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ACL Reconstruction: What You Need to Know About Surgery, Recovery

by Dan Bien, PT, OCS, CSCS

ACL injuries can impact athletes and patients in many ways. Rehabilitation after ACL injuries and surgery is effective in addressing the various impairments that often follow an ACL injury. The athlete or patient and their care team must understand what surgery and rehabilitation will entail to optimize the chances of a successful recovery.

Should I do pre-op rehab or exercises, and will it help my recovery?

Yes, you should do some pre-operative rehabilitation because there is significant evidence of benefits to your post-operative outcome and the knee with pre-operative exercise.[1-4,27] This pre-operative rehabilitation can be supervised by a physical therapist or unsupervised on your own. Pre-operative physical therapy may be limited due to insurance considerations in some instances. We have created written and video informational resources for basic exercises and steps which should allow you to address some of the impairments that commonly develop following an ACL injury if you are unable to undergo a formal supervised pre-operative rehabilitation or "prehab" program.

There is often significant swelling and related pain or discomfort at the knee and affected limb due to tissue trauma from an ACL injury. Tissue injury, swelling, and discomfort may lead to knee stiffness, lower extremity weakness, altered proprioception or position sense at the joint, and alterations in movement and gait patterns. Extensive research shows that restoring full range of motion at the knee before surgery improves post-operative outcomes.[4-5] Based on this evidence, some surgeons will not perform the ACL surgery until knee range of motion is fully restored, pending any other secondary injuries that may prevent this. Further research shows that improving lower extremity strength prior to surgery may also improve post-operative outcomes.[2,6,7] The quadriceps, hamstring, calf, and hip musculature are most often impacted by an ACL injury and associated movement compensations. Completing a basic pre-operative rehabilitation program to address these impairments may improve the likelihood of a successful post-operative outcome and limit further pre-operative functional limitations.

When will I begin physical therapy and rehabilitation following surgery?

Typically, most patients will begin supervised physical therapy anywhere from 2-14 days following surgery, depending on the preference of your surgeon. It is imperative that you follow the surgeon's preference and begin physical therapy during this window to limit post-operative complications and to set yourself up for a successful outcome.

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What can I do to set myself up for success post-operatively?

Manage Swelling

Swelling is expected post-operatively due to the inflammatory process, invasiveness of the surgical procedure, and trauma to the knee joint and tissues. However, excessive and prolonged swelling can lead to stiffness and range of motion deficits, muscular weakness and inhibition, and pain or discomfort.[8-11]

It is advisable to manage the limb swelling through limb elevation, cryotherapy or icing, use of prescribed medications, intermittent exercise, and compression garments or wraps as directed by your surgeon and physical therapist. Be aware that periods of prolonged standing and/or walking may also contribute to excessive swelling in the early post-operative period, and you should plan to modify your activity accordingly.

Control Pain

Pain control is another critical element to a successful rehabilitation and surgical outcome. Prescribed and over-the-counter medications may have some side effects; however, they are often a useful tool to limit swelling and pain that may prevent completion of the home exercise program, restorative sleep, etc., which are essential to healing and recovery. Temporary use of these medications may allow faster and more comprehensive recovery when they are used as directed.

There are also several online tools to help manage pain through evidence-based strategies, as well as meditation, breathing, pain science education, and other tools.

Ice has also been shown to improve pain control and decrease pain medication usage in the early post-operative period.[18-20]

Don't Overlook Diet

Patients should strive for a well-balanced diet to ensure adequate nutrition, including additional protein intake to build and repair tissues, allow wound/incision repair, and preserve immune function. This may take on added importance as strength training progresses to fully ensure muscle fiber repair following more intense exercises that may trigger muscle fiber breakdown from progressive overload for strengthening.

Get Enough Sleep

Although sleep may be interrupted in the early stages of post-operative recovery due to discomfort from the surgery, brace application at the involved limb, and other factors, attempting to obtain adequate restorative sleep is vital to your body's recovery both physically and mentally. The use of ice just before bed, prescribed medications, and brace use while sleeping may limit pain that could negatively impact sleep quality.

Ice Before Exercise

Additionally, there is some research evidence that applying ice to the affected knee for 20 minutes prior to exercise may allow improved forced production for greater exercise effectiveness during home exercise program and physical therapy sessions.[26]

What type of psychological and mental health effects can I expect?

Rehabilitation following ACLR is long and physically and mentally challenging at times. Recovery after ACLR is rarely a steady linear progression, which can be frustrating. Following an ACL injury, patients may experience many different emotions or reactions.[13-16]

Frustration due to functional loss and limitations, and a loss of independence, may commonly result. Due to the lengthy rehabilitation and slow progress at times, patients may also struggle to maintain motivation and consistency with the rehabilitation program. It is important to share these kinds of feelings and challenges with your providers, who can help address these issues and work closely with you and an interdisciplinary care team to help you overcome these challenges.

Additionally, many athletes may experience a loss of social interaction with teammates and even a loss of personal identity as an athlete, which can have negative psychological consequences.[13-16] For example, depression rates in athletes following ACL injury have been estimated at up to 40%.[13] Even non-athletes may experience a loss of connection to activities, identities, and social connection during this time that can feel isolating. For any patients, the prospect of a prolonged rehab may be daunting and discouraging at times, and they may worry about their ability to return to "normal." These and other psychological issues resulting from injury may impact mental health.

It is important to stay as connected as possible to activities you enjoy and social support networks, and to recognize and properly address any mental health issues following ACL injury. Your UOI interdisciplinary team can work collaboratively to support you, and we have a network of mental health professionals that we can refer you to if needed to optimize your post-op outcome and success.

What should I expect on my first physical therapy visit?

Your first physical therapy visit will involve the provider reviewing your history and details of your surgical procedure, getting baseline range of motion and strength data, beginning some treatment, developing a home exercise program based on the surgery details and demonstrated impairments or deficits, and providing some education to begin a successful rehab journey.

You should wear loose-fitting fitness clothing or bring shorts to allow your provider to properly examine and treat your knee.

How long will I be in a brace or on crutches following surgery?

Most patients will discontinue the brace and crutches 1-3 weeks after surgery. However, this is variable depending on the specific surgical procedures performed, your individual progress with rehabilitation, and meeting certain accepted criteria or benchmarks such as the ability to

perform an independent straight leg raise, pain, motor control and stability on the affected limb, and gait pattern or movement competency. Please note that certain related surgical procedures that involve meniscal repair, articular cartilage, or other anatomical structures may require a longer period of bracing or restricted weight bearing to allow adequate healing and to limit stress.

Your surgeon and therapist will review individual considerations for crutch and brace discharge with you.

When can I shower or bathe?

It is advisable to sponge bathe for the first few days following surgery. If you do not have weight-bearing post-operative precautions and you're comfortable weight bearing at the surgical leg, you may shower with the wounds adequately covered to stay dry.

Typically, plastic wrap or plastic trash bags wrapped tightly around the leg to waterproof the knee and protect the incisions work best. You want to avoid getting the incisions wet, which may increase the risk of infection, and you will not be permitted to submerge the incisions in a bath or pool until all surgical incisions are completely closed and fully healed.

What will physical therapy (PT) involve?

For PT appointments, please dress in comfortable clothing in which you can bend, move, and exercise, and that will allow your provider to examine and/or treat your knee. PT will involve exercises to address knee range of motion and stiffness, lower extremity strength of the surgical and non-surgical leg, gait and movement training, and in many cases, manual therapy and stretching to help restore normal mobility.

Your PT provider may choose to implement other modalities such as neuromuscular electrical stimulation (NMES), blood flow restriction (BFR) training, or other equipment and techniques to expedite your recovery. As you improve and the program progresses, the program will shift towards strength training, movement retraining, and sport-specific training focus.

How often will my physical therapy sessions be?

This is variable according to insurance restrictions and financial considerations with copays, deductible responsibilities, etc. Your therapist will do their best to effectively allocate and utilize your available PT visits based on some of these considerations, as well as your progress.

For those whose benefits may be limited, we have developed video and exercise resources to help you continue to progress even when you are not able to attend physical therapy in person.

Do I need to purchase additional equipment or materials?

We do not mandate or require that you purchase additional equipment. Adhering to the provided education suggestions and regular prescribed PT attendance is typically sufficient to allow successful rehabilitation. Some patients have reported added benefits from integration of a portable neuromuscular electrical stimulation (NMES) unit to facilitate quadriceps strength recovery.[17]

There is some additional evidence that the use of electrical stimulation devices or transcutaneous electrical nerve stimulation may assist not only in pain control, but also with quadriceps muscle activation, especially when combined with ice for focal knee joint cooling.[25] Cryotherapy and cryocompression devices have been shown to assist with improved pain and swelling control[18-21] Your insurance plan may fully or partially cover some of these items with a written order from your surgeon, but you should check with your insurer.

Some patients also report that a stretching/yoga strap or Stretch Out Strap™ is helpful following surgery when knee mobility and strength are limited, and certain positions are difficult to tolerate.

What should I avoid with the surgical leg post-operatively?

Post-op ACLR patients should avoid pivoting on the affected limb in a weight-bearing position with the foot fixed on the ground, such as when turning or during transfers. We do want patients to resume normal activities as soon as possible and as permitted, including returning to fitness training and programming. However, you should consult your provider prior to resuming, because there may be activities that are not indicated and may be harmful in the early post-operative period.

How long will PT last?

This will again vary from patient to patient depending on multiple factors including individual goals, your insurance coverage, and your rehabilitation progress.

Will I need to join a gym or perform weight training exercises?

Body weight exercises will be useful earlier in rehabilitation, but to fully restore strength in the affected leg, you will need to progressively overload the lower extremities with resistance exercises. Lower extremity weakness and lack of force production, specifically at the quadriceps, is a common deficit following ACLR.

For patients with a limited training history and limited familiarity with weight training technique, it may be useful to review technique with your physical therapist and/or implement video resources. Additionally, it will be critical to work with your physical therapist to adjust the training volume and resistance to facilitate continued progress. Those patients with a limited training history may also need assistance to determine appropriate training intensity.

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When can I return to work?

This will be a very individualized decision for each person based on job duties and requirements, financial considerations, job security and job stability concerns, and vacation or sick time available. Be aware that a return to a more physically demanding job may not be appropriate for several weeks or months following surgery. Also, jobs requiring prolonged standing, walking, or positioning the leg in a dependent position for lengthy periods may contribute to an increase in swelling and discomfort, which may delay rehabilitation progress and recovery.

When can I begin to run again?

Running often begins between 3-5 months post-operatively. However, this will vary between individuals based on whether and when they attain established clinical benchmarks and criteria.

When can I return to sport?

Return to sports clearance is based on multiple considerations. However, the time from surgery is not as important as meeting established clinical benchmarks and criteria.

Benchmark testing may include hop testing, vertical jump testing, peak force testing of specific muscle groups, torque/body weight ratio, movement/motor control testing, and other screening tools. 9 to 12 months is the typical timeframe to fully resume return to pivoting and/or contact sports, but this will vary between individuals.

Will I get back to my pre-surgery functioning?

A significant proportion of patients will resume pre-injury activities and performance levels.[22-23] The timeframe for everyone to achieve these goals varies significantly, and each patient's rehabilitation is different. It is often tempting to compare your progress to others who have previously undergone similar surgery. However, everyone's rehabilitation journey is unique and impacted by many factors.

Working closely with your providers to identify, continually reassess, and target your specific deficits or impairments is critical to your success. Fully completing rehabilitation and achieving established clinical rehabilitation benchmarks and criteria significantly improves chances of return to sport and/or return to pre-injury activity and performance.

About Dan Bien

Dan Bien is a physical therapist at our Kettle Point Campus in East Providence. Dan has worked at University Orthopedics since 2006 and serves as the Coordinator of Clinical Education for the practice's Physical Therapy Department.

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Dan is currently recognized as an Orthopedic Certified Specialist by the American Board of Physical Therapy Specialties, a Certified Strength and Conditioning Specialist through the National Strength and Conditioning Association, and a Credentialed Clinical Instructor by the American Physical Therapy Association.

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