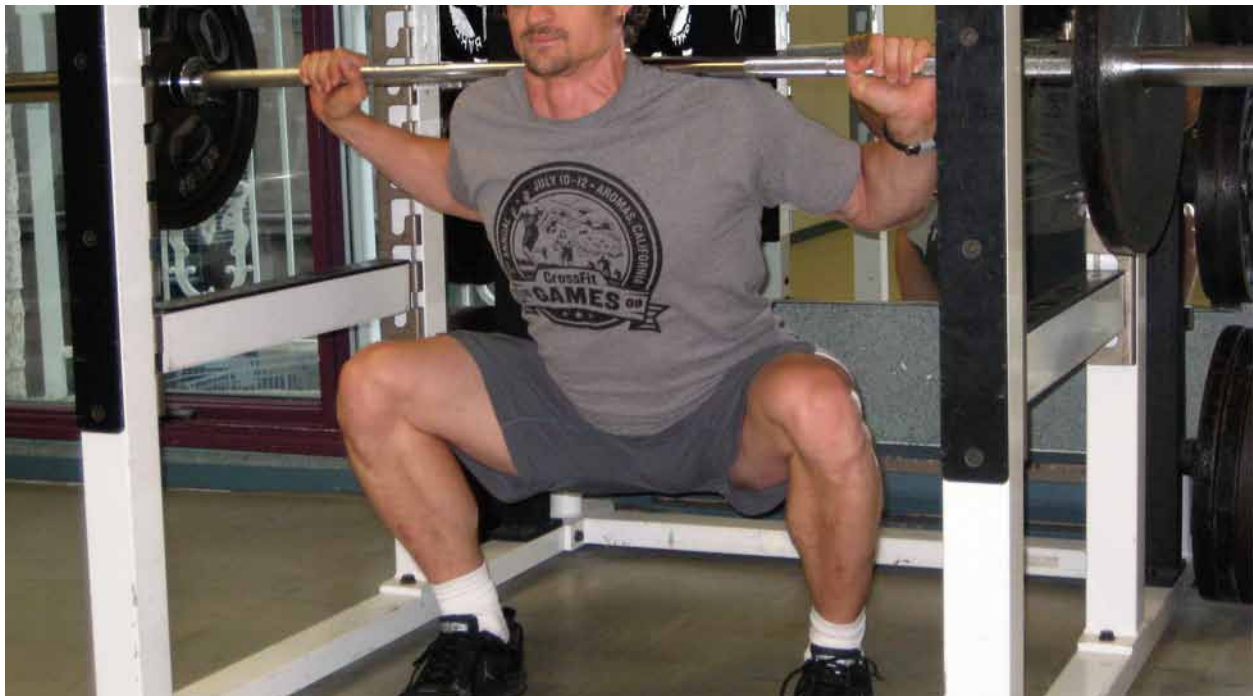
Adductor machines are not found in every weight room, and very few home gyms have one. What to do if one is not available? Actually, an athlete can do quite a few barbell exercises to improve strength in his adductors.

The one I use in the absence of an adductor machine is wide-stance squats. How wide? The wider the better, just so long as you can maintain your balance and go extremely deep. The adductors really get in the act once you dip below parallel, and the deeper you go, the more they're activated. It takes a bit of practice to do these correctly, so start off with a light poundage and concentrate on form.

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Staff/CrossFit Journal

**Wide-stance squats with the toes pointed forward are good for working the adductors. Athletes should work to go as low as they can: the deeper they go, the more they will work their adductors. Depth will increase as flexibility increases.**

Some form pointers: Your feet have to be pointed straight ahead, not outward as in the conventional squat. The pressure should be on the outside of your feet, not on the toes or heels, and your torso must remain perfectly upright on both the down and up motion. It should appear as if you are working inside a Smith machine when you do these. Of course, wide-stance squats can be performed inside a Smith machine, but for athletes, having to balance the weight during the execution of the exercise is a good thing. Any time you have to utilize any athletic attribute during an exercise with resistance, it carries over to other athletic activities.

Do these for higher reps, 15-20 for 3 sets, and, again, the final few reps should make your eyes water. If you stay in the comfortable range, the results will not be nearly as good as if you lean on these. When the adductor weakness is glaring, I have the athlete do all his squats in this manner until the problem is solved, then I have him do wide-stances twice a week after he has done his regular squat workout. These back-off sets are done on the heavy and medium days, but not on the light day.

### Sumo Deadlifts

I mentioned that the knees turning inward during heavy pulling exercises represents one indication of adductor weakness. It's most apparent when doing deadlifts, but I have also seen it in Olympic lifters when they approach their limit in snatches and cleans. Their knees move inward when the bar breaks off the floor. When the athlete has very weak adductors, his knees will move even when doing high pulls, bent-over rows and good mornings. I use wide-stance deadlifts, or sumo-style deadlifts, to rectify the weakness. They work extremely well, and quite often an athlete finds he is much more comfortable deadlifting with the wide stance than with the conventional close stance normally used by most powerlifters.

Again, the question, how wide should the feet be placed? This will take a bit of experimentation. You will be gripping the bar with your hands inside your thighs, but you don't want to place your feet so wide that you can't lower your hips enough to be in the proper starting position. Use straps so you can concentrate on doing the movement correctly, or you can use the over and under grip if you prefer.



Staff/CrossFit Journal

***Isometric work on the adductors can be done anywhere. All you have to do is hold the knees out with your hands while activating the adductors for 8-10 seconds by trying to pull your legs together.***

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Lower the bar in a controlled manner. Even if you're using rubber bumper plates, don't let the bar crash back to the floor. This will cause your back to round.

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## Adductors ... (continued)

Use the same idea for foot placement that I mentioned with the wide-stance squats: feet pointed straight ahead with all the pressure placed on the outside. When doing a sumo deadlift, there is a tendency for the bar to run forward more so than it does with the conventional style. You have to tuck it in snugly against your shins and make sure it doesn't move forward when you break it off the floor. One way to ensure doing that is to get set for the start, then think of pushing your feet down through the floor rather than thinking of pulling the weight upward. Guide the bar right up your shins and thighs. Right after the bar breaks off the floor, just lay back and like magic it will climb right into lockout. Don't look down. Rather, look slightly upward, and this will help you keep the bar close to your body on its flight.

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Lower the bar in a controlled manner. Even if you're using rubber bumper plates, don't let the bar crash back to the floor. This will cause your back to round. Whenever the back rounds in a pulling exercise, there is a risk of injury, and it doesn't matter whether it happens on the way up or down. Plus, the controlled lowering of the weight acts as a negative and adds a bit more usefulness to the exercise.

Same set and rep idea if you're using these to improve strength in your adductors: 3 sets of 15-20 reps, with those final half dozen reps being gruesome. Make sure your hips don't rise up too fast on these because that will send the bar scurrying forward. Try to set your hips as low as possible, and this will force the adductors, along with many other muscles in the hips, legs and lower back, to work harder. This, of course, translates to stronger muscles and corresponding attachments.

Once you've pulled your adductors up to par with the high reps, you can start doing these as a pure strength exercise. The formula I like is 5 sets of 5 with a high-rep back-off, but if you have a favorite routine, by all means use it. There's more than one way to skin a cat.



Courtesy of Focus Fitness

*Former Atlanta Thrashers forward J.P. Vigier uses a slide board. Many NHL players use slide boards in dry-land training, and Bill Starr has used them to build up weak adductors in his athletes.*



I had a lacrosse player at Hopkins who always did 7 reps on the various primary exercises. I never was sure why, but it worked for him, and that's all that matters.

### Tricks and ThighMasters

I've also had success in strengthening relatively weak adductors by having athletes utilize the slide, an apparatus that came out of speed skating. It's a wide board with a slick surface where the athlete moves laterally wearing socks or little booties. It was quite a hit with the group aerobics crowd for a while and does a terrific job of working the adductors and abductors. Those who used it consistently discovered that they greatly improved their lateral speed as they made their adductors and abductors stronger.

It's also very demanding, so several sets of lateral movement for 5 minutes at a time is generally enough for most. Naturally, the more you work on the slide, the more proficient you will become, and as a bonus you will improve your aerobic base.

Another gadget I have used to either help rehab injured adductors or build them up when they're very weak is the ThighMaster that Suzanne Somers hawked on TV for years. It wouldn't be useful to anyone squatting and deadlifting 400 lb., but it would help someone who is starting from scratch in terms of building some strength in his adductors, such as after knee or hip surgery.

There is another form of exercise that has been around for nearly a century that is beneficial to someone with very weak adductors. Usually this occurs after an accident, surgery or long illness. It's called Dynamic Tension and was the brainchild of George Jowett. I sent away for one of his courses when I was in high school, and because I couldn't afford to buy a set of weights to use his weight-training program, I just did the Dynamic Tension stuff. The only movement that got me sore was the one for my adductors, so I did lots of those.

Sit on the floor or a chair with your legs wide apart. Cross your arms and push against the insides of your knees with your hands as you try and pull them together. Hold the tension against your knees for 8-10 seconds, then ease off a bit and allow them to touch and rest. Then do another set.



Staff/CrossFit Journal

*The multi-hip station found in most Globo Gyms provides another way you can do some additional work on weak adductors.*



***Lateral movement on a slide board will build the adductors, and doing 5-minute sets will train the aerobic system at the same time.***

Do as many sets as necessary to fatigue the adductors, which will happen surprisingly fast the first few times you do these. I've had athletes who did these on spring break tell me the simple exercise got their adductors sore the following day. They're obviously not going to be as effective as wide-stance squats or deadlifts, but sometimes weight equipment just isn't available.

Back before the adductor machine came on the scene, those wanting to build more strength in their inner thighs or to shape them for appearance's sake used other ways to achieve their goal. One of the most popular methods in fitness centers was to use cables attached to stacks of plates in a Universal machine. The cable was fixed to a padded strap that was secured to the ankle, then the person either stood or sat on the floor and with straight legs worked his, or her, adductors. High reps, as in 20s for 3 sets, were the order for the day.

Ankle weights were all the rage for a while, and they still get the job done. These are especially useful for someone who trains at home. In the formative years of weight training, Iron Boots served the same purpose. They're still around, although few know how to put them to use. Basically, Iron Boots are pieces of metal shaped like a foot, with straps and a hole in which a dumbbell bar can be inserted and plates added to it, if need be. It's actually a very versatile piece of equipment. John Grimek once

demonstrated an entire leg workout using them. I tried them for my hamstrings and quickly discovered that they were not for the lighthearted, especially when a fair amount of weight is added to the boots themselves. The last time I was at York Barbell, I saw them and later on wished I had bought a pair. They would be most useful in my high-rep type of program.

There are times in everyone's life when he finds himself in a place that doesn't have any sort of training equipment. I usually scrounge something up or make long drives to gyms whenever this happens, but a friend of mine wasn't able to do either of these things. He was house-sitting for a month at an isolated estate on the side of a mountain. The nearest training facility was 50 miles away, and there were no neighbors for him to try and borrow some weights from. So he ran the hills and did an hour-and-a-half workout every day that consisted of freehand movements. I won't bother going into his whole routine, but for his adductors, he sat in a chair, and while keeping his leg straight, moved it back and forth until his adductor gave out, then did the other leg. When he first started this program, he could do 200 reps, and after only three weeks he was up to 300 for 3 sets. He told me he was surprised at how sore his adductors were after a session with the freehand reps, and since then I have put the idea to use on several occasions, usually when I'm traveling.



### Smith Machines and Advanced Techniques

That's the far end of the spectrum. At the other end are the adductor machine, wide-stance deadlifts and squats. In regards to the latter exercise, I want to mention a couple of ways of doing these when the athlete is having a great deal of difficulty going low using the very wide stance. In some cases, this is due to a lack of flexibility, and in others it's because the adductors are not strong enough for him to hold his balance.

While I'm not a fan of the Smith machine, I have found that it can be most useful in this regard. By doing the wide-stance squats in the Smith machine, an athlete can stop worrying about his balance and concentrate on going lower and lower. Wide stances are only effective if the movement is done very, very low.

Not all training facilities have a Smith machine, of course, but most do have power racks. If the rack is wide enough, the athlete who is having trouble going into the hole when he does wide-stance squats can use the uprights to steady the bar as he moves up and down. However, as soon as he gets his adductors strong enough and gains the sufficient flexibility to nearly touch his butt on the floor at the bottom position, he needs to move out of the rack and do them without any support. Same holds true for working in the Smith machine.

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**Make sure you always go low  
on all your squats.**

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Finally, an exercise for those strength athletes who are very advanced and are looking for a way to further improve their adductor strength so they can move bigger numbers in the front and back squat and all the pulling movements in their routine. Be warned: it's not for the weak of spirit, because these will make your eyes cross.

It's an isotonic-isometric move done from the lowest point of the wide-stance squat. Set the bar across the pins inside the rack so that it's where you would be when you hit the deepest part of the movement. This will require a bit of trial and error as you test the position



Staff/CrossFit Journal

of the bar to make sure you can get under it and still be able to maintain an erect body posture. Once you have the right pin placement, put two more pins just above the lower ones. The closer they are together, the better.

While learning how to do this, use light weights. Squeeze under the loaded bar, set your feet as wide as you can, make sure your upper body is rigidly upright, take a breath and move the bar up to the top pins. In the learning stage, just tap the top pins, lower the bar to the bottom pins, then tap the top pins a second time. But on the third rep, lock the bar against the top pins and hold it there for an 8-12 second count.

Once you get the feel of what you're trying to accomplish, you can skip the first two reps and go right to the work set. As you get used to the isos, add more weight to the bar for the work set. But keep in mind that for these the time factor is far more important than how much weight is being used. If, when you get to a 12 count and find you can hold the contraction longer, use more weight the next time. Conversely, if you can't lock the bar into the top pins for at least an eight count, lower the poundages.

These are very concentrated exertions and can be done right after a regular squat session two or three times a week. They work best for advanced strength athletes, but there is no reason why anyone, at any strength level, shouldn't try them if for no other purpose than to know how to do them later on.

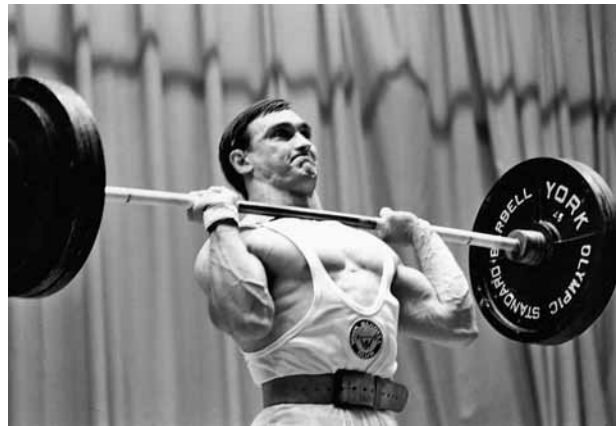
### Don't Ignore a Weakness

Make sure you always go low on all your squats. One of the things I like about front squatting is that the athlete has to go deep, and this helps strengthen the adductors. Be aware of how your knees react during a heavy squat or pull. Or better yet, have someone keep an eye on your knees when you're squatting or pulling heavy. You may be focusing all your attention on the exercise itself, so get some help in identifying the fact that your knees are turning inward during a heavy attempt.

When a weakness in the adductors is determined, don't hesitate. Start doing something to remedy the situation right away. As I mentioned, adductors respond to specific exercises very readily. Then, after you've brought them back in proportionate strength to your hamstrings and quads, continue to include at least one exercise in your weekly program specifically for your adductors.

Keep in mind that when adductor strength falls behind, it adversely affects every back and leg exercise you do. And that's a lot of exercises. Weak adductors have a direct bearing on foot speed, leaping ability and endurance. Equally as important to any aspiring athlete is the fact that the adductors play a major role in securing the knee joint, especially the anterior part. Strong knees are critical for anyone participating in any sport, but doubly so for those engaged in contact sports like football, soccer, lacrosse, rugby and hockey.

Don't take your adductors for granted. Make sure you give them the attention they deserve and require so you can continue to make gains in the weight room and become a stronger, more proficient athlete.



Jody Forster

### About the Author

*Bill Starr coached at the 1968 Olympics in Mexico City, the 1970 World Olympic Weightlifting Championship in Columbus, Ohio, and the 1975 World Powerlifting Championships in Birmingham, England. He was selected as head coach of the 1969 team that competed in the Tournament of Americas in Mayaguez, Puerto Rico, where the United States won the team title, making him the first active lifter to be head coach of an international Olympic weightlifting team. Starr is the author of the books **The Strongest Shall Survive: Strength Training for Football** and **Defying Gravity**, which can be found at [The Aasgaard Company Bookstore](#).*