

A close-up photograph of a petri dish containing a bacterial culture. The agar surface is covered with numerous circular colonies of varying sizes. Many colonies have a dark, dense center surrounded by a lighter, more diffuse ring, giving them a 'bull's-eye' appearance. The colonies are distributed across the entire surface of the dish.

In this article we discuss infection and knee replacement. Included is crucial information about causes, risks, diagnosis, prevention, and treatment.

Infection and Knee Replacement

THREATS TO A PROPER TOTAL KNEE REPLACEMENT RECOVERY

by PJ EWING

Threats to a Proper Knee Surgery Recovery (Infection and Knee Replacement)

This is Part 2 of a series of articles on threats to a proper knee surgery recovery. In this installment we discuss infection and knee replacement. I encourage you to explore the other articles which you can find by clicking on the link below.

Deep Vein Thrombosis and Knee Replacement

So let's get started. There are two types of infections to think about when it comes to knee replacement: 'Superficial' and 'Deep'.

After [knee replacement surgery](#), it's possible to develop an infection in the incision. Doctors call these superficial, minor, or early-onset infections. Superficial infections usually occur soon after your surgery. You may develop a minor infection in the hospital or when you go home. The treatment is simple, but a minor infection can lead to a major one if it's not treated.

You can also develop an infection around your artificial knee, also called a prosthesis or implant. Doctors call these deep, major, delayed-onset, or late-onset infections. Deep infections are serious and can occur weeks or even years after your knee replacement surgery. The treatment may involve several steps. You may need surgery to remove the infected artificial knee.

A knee replacement infection may develop in the wound after surgery. It may also occur around the artificial implant that is used to replace the knee joint. Harmful bacteria entering the wound usually cause the infection.

A knee replacement infection can occur any time after surgery. For instance:

- at the hospital
- once you get home after your surgery
- months or even years after surgery

In a study by the [American Academy of Orthopaedic Surgeons](#), only 1%, one in every 100 people who have a hip or knee replacement, will develop an infection.

How to Diagnose an Infection

It may be evident to a surgeon that there is an infection in the knee with a simply visual inspection. There are tests that can be conducted to validate the presence of infection as you can see here:

- **A Simple Blood Test:** This can help measure inflammation in the body, which can indicate an infection.
- **An Imaging Test:** This can help determine if there is an infection in the artificial joint. Examples of imaging tests include X-rays, computed tomography (CT) scans, magnetic resonance imaging (MRI), or bone scans.
- **Joint aspiration:** Fluid is drawn from the knee and tested for bacteria and white blood cells. A large number of white blood cells is a sign the body is fighting an infection.
- **Tissue Culture:** The doctor may take a tissue sample from within the infected bone or joint. The doctor sends this specimen to a laboratory for examination.
- **Bone Biopsy:** Your doctor might perform a bone biopsy if he suspects that you have an infection that isn't showing up clearly on imaging tests. This process is similar to a tissue culture, in which a doctor uses a needle to remove a sample from the affected area.

For more on how to diagnose a knee infection click here: [Diagnosing a Knee Infection](#)

Causes of a Knee Infection

Bacteria might enter a person's body through the wound where the surgical incision was made, after knee replacement surgery. If bacteria reach a person's new artificial knee joint, they may multiply and cause an infection.

Some bacteria are harmless (think of as those that occur naturally in the stomach) while others may harm a person and cause an infection. Your immune system most likely will kill any harmful bacteria that get into the bloodstream.

With a knee replacement, the knee joint is replaced with an artificial joint made of metal and plastic. Because these materials are not organic, it is harder for the body to kill bacteria on them.

Risks to Consider

Anyone who has a knee replacement can develop an infection after surgery, but some groups are at a greater risk of infection. These include people who:

- have poor circulation in their hands or feet
- are using treatments that suppress the immune system (including chemotherapy or corticosteroids)
- have frequent urinary tract infections
- have a high BMI (+50)
- suffer from immune deficiencies, such as HIV or lymphoma
- have diabetes, dental problems, dermatitis or psoriasis
- have rheumatoid arthritis
- smoke
- have had knee injury and surgery before
- have had an infection in their artificial knee before



Treatment of an Infection

There are many treatments for a knee replacement infection, including both nonsurgical and surgical procedures.

Nonsurgical

Some knee replacement infections are superficial, which means that the infection has reached the skin and tissue around the joint but does not affect the artificial joint itself. A superficial knee replacement infection may be treated with oral or intravenous (IV) antibiotics.

Surgical

If a knee replacement infection goes deeper than the skin and tissue around a joint, it may need to be treated surgically, as follows:

- **Debridement:** This is a surgical washout of the joint. Any contaminated soft tissue is removed, and the artificial joint is cleaned. Plastic liners or spacers in the artificial joint may be replaced. The doctor will prescribe IV antibiotics to be taken after surgery.
- **Staged surgery:** This involves a series of surgeries to remove and replace the artificial joint. This may be necessary if the infection has developed months or years after the original knee replacement.

Details on a Staged Surgery:

- **Removal of the artificial joint:** When the infection is deep and long-lasting, the artificial joint will need to be removed.
- **Joint washout:** Washing helps get rid of infected soft tissue in the joint.
- **Placement of antibiotic spacer:** This helps maintain joint space and keeps the joint aligned while the infection is treated.
- **IV antibiotics:** These help kill the infection. The doctor may prescribe a course that lasts up to 6 weeks.
- **New knee replacement surgery:** Once the infection has been treated, another knee replacement surgery can be carried out. The doctor will remove the antibiotic spacer and give the person a new artificial knee joint.

But what are the results of all this work after an infection has been identified and requires treatment?

In a 2015 study ([TREATMENT OF INFECTION AFTER TOTAL KNEE ARTHROPLASTY](#)) it was concluded that: "the success rate in debridement plus prosthesis retention (debridement and retention of the prosthesis), one-stage and two-stages revision was 75%, 83.3% and 100%, respectively. The best results of quality of life and functional outcome, according to the SF-36 and WOMAC, occur in patients undergoing debridement and retention of the prosthesis as compared to the other treatments. In contrast, the worst quality of life and functional results were obtained in patients treated with two-stages revision arthroplasty" which is debridement and then a later replacement of the prosthesis. So it is better to treat the infection and keep the existing joint vs. starting all over again.

To Prevent a Knee Infection

Before and during knee replacement surgery, the following steps may help reduce the risk of infection:

- **Using prophylactic antibiotics:** Preventive medicines may help reduce the risk of knee replacement infection.
- **Using antibiotics:** These should be given immediately before, during, and after surgery for up to 24 hours.
- **Keeping operation time short:** A short operation time reduces the length of time the wound is open and vulnerable to infection.
- **Reducing the number of people present:** Limiting the number of people and limiting the number of times they come and go may reduce the bacteria in the room and decrease the risk of infection.
- **Using sterile equipment:** The theatre, instruments, and artificial joint should all be sterilized.
- **Screening for bacteria in the nose:** If a person has certain types of harmful bacteria in their nasal passage, they may increase the risk of infection. Some hospitals screen for these bacteria before operating. If harmful bacteria are found, the person will be given an antibacterial ointment to use. Some medical centers will routinely decolonize nasal passages with mupirocin several days before surgery.
- **Washing with chlorhexidine:** This may help reduce the number of harmful bacteria on the skin before surgery.

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After knee replacement surgery, you may help reduce the risk of infection by:

- following the doctor's advice on how to treat the wound
- cleaning and covering cuts, wounds, or burns as soon as they happen
- maintaining dental hygiene, as infections in the mouth may spread to the artificial joint

Don't Panic

Remember what I said at the beginning of this article. Only 1% of hip and knee patients are diagnosed with an infection. So please do not stay up at night worrying about infection... the odds are certainly with you. That said, be smart, protect yourself, choose a hospital and surgeon with a low (or nonexistent) infection rate. And pass this article on to anyone you know who has a knee surgery upcoming. The more we take care of each other, the better off we will all be.

For Further Reading / Source Material*:

American Academy of Orthopedic Surgeons (www.aaos.org)

Talking Docs (www.talkingwithdocs.com)

Ortho Info (www.orthoinfo.com)

NYU Langone (www.nyulangone.org)

Medical News Today (www.medicalnewstoday.com)

Treatment of Infection After Total Knee Arthroplasty (www.ncib.com) Cury,¹ Cinagawa,¹ Camargo,¹ Honda,¹ Klautau



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