

Treatment choices for

Knee Osteoarthritis

A Shared Decision Making Program



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About Shared Decision Making Programs

Health Dialog's shared decision making programs (decision aids) include videos and booklets that give up-to-date facts about health conditions and the pros and cons of different healthcare choices. These programs can help you talk with your doctor about which healthcare options may be best for you. Together, you and your doctor make a decision—a shared decision. Shared decision making programs do not recommend treatment, give medical advice, or diagnose medical problems.

Who Reviews This Program?

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Who Are the People in This Program?

The people who appear in the video and are quoted in the booklet are not actors. They volunteered to share their stories about how they decided to deal with knee *osteoarthritis*.

They received a small fee for their time. They do not profit from recommending any treatment or self-care strategy.



Introduction

The information in this booklet is intended to support you in choosing among different ways to treat your knee *osteoarthritis*. This information is designed to help you work with your doctor to decide what's right for you.

Treatment choices for knee osteoarthritis include:

- Managing the symptoms with nonsurgical treatments, including exercise, physical therapy, and pain medicine
- Having surgery to replace the knee with an artificial joint.

This information is for you if:

- Your symptoms make it hard to do everyday activities or things you want or need to do
- Your symptoms greatly reduce your quality of life
- You are considering treatments, including joint replacement surgery.

This information is **not** for you if:

- You have a knee problem that is different from osteoarthritis.

How to Use This Booklet

As you read through this booklet and watch the accompanying video, think about your values and preferences, and consider how each treatment option ties into your personal and work-life needs as well as your family interactions. Before your appointment with your doctor, be sure to write down any questions or concerns you have so that they are fresh in your mind.

Osteoarthritis is the most common form of arthritis. In this booklet, the term “arthritis” is used to mean osteoarthritis.

Note: Italics are used in this booklet to emphasize key words or to identify medical terms. See the *Medical Terms* section at the end of the booklet for full descriptions of medical terms that are italicized.

What Is Knee Osteoarthritis?

About Your Knee Joint

The knee joint works like a hinge:

- On top is the thighbone (*femur*)
- On the bottom are two bones: the shinbone (*tibia*) and a long, thin bone behind it (*fibula*)
- In front is the kneecap (*patella*).

These bones are held together by muscles, tendons, and ligaments. Where the bones meet at the joints, the surfaces are covered with a firm, smooth material called *cartilage*. This protective coating absorbs shock and allows the moving bones to slide effortlessly when the cartilage is healthy.

Front View of Normal Knee



The femur, patella, and tibia are all bones that meet at the knee. They are lined with cartilage, a hard, smooth material that allows bones to slide easily when moving the knee.

Osteoarthritis is a condition that affects all parts of the joint as cartilage breaks down and becomes rough. As osteoarthritis gets worse, the bones begin to rub against one another.

In addition, *bone spurs*—growths on the inside of the knee, also known as osteophytes—sometimes form. They make more rough surfaces where bones rub against each other.

Experts used to think osteoarthritis was only due to “wear and tear” on the cartilage that cushions joints. Now, some research suggests inflammation, minor abnormalities in alignment, bone loss, and tiny changes in bone may play a bigger role than damaged cartilage. Aging, being overweight, being female, or having a knee injury are a few examples of factors that can cause these changes.

People with osteoarthritis may have pain, stiffness, and limited motion.

The decision as to whether to have total joint replacement is uniquely individual.

—Jose Rodriguez, MD

Front View of Knee with Osteoarthritis



When the cartilage is damaged by arthritis, the joint no longer moves smoothly. Bone spurs may also form, which make the bone surfaces even rougher. This can cause stiffness, limited motion, and pain.

Tests for Osteoarthritis

While the description of your symptoms and physical examination can suggest the diagnosis of osteoarthritis, the most useful test is a standard x-ray.

An x-ray will show:

- The form and structure of the bones
- If bone spurs have developed
- The amount of space between the bones—an indicator of how much arthritis has damaged the cartilage, the *meniscus*, and bone.

Other tests, such as magnetic resonance imaging (MRI), are sometimes used. But these tests aren't usually needed to tell if you have knee arthritis or how to treat it.

Tests Might Not Accurately Show Your Pain Level

Imaging tests, such as x-rays, can show changes to the bones and cartilage. However, these images do not tell the full story. Some people have x-rays that show lots of damage, but they have little pain. Other people have x-rays that show little damage, but they have a lot of pain.

Tell Your Doctor If Pain Affects Your Mood

Talking with your doctor about how symptoms affect your mood is important. It's common for people with chronic pain to feel tired, frustrated, or depressed. If you do, tell your doctor. Then the two of you can choose treatments that address all your needs.

Deciding What Treatment is Right for You

Your decision about how to treat your knee osteoarthritis depends on how your arthritis pain and stiffness affect you—not on how much arthritis your x-ray shows.

Osteoarthritis doesn't go away. Over time the cartilage usually continues to break down. But there's no way to predict if your pain will get worse, or how fast it may worsen. That said, there are treatments that can make the pain and stiffness manageable. In the next sections you will read about lifestyle changes, medicine and other nonsurgical treatments, and surgical options.

About Nonsurgical Treatments

Keep in mind that there isn't one "right" choice for treatment. *Osteoarthritis* of the knee affects each person differently. How much the pain interferes with your daily activities can be a key factor in choosing a treatment.

The goal of treatment is to relieve pain and stiffness and to improve ability to function.

Most people start by trying one or more nonsurgical treatments, including:

- Lifestyle changes
- Physical therapy and walking aids
- Pain medicines
- Injections
- Complementary health approaches
- Simple treatments that might help.

Many people with painful knee arthritis find a combination of nonsurgical treatments to be helpful, allowing them to manage their pain and continue doing the things they want and need to do.

For example, one study compared people who had knee surgery plus nonsurgical treatments to people who only used nonsurgical treatments (such as supervised exercise, pain medicines, and other measures). All people in the study had moderate to severe osteoarthritis. Meaningful improvements in pain were reported by:

- 85 out of 100 of people who had knee replacement plus nonsurgical treatments
- 68 out of 100 of people who used nonsurgical treatments only.

You might experiment with different combinations of nonsurgical treatments to see what helps most.

I feel that unless you are in constant, unremitting pain, what you have that is natural is better than any replacement that someone can put in.

— Nancy

Lifestyle Changes

Living better with knee *osteoarthritis* often means making changes in your everyday life.

Exercise

If you've stopped doing some activities because of pain, it's important to start moving again with a regular exercise program.

Exercise can help reduce stiffness, strengthen supporting muscles, improve overall physical condition, and boost energy level and mood.

Exercise doesn't have to be hard work. Simply going for a walk can help build strength and keep your joints flexible.

Some types of exercise can hurt an arthritic knee more than help. So, before starting any type of exercise program, get advice from your doctor or *physical therapist*. Find out if the exercise you would like to do will be safe for you.

Good exercises for people with knee osteoarthritis include:

- Swimming or exercises in a pool
- Walking

- Bicycle riding
- *Tai chi*
- Strength training for the muscles around your knees with weights or elastic exercise bands.

Tips for Getting the Most Benefit from Exercise

- Schedule activities for the time of day when you are least stiff.
- Try taking pain medicine before you exercise to see if it helps (ask your doctor or pharmacist about the best timing for your particular medicine).
- Be patient—it can take several weeks or months to feel the benefits of an exercise program.
- Stick with your exercises—but if you have any serious pain, stop and consult your doctor.

Changing Habits and Routines

Learning new ways to do everyday activities helps some people with knee pain and stiffness.

Education programs can provide a better understanding of what's wrong and how to manage the symptoms.

Arthritis education programs may be found through hospitals, health and fitness centers, YMCAs, and churches. In addition, *occupational therapists* or physical therapists can provide one-on-one training.

Activity changes that might help include:

- Use a “grabber” to pick up items that are low
- Use dressing sticks for putting on socks
- Use a raised toilet seat
- Use wall bars in the bathtub
- Plan time to rest between activities
- Avoid standing or sitting in one position for a long time
- Avoid carrying heavy loads
- Avoid climbing stairs, if possible.

Weight Loss

Losing excess weight can reduce your knee pain. During daily activities like walking, the force acting on your knees is 2 to 5 times the total weight of your body. Losing even a small amount of weight may help. For example, some people carrying excess weight notice less knee pain after losing only 5 pounds. For others, more weight loss is needed.

Experts especially recommend weight loss if you have a body mass index (BMI) of 25 or higher. Talk with your doctor about your BMI and what you can do if it's high.

For guidance about losing excess weight, ask your doctor for suggestions. Your doctor can also refer you to a dietitian or nutritionist. These specialists can help you with a diet to lose weight or to avoid gaining weight from being less active. Learning to eat right is especially important when arthritis limits the type or amount of exercise you can do.

I'd lost about 25 pounds, and I kept that off for about 4 or 5 years. No pain at all.

—Phyllis

Physical Therapy and Walking Aids

Physical Therapy

Physical therapy can help you:

- Strengthen muscles—good muscle support can take some stress off your knee, which may reduce pain
- Improve flexibility—this can increase your range of motion and reduce stiffness.

Physical therapists have special training in how muscles, joints, and bones work together. During your sessions with a physical therapist, you will learn special exercises that you can do on your own. It is common to need several weeks of physical therapy before you may notice an improvement in your condition.

Walking Aids

Knee braces can support the knee and help keep it in a position that is more comfortable when you move. Don't buy just any brace at the drugstore. Ask your doctor or physical therapist what type and size will work best for you.

Walking with a cane may help reduce your pain and improve your ability to get around. It works by reducing the load on your knee joint and the amount of effort needed to move.

Tips for Using a Cane

- Use the proper size cane. Ask your doctor or physical therapist for advice on getting the right size for you.
- Hold the cane in the hand opposite your painful knee.
- When walking, keep the cane close to your body so you can push straight down. This takes some of the load off your knee.

Pain Medicines

Many over-the-counter and prescription medicines may provide temporary relief from knee pain.

Most people try over-the-counter pain relievers first (such as acetaminophen), because they are not habit-forming and are generally safe when used according to directions.

Acetaminophen

Acetaminophen is a mild pain reliever, and the active ingredient in Tylenol[®]. Typically, it offers minor relief from osteoarthritis symptoms, but it may provide more noticeable relief for some people. It is generally safe at the recommended doses.

Because other medicines contain acetaminophen, it can be easy to take too much without knowing it. Other medicines that contain acetaminophen include:

- Some cold medicines
- Certain opioid medicines, such as Percocet[®] and Vicodin[®].

If you take several medicines, check the labels to be sure that you don't take more than the total recommended daily acetaminophen dose. Taking too much acetaminophen can damage the liver. The risk of liver damage is higher in people who take

acetaminophen and also drink too much alcohol. If you have liver disease, talk to your doctor before taking acetaminophen.

Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)

Nonsteroidal anti-inflammatory drugs, also called NSAIDs, can relieve pain. NSAIDs available without a prescription include:

- Aspirin
- Ibuprofen (Advil[®], Motrin[®])
- Naproxen (Aleve[®]).

These and other NSAIDs are available in higher doses that require a prescription, but many people get enough pain relief with recommended doses of over-the-counter products. Because people respond differently to NSAIDs, you may need to try a few to find the one that works for you.

Common side effects include stomach pain, bleeding, ulcers, and higher blood pressure. If you take a blood thinner, NSAIDs are usually not recommended due to an increased risk of bleeding.

Less commonly, some NSAIDs may increase the risk of cardiovascular problems, such as heart attack or stroke. The risk of these problems may be higher in people who have already had a heart attack and in those taking NSAIDs at higher doses or for a longer period of time. Long-term NSAID use may cause kidney damage.

Older people and people with long-term medical problems are at especially high risk of these side effects. NSAIDs can also interact with drugs for high blood pressure.

Doctors sometimes recommend the NSAID celecoxib (Celebrex[®]), one of a class of drugs known as COX-2 inhibitors. People who take COX-2 medicines tend to have fewer serious stomach problems than people taking other NSAIDs. While studies have linked NSAID use with a higher risk of heart attack and stroke, the risk may be even higher among people taking COX-2 medicines, such as celecoxib. Ask your doctor about possible risks and benefits for you.

PPIs Can Lower the Risk of Stomach Irritation

To lower the risk of stomach irritation from NSAIDs, ask your doctor about taking them with over-the-counter or prescription acid-reducing medicines known as *proton pump inhibitors* or *PPIs*. Examples include esomeprazole (Nexium[®]),

lansoprazole (Prevacid[®]), and omeprazole (Prilosec[®]). Some new research suggests long-term use of PPIs may reduce bone density and raise risks for certain infections, kidney problems, and other health issues. Ask your doctor about the risks and benefits in your case.

The table on page 16 lists some side effects that may occur when using common pain relievers, like acetaminophen and NSAIDs. Talk to your doctor or pharmacist if you have concerns about any medicines you take.

Using Acetaminophen or NSAIDs Safely

If acetaminophen or NSAIDs relieve your symptoms, make sure to use them safely. Even though these drugs are available without a prescription, they can cause problems, especially when they are used at high doses or for a long time.

When medicines do help, it's generally safest to use them for a short time. Some people take medicines for brief periods of time when they:

- Have a sudden flare-up of pain
- Are going to do something that may increase pain (such as starting an exercise program)
- Have a special event they want to enjoy.

Tips on How to Use Acetaminophen and NSAIDs Safely

- **Do not take two different NSAIDs—such as aspirin and Aleve®—together unless you have a doctor’s approval.** The drugs can interact, increasing the risk of stomach problems or bleeding. If you take a low-dose (81 milligrams) “baby” aspirin to protect your heart, be sure to ask your doctor whether you should continue to take it along with your NSAID. If you take both, take the aspirin at least one hour before taking the NSAID.
- **Try not to take acetaminophen and an NSAID together on a regular basis.** Although this combination is okay for many people, it may increase the risk of stomach bleeding.
- **Try not to use pain medicines daily or long term.** Instead, use these medicines when your symptoms flare up, or when you know you will be doing things that make your symptoms worse.
- **Talk to your doctor or pharmacist if you have had a heart attack.** Taking certain pain medicines may increase your risk of heart problems.
- **Read the label carefully and follow the instructions.** Make sure you do not take more than the recommended dose.
- **Stop using them when your pain improves.** If your pain returns or gets worse, you can start them again.
- **Use the lowest possible dose.** This can help reduce side effects, especially in older adults who are more prone to bleeding and ulcers.
- **Tell your doctor about all the medicines you take.** Over-the-counter drugs and herbal or dietary supplements can interact with prescription medicines. It’s important that your doctor know about all the medicines and supplements you take.

Common Pain Relievers and Possible Side Effects

Medicine Type	Generic Name	Sample Brand Name	Possible Side Effects
Non-NSAIDs Over-the-counter	acetaminophen	Aspirin-free Anacin® Tylenol®	<ul style="list-style-type: none"> • Liver damage with overdose or excess alcohol use • Worsening of existing liver disease • Interaction with medicines to prevent blood clots
	NSAIDs Over-the-counter	aspirin ibuprofen* naproxen*	Bayer®, Bufferin® Advil®, Motrin® Aleve®
Prescription-only (not all listed)	celecoxib	Celebrex®	• Headache or dizziness
	diclofenac	Cataflam®, Voltaren®	• Excess bruising or bleeding from wounds
	etodolac	Available as generic only	• Higher blood pressure
	indomethacin	Indocin®	• Leg swelling
	nabumetone	Available as generic only	• Allergic reactions**
	oxaprozin	Daypro®	• Liver damage
	piroxicam	Feldene®	• Increased risk of heart attack, stroke, and kidney damage
	sulindac	Clinoril®	
	diclofenac sodium gel or liquid* (topical medicine)	Voltaren® gel Pennsaid®	<ul style="list-style-type: none"> • Skin irritation • Liver problems

*Also available in higher doses with prescription.

**Signs of an allergic reaction include rash, itching, swelling (such as in the face, hands, feet, or lower legs), and trouble breathing or swallowing. If you experience these symptoms, call your doctor right away or seek emergency medical help.

Other Prescription Pain Relief Medicines

Some medicines used for other health conditions may also help relieve knee arthritis pain:

- Duloxetine (Cymbalta[®]), a medicine approved for some types of chronic pain, depression, and anxiety
- Gabapentin (Neurontin[®]), a medicine that is usually prescribed for nerve pain.

If you are not getting enough pain relief from acetaminophen or NSAIDs, your doctor may recommend one of these options.

Topical Pain Relievers

Putting a pain-relieving cream, gel, or liquid directly on the knee several times a day may also help some people. Generally, there are fewer side effects than medicines taken by mouth.

Two options are:

- Capsaicin cream (Capsagel[®], Zostrix[®], and others), which is available over the counter. Studies are mixed, but some research shows it is moderately effective in easing pain. This medicine may cause a burning or stinging sensation on the skin that may decrease with continued use.

- Diclofenac sodium gel or liquid (Voltaren[®] gel, Pennsaid[®]), an NSAID available by prescription. It's not clear how effective diclofenac sodium is at reducing knee pain. That being said, if you are deciding between using the gel or the pill, studies show the gel may cause fewer side effects. These products may irritate your skin and possibly can cause liver problems. More studies are needed to see if they are safe to use for a long time.

Some people find that other topical treatments (such as IcyHot, BenGay, or Tiger Balm) help relieve pain, but response to these varies widely.

Opioids

Opioids are not recommended for relieving chronic pain due to knee osteoarthritis. For most people, the other medicines and treatment options mentioned in this guide are better and safer choices for managing your pain.

If you're prescribed an opioid, the best approach is to try the lowest possible dose and for the shortest possible time. Opioids should be used only when necessary and only for as long as necessary.

Anyone taking prescription opioids can become addicted and is at risk for unintentional overdose or death.

In addition to these serious risks, prescription opioids can have a number of side effects, even when taken as directed. These include:

- Constipation
- Nausea or vomiting
- Dizziness.

If you have chronic pain and are prescribed opioids, your doctor should monitor you regularly. This might include extra assessments, a pain treatment plan, more frequent office visits, and urine testing. Prescription opioids can be very dangerous if not used properly. There are also special guidelines for their safe storage in your home and disposal of any unused medicine. Make sure to follow all of your doctor's recommendations.

Injections

There are two types of injections for people with knee arthritis:

- Corticosteroid injections
- Hyaluronic acid injections.

Corticosteroid Injections

Corticosteroid injections are used for temporary pain relief and to reduce swelling. They are usually given in a single injection.

Corticosteroid injections may provide rapid pain relief for 2 to 3 weeks or even longer. But for some people, this benefit may not last long.

Repeated corticosteroid injections may damage knee cartilage. A common recommendation is to have no more than 2 or 3 injections a year in the same joint.

I did have immediate pain relief and that was good. But unfortunately it did not last as long as I wanted it to.

—Susie

Hyaluronic Acid Injections

Although approved by the U.S. Food and Drug Administration (FDA) for knee arthritis, studies suggest that for most people, hyaluronic acid injections don't do much to relieve pain or make it easier to move. However, these injections may be worth considering if other treatments don't work well, cause side effects, or are considered too risky.

Risk of Side Effects from Injections

Corticosteroid and hyaluronic acid injections can have side effects, including:

- Discomfort or swelling at the injection site
- Small risk of inflamed knee after the injection
- Allergic reaction (causing pain and swelling in the knee).

Complementary Health Approaches

Some people use standard treatments plus *complementary health approaches*, a practice known as integrative healthcare. Standard treatments are conventional medicine that is widely accepted and used by most of the medical community. Complementary health approaches are non-mainstream practices and products, according to the National Center for Complementary and Integrative Health (NCCIH). Integrative healthcare combines complementary health approaches that are considered to be safe with standard treatments.

Two major types of complementary health approaches are:

- **Natural products**, including herbs (also called botanicals), vitamins and minerals, and probiotics that are often sold as dietary supplements. Unlike standard treatments, these products do not have to be tested thoroughly for safety or effectiveness.
- **Mind-body practices**, including yoga, meditation, massage therapy, acupuncture, relaxation techniques such as visualization and biofeedback, tai chi, qi gong, hypnotherapy, movement therapies, and chiropractic and osteopathic manipulation.

Other complementary health practices include traditional healers, Ayurvedic medicine, Chinese medicine, homeopathy, and naturopathy.

Complementary Health Approaches and Osteoarthritis

Some people try complementary health approaches to manage their knee pain and help them exercise and stay strong. Not many large, high-quality studies have been done to show whether specific complementary health approaches have any effect on osteoarthritis. Also, differences in study design and size can make it difficult to compare studies and draw clear conclusions.

The NCCIH says acupuncture, massage therapy, and tai chi may be helpful for knee osteoarthritis.

Tips for Trying Massage and Acupuncture

Acupuncture may cause minor bruising, bleeding, or possibly infection if the needles are not sterile or the practitioner is inexperienced. Massage and tai chi are generally considered safe.

If you want to try massage or acupuncture, you should:

- Understand that these practices may help you feel better, but they do not slow or reverse damage to cartilage and bone
- Find qualified acupuncture and massage professionals by asking people you know; talking with your doctor or physical therapist; or checking with local hospitals, pain clinics, or the health department
- Find out if your state requires licensing. If so, be sure you find a professional who is licensed. If licensing is not required, check if the person has certification from professional organizations (see *For More Information*).

Check with your health insurance plan to see if it covers acupuncture or massage therapy.

Dietary Supplements

Several dietary supplements are marketed as treatments for arthritis pain. These include:

- Glucosamine
- Chondroitin
- SAME and other dietary supplements.

However, most evidence shows that these products don't significantly help ease pain from arthritis or keep the disease from progressing. For more, see information from the American Academy of Orthopaedic Surgeons and the National Center for Complementary and Integrative Care.

If you want to try taking supplements, talk with your doctor first. People with some health problems need to be especially careful when using certain products.

- If you have diabetes, glucosamine may affect insulin or blood sugar levels.
- If you have a bleeding disorder or take blood-thinning medicine, chondroitin could interact with medicines or cause bleeding.

Possible Harms

While some natural products are safe, others are not. The FDA does not check supplements for safety or effectiveness. Research shows that ingredients on the label aren't always in the bottle. Some products are contaminated with unhealthy substances.

Additionally, high doses of certain vitamins can be harmful. And even safe remedies may cause harm when combined with certain standard treatments.

Because of the potential for harm, talk with your doctor before using any complementary treatments that are:

- Taken into the body (such as pills, dietary supplements, or herbs taken by mouth)
- Inhaled into the nose
- Injected into the bloodstream or into a joint.

Some therapies that are more likely to be safe include meditation, biofeedback, visualization, and massage.

Many studies of complementary health approaches and integrative healthcare are underway. If you wish to explore these approaches, talk with your doctor. Find out if your healthcare plan covers integrative healthcare or can recommend reliable and reputable providers.

Simple Treatments That Might Help

Other treatments that don't involve drugs may also help you control your pain and stay active. These treatments include using heat and cold. Heat can get a stiff joint moving before exercising, and cold packs can ease pain from muscles that are sore after physical activity.

They put heat, cold packs on my knee.

They would put me in a ... heated
whirlpool.

—Albert, tried heat and cold treatments

Osteotomy, Partial Knee Replacement, Arthroscopic Surgery

If nonsurgical treatments do not help enough, surgery may be an option. You may have heard about different knee surgeries and wondered if they could help your arthritis symptoms.

- **Osteotomy**—realigns leg bones
- **Partial knee replacement**—replaces only the damaged section of the knee
- **Arthroscopic surgery**—smooths the knee joint and removes loose bone, *cartilage*, and *meniscus*
- **Total knee replacement**—replaces a knee joint widely damaged by *osteoarthritis*.

Osteotomy

Osteotomy is surgery that realigns the leg bones. It can reduce deformities such as:

- Bowed legs, where the knees curve outward
- Knock knee, where one knee or both knees bend in toward the opposite leg.

The surgeon may:

- Cut out a wedge of bone and bring the exposed surfaces of bone together to straighten the leg, or
- Cut the bone and open up a wedge-shaped space, and add bony material to fill in the gap. The surgeon may implant a metal plate on the side of the bone for added support.

Osteotomy is more often done in people who are younger than 65 to relieve stress and pain. The surgery helps shift weight off the damaged cartilage, which might slow down arthritis and delay the need for a total knee replacement.

Osteotomy does not replace damaged cartilage—only total knee replacement does that. Your doctor can help you determine which surgical options might make sense in your particular case.

Partial Knee Replacement

For people who have damage in only one area of the knee joint, a *partial knee replacement* may help. This procedure is called *unicompartmental or unicondylar knee replacement*.

With partial knee replacement, only the damaged section of the knee will be resurfaced, rather than the whole knee. This procedure may take less time for surgery and rehabilitation, but it is suitable only when the bone damage is limited to one section of the knee.

Arthroscopic Surgery

Medical experts used to think that *arthroscopic surgery* of the knee could help people with arthritis symptoms by smoothing the rough surfaces of the joint, and removing loose pieces of bone, cartilage, and meniscus.

But studies show that for most people with knee arthritis, arthroscopic surgery does not improve pain or other symptoms from knee arthritis any better than nonsurgical treatments, such as exercise and pain medicine.

Total Knee Replacement

Total knee replacement surgery is the most common surgery for knee osteoarthritis.

People who find they don't get enough pain relief from medicine and other non-surgical approaches often consider joint replacement surgery. It is a very effective way to relieve arthritis pain, but it involves the risks and recovery of a major operation.

This surgery removes all of the bone and cartilage that have been damaged by arthritis. These areas are then fitted with strong, smooth, metal and plastic materials.

How is Knee Replacement Surgery Done?

There are several types of knee replacement surgery. During this procedure, the surgeon:

- Removes all the bone and cartilage that have been damaged by arthritis
- Replaces the natural knee joint with artificial parts made of metal and plastic.

The 'replacement' parts are called *implants*. Most artificial knee joints have 3 parts:

- One part attaches to the thighbone, or *femur*
- A second part connects to the shinbone, or *tibia*
- A third part resurfaces the kneecap (*patella*).

Replacing Both Knees

If both knees have osteoarthritis, you can have surgery done on one knee at a time, or both knees at the same time (called *bilateral knee replacement*).

Some doctors and patients feel it's easier to focus on healing one knee at a time, and to have the other knee to support you while the first knee is healing. Before making your decision, consider the time off from work each choice requires, as well as the inconvenience and expense.

Bilateral knee surgery is **not** recommended for:

- People with heart or breathing problems
- People who are over 80 years old.

If you choose to have surgery on both knees, you and your doctor should discuss the best schedule for two knee replacements.

Replacing Both Knees at Same Time

Possible Advantages

- Single hospital stay
- Single recovery period of 3 to 6 months

Possible Disadvantages

- Longer anesthesia and surgery time for 2 procedures
 - More difficult recovery with no "good" leg to stand on
-

Surgery Benefits and Risks

Benefits of Knee Replacement Surgery

Total knee replacement surgery usually has very good results. Most people get relief from pain and get back to moving normally. However, some people will continue to have pain in their knee and difficulty with activities, such as kneeling, walking up and down stairs, and doing household work or other daily activities.

One review of past research on knee replacement surgery found that:

- About 80 out of 100 people have nearly all of their pain go away after recovery, and they can do daily activities better than before the surgery
- About 20 out of 100 still have moderate to severe pain after surgery.

However, it's possible that better techniques and knee replacement materials since that review was reported might lead to better outcomes.

Knee replacement surgery can help you stay independent, keep working, and help you lead a more active life. However, it takes time and effort after surgery to achieve these goals.

There are several important things to consider before deciding whether this is the right treatment for you.

Possible Complications of Knee Replacement Surgery

All surgery has risks. Some are common to all types of surgery; others are specific to type of surgery you have. Below are risks you should know about when considering knee replacement surgery.

The risks may happen less often in younger people. They may happen more often in people who:

- Are older
- Are overweight (especially those who have a body mass index or BMI of 35 or higher)
- Have other health problems, including a previous heart attack or blood clot.

Although people who are very overweight face a higher risk of complications from surgery, getting knee replacement should help them get around better. This may help improve their overall health.

Not all people are candidates for knee surgery. For example, people with severe heart and lung disease may not survive a major operation such as knee replacement surgery. In fact, an *orthopaedic surgeon* may not even offer surgery when the risks are too high. Talk with your doctor about how your personal situation will affect your risks.

While it's important to know the risks of knee replacement surgery, keep in mind that most people do just fine after surgery. And if you have a choice of where to have your surgery, you can lower your risk of complications by choosing a hospital that does a lot of knee replacements. For example, studies have found fewer complications among people who had their surgery done in a hospital that performs 200 or more knee replacements each year or by a surgeon who performs more than 50 each year.

The table on the next page lists the possible risks of knee replacement surgery.

Possible Risks of Knee Replacement Surgery

Risk	How Often	Comments
Pneumonia	<ul style="list-style-type: none"> • Infection in the lungs that requires antibiotics and a longer stay in the hospital. 	
Blood infection	<ul style="list-style-type: none"> • Complications related to an infection (called sepsis or septic shock) can be life-threatening. • Requires treatment with antibiotics in the intensive care unit. 	
Heart attack	<ul style="list-style-type: none"> • Additional heart problems may also occur, including congestive heart failure and an abnormal heart rhythm requiring treatment 	
Bleeding that requires treatment	<ul style="list-style-type: none"> • Can happen days or up to a month after surgery. 	<p>If you are 65 or older:</p> <p>About 3 in 100 people who have knee replacement surgery have at least 1 of these complications in the days and weeks afterward.</p>
Blood clot in lungs	<ul style="list-style-type: none"> • Usually prevented by using blood thinners and compression devices (special stockings and foot pumps); without blood thinners, risk is higher 	
Death	<ul style="list-style-type: none"> • Usually due to complications of anesthesia, blood clot in lung • Rates may be lower in younger, healthier people and in hospitals that do more of these surgeries 	<p>Your chance of complications may be lower if you are younger than 65.</p>
Problems with implant	<ul style="list-style-type: none"> • If the implant breaks or loosens, more surgery may be needed. 	
Joint/wound infection	<ul style="list-style-type: none"> • Risk decreases with time but can occur months or years later • More common in people with other chronic medical problems • May require surgeon to remove the artificial joint, then implant a new joint 	

Recovery from Surgery

Rehabilitation May Start Before Surgery

Your surgeon may recommend a program of “prehabilitation,” or “prehab,” exercises before surgery. The exercises help strengthen muscles that support the knee, such as the quadriceps muscles of the thigh that help you sit or walk up stairs. Usually, you do the exercises 3 times a week for several weeks.

Small studies have compared the effects of a presurgery program of strength and flexibility exercises to usual care. People who do the exercise program may have slightly less pain in the early weeks after surgery and slightly better function at 6 to 8 weeks and at 3 months.

In addition to strength, some research shows that people who are overweight before the surgery don't benefit from the surgery as much as people who are at a healthy weight before surgery. This means that if you are overweight and plan to have total knee replacement surgery, you may want to consider speaking with your doctor about getting to a healthy weight first.

The decision as to whether to have total joint replacement is uniquely individual.

—Jose Rodriguez, MD

Recovery From Surgery

The surgery usually takes from 1 to 3 hours. Most people stay in the hospital to receive physical therapy before going home or to a rehabilitation facility. Less often, the patient is discharged from a surgery center on the same day.

The time to recover from knee replacement surgery varies among different people.

Some people are surprised by how long it takes to fully recover. It's important that you have a realistic idea of how long recovery can take.

The time frames in the table on the next page vary by hospital or institution, and your experience may be different than what is described here. Younger or healthier people may have shorter hospital stays than people who are older or less healthy.

It was awfully hard and ... these little things like walking, they're ... not such little things. They're really pretty incredible things when you have to start all over again.

—Susie, describes rehab after surgery

Recovery from Total Knee Replacement

Time After Surgery	Recovery Phase/Activity
During hospital stay	<ul style="list-style-type: none">• Start physical therapy
First weeks	<ul style="list-style-type: none">• Some people go home and do rehab on their own• Some who go home receive visits from specialists such as nurses and physical therapists• Some go to a rehabilitation (rehab) facility to regain strength and mobility.
First 2 to 3 months	<ul style="list-style-type: none">• Physical therapy, exercise, and recovery continue on your own• Most people walk without a cane and are able to do many usual activities, including work. People with physically demanding jobs may need more time off work.
Up to 1 year	<ul style="list-style-type: none">• Most people continue to heal and get stronger and more flexible.

Tips on Planning for Your Recovery

- Before surgery, talk to your doctor about whether you should start an exercise program before surgery. Decide whether you'll go to a rehab facility or directly home after leaving the hospital or surgery center.
- Try to line up some help for when you first get home.
- Ask your healthcare providers for information on making your home a good place to recover. Find out when you'll be able to drive again.
- Check health insurance in advance to find out what medical expenses are covered and what you will pay out of pocket.
- If you work and have disability insurance, find out if it will cover any lost income. If you don't have coverage for lost income, try to set aside enough money to cover expenses during your recovery.

Activities to Avoid After Knee Surgery

Your doctor may suggest you limit certain activities after knee replacement surgery. For example:

- Jogging and high-impact sports, such as basketball, which can damage the replacement knee
- Kneeling or activities that put pressure on the knee; this can cause pain or discomfort even years after surgery.

Every day you have more functioning, and you go from a walker to crutches to a cane. I drove in 4 weeks, so I think that was pretty good.

—Ellie, describes rehab after surgery

Timing of Surgery

How Long Will an Artificial Knee Last?

Artificial knees can wear out and loosen. Research on people who have had total knee replacements shows that:

- 80 out of 100 knee replacements lasted at least 15 years.

How long an artificial joint lasts depends in part on your individual situation. Artificial joints tend to wear out faster in people who:

- Weigh more
- Are younger
- Are more active
- Have diabetes, high blood pressure, heart or lung disease, or cancer.

Your surgeon can help you choose the appropriate implant for your situation, lifestyle, and overall health.

What Happens If the Artificial Knee Wears Out?

If your artificial knee becomes loose or worn, you may need another surgery. A repeat or second knee replacement is called revision surgery.

The results following knee replacement revision may not be as good as the first replacement. The outcome can depend on the amount of damage to the surrounding tissues. If there is bone loss or damage to the muscles and ligaments around the knee joint, the new implant may not work as well.

Recovery from revision surgery usually takes longer than the first recovery. This is partly because the person is older, and partly because a second surgery on the same knee is usually more complicated. The surgeon must remove the old knee replacement. There may be scar tissue, and the person's bones may not be as strong as they were. All this may affect how well the second knee works. Most people who have revision surgery have good results and return to the same activities as they did after their first surgery.

As with all surgery, the chance of complications is higher when a person is older. Some doctors advise people in their 40s and 50s to hold off initial knee replacement as long as possible to reduce the chances of needing to have it replaced later in life.

When to Have Total Knee Replacement

You may feel surgery is your best option, but be uncertain when to have it. You may wonder if your knee is “bad enough” to operate on now. You may ask if you’d be better off waiting so that you’re less likely to need another knee replacement later.

Your decision about if and when to have knee surgery depends on:

- How your knee pain affects your life
- How much nonsurgical treatment helps
- What you are willing to do to make things better.

If you go without surgery, pain and disability may stop you from exercising. When you stop exercising, you may gain weight and lose muscle strength. This can make it harder to recover from knee surgery in the future. Another consideration is that if you wait to have surgery, other health issues, such as heart disease, may develop that make surgery riskier.

The doctor didn’t try to encourage me to do it one way or the other. He left the decision up to me.

—Alton

Choosing When to Have Total Knee Replacement

You might have it sooner, if...

- Your pain is severe (for example, it keeps you awake at night)
- You are unable to do things you want or need to do
- You are concerned about inactivity harming your overall health
- You want to improve the chance of having good function from the replaced knee.

You might have it later, if...

- Your pain is manageable
- Nonsurgical options let you do things you want or need to do
- You cannot currently devote enough time to rehabilitation
- You are concerned about the knee wearing out and needing another replacement when you are older.

If knee pain has you cutting back on your activity level now, it's important to weigh the benefits and risks of surgery.

The idea behind delaying a joint reconstruction surgery is to try to maintain your function as long as that function is tolerable to you.

Questions to Consider

As you and your doctor consider treatments, it's helpful to ask yourself the following questions to understand how pain and other symptoms affect you.

- How much pain are you in?
- Is your pain preventing you from doing the things you want to do?
- Would you prefer to use lifestyle changes, non-drug treatments, medicines, and/or complementary health approaches to treat your arthritis and put off surgery for as long as possible?

- Would you rather have total knee replacement sooner rather than later?
- Do you understand the potential risks of surgery?
- Can you afford to take time off for recovery after surgery?
- If you live alone, do you have family, friends, or services such as visiting nurses to help you during recovery from surgery?
- Which is more important, getting the possible benefits from surgery or avoiding the possible harms?

There are no right or wrong answers—only your answers. Let your doctor know how you feel about your pain, the different treatments, and their benefits and harms. Together, you can make the treatment choice that is right for you.

Working with Your Doctor

Working with your healthcare providers to make decisions about your care and telling them about your preferences is called **shared decision making**.

There are many reasons for getting involved in your healthcare. Shared decision making can help you:

- Get more out of conversations with your doctors
- Feel more satisfied with your healthcare
- Get the type of medical care you want
- Avoid treatments or side effects you don't want
- Gain a feeling of control over your life.

Shared Goal

Shared decision making starts with a shared goal: keeping you healthy with care that's right for your needs. For your knee osteoarthritis, that means choosing from among different approaches to treatment. This information is designed to help you work with your doctor to choose the treatment that's best for you. It's not meant to be a substitute for talking with your doctor.

Getting good care requires good communication between you and your doctor. You and your doctor need to talk about your personal health goals and what you're able and willing to do to protect or improve your health.

Shared Effort

Shared decision making also includes shared effort.

- Part of your doctor's job is to explain your condition and treatment choices, and listen carefully to your concerns.
- Your job is to prepare your questions, make sure you understand the answers, and speak up about what is important to you.

If the pain gets to the point where it's unbearable and you don't want to live in pain, and you explored everything else, I will strongly recommend the process.

—Alton

Tips for Working with Your Doctor

- Learn about the medical conditions you have, as well as any health problems you may be at risk for in the future.
- Talk openly and honestly with your doctor about your health and habits.
- Ask questions until you understand the answers.
- Use your time with your doctor wisely. Writing questions down in advance can be helpful.
- Work with your doctor to make your healthcare decisions.
- Follow through on the care plan you choose together.

For more information, see the **Getting the Healthcare That's Right For You** booklet.

Making Your Decision



Which Choice Is Best for You?

Putting all the pieces together to figure out which choice is best for you can be challenging. Remember, you are in the best position to decide what treatment is right for you because you know better than anyone how your knee problem affects your life.

It can help to talk with family and friends to get a fuller picture. Sometimes pain increases so slowly you don't fully recognize how much it has changed you, your level of activities, and your relationships.

As you think about the right treatment for your situation, it may help to compare the possible benefits and harms of each choice and think about how they would affect your way of life.

The table on the next pages summarizes the scientific evidence about each of the treatment options.

Comparing Treatments for Knee Osteoarthritis

Options	Effectiveness in Relieving Pain and Improving Joint Function	Possible Harms	Other Considerations
Losing excess weight	Small but significant improvements in pain and function.	<p>Few known harms.</p> <p>Fad and crash diets, as well as untested dietary supplements, may be harmful.</p> <p>Rapid loss and regain of weight (weight cycling) is also unhealthy.</p>	Prudent and maintained weight loss improves overall health and quality of life.
Exercise	<p>Mild to moderate improvements in people with mild to moderate arthritis.</p> <p>Exercise, such as tai chi, swimming, or walking, can help reduce stiffness and strengthen muscles.</p>	<p>Few known harms.</p> <p>Check with healthcare provider; impact exercises such as jumping and running may be harmful.</p>	People in exercise programs tend to take less medicine.
Physical therapy, walking aids, heat/cold	<p>Mild to moderate pain relief in some people.</p> <p>Physical therapy or occupational therapy, a properly fitted cane, certain braces and splints can improve pain and/or mobility.</p> <p>Heat can help stiff joints; cold packs can ease pain from sore muscles.</p>	Few known harms.	Generally low-cost and safe.
Complementary health approaches (such as acupuncture and massage)	Little conclusive evidence of effectiveness, but some people report at least short-term improvement.	<p>Few known harms.</p> <p>Glucosamine may create problems in people with diabetes.</p> <p>Chondroitin may interfere with blood clotting.</p>	<p>Generally safe, but not enough high-quality studies to support most treatments.</p> <p>Costs vary.</p>

Comparing Treatments for Knee Osteoarthritis (continued)

Options	Effectiveness in Relieving Pain and Improving Joint Function	Possible Harms	Other Considerations
Acetaminophen	Mild to moderate pain relief in some people. Small improvement in stiffness or mobility.	Possible harms include liver problems and medicine interactions. See <i>Common Pain Relievers and Possible Side Effects</i> table on page 16.	Try as first medicine before NSAIDs because safer and inexpensive.
NSAIDs	Mild to moderate improvements for some people. Reduces joint inflammation and swelling.	Possible harms include side effects. See <i>Common Pain Relievers and Possible Side Effects</i> table on page 16.	Risk of side effects may be higher in older people and those with other health problems such as heart disease.
Hyaluronic acid injections	Most studies show they do not help reduce pain or help the knee move more easily.	Possible harms include discomfort at the injection site. Temporary knee inflammation. Small risk of infection. Allergic reaction.	Expensive and may not be covered by insurance.
Corticosteroid injections	Rapid, temporary pain relief; occasionally improvement lasts for months. Little evidence that they help the knee work better and move more easily.	Possible harms related to injection or drug reaction. See <i>Injections</i> on page 19. Repeat injections may damage cartilage.	For temporary relief and not a good long-term solution. The number of injections is generally limited to no more than 2–3 times per year in a single joint.
Total knee replacement surgery	Longest-lasting effects. 80 out of 100 people find that nearly all pain goes away. About 20 out of 100 still have moderate to severe pain. Most knee replacements last at least 15 years.	About 3% of people will have a serious complication in the days and weeks after surgery. See <i>Possible Risks of Knee Replacement Surgery</i> table on page 30.	Recovery takes several months. Long-term solution. Possible need for another knee replacement in the future.

Medical Terms

arthroscopic surgery:

A type of surgery done with three small incisions. A tiny camera is put into the knee to show the joint on a TV monitor.

bilateral knee replacement:

Knee replacement surgery on both knees at the same time.

bone spur:

A bony overgrowth on the side of a bone that may be a sign of osteoarthritis. Also called an osteophyte.

cartilage:

A firm, smooth material that allows the bones of a joint to slide smoothly against one another.

complementary health approaches:

Non-conventional practices and products that can be used in addition to standard treatments. Two major types of complementary health approaches are natural products, such as vitamins or other dietary supplements, and mind-body practices, such as yoga, meditation, and acupuncture.

femur:

The thighbone.

fibula:

The long, thin bone in the lower leg behind the shinbone.

implant:

The smooth plastic or metal materials used to replace knee joints during total knee replacement surgery.

meniscus:

The disc of tissue between the bones of the knee that absorbs impact and helps distribute body weight across the entire knee.

nonsteroidal anti-inflammatory drugs (NSAIDs):

One group of medicines used to reduce inflammation and help control pain. Examples include aspirin, ibuprofen, and naproxen.

occupational therapist:

A professional trained to show people how to minimize strain on the muscles and joints and improve performance in daily activities.

opioids:

Powerful pain-relieving drugs that are available only by prescription. These drugs must be used with care because they can cause tolerance and physical dependence. They can also be addictive and have serious side effects. Also known as narcotics.

orthopaedic surgeon:

A surgeon with special training in surgery on bones, joints, and muscles.

osteoarthritis:

The most common type of arthritis. The cartilage on the bone wears away and becomes rough and the bone can develop small holes (cysts) or growths called bone spurs (osteophytes). Symptoms include pain, stiffness, and limited motion.

osteotomy:

Surgery that realigns the leg bones.

partial knee replacement:

Knee surgery to remove damaged bone and cartilage found in only one section of the knee joint. The damaged section is fitted with strong, smooth metal and plastic materials so the bones in the joint will move smoothly against one another. Also known as unicompartmental or unicondylar knee replacement. Unicondylar refers to one of the two rounded ends of the thighbone (called condyles) that make up part of the knee joint.

patella:

The kneecap.

physical therapist:

A professional trained to teach exercises to strengthen muscles, reduce stiffness, and increase range of motion.

proton pump inhibitors (PPIs):

Stomach-acid-reducing medicines that are available over-the-counter or with a prescription.

tai chi:

A type of exercise that uses slow, continuous movements and deep breathing.

tibia:

The shinbone.

total knee replacement:

Knee surgery to remove all the bone and cartilage damaged by arthritis. The area is fitted with strong, smooth metal and plastic materials so the bones in the joint will move smoothly against one another.

unicompartmental or unicondylar knee replacement:

See *partial knee replacement*.

For More Information

American Academy of Medical Acupuncture

www.medicalacupuncture.org

Phone: (310) 379-8261

The American Academy of Medical Acupuncture Web site includes an online directory of physicians who integrate acupuncture into their medical practice.

American Academy of Orthopaedic Surgeons

www.aaos.org

Phone: (847) 823-7186

The American Academy of Orthopaedic Surgeons Web site includes well-organized information about different forms of arthritis, focusing on summaries of treatment options. An online directory of orthopaedic surgeons, searchable by specialty, is also available.

American Association of Acupuncture and Oriental Medicine

www.aaaonline.org

The American Association of Acupuncture and Oriental Medicine promotes high ethical, educational, and professional standards in acupuncture and Oriental medicine in the U.S. Their Web site offers links to additional resources.

American College of Rheumatology

www.rheumatology.org

Phone: (404) 633-3777

The American College of Rheumatology (ACR) has developed patient information on over 45 topics for patients with rheumatic diseases. Their Web site also includes a list of assistance programs for certain rheumatology-related drugs, as well as links to additional resources.

American Physical Therapy Association

www.apta.org

Toll-free: (800) 999-APTA [(800) 999-2782]

Phone: (703) 684-APTA [(703) 684-2782]

The American Physical Therapy Association (APTA) Web site offers guidelines for choosing a physical therapist who is most appropriate to help you meet your individual goals. Their Web site offers interactive tools and links to additional information.

Arthritis Foundation

www.arthritis.org

Toll-free: (844) 571-HELP [(844) 571-4357]

The comprehensive information available on the Arthritis Foundation Web site includes pages on joint health, risk factors, alternative treatments, supplements, and ongoing research. Other available resources include community-building and fundraising events, quizzes, and brochures. The site's content is available in Spanish.

National Center for Complementary and Integrative Health

<https://nccih.nih.gov/>

Toll-free: (888) 644-6226

This Web site from the National Institutes of Health provides information about complementary health approaches and integrative medicine, such as supplements, acupuncture, homeopathy, mind-body approaches, and others. Some of the information is available in Spanish.

National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institutes of Health

www.niams.nih.gov

Toll-free: (877) 22-NIAMS [(877) 226-4267]

Phone: (301) 495-4484

This Web site includes introductory information on a variety of arthritis, musculoskeletal, and skin diseases, searchable alphabetically.

Information about dietary supplements:

U.S. Food and Drug Administration: Center for Food Safety and Applied Nutrition

www.fda.gov

Toll-free: (888) INFO-FDA [(888) 463-6332]

The “Dietary Supplements” section of the U.S. Food and Drug Administration (FDA) Web site includes up-to-date information and cautions on dietary supplements, including safety, health claims, labeling, and FDA regulations.

Research Publications

This booklet was written using the most up-to-date medical and scientific research. The research is described in the articles listed below. Each listing includes the authors of the article, the article title, the journal in which it was published, and the publication year. You might notice that some articles were published some time ago. These articles are included here because the research in the article is relevant to the content in the booklet. If you are interested in reading any of these articles, your doctor or librarian may be able to help you get a copy.

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