

Dr. Ryan Nelson
861 Health Park Blvd.
Grand Blanc, MI 48439
(810) 953-0500
www.DrRNelson.com
ryan.Nelson@DrRNelson.com

EXERCISES AFTER INJURY TO THE ANTERIOR CRUCIATE LIGAMENT (ACL) OF THE KNEE

Phase one: The First Six Weeks after Injury

Initially, the knee needs to be protected-use the knee immobilizer and/or crutches and avoid full weight bearing. Apply ice and an elastic wrap to control swelling. Elevate the leg and use elastic stockings if the leg is swollen. As the pain lessens and the swelling decreases, try to gradually regain knee motion. Avoid pivoting or twisting the knee because it might be unstable and give out.

Do not place a pillow under the knee for comfort. This can lead to knee stiffness. When walking, bear weight according to the doctor's instructions. Use crutches to assist when walking. You may gradually wean from 2 crutches to 1 crutch, held on the side opposite the injured knee. Progress to no crutch(es) or brace when you can walk without a limp and there is no pain. Ice the knee if there is pain and swelling. Place a towel or cloth between the skin and the ice to prevent skin injury. Ice for 20 minutes, three times a day. At about three weeks following injury, the pain is usually subsiding and the swelling is lessened. You can now try to stretch the knee to regain motion. Stationary cycle, swimming (flutter kick only) and the following exercise program are recommended.

QUADRICEPS SETTING – to maintain muscle tone in the thigh (quadriceps) muscles and straighten the knee

Lie on your back with the knee extended fully straight as in the figure. Contract and hold the front thigh muscles (quadriceps) making the knee flat and straight. If done correctly, the kneecap will slide slightly upward toward the thigh muscles. The tightening action of the quadriceps muscles should make your knee straighten and be pushed flat against the bed or floor. Hold five seconds for each contraction. Do at least 20 repetitions three or four times a day until you can fully straighten your knee equal to the uninjured side.



HEEL PROP- to straighten (extend) the knee.

Lie on your back with a rolled up towel under your heel or sit in a chair with the heel on a stool as shown in the figure. Let the knee relax into extension (straight). If the knee will not straighten fully, you can place a weight (2 to 5 pounds) on the thigh, just above the kneecap. Try to hold this position for **5 minutes, three times a day. While maintaining this extended position, practice quadriceps setting.**

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HEEL SLIDES - to regain the bend (flexion) of the knee.

While lying on your back (figure), actively slide your heel backward to bend the knee. Keep bending the knee until you feel a stretch in the front of the knee. Hold this bent position for five seconds and then slowly relieve the stretch and straighten the knee. While the knee is straight, you may repeat the quadriceps setting exercise. Continue this exercise until you can fully bend your knee equal to the un-injured side. Also, as you start to gain flexion, you can assist your efforts to gain flexion by assisting the heel slide with a towel. See illustration. Repeat 20 times, three times a day.



STRAIGHT LEG LIFT

The quality of the muscle contraction in this exercise is what counts the most, not just the ability to lift the leg!

1. Tighten the quadriceps (quadriceps setting) as much as you can, push the back of the knee against the floor.
2. Tighten this muscle **harder!**
3. Lift your heel 4 to 6 inches off the floor
4. Tighten the quadriceps **harder again.**
5. Lower your leg and heel back to the floor. Keep the quadriceps as tight as possible.
6. Tighten this muscle **harder again.**
7. Relax and repeat .



If the knee bends when you attempt to lift the limb off of the bed, do not do this exercise. Keep trying to do the quadriceps setting exercise until you can lift the limb without letting the knee bend.

You can advance to the following exercise program to help you regain knee motion and strength. If the exercises can be performed easily after the first week, then an ankle weight may be used to increase the resistance of the exercise and to build strength. Start with one pound and add one pound per week until you reach five pounds.

Do the exercises daily for the first week, then decrease to every other day when using ankle weights. You may ride the stationary bicycle daily for 10 to 20 minutes. Avoid using stair-stepper machines, doing deep knee bends and squats or any exercise that causes crunching, clicking or pain at the kneecap.

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STATIONARY BICYCLE

Utilize a stationary bicycle to move the knee joint and increase knee flexion. If you cannot pedal all the way around, then keep the foot of your operated leg on the pedal, and pedal back and forth until your knee will bend far enough to allow a full cycle. Most people are able to achieve a full cycle revolution backwards first, followed by forward. You may ride the cycle with no resistance for 10 to 20 minutes a day. Set the seat height so that when you are sitting on the bicycle seat, your knee is fully extended with the heel resting on the pedal in the fully bottom position. *You should then ride the bicycle with your forefoot resting on the pedal.*

STANDING HAMSTRING CURL

Stand facing the wall, using the wall for balance and support. While standing on the uninjured limb bend the knee of the operated side and raise the heel toward the buttock. Hold this flexed position for one second. Slowly lower the foot back to the floor. Keep the thighs aligned as illustrated. Repeat 20 times



STANDING TOE RAISE

Stand facing a table, hands on the table for support and balance. Keep the knees extended fully. Tighten the quadriceps to hold the knee fully straight. Raise up on 'tip-toes' while maintaining the knees in full extension. Hold for one second, then lower slowly to the starting position. Repeat 20 times.

HIP ABDUCTION

Lie on your uninjured side. Keep the knees fully extended. Raise the operated limb upward to a 45 degree angle as illustrated. Hold one second, then lower slowly. Repeat 20 times.

WALL SLIDES

Stand upright with your back and buttocks touching a wall. Place the feet about 12 inches apart and about 6 inches from the wall. Slowly lower your hips by bending the knees and slide down the wall until the knees are flexed about 45 degrees (illustration). Pause five seconds and then slowly slide back up to the upright starting position. Do 3 sets of 10 to 15 repetitions.

