

Life After Knee Surgery

TEACH YOUR CLIENTS
HOW TO RECUPERATE
QUICKLY AND SAFELY.

BY HOLLY KOUVO

Most people wait so long to have knee surgery that when recovering from the procedure, they fear injuring themselves again, even if they have been given the go-ahead to resume an exercise routine. They aren't just afraid of the pain or discomfort, they are unaware of how much exercise they should begin with. Some people worry about going back to the level of activity they enjoyed before their knee injury because they are afraid of a recurrence.

Fitness professionals play a critical role in helping clients physically and mentally after a major surgery. You can help them make a successful entry or return to exercise by creating a well-rounded exercise program for the whole body with emphasis on knee-friendly exercises—rather than a routine designed exclusively to strengthen the knee. The right program incorporates strength training, cardiovascular exercise and stretching for flexibility.

ANATOMY OF THE KNEE

The knee, also known as the patellofemoral joint, is a hinge joint connecting the femur and tibia bones. It is supported by muscles and tendons on three sides; the support is balanced between the quadriceps (knee extensors) and the hamstrings (knee flexors). The hamstrings are about 60 to 70 percent as strong as the quadriceps.

The medial collateral ligament (MCL), on the medial aspect of the knee, keeps the tibia and femur stable. The medial side is the major weight-bearing side of the knee. The cruciate ligaments are named “anterior” and “posterior” according to their site of attachment to the tibia. The anterior cruciate ligament (ACL), attaches to the tibia anteriorly, and the posterior cruciate ligament attaches to the tibia posteriorly. The ACL is taut when the knee is fully extended, preventing the knee from being displaced posteriorly. When the knee is flexed, an intact ACL prevents the tibia from being pulled anteriorly.

The main extensor of the knee is the quadriceps muscle, which has four parts: rectus femoris, vastus medialis, vastus intermedius and vastus lateralis.¹ The large fibers converge in a single tendon called the patellar tendon at the patella (knee cap). The tendon wraps around the patella and attaches to the tibia as the patellar ligament. The patella acts like a pulley, giving the muscle an angle of pull when the knee is flexed. All parts of this knee extensor are used when lifting heavy objects (such as weights on the ankles), climbing stairs, running, jumping and rising from a chair.

The muscles acting as knee flexors are the biceps femoris, semitendinosus, semimembranosus (together they are referred to as the hamstrings), gastrocne-

mius, sartorius, gracilis and popliteus. The biceps femoris attaches below the knee on the head of the fibula. The semitendinosus and semimembranosus attach on the medial aspect of the tibia. Between these tendons lies the popliteal space. The popliteus weakly flexes the knee, but is more important in unlocking the knee when it's extended. As the popliteus rotates the tibia and femur on each other, it draws the lateral meniscus posteriorly. The sartorius originates on the ilium and diagonally crosses the anterior aspect of the thigh to insert on the proximal tibia. It is used to sit cross-legged and also to squat. The gastrocnemius flexes the knee and it also plantarflexes the foot and raises the heel during walking.

KNEE-FRIENDLY EXERCISES

The following knee-strengthening exercises will engage the muscles surrounding the knee and help reduce pain or discomfort in the joint. As a trainer, you want to emphasize strengthening the quadriceps, hamstrings, abductors, adductors and gastrocnemius muscles to keep the knee stable.

If clients are still unsteady on their feet you can have them do these exercises sitting or lying on the floor (or bed). As their legs get stronger, encourage them to add ankle weights to increase the resistance. Add weights in increments of two pounds, and do not exceed six pounds on each leg.

- **Leg extension: to strengthen quadriceps muscle.**

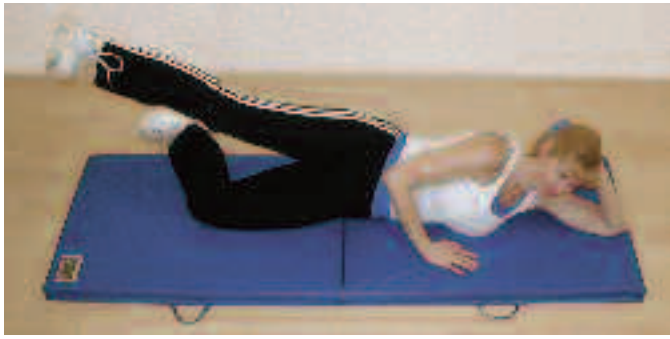
Sit up straight in a chair with both feet on the floor. Extend one leg out slowly to a straight-leg position. If you cannot extend the leg fully, just go as far as is comfortable. Bring the leg back down and place the foot on the floor. Do 12 to 15 repetitions on each leg.

- **Leg press: to strengthen quadriceps muscle.**

This exercise can be done lying down on the floor (or bed) or using a leg press machine at the gym. Lie on your back with knees bent and feet on the floor. Bring one knee toward your chest. Then extend the leg up to the ceiling, leading with the heel of your foot. Do 12 to 15 repetitions on each leg, keeping your toes pulled toward your nose and the ankle flexed.

- **Outer thigh lifts: to strengthen the abductor muscle.**

Lie on the floor or bed on your side. Align your head, shoulders and hips. Bend the bottom leg to give you added support. You may also place your hand in front of you for additional support. Raise your top leg toward the ceiling



Outer thigh lifts: to strengthen the abductor muscle.



Inner thigh lifts: to strengthen the adductor muscle.



Lying quad stretch.



Lying hamstring stretch.

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slowly. Keep your top leg straight with your foot flexed. Raise it as high as you comfortably can and slowly bring it back down. Do 12 to 15 repetitions on each leg. Keep your toes pointed down or parallel to the floor.

- **Inner thigh lifts: to strengthen the adductor muscle.**

Lie on your right side on the floor or bed so that your head, shoulders and hips are aligned. Place the foot of the top (left) leg on the floor in front of you. If this is uncomfortable for your knee, extend the leg out in front with only a slight bend in the knee. Place your left hand in front of you for additional support. Slowly lift the bottom right leg up as high as you comfortably can and return it back down to the floor, keeping the leg straight with your foot flexed. Do 12 to 15 repetitions on each side.

POOL EXERCISES

Water exercises are a great way to avoid hard impact on recovering knees. Exercising in the water gives you 14 times the resistance of land-based exercise. Your clients do not need to know how to swim or have any special equipment to do the following exercises, since they are completed in the shallow end or while sitting on a step in the water.

- **Leg extension**

Stand in the shallow end of the pool holding on to the side with one hand. Bend one knee and raise the leg up to the top of the water. Once the knee is at the surface, extend the leg straight out (only extend as far as you can comfortably). Then bring the leg back down and place the foot on the bottom of the pool. Do 12 to 15 repetitions on each leg.

- **Bent knee hamstring press**

Stand facing the wall in the shallow end of the pool. Hold on to the side of the pool with both hands. Bend one knee and raise your leg back. Press your foot out, away from your body, and return it back like a donkey kick. Keep your body straight while your leg extends back, but don't hyperextend your back. Do 12 to 15 repetitions on each leg.

- **Kicking**

These kicks can be performed either floating on top of the water or sitting on a step.

1. Floating

a. Surface kicks

Holding on to the side with your arms extended, bring your legs up behind you to the surface of the water. Alternate bringing one leg up

to the surface and then the other, keeping your legs straight. Start with quick, short kicks and as your legs strengthen move to long, smooth kicks.

b. Submerged kicks

Stand holding on to the side in the shallow end of the pool. Bring your legs up behind you halfway to the surface of the water. Alternate bringing one leg up just below the surface of the water and back down halfway to the bottom.

2. Sitting

a. Surface kicks

Sit on a step where the water level is up to your chest. Rest your elbows on a higher step for support. Bring your legs up in front of you to the surface of the water. Alternate bringing one leg up to the surface and then the other. Start with quick, short kicks and, as your legs strengthen, move to long, smooth kicks. Keep your hips firmly planted so they don't pop up and down while kicking.

b. Submerged kicks

Sit on a step where the water level is up to your chest. Rest your elbows on a higher step for support. Raise your legs in front of you, keeping them submerged under the water. Alternate bringing one leg up just below the surface and then the other. Start with quick, short kicks; as your legs strengthen move to long, smooth kicks.

CARDIO

In addition to strength training, incorporate some cardiovascular exercise into your client's regimen. Walking at a brisk yet comfortable pace is an excellent first step in their exercise regimen. They can increase their speed gradually to get a more strenuous workout. This can be done on land or on a treadmill.

Additional options for cardio are an upright or recumbent stationary bike, training on an elliptical machine, or swimming laps. The bike, elliptical and lap swimming provide low-impact cardiovascular workouts that help work the muscles around the knee.

STRETCHING

Every exercise program should include stretching to maintain and increase flexibility. The following leg stretches are recommended after a workout.

• Lying quad stretch

Lie on your side with your head supported on your arm. Bend your knee and bring your foot back as far as you comfortably can (hold your foot with your hand if possible). Optimally, the stretch should be held for 10 to 20 seconds on each leg.

• Lying hamstring stretch

Lie on your back with knees bent and both feet

on the floor. Bring one leg up toward the ceiling. Hold your hands around your calf (the knee can be bent slightly). Hold the stretch for 10 to 20 seconds on each leg.

• Russian twist stretch

Lie on your back with knees bent and feet on the floor. Pull your knees toward your chest and roll your legs over to the floor on one side. Hold your arms straight out to your sides at shoulder height. Turn your head in the opposite direction of your knees. Then roll your legs over to the other side and turn your head in the opposite direction. Hold the stretch for 10 to 20 seconds on each side.

THE PSYCHOLOGICAL EDGE

Because a client may be tentative or nervous about exercise after surgery, you can play a pivotal role in motivation. To get your clients back to their favorite activities, teach them some success strategies:

- Ease back in; they cannot just jump back to the level they were at before surgery.
- Set goals. Start your client with strength training for 10 minutes each day for the first week. Then move to 20 minutes of daily strength training and 10 minutes of daily cardio the second week. Set achievable goals that will give your client a sense of accomplishment. The progression of exercises will give them confidence along the way.
- Notice and mention the increased functionality of their knees in their daily activity that is a result of exercising and strengthening the muscles around the knee.

It's natural for clients to be fearful of an exercise program after undergoing a painful knee procedure and recovery. They will rely on you to encourage them physically and mentally as they start, sustain and succeed in a fitness routine that's tailored for them.

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Holly Kouvo, president of Fitting Fitness In, is an AFAA certified personal trainer and group fitness instructor focused on helping people who need to lose 100 pounds or more. She recently introduced a video, *Total Body Workout...Just Easy on the Knees*, the first in her Easy On™ series. She is a featured fitness expert on Eons.com and a trainer on OnlineFit.com.

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