



Physical Therapy as Nonsurgical and Presurgical Management of Common Knee Pathologies

Urgent message: Appreciation for the cause of knee pain, along with an understanding of potential nonoperative rehabilitation therapies that could be provided in urgent care, can enhance patient care and improve patient satisfaction while minimizing the need for referral.

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Introduction

Knee injuries in adults and children are common presentations to urgent care and emergency rooms.¹ Rehabilitation of those injuries is essential in aiding patients to return to normal function and activities. Many common causes of knee pain improve with a combination of oral analgesics and appropriate physical therapy programs.

Postinjury, physical therapy aids in the recovery process by facilitating improvements in the effects of pain, range of motion, muscle performance, functional ability, and invariably the patient's quality of life. Physical therapy has been shown to be crucial in improving short- and long-term outcomes.

There remains controversy, however, regarding when physical therapy should be initiated and how certain aspects of the therapy are instituted.²

Optimal clinical outcomes are dependent on a collaborative multidisciplinary approach that involves the primary physician (UC/ED), orthopedic surgeon, physiotherapist, patient, and other healthcare professionals involved in the patient's care.

The use of adjunct treatment such as splints can be



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considered. However, the effectiveness of knee braces for chronic knee pain is uncertain, and the use of braces should not replace physical therapy.³

This article will look at the various types of knee injuries that present to the urgent care clinics and the

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role of physical therapy as part of the postinjury rehabilitation process or presurgical conditioning to enable patients to have better recovery postprocedure. We will also look at the latest evidence regarding physical therapy for the common knee presentations to UC.

Medial Collateral Ligament Injury

Most medial collateral ligament (MCL) injuries heal well with conservative treatment. The severity of an MCL sprain helps to determine appropriate treatment. Grade I and II injuries are routinely treated with rehabilitation alone. Many isolated grade III sprains can also be treated solely with rehabilitation, with multiple studies demonstrating the success of nonoperative treatment of MCL tears, including complete tears (grade III injuries).

Rehabilitation programs focus on restoring quadriceps function, improving knee range of motion, and controlling knee edema. In general, most athletes can return to full competition, following a well-guided rehabilitation program, 5 to 7 weeks after injury on average.⁴ However, it is important to distinguish grade III sprain and sprains associated with additional knee injuries, as treatments are often more complex and rehabilitation alone may not be sufficient.^{5,6}

In MCL sprains with concomitant anterior cruciate ligament (ACL) disruption, the MCL injury can often be treated conservatively with rehabilitation while awaiting definitive treatment of the ACL injury. Bony avulsion of the MCL attachment, tibial plateau fracture, or the presence of osteochondral fragments would alter the treatment for an MCL injury and possibly the approach to rehabilitation.^{2,5,6}

Lateral Collateral Ligament Injury

Isolated injury of the lateral collateral ligament (LCL) is uncommon, with grade III tears frequently associated with injury to either one of the cruciate ligaments or the posterolateral complex (PLC). Isolated grade I and grade II injuries are amenable to treatment with physical therapy alone. Grade III injuries or patients with suspected concomitant ACL injury, posterior cruciate ligament (PCL) injury, or PLC injury should be evaluated for possible surgical intervention by the orthopedic specialist. These combination injuries are generally not treated with physical therapy alone, and potentially require an element of surgical intervention to ensure stability of the knee.⁷

Patellofemoral Pain

Exercise-based therapy is the first-line therapy for treating patellofemoral pain (PFP).^{3,8}

Based on evidence from the literature, results are optimal when exercises are performed daily for 6 or more weeks.⁹ Rehabilitation programs have been shown to reduce PFP-related symptoms at short-term (less than 1 year).^{10,11} Long-term improvements have proven more difficult to sustain. An exercise program consisting of several simple strength and mobility exercises can prevent the development of anterior knee pain.¹² This potentially improves the patient's quality of life without requiring surgical intervention.

Quadriceps and Patella Tendon Pain

Published evidence about specific rehabilitation protocols for quadriceps tendinopathy is limited. However, general concepts of tendinopathy treatment, especially those drawn for the treatment of patellar tendinopathy, provide a useful guide for treatment.¹³ Several strapping techniques have been shown to be effective in reducing pain and enhancing active movement, therefore improving the patient's overall movements.^{2,14}

Quadriceps Muscle Tears

Surgical treatment is indicated for complete quadriceps and patellar tendon ruptures and for high-grade partial ruptures.^{15,16} Other than the previously stated, quadriceps muscle and tendon injuries are generally treated conservatively. Following injury, quadriceps muscles quickly develop some degree of wasting due to muscular atrophy from disuse. Therefore, a progressive rehabilitation program should begin as early as possible after injury to prevent muscle wasting from occurring.¹⁶ A dedicated rehabilitation program that allows for continued proprioception and muscular conditioning will allow for speedy recovery in patients, especially those who are keen to return to sporting activities.

Meniscal Injury

Meniscal injuries may occur as an isolated condition or in combination with other injuries, such as ACL tear.¹⁷ Meniscal tears that have issues with symptoms of locking or giving way of the knee should be considered for referral to an orthopedic surgeon, as these patients may benefit from surgical intervention to alleviate those symptoms.^{3,18} Small intrasubstance and vertical tears that cause infrequent symptoms and do not interfere with general knee function can be managed conservatively with rest, activity restriction, and physical therapy.¹⁸ In these cases, proprioceptive and quadriceps strengthening programs will enable the patient to return to activities and sports within a timely fashion without

any significant sequelae to the injury.

In patients presenting with degenerative tears, rehabilitation is especially appropriate.¹⁹ Active rehabilitation has been shown to be as effective as arthroscopy in decreasing pain and improving function in patients with nontraumatic degenerative medial meniscal tears without mechanical symptoms.^{3,20} Initial treatment for all meniscal injuries is similar, regardless of the cause of the injury with no difference in the treatment approaches for those with acute meniscal injury, degenerative tears, or postoperative rehabilitation after meniscectomy.¹⁸

Prolonged knee immobilization in splints and casts should be avoided, as these can lead to muscular atrophy and ultimately delay functional recovery. Progressive weight-bearing and range-of-motion movements are allowed. However, excessive shear forces on the meniscus should be avoided as they can disrupt the healing in all types of injuries.^{21,22}

Iliotibial Band Syndrome

Iliotibial band (ITB) syndrome is a common cause of lateral knee pain in the active and athletic population, especially among runners and cyclists.²³ Nonsurgical management is the mainstay of this condition with rest, and activity modification improving pain associated with this condition. Rehabilitation programs for ITB syndrome focus on identifying and correcting strength deficits and discrepancies and mobility defects.^{23,24} Additionally, foam rolling can be used as a myofascial release tool to break down any soft tissue adhesions within the ITB.²³

Osteoarthritis

Physical therapy and exercise are the foundation of nonsurgical management of osteoarthritis-associated knee pain with no clear lesions or associated abnormalities requiring to be addressed surgically.^{3,25}

Evidence has shown that active management is more effective than passive modalities in decreasing knee pain and improving function. Treatment modalities are focused on exercise-based therapies and targeted weight loss.³ Treatment programs that strengthen the quadriceps musculature with either isometric or isotonic-resistive exercise are associated with significant improvement in quadriceps strength, reduction of knee pain, and function.²⁶

There is no evidence that presurgical rehabilitation provides postoperative benefits in patients who have had knee arthroplasty for osteoarthritis.^{27,28}

Anterior Cruciate Ligament Injury

Physical therapy and a nonoperative approach are

generally recommended for grade I and grade II ACL injuries without the presence of knee instability. The principles of rehabilitation for patients with partial tears are similar to those used for patients with complete tears.

Rehabilitation programs consist of exercises for muscle stretching and strengthening and cardiovascular, proprioceptive, and adaptive training.²⁹ Studies have revealed the ability of partial ACL tears to heal contrary to previous understanding regarding the injury.³⁰

Surgical repair of complete rupture of the ACL is recommended to prevent knee joint instability. In highly active patients engaged in jumping, cutting, and pivoting sports, early anatomic ACL reconstruction is recommended because of the high risk of secondary meniscal and cartilage injuries with delayed surgery. A period of progressive rehabilitation to resolve impairments and improve neuromuscular function may be recommended. For patients who want to return to straight-plane activities, nonoperative treatment with structured, progressive rehabilitation is an acceptable treatment option. However, with persistent functional instability, or when episodes of giving way occur, anatomic ACL reconstruction is indicated.³¹

Knee extensor strength deficit following ACL reconstruction is a common problem, producing deficits on knee function for sports activities and even during daily activities. Therefore, the recovery of quadriceps muscles strength is one of the most important factors after ACL reconstruction.³⁰

There is evidence to suggest that preoperative physiotherapy rehabilitation is beneficial to patients with ACL injury requiring reconstruction in terms of faster recovery of knee extensor strength and function.^{30,32} It is also anticipated that possible reinjury could be prevented by having better quadricep strength and function.³²

Posterior Cruciate Ligament Injury

In general, nonsurgical treatment has been advocated for patients with isolated grade I or grade II PCL injuries, or those who have grade III injuries with mild symptoms, or who only participate in low-demand activities.³³ Surgical treatment is therefore recommended for symptomatic complete PCL injuries or combination injuries to restore joint stability and improve function.³⁴

Rehabilitation may begin when swelling has diminished and pain is well controlled; for many patients that means immediately after presentation. The goal of early rehabilitation is to prevent joint stiffness and encourage recruitment of the quadriceps,

which the patient may have difficulty activating due to pain or joint effusion.

Full strength and function of the quadriceps are needed for full recovery—thus, the importance of addressing this muscle group early during treatment.³³ Dynamic PCL braces can help to keep the tibia in a reduced position during the recovery period by avoiding posterior tibial sag, and are indicated both for nonoperative treatment and postoperative rehabilitation of PCL tears.³⁴

Conclusion

There are many causes for knee pain that present to urgent care. Appreciation of the cause of the pain and understanding of the potential nonoperative rehabilitation therapies that are available will help patients' consultations. The ability for the UC physician to provide basic rehabilitation programs, understand the potential benefits of physical therapy in each of the common causes for knee pain, and when to refer patients for these therapies will enhance patient care and improve patient satisfaction. ■

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Take-Home Points

- Many common causes of knee pain improve with a combination of oral analgesics and appropriate physical therapy programs (ie, without surgery).
- Medial collateral ligament disruption can often be treated conservatively except in cases where there is bony avulsion of the MCL attachment, tibial plateau fracture, or presence of osteochondral fragments.
- Patients with grade III lateral collateral ligament injury should be evaluated for possible surgical intervention if there is concomitant posterior cruciate ligament injury.
- There is evidence suggesting that preoperative physiotherapy is beneficial in anterior cruciate ligament injury requiring reconstruction.
- Physical therapy and a nonoperative approach are generally recommended for grade I and grade II anterior cruciate ligament injuries without the presence of knee instability.

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