Knee Owner's Manual
A Guide to the Care of Knee Problems
When Your Knee Hurts

Your knees support you in countless ways every day. Walking, running, standing, squatting, even sitting—your knees are vital to most activity. Because your knees are constantly working, they can be prone to problems. And as you probably know, these problems can be painful. Read on to learn more about the knee and common knee problems, and how to get a painful knee back up and running.

Common Symptoms

Because you use your knees so much, symptoms from a knee problem can make it hard to get through the day. Following are symptoms you may have:

- **Pain** can vary from sudden and severe to a mild ache that comes and goes.
- **Swelling** can be caused by inflamed tissues and/or bleeding in or around the joint.
- **“Catching” or “giving way”** can be caused by a loose piece of cartilage or a torn ligament.
- **Limited movement or stiffness** may be due to injury, wear and tear, or inflamed tissue.
- **“Grinding” or “cracking”** can be caused by rough bone or cartilage in the knee joint.

What You Can Do

A variety of treatments can be used to help your knee. Most don’t involve surgery. In fact, many treatment plans are based on actions you need to take to help your knee heal. Don’t let knee pain put limits on your life. Work with your healthcare provider to create a plan to treat your knee problem.

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Your Medical Evaluation

Your healthcare provider will evaluate your knee to determine the problem and possible treatments. This evaluation will likely include a medical history, a physical exam, and tests. Depending on your problem, you may be referred to a physical therapist or an orthopaedic (bone and joint) surgeon.

Medical History
Your healthcare provider will ask about your health history and symptoms. The healthcare provider will also ask where and how bad the pain is, and when it occurs. Be sure to mention anything you think might have caused the problem, such as a twist or fall. You may also be asked if you've had knee problems in the past, and about your lifestyle, including any sports you play.

Physical Exam
Your healthcare provider will examine your knee for tenderness, swelling, warmth, and bruising. He or she will also move your knee to check if motion is limited and if certain parts of the knee are injured. Your healthcare provider may ask you to walk or crouch to see how your knee functions.

Diagnostic Tests
Based on your history and exam, the healthcare provider may order certain tests. These include imaging tests such as an x-ray, MRI (magnetic resonance imaging), and CT (computed tomography). Blood tests may be ordered to check for certain types of arthritis. Also, fluid may be removed from your knee (aspiration) to be analyzed.

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The Amazing Knee

Knowing how the knee works can help you understand your knee problem. The body's biggest joint (site where bones meet), the knee is a marvel of mechanical design. Every day, it absorbs the immense forces placed upon it by body weight and gravity. In addition, the knee bends, extends, and rotates thousands of times daily. To perform all these tasks, the knee joint contains many parts that work together. It is this complex structure that makes the knee easy to damage.

Bones and Cartilage Provide the Foundation

The knee joint is formed where four bones meet. Cartilage helps these bones move together smoothly in the joint.

- **Bones** support the body. The femur, tibia, fibula, and patella make up the bones of the knee joint.

- **Cartilage** is smooth tissue that absorbs shock and eases movement between bones. The knee contains two types of cartilage: *articular cartilage* and the *meniscus*. 

![Diagram of knee joint with labels for femur, tibia, fibula, patella, articular cartilage, and meniscus.](image-url)
Soft Tissues Hold It Together

The knee also contains other soft tissues that allow this complex joint to move safely. These tissues hold the parts of the knee in place.

- **Ligaments** are strong bands of tissue that connect bone to bone. They brace the knee and keep it from bending too far. They also help guide motion.
- **Tendons** are cords of tissue that attach bones to muscles. They enable nearby muscles to move the knee.

- **Muscles** are bundles of fibers that contract to provide power for movement. Muscles, such as the hamstrings and quadriceps, help the knee bend and straighten. They also help keep the knee stable by holding the bones in place.
- **Bursae** are small sacs of fluid. They allow bones and soft tissues to glide smoothly past each other.
Overuse and Wear & Tear

Common causes of knee problems are overuse and wear and tear. Overuse means repeatedly placing too much strain on the joint. Wear and tear, which gets worse with age, involves damage brought on by daily use of your knee. Following are knee problems that can result from these causes.

Osteoarthritis

With osteoarthritis, articular cartilage in the knee wears away. When this happens, bones rub against each other, causing pain. The condition is often due to aging, but can also be caused by injury, disease, or overweight. Osteoarthritis may lead to bone spurs (bony growths that form on the edges of bones).

**Signs and symptoms** may include:

- Pain, especially after repeated activity or a period of inactivity
- Swelling
- Stiffness
- Warmth
- A grinding sensation
- Catching in the knee

Bursitis

With bursitis, bursae in the knee are inflamed. This is often due to overuse, but may also be caused by infection or injury. Prepatellar bursitis (shown at right) affects the bursa near the front of the kneecap. Another common type is pes bursitis, which affects the bursa on the inner side of the knee.

**Signs and symptoms** may include:

- Pain, especially with movement
- Swelling (may form a visible bulge on the front of the knee)
- Warmth
- Redness
- Limited movement
Runner's Knee
With runner's knee (also called patellofemoral pain syndrome or chondromalacia patella), the articular cartilage beneath the kneecap is irritated. This problem can be caused over time by activities such as running. It can also result from misalignment of the kneecap or a blow to the front of the knee.

**Signs and symptoms** may include:
- Pain, especially when running, walking up and down stairs, or sitting with bent knees
- Mild swelling
- A grinding noise
- Giving way of the joint

Jumper's Knee
With jumper's knee (also called patellar tendinitis), the patellar tendon is inflamed or partially torn. The condition is often caused by sports that involve lots of jumping or running. It can also result from overuse, overweight, or problems with alignment of the leg bones. Symptoms of jumper's knee often build up gradually.

**Signs and symptoms** may include:
- Pain in the front of the knee, at the lower end of the kneecap.
- Pain that is worse when active. It is often felt on impact when running, landing after a jump, or going up and down stairs.
Knee Injuries

Knee problems are often a result of injury. A wrong move can lead to injury during almost any activity, from playing sports to dancing to just walking down the street. The most common knee problems caused by injury are described here.

Sprains
Sprains involve stretching or tearing of the knee ligaments. A sprain can involve the cruciate ligaments or the collateral ligaments, or both.

Collateral ligaments. These are the medial collateral ligament (MCL) and lateral collateral ligament (LCL). An MCL sprain, the most frequent ligament injury, is often caused by a blow to the outer knee.

Cruciate ligaments. These are the anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL). The ACL is most often sprained by sudden twisting motions. A PCL sprain typically results from a blow to the front of the knee.

Signs and symptoms of ligament injuries may include:
- A “pop” sound at the time of injury
- Pain
- Swelling
- Buckling of the knee

Fractures or Joint Dislocation
Some knee injuries may require surgery. They include fractures (when a bone breaks, cracks, or chips). They also include dislocation of the knee joint (when the femur is displaced from the tibia).

Signs and symptoms may include:
- Severe pain
- Swelling
- Inability to move the knee or put weight on the leg
- A deformed-looking knee
Meniscus Tears

The meniscus is one of the most commonly injured parts of the knee. Tears are often caused by twisting motions or wear and tear, or a combination of the two. Meniscus tears are sometimes referred to as torn cartilage. Osteoarthritis can be linked with meniscus tears.

**Signs and symptoms** may include:
- A “popping” sensation at the time of injury
- Pain
- Swelling
- Locking, catching, or giving out of the knee

Dislocated Kneecap

This condition occurs when the kneecap moves out of place (most often toward the outside of the leg). A dislocated kneecap may be caused by an abrupt change in direction of the leg. It can also result from a blow to the knee. If the kneecap pops right back into place, the condition is called a subluxation.

**Signs and symptoms** may include:
- Pain in the front of the knee
- Immediate swelling
- Trouble straightening the knee
- A deformed-looking knee
Treating Knee Problems

Most knee problems can be handled using the treatments listed on these pages. Your healthcare provider will work with you to create a treatment plan that meets your needs. Your plan will include self-care, which is important for all knee problems. In fact, it may be the only treatment you need. Self-care can include R.I.C.E. (see below), as well as stretches and exercises, such as those on pages 13 to 15. Self-care will help your knee feel better faster, so be sure to do it daily as instructed.

R.I.C.E.

Treatment for most knee problems starts with R.I.C.E. This stands for Rest, Ice, Compression, and Elevation.

- **Rest** prevents further damage and gives the knee a chance to heal.
- **Ice** helps reduce swelling and pain. Wrap a cold pack or bag of ice in a thin cloth. Place it on your knee for up to 20 minutes every 3 to 4 hours.
- **Compression** helps reduce swelling and provides support. Wrap the knee snugly with an elastic bandage, making sure it is not too tight. Don't wear the bandage overnight.
- **Elevation** helps reduce swelling and pain. Keep the knee raised above heart level for best results.

Medication

Medication can help relieve pain and reduce swelling in the knee. Your healthcare provider may suggest:

- **Oral medications**, such as acetaminophen, aspirin, ibuprofen, and naproxen. You may also take oral narcotics (by prescription only).
- **Injections** into or near the knee. These can include a steroid such as cortisone or a lubricant called hyaluronic acid.
- **Topical creams** such as aspirin cream and capsaicin.
Physical Therapy

Physical therapy (PT) is a program of exercise and treatments guided by your physical therapist or healthcare provider. It is tailored to your particular knee problem. PT may include the following:

- **Exercises** to help you regain movement and strength in your knee. Many of these are done with the help of a physical therapist. Others can be done at home.

- **Electrical stimulation** or **ultrasound** to reduce pain and improve healing. These are typically done by a physical therapist.

- **Massage** to help fluid drain from the knee. Your healthcare provider may teach you how to massage your knee at home.

Knee Procedures

If other treatments don’t work, your healthcare provider may recommend a procedure. **Aspiration** involves removing excess fluid from the knee. It is often used to diagnose and treat problems such as bursitis. When needed, knee **surgery** can be done using two main techniques. With arthroscopy, special instruments are inserted into small incisions in the knee to remove or repair damaged tissue. With open surgery, damage is repaired through a larger incision in the knee. These techniques can be used for the following knee surgeries:

- **Meniscectomy.** Part of a torn meniscus is removed or repaired. This is typically done using arthroscopy.

- **Ligament reconstruction.** A torn ACL is replaced, often with part of a tendon such as the patellar tendon. This is usually done using arthroscopy.

- **Knee replacement.** Part or all of the bone and cartilage on the surface of the knee joint is replaced with metal and plastic. This is done with open surgery, often in cases of severe osteoarthritis.
Building Strength and Flexibility

Stretching and strengthening can help knee problems heal, whether done during or after other types of treatment. Exercises can even help prevent future problems. Talk to your healthcare provider about which activities are safe for you. Together you can create a daily workout plan. The stretches and exercises on the following pages are a good place to start.

Easing Into Your Workout Routine

As you begin to work out, be gentle with your knee. Follow all of your healthcare provider’s instructions, and try these tips:

- **Warm up** before exercising. Do light cardio exercise, such as brisk walking, to get your blood moving, and then stretch.

- **Always stretch** before and after working out. Stretching between workouts is helpful, too.

- **Go slowly.** Start with gentle exercises. Working your knee too hard too soon can cause more knee problems.

- **Stop any exercise** that causes or worsens pain. Talk to your healthcare provider before resuming the exercise.

- **Limit activity** that uses the knee if your healthcare provider recommends it. Wait until the joint has healed more fully.

More Ways to Help Your Knee

The following can help heal or prevent further damage to your knee:

- **Bracing the knee.** Your healthcare provider may prescribe a brace to treat your knee problem. You may also want to wear an elastic bandage or neoprene sleeve to help support the knee during activity.

- **Losing weight.** Excess weight puts pressure on the knees. It can even lead to osteoarthritis. If you are overweight, talk to your healthcare provider about a diet and exercise plan to help you lose the extra pounds.

- **Wearing appropriate shoes or inserts.** These can absorb shock as you move, helping prevent knee strain. Wear shoes that fit well and are in good condition.
STRETCHES

☐ Calf Stretch
1. Place the palms of your hands flat against a wall. Put the foot of your injured leg about 18 inches behind the other foot. Point both feet straight ahead.
2. Bend your front leg. Keep both heels on the floor and your problem knee straight. Hold for _____ seconds, then relax. Repeat _____ times.

☐ Hamstring Stretch
1. Lie on your back with your good knee bent. Loop a towel around the foot of your injured leg. Tighten your stomach muscles.
2. Keeping the knee as straight as you can, slowly pull on the towel to bring your injured leg up. Raise it as far as you comfortably can. Hold for _____ seconds, then relax. Repeat _____ times.

Caution: If you feel tingling or pain in your back or legs, you're pulling too hard or too far.

☐ Quadriceps Stretch
1. Lie on your stomach on the floor. Grab the ankle of your injured leg.
2. Gently pull the ankle toward the buttock, feeling the stretch in the front of your thigh. (If you can't reach your ankle, grab your sock or a towel wrapped around the foot.) Hold for _____ seconds, then relax. Repeat _____ times.
EXERCISES

☐ Quad Sets
1. Sit with the injured leg straight out. Keep the other leg bent with the foot flat on the floor.
2. Tighten the front thigh muscle (quadricep, or quad) of the injured leg, pressing your knee toward the floor. Make your leg as stiff as you can. (Feel for the tightened muscle with your hand.) Hold for ____ seconds, then relax. Repeat ____ times.

Note: You can also do this exercise while standing or lying down, as long as your injured leg is straight.

☐ Leg Lifts
1. Lie flat, with the injured leg straight. Keep your good leg bent to protect your lower back from strain.
2. Tighten the quad muscles of your injured leg. Keeping that leg almost straight, slowly raise it 6 to 8 inches off the floor. Hold for ____ seconds.
3. Slowly lower the leg. Repeat ____ times.

Note: Bend your injured knee slightly if you have pain during this exercise.

☐ Short Arc Quad
1. Sit on the floor with your injured leg straight and the other leg bent. Place a rolled-up towel under the thigh of your injured knee. This should bend your knee, raising it about 6 inches off the floor.
2. Straighten your injured knee, lifting the lower part of your leg off the ground. Hold for ____ seconds.
3. Slowly lower the leg. Repeat ____ times.
Step-Ups

1. Stand with the foot of your injured leg on a 3- to 5-inch support (such as an exercise step or a wide, low stair). Place the other foot flat on the floor.

2. Shift your weight onto the foot that's on the stair. Straighten the injured knee and raise the other foot off the floor. Then, bending the injured knee again, slowly lower the foot until only the heel touches the floor. Repeat ____ times.

At the Gym

You can exercise your knees at the gym, too. For instance, the leg press helps strengthen the quadriceps and hamstrings. The elliptical machine works these muscles and others, too. If you're new to these exercises, ask a trainer to help you.

Leg Press

1. To start, use the machine without weights. Sit on the machine with your head and back against the cushioned support. Place your feet flat on the footplate. Your knees should be bent at about a 45° to 60° angle.

2. Press your legs forward until they're almost straight. Relax. Slowly return halfway to the starting position, hold for 2 seconds, and press forward again. Repeat ____ times. Return the footplate to the start position.

Elliptical Machine

1. Follow the instructions on the monitor. You may need to start moving the pedals to start the monitor.

2. Use a setting with low resistance. Exercise for about 5 minutes to start. Then slowly increase the amount of time you use the machine.

Note: Avoid backward pedaling. It can be hard on your knees.
Keeping Your Knees Healthy

Once your knee has been injured, it may be more likely to be hurt again. So do your best to take care of your knee. Follow your treatment plan, and talk to your healthcare provider if pain or swelling persists. Also, remember these tips:

- Exercise to keep your knee strong and stable. Be sure to get your knees in shape before you return to strenuous activity.
- Always warm up your muscles before doing sports.
- Avoid activities that cause pain or swelling.
- Reduce stress on your knees by keeping your weight down.
- Use medication only as directed by your healthcare provider. Don’t use it to cover up severe pain during an activity.
- If you’ve had knee surgery, ask your healthcare provider when you can return to activities.

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