

Plain Language Summary

Osteoarthritis of the Knee

Background

This summary gives an overview for managing knee osteoarthritis. Osteoarthritis happens when the normally smooth cushioning surface of the knee wears out. This leads to pain with most basic activities including walking and going up and down stairs. Stiffness in the joint is common as the arthritis becomes more severe. Knee arthritis most commonly affects people over 50 years old, but it can affect individuals of any age.

There are multiple options for treating arthritis of the knee. The treatments are either non-operative (without or before surgery) or operative (with surgery). People affected by arthritis may be treated with a combination of lifestyle changes, bracing, therapy, oral medications and/or medication injected into the knee. Once non-operative treatment stops working, surgery may be considered. Many patients choose to cope with their arthritis as long as they can remain active, but as the symptoms become more severe and limit activity and quality of life, then surgery is a good option. There are multiple surgical options for worn out knees. A total knee replacement is the most common. A total knee replacement removes worn out bone and replaces it with metal and plastic.

Lifestyle changes before surgery

Patients with worn out knees have multiple options to improve their quality of life. A low impact workout regimen of walking and/or supervised physical therapy can strengthen the muscles around the knee joint, improve balance and mobility, and reduce pain. If the patient is overweight or obese, an exercise and diet plan to achieve weight loss can

lessen knee pain and symptoms as well as improve overall health. Achieving a healthy weight before surgery can also make surgery safer by reducing the risk of complications.

Medical treatments before surgery

There are many medical treatments for worn out knees and some are more effective than others. Anti-inflammatory medications called NSAIDs, or non-steroidal anti-inflammatory drugs, help ease pain, swelling, and stiffness and can improve patients' ability to perform daily activities. Glucosamine and chondroitin supplements, on the other hand, have not been demonstrated to be better than placebo or sham treatment. Acetaminophen and opioids may be effective for treating short term pain, but they have not been shown to be beneficial in treating the symptoms of arthritis. Opioids have multiple side effects as well a risk of developing tolerance, dependence, and addiction, and acetaminophen can cause harm to the liver if taken in excess.

Other treatments that may be helpful, but have not been proven effective, include knee braces, manual therapy/manipulation, and electrical stimulation (TENS units). Bulky hinged knee braces, such as an unloader brace, often are poorly tolerated and compliance with these braces is poor. Both heel wedge inserts placed in shoes and acupuncture are ineffective at improving knee arthritis symptoms.

Knee injections before surgery

Steroid injections are one option, but studies have not definitively proven that these powerful anti-inflammatory injections are effective. Newer injection medications called biologics are medica-

tions where biological substances are injected into a patient's knee. An example is PRP or "platelet rich plasma," where a patient's blood is spun down and re-injected into the knee. The biologic injectables are expensive and have not been reliably shown to be effective and are currently not covered by most insurance carriers; additional research is required to make a definitive treatment recommendation. Injectables that are not recommended include rinsing the joint (needle lavage) and viscosupplementation (lubricating injections). Rinsing the knee with sterile water using an injection, or needle lavage, has shown no benefit and should not be considered as a treatment option. The use of hyaluronic acid and/or viscosupplementation, or what many patients consider "lubricants," has also been shown to have no clinical benefit and should not be considered.

Management before surgery

Once someone has a worn-out knee, there is evidence that waiting 8 months before a knee replacement does not make outcomes worse. Additionally, supervised exercise before a knee replacement may decrease pain and improve function. These exercises include resistance exercises, flexibility training, and activities for daily life.

Surgery

Multiple surgeries are available for patients with knee arthritis. Arthroscopy is a common procedure, where a camera is placed in the knee and the knee is cleaned of unstable or loose material. In patients with the diagnosis of arthritis, arthroscopy is not recommended as there is no proven benefit and patients may have limited relief yet still are exposed to the risks and costs of surgery. When patients have a meniscal tear with arthritis and additional symptoms, such as catching or locking, it is unclear as to whether surgery would be beneficial. In these cases, depending on the duration and severity of symptoms, the option for surgical treatment should be discussed with the patient with consideration of the potential risks associated with surgery. For patients who only have loss of the cartilage cushion on the inside portion of their knee, there are 3 different types of surgery. These options include: cutting the bone to realign the leg to take stress off

the inside of the knee (high tibial osteotomy), a partial knee replacement (replacing just the part of the knee that is worn out), and a total knee replacement. There is evidence to support similar outcomes and complications between all three procedures.

A high tibial osteotomy can be performed, where the bone just below the knee joint is cut and the alignment of the leg is redirected to shift the pressure in the knee to a part of the knee that does not have arthritis. These procedures can work well in patients who have limited arthritis in other parts of their knee, and in patients who desire to continue intense activities.

Patients with arthritis in only one part of the knee can also be treated with a partial knee replacement. Partial knee replacements may be helpful, but only in highly select patients. Requirements such as good limb alignment, no ligament damage or instability, and good knee range of motion determine a patient's suitability for this procedure. In partial knee replacements, only implants fixed to the bone should be used. There is a high failure rate for those patients treated with a mobile, or "free-floating," knee insert. There is also evidence to support a higher rate of revision for partial knee replacements compared to total knee replacements, but partial knee replacements may have fewer complications and easier recovery.

The most common option is a total knee replacement, where the worn cartilage on the ends of the bones around the knee are resurfaced or replaced. When a patient has severe arthritis in both knees, both knees can be replaced at the same time. Healthy patients under 70 years old may be candidates for replacing both knees simultaneously in one surgery.

For total knee replacement surgery, using a computer or specially made instrumentation created from obtaining an MRI or CT scan prior to surgery has not been shown to improve outcomes or how a patient does after surgery and the chance of complications may remain the same. However, using spinal anesthesia where numbing medicine is injected into the spine or back may improve outcomes and decrease complications compared to general anesthesia

where a breathing tube is placed in the throat. Tourniquets, or a device that temporarily stops blood flow to the leg during surgery, are often used during surgery. These can decrease blood loss during surgery, but may increase short-term pain after surgery, and decrease short-term function after surgery. Although blood transfusions are uncommon after knee replacement, use of a drug called tranexamic acid is strongly recommended as it can decrease blood loss from surgery further reducing the risk of blood transfusions. Antibiotics are important to administer prior to surgery, but their use in bone cement used to glue a total knee replacement to bone is unclear. It is also recommended that drains not be used during knee replacement surgery as they have not been shown to be beneficial.

With regards to knee implants, the outcomes are similar between different types of implants including those that take out the cruciate or internal ligaments and those that do not. Outcomes are also similar when the components in the shin bone or tibia are made of all plastic or made of metal and plastic. There is also no clear difference between knee replacements fixed with or without cement used to glue the implants to the bone. The kneecap may or may not be resurfaced or replaced, as there is no difference in pain or function. However, if the

kneecap is replaced with plastic, there may be less repeat operations after the initial total knee replacement.

Management after Surgery

The injection of numbing agents and other drugs around the knee can help decrease pain after surgery. Using nerve blocks where a numbing medication is placed next to the nerve can lead to lower pain scores, less narcotic medication, and better range of motion after a knee replacement. Evidence shows that the use of ice or cold packs does not improve outcomes after total knee replacements. Similarly, the use of a continuous motion machine to help bend the knee does not improve outcomes and is not recommended. However, it has been shown that starting physical therapy on the day of surgery can reduce pain, improve function, and reduce the length of hospital stay. Supervised therapy for 2 months after surgery may also improve physical function and decrease pain.

Patient Conditions and Outcomes

Patients should be advised that they may have worse outcomes if they are overweight or have chronic pain conditions such as low back pain, or pain in multiple joints. Also, patients with diabetes, hepatitis C and liver cirrhosis have higher rates of complications.