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## Level A Exercises

As you achieve full range-of-motion with the range of motion (ROM) stretches, you can also work toward getting your muscles strong. By practicing these exercises, you will establish a smooth highway between your brain, spinal cord, and knee, allowing a seamless transition to more advanced movements (otherwise known as your normal life).

For those who have not darkened the door of a gym for a while, enlist a friend who can read the text aloud and help you match your body position with the photos. If you are an active, athletic person, the exercises should seem simple. Their purpose, however, is to educate your muscles so you can move on to more aggressive training. Remember: sometimes trying to “get back” too quickly from an injury will result in more, not less, time off.

### “Well-Leg”:

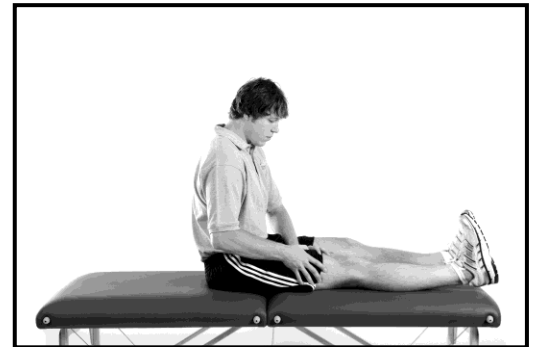
When going through your stretching and exercise routine, do all the movements with your “well-leg” first and then the injured leg. This serves a few purposes. First, similar to our discussion above, well-leg exercises allow your brain to figure out the movement on a “normal” knee and then translate that knowledge to the injured knee. Well-leg, coupled with upper body exercises, can help keep your sanity by allowing you an aggressive strength and cardio workout. The resulting increased blood flow will also help pump the swelling out of the injured knee. Finally, well-leg, upper body or core exercises (sit-ups, etc.) can serve as a good warm-up before doing your knee exercise program.

### Level A - Exercise 1 : Quad Sets

**Purpose:** Your quadriceps muscle, the big muscle on the front of the thigh, takes any opportunity to go on vacation after knee trauma. As a result, do Quad Sets on your way into surgery and make them the first thing you do in the recovery room. *Quad Sets are truly a key exercise* everyone should do for any lower-extremity problem.

**Starting Position:** Begin with your leg straight, whether you are lying down, sitting on the floor, or standing.

**Action:** Tighten your quadriceps muscle and hold for 5 seconds. If you are sitting or lying, pull the back of your knee *down* into the floor so the leg actually bends backwards as far as it can (“back knee” or “hyper-extended”). While you pull the knee *DOWN*, lift the foot *UP*. Do 3 sets of 5 reps and hold each rep for 5 seconds. Attempt to increase quad contraction over the 5 seconds.



**Note:** Perform these exercises at work, in class, or at home, multiple times a day. People who do Pilates can think of Quad Sets as the knee version of an abdominal contraction. Your first motion is *down*, pressing the knee into the floor, similar to pulling in your stomach muscles. The second motion is the quad contraction, similar to raising your chest with your stomach pulled in firm.

### What Are Reps and Sets?

A “rep” is a repetition of a particular exercise. A “set” is a group of these repetitions. Thus, 3 sets of 5 reps is a total of 15 exercises. The other way to do exercises is by time. For example, do Quad Sets of 5 seconds followed by 5 seconds rest for the next 2 minutes. The benefit of doing exercises by time is you do not rush trying to finish a predetermined number of reps. Whatever your method, strive to do all exercises slowly, carefully, and deliberately.

## Level A - Exercise 2 : Hamstring Sets

**Purpose:** To increase control and strength of the hamstrings, that wad of muscles on the back of your thigh.

**Starting Position:** Begin with your leg bent, whether lying down or sitting.

**Action:** Tighten your hamstring muscles by pushing down on your heel, and hold for 5 seconds. Do 3 sets of 5 reps and hold each rep for 5 seconds. Attempt to increase the contraction over the 5 seconds by pulling steadily harder. Watch out for cramps.



**Note:** Perform these exercises at work, in class, or at home, several times a day.

## Level A - Exercise 3 : Co-Constrictions

**Purpose:** This is another one of those critically important exercises that you will be doing obsessively. When you simultaneously contract the quadriceps (front of the thigh) and hamstrings (in back of the thigh), your knee is stabilized. Co-contraction means muscles “contracting together” --something that needs to take place automatically as this stability serves to protect your knee ligaments and cartilage (thus well worth practicing).

**Starting Position:** While seated in a chair or on the floor, bend your hips and knees to approximately 90 degrees.

**Action:** Contract both the hamstring and the quadriceps muscles. This can be done by pushing your heel into the floor and pulling backward at the same time. The foot does not move. This will take a bit of practice, but it is important that you master this. Place your hands on the front and back of your thigh so you can feel the muscles tighten. Do the “well-leg” first so your brain knows what you’re trying to accomplish on the injured leg. Do 3 sets of 5 reps and hold each rep for 5 seconds. Attempt to increase the contraction over the 5 seconds by pulling steadily harder

**Note:** Develop a habit of doing this almost unconsciously—like blinking.



## Level A - Exercise 4 : Leg Raises with Co-Contraction

**Purpose:** To increase control and strength of the quadriceps and hamstrings, while also strengthening the hip flexors. The hip flexors are the muscles in your groin that bend your hip, lifting the thigh bone toward your chest. This is also a great “core” exercise as it is also working your abdominal muscles.

**Starting Position:** Begin with your leg co-contracted (lying or seated) with a 30-degree bend in the knee.

**Action 1:** Lift the leg 2 feet off the floor. Hold for 5 seconds; then lower the leg back to the floor. Maintain the co-contraction, keeping those quad and hamstring muscles working hard throughout the movement. Do 2 sets of 5 reps on each side and hold each rep for 5 seconds.

**Action 2:** Co-contrast and raise and lower the leg quickly without touching it down to the ground. Do 2 sets of 10 reps on each side. Try to perform 1 rep every second.

**Note:** Once you feel strong enough, this exercise (and others as noted) may be done with ankle weights. Start with 2-3 pounds on each ankle and progress up from there. This exercise should be performed at least 2 times per day.



## Level A - Exercise 5 : Prone Hamstring Curls

**Purpose:** To increase control and strength of the hamstrings through an active range of motion.

**Starting Position:** Begin by lying on your stomach, legs straight.

**Action:** Bend your knee by bringing your heel as close to your gluteals (buttocks) as possible; then lower your leg with a slow, smooth, *controlled* motion. This exercise should be done slowly. Try counting slowly to 4 going up, and count to 4 again going down. Do 2 sets of 10 reps on each side.



**Note:** Add ankle weights after gaining control and strength. This exercise should be performed 2 times per day.

*At this point you might be noticing a pattern. I am asking you to incorporate knee rehab into your life, not just for a specific number of minutes a day. Don't relegate stretching and exercise to the time spent with your therapist or trainer. Those sessions are just the tip of the total recovery iceberg.*

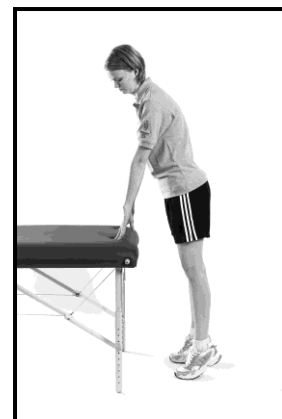
## Level A - Exercise 6 : Heel Raises

**Purpose:** To increase strength in your calf muscles and get a good stretch in the back of the leg.

**Starting Position:** Standing on the ground, or with the balls of your feet on the edge of a stair.

**Action:** Slowly rise up on to your toes, pause, and then return to the starting position. If you are on stairs, rise up, pause, and then let your heels lower over the edge of the stair. Do 2 sets of 10 reps.

**Note:** To increase the level of difficulty, perform the exercise one leg at a time. Think balance! Heel Raises should be performed 2 times per day.

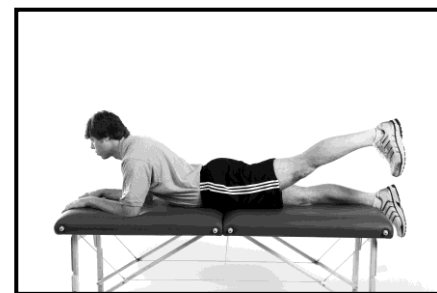


## Level A - Exercise 7 : Hip Extensions

**Purpose:** To get great gluts and strengthen your low back.

**Starting Position:** Lie on your stomach. A pillow can be placed under the hips to decrease stress on your back.

**Action 1:** Lift the leg just off the floor with the knee straight. Squeeze the buttocks for 3 seconds. Slowly lower the leg, always in control. Raise and lower the opposite hand at the same time. Do 2 sets of 10 reps.



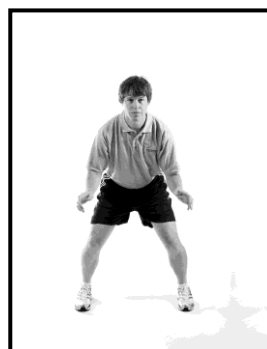
**Note:** Add ankle weights when you're ready. Try to do these at least once a day.

## Level A - Exercise 8 : Squats—Double Leg

**Purpose:** *Squats are the cornerstone functional exercise for your legs.* Almost every sport has its players in a partial squat a large percentage of the time. Watch any football, soccer, baseball, tennis, basketball player or snowboarder as they assume the “ready position.” (see photo).

**Starting Position:** Begin with feet shoulder-width apart. Hold onto a chair or other secure object.

**Action:** Squat as if you are sitting down in a chair. Keep your lower back straight and strong. You may eventually go as low as 90 degrees but start by just doing “quarter-squats” to 45 degrees. Do 2 sets of 10 reps, twice a day.



**Note:** Keep your weight evenly distributed on both legs. Your feet should remain flat on the floor. As you can see by the photo, 90 degrees is a fairly deep squat, and most of us do not need to go down this low to get the benefit. Having a chair behind you not only reminds you to “squat as if you’re sitting,” but can serve as a bail-out if you get fatigued.

## Level A - Exercise 9 : Single Leg Stance

**Purpose:** To improve balance, strength and develop proprioception—a sixth-sense radar system- which simply means knowing where your body is in space (without having to look). Having good balance and becoming aware of how and where your body is positioned at any given moment is a tremendous advantage in preventing injuries and falls.

**Starting Position:** Stand with a chair or something stable for balance.

**Action:** Stand on one leg. Keep the knee of your standing leg slightly bent in a nice, co-contracted position. Hold for 5 seconds after letting go of the chair and work up to 30-60 seconds. Try not to touch the opposite foot to the floor.



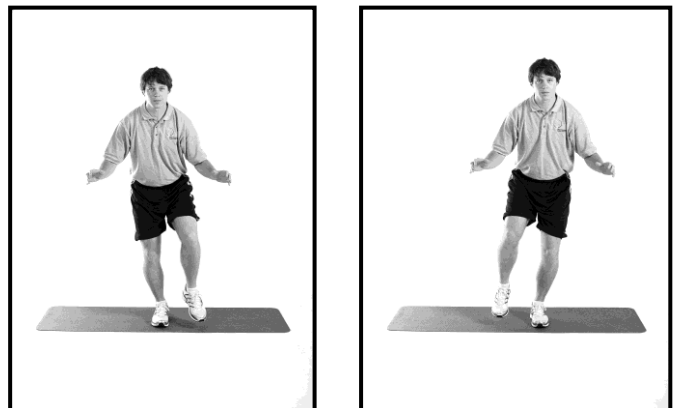
**Note:** When you are ready to make this exercise more challenging, try closing your eyes or standing on a Dyna-Disc (see Appendix), hard pillow, or similar challenge to your balance. The Single Leg Stance is another one of those exercises you should do obsessively, like when waiting in line for Rolling Stones tickets or talking to your broker.

## Level A - Exercise 10 : Quick Step Running

**Purpose:** Quick Step Running allows you to “run” soon after surgery by using your calf and hip muscles to absorb the shock. Depending on the state of your knee, even Quick Steps might be too aggressive to do before surgery, but give it a try perhaps not so “quickly”.

**Starting Position:** Start in the “ready position” with feet facing forward and placed in line with your shoulders. This is the position that many sports start from since it allows you to move quickly in any direction.

**Action:** Quickly step from right foot to left foot. Stay in place, keep the feet close to the ground, and think light and quick. Gain confidence before increasing the speed. Do 3 sets of 30 seconds each, twice a day.



**Note:** Once you’re feeling fast and light, try moving forward / backward / and laterally (side-to-side) while quick-stepping. If you are an athlete who is returning to sports, your first running outside should actually be Quick Step Running (i.e. soft footfalls!).

## Level A Sample Workout

The following chart summarizes your Level A exercise workout. As you return to normal life, it will be more difficult to fit blocks of time for your knee into your daily routine. As suggested, get in the habit of doing Level A Exercises throughout the day. This does not let you off from following your program and doing your exercises, it just means that on busier days you will still get in some reps. For those compulsive souls, take one day off a week just do ROM stretch and recover.

Some stiffness at the beginning of your workout is normal. Pain is not. If any movement is consistently uncomfortable, ask your doctor or therapist. Also, pain and swelling the next day means you overdid things. Take a day off until the knee feels better and limit your reps for the next few workouts.

EXERCISE	FREQUENCY	COMMENTS
Quad Sets	3 sets of 5 reps 2 times a day	<ul style="list-style-type: none"> <li>Perform at home, school, work, the office...etc.</li> <li>Quad sets should become a reflex throughout the day.</li> </ul>
Hamstring Sets	3 sets of 5 reps 2 times a day	<ul style="list-style-type: none"> <li>Remember: You can never have hamstrings that are too strong.</li> </ul>
Co-Contractions	3 sets of 5 reps multiple times a day	<ul style="list-style-type: none"> <li>Feel the muscles with your hands.</li> </ul>
Leg Raises w/ Co-Contraction*	2 sets of 5 reps (each side) 2 times a day	<ul style="list-style-type: none"> <li>It takes concentration to perform the co-contraction without your foot on the floor.</li> </ul>
Prone Hamstring Curls*	2 sets of 10 reps (each side) 2 times a day	<ul style="list-style-type: none"> <li>Slow and steady you hamstring ACL patients.</li> </ul>
Heel Raises*	2 sets of 10 reps 2 times a day	<ul style="list-style-type: none"> <li>Use a block or stair to increase the ROM.</li> </ul>
Hip Extensions*	2 sets of 10 reps once a day	<ul style="list-style-type: none"> <li>Think rock-solid butt.</li> </ul>
Squat–Double Leg	2 sets of 10 reps 2 times a day	<ul style="list-style-type: none"> <li>The workhorse exercise you will do the rest of your life.</li> </ul>
Single Leg Stance	Work up to 60 seconds multiple times a day	<ul style="list-style-type: none"> <li>Become obsessive about this move.</li> </ul>
Quick Step Running	3 sets of 30 seconds twice a day	<ul style="list-style-type: none"> <li>Feel light, quick, quiet.</li> </ul>

\*With time, add ankle weights to these exercises for increased strengthening.