Dynamic Chiropractic

SPORTS / EXERCISE / FITNESS

Strengthening the Legs

The previous article in this series (May 31) addressed weightlifting exercises as a method of strengthening the back. I began by emphasizing what I called the power groups, those muscle complexes which contain the larger muscles: the back, the chest and the legs. I also stated that the power of the chiropractic adjustment is most beneficial when a regular routine is established so that the body is continually conditioned for these benefits. "Good sense" and "continuous conditioning" were key phrases.

I urge you to imbue your patients with the understanding that it makes good sense to take charge of their health. The critical tools necessary to accomplish this are active participation in fitness exercise (cardiovascular), nutrition and strength conditioning (weightlifting).

It's my view that the chiropractic adjustment is the most powerful adjunct to all physical activities. The best method to develop muscular strength is by weight-resistance exercise. It's a wise choice to combine these dynamic factors as part of one's self health care. I'm not talking about developing hulking muscles. Our goal is to educate the patient about the value of strengthening the body through weightlifting.

Among weightlifters, the legs are the most neglected muscles. Far too many people do little or nothing to strengthen the lower body. This is unfortunate, because the legs are truly the foundation of the body. Strong legs make all other physical activities easier and more fun.
If you want a strong upper body, you must have a strong lower body. Countless examples have taught me that major breakthroughs in overall strength and endurance come from strengthening and conditioning the legs. As an added bonus, the increased stamina acquired from building stronger and better conditioned legs makes the body a better vehicle for burning fat in cardiovascular (aerobic) training.

For our purposes, we'll only be concerned with the muscles of the hip (hip flexors), thighs (quadriceps and hamstrings), and lower leg (calves). Obviously, there are more intricate muscles groups in the legs, but these are the muscles most commonly known in the exercise environment.

Instruct your patients that there is a potential for injury while doing any weightlifting. Overtraining can cause muscle spasms, muscle strains and possible joint sprains. Incorrect mechanics may also lead to pelvic (specifically the sacroiliac joints) or lumbar misalignments. If I have patients or clients with acute or long-standing low back or knee problems, I strongly suggest they do leg exercises that don't directly affect the injured region (squatting movements as an example) until such time when these movements can be more beneficial.

Necessary terminology includes sets and repetitions. A repetition is the amount of times the weights are lifted throughout a specific movement. Moving a weight up and down is one repetition. A series of repetitions makes up a set.

Following are a list of the most common exercises for strengthening the legs. I will discuss the value of squats, leg extensions, leg curls and calve raises. Other exercises are very valuable and should also be done as a variation utilizing the same methods and mechanics of training. Unless

you are in a mode of rehabilitation, I suggest doing moderately intense leg training no more than twice per week, preferably every fifth or sixth day. If in rehabilitation, perform a variety of specific exercises using lighter weights with more repetitions more times per week. In general, it is a good idea to do two exercises for the quads (including the hip flexors), two for the hamstrings and two for the calves. Any variation can obviously be productive. It is purely a matter of choice.

Exercises

• *squats*
• *lunges*
• *leg curls*
• *stiff-legged dead lifts*
• *thigh abduction*
• *leg press*
• *leg extensions*
• *hyperextensions*
• *calf raises*
• *thigh adduction*

Squats are the premiere exercise for strengthening the legs (including quads and hip flexors). I can hear some of you nonlifting types commenting already. Sad to say, I've heard other chiropractors make negative comments on the value of squatting. Most comments revolve around the knees or lower back being unusually stressed, and that squats therefore should be avoided above all other exercises. To that I say, take the blinders off, doctors. Any exercise, when done incorrectly and under the wrong circumstances can produce negative results.

I believe this to be the single best exercise to strengthen the muscles of the lower body. To properly do this exercise you need a rack built specifically for this maneuver. Certainly, if your body is not yet prepared for this weightbearing exercise, the squatting motion may be done without weights. In this situation, the weight of the body may be enough to get you started.
Most gyms have one or two of these stations. Choose the one most comfortable for you and be aware that there are three phases to the squatting movement using the squat rack.

Set the barbell high enough so that you can get under it with your head and shoulders, but low enough so you cannot stand completely erect. Place the feet about shoulders-width apart, with the toes pointed slightly outward. With the knees slightly bent, descend into a squatting position with the head looking up to emphasize the curve in the low back. It is important to keep the knees tracking over the feet so that the legs do not converge toward each other. This keeps the legs moving with the least amount of stress on the knees. You know when you are in a substantial squat position when your thighs are slightly lower than parallel to the ground. There is no need to go deeper. Return to the standing position with the knees slightly bent. You are now ready to continue with your repetitions. Breath control is important during this exercise. Just before descending, take a breath and tighten the mid-section to equalize the internal pressure of the body and add support to the low back. Always descend more slowly than you ascend to maintain ultimate control of the movement.

Common sense tips to avoid injury:

1. Do these movements under control to avoid back or knee injuries.

2. Do not set the bar too high on the back. Try to stay below the neck.

3. Do not bounce at the bottom. This is one of the most common and costly mistakes with this exercise. Bouncing causes incredible stress on the low back and the knees.

4. This is one of the best overall strength builders for the body. Treat it with respect.

5. I suggest wearing a weight belt for extra support as the weights get heavier. No exceptions. Safety first, no matter what you've heard about the potential muscle weakening effects of this type of support.

6. Wear shoes that give solid support.

Five sets are adequate, with the first two being warm-up sets. The warm-up sets should be done with relatively lighter weights for 15-20 repetitions. This ensures that the muscles will have an increased blood flow established and the muscle fibers will be prepared for the specific movement. The remaining sets may be performed using 8-12 repetitions. With each set, try to add a little more resistance (pyramid up) and make sure the rest period is from 60-90 seconds between each set. One way to increase intensity without increasing the amount of weight is to reduce the time of the rest period.

Many gyms have a variety of machines that will allow the benefits of the squatting movement without the use of free weights. These machines give decent results without the discomfort of lifting the weight off the rack, stepping back to begin the exercise, then stepping forward to rerack the weight.

Leg extensions are a very good exercise for isolation of the quadriceps muscle, and they (along with leg curls and calf raises) are very important exercises for keeping the overall knee complex strong. This exercise is done on a machine which allows you to sit and hook the front of the ankles on pads and to grab handles on the sides of the seat for support. You select the weight by inserting a pin in a rack. Slowly extend the weights under control, feeling the quads contract. Slowly release the weight under control, not allowing the weight you're moving to touch the stack of weights. Continue with this motion until you have reached the desired repetitions.

Remember to start with a warm up set with lighter weights. Progressively add resistance, if you choose, or establish a working weight slightly higher than the warm up set and finish the remainder of the sets and repetitions. Use up to 15-20 repetitions for the warm up set. The next 3-4 sets should be done using from 8-12 repetitions. Each repetition should be performed with the maximum range-of-motion necessary to encompass the eccentric and concentric contraction of the muscles (an example of one method).

Leg curls are a primary mover for the hamstrings. It helps strengthen the knee complex as a secondary benefit. Strong and flexible hamstrings help support and stabilize the inferior aspect of the pelvic girdle. As chiropractors, we often find pelvic imbalance resulting from shortened or overly tightened hamstrings unilaterally or bilaterally.

The leg curl exercise requires specific equipment, which most gyms have. You lie on your stomach on a padded bench with the feet extended and the heels hooked under a padded extension. With a smooth movement, pull the heel pads slowly as you contract the hamstrings. The contraction is

complete when the pads gently touch the upper hamstrings. Release the foot bar more slowly to accentuate the eccentric contraction. When the feet are back to the starting position, you'll feel a nice stretch in the hamstrings as you begin the next contraction.

It's okay to do a few more sets with this exercise since the hamstrings usually lag in terms of overall balanced leg strength. Use the first two for warmup sets, doing about 15-20 repetitions. Follow this with four working sets of 8-12 reps.

Calf raises and the several variations for this exercise have the same effect on the gastrocnemius muscles. There are several methods of exercising the calves including seated calf raises (emphasizing the soleus muscles), standing calf raises, donkey calf raises and toe raises using the leg press machine.

Situate yourself so that the balls of the feet are on the edge of the appropriate platform. The upward movement, or the concentric contraction, occurs when you plantar flex the foot. Come up as high as you can to get the maximum contraction. Release slowly and make sure to get a very deep stretch for the eccentric contraction. This muscle group can be worked as often as you desire. Unknown to many doctors, this exercise (along with leg extensions and leg curls) completes all of the work necessary for the tie-ins that support the entire knee complex. It follows then that these three exercises are important for a complete synergistic approach to complex conditioning of the knee complex.

Do at least two different exercises for the calves and change the angle of the foot for different variations (i.e., toes straight, toes in, toes out). Four to five sets per exercise with 15-20 repetitions per set will suffice.

Look for my next installment on strengthening exercises with weightlifting. I will cover the last of the three power groups (the chest) and give some insights to proper techniques for your patients.

To reiterate, the basic premise for weight training is to do at least one warm-up set followed by 3-4 working sets. This will establish a template that may then be expanded as your understanding of strength training increases.

It should be obvious to all that the conservative care of chiropractic works at its best when the patient takes charge of their own health. Part of that responsibility includes a reasonably consistent routine of strengthening and stretching. This, coupled with cardiovascular exercise and proper nutrition, comprises the most powerful combination of health care in existence.

Reference

Leone M. *It's Time to Play Weights.*

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