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JOINT REPLACEMENT SURGERY - a patient's guide

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What is it?

Joint replacement surgery has revolutionised the treatment of arthritis of the hip and knee particularly in the older person. Almost all patients receive major benefits from total hip arthroplasty. These benefits are apparent within three months of surgery and usually include relief of pain with consequent improvement in physical function, social interaction and overall health.

The success of joint replacement has not only caused a greatly increased use of the technique but also provoked great interest in the ways to avoid or solve the very real problems that still occur in some patients. The vast majority of patients proceed through this surgery without complication. It is ideally suited for the older individual but in some circumstances it is appropriate for younger patients and good long-term results can be expected.

Who needs a joint replacement?

The main indication or reason for a joint replacement of any sort is significant pain in that joint. Joint replacement may secondarily ease stiffness and deformity but in the absence of significant pain would rarely be done. In general older people benefit most with excellent relief of pain and a long-lasting joint.

Painful joints are usually the result of arthritis. There are many types of arthritis but osteoarthritis and rheumatoid arthritis are the most common. There is usually no outside cause for osteoarthritis. That is the joints do not wear out because of overuse. The fact is that some people's hip or knee joints may wear abnormally for reasons that are not clear. Rarely a major injury in the past may be a cause. Falls and strains do not usually cause the problem, although previous knee cartilage or ligament injury may be a factor.

Rheumatoid arthritis is an inflammatory arthritis. In this type of arthritis the body in some way sets up a damaging inflammation within the joints. Again it is not exactly certain why this should occur in one person and not another, but the result is stiff and painful joints.

Gout is another type of inflammatory arthritis but it rarely damages the major joints.

The end result of the various forms of arthritis is the loss of the normal smoothness to the joint bearing surfaces. The joints then become painful and stiff. In joint replacement surgery the damaged bearing surfaces are replaced with man-made materials.

Considerations before a joint replacement is undertaken

Your doctor and your specialist will take a history and examine you. This is because the doctor must be certain that your pain is coming from the joint in question. This is not always clear cut - for example pain in the groin is usually coming from the hip joint but pain in the buttock often is radiating from the back. Pain in the front of the thigh or knee may be radiating from the hip, or may be coming locally from the knee.

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Once your doctor has made a diagnosis of the type of arthritis then he or she will advise on treatment. The best initial treatment is almost always tablets which take away pain and settle inflammation. Many people do not like to take tablets but in general the benefits of the tablets outweigh the risks and they may let the person avoid surgery or delay it for a long period. Delaying surgery until a person is older is reasonable as, like all man-made things, artificial joints do wear out.

Modification of activities can also be useful. A walking stick can be very helpful and may relieve pain and minimise a limp. Generally keeping fit and strong is very useful. This can be done in ways which minimise loading the joint - for example using an exercycle, swimming or waterwalking. Maintaining body weight as close as possible to the ideal will also minimise symptoms.

There may be operations other than joint replacement to help painful joints. These operations may be useful in younger patients particularly. This is because all artificial joints eventually loosen or wear out and an operation which can delay or eliminate the need for joint replacement may be the best option. These operations include re-aligning joints so that less damaged regions take up the load. Stiffening a joint so that it does not move can also eliminate pain.

Preparing for the operation

Your specialist will take a history and complete a physical examination. The specialist will discuss the reasons for the surgery, its benefits and risks. This is the time to ask questions. You will have to complete a consent form. There will also be hospital forms to complete which ask details about your past history, medications and previous operations. It also asks for insurance and billing information.

The ideal patient for joint replacement is older, with arthritis affecting one or more joints, who is otherwise fit and well. Medical problems e.g. blood pressure or heart conditions do not prevent joint replacement surgery but do need to be treated first. Infection within a joint or abscesses on the skin of the leg or about the toes would mean that surgery should not be done, at least until the problem is cured. Also abscesses or infections elsewhere, for example in the mouth or bladder, must be treated.

You will have screening blood and urine tests. Your doctor may advise you to see the anaesthetist in advance of the surgery but usually you would meet the anaesthetist in the hospital on the day of the surgery.

You will be admitted to hospital on the day of the surgery or the night before and an identity bracelet placed on your wrist. A cardiogram is usually taken. You will usually be asked to wash or shower with an antiseptic solution. You may be asked to have an enema. Your surgeon will see you before operating and will mark the area to be operated. There are a number of other checks to be sure that the correct joint is being replaced. The nursing staff will usually check the consent form that you have signed and see that it agrees with what is on their list. They will usually ask you to confirm the consent. The surgeon will generally check the x-ray again just before starting to be sure that this correlates with what is planned. You will be seen by the anaesthetist; your anaesthetic will be discussed and you may be given a pre-med. This is medication to prepare you for your anaesthetic.

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Your anaesthetist will discuss this with you in the hospital before the surgery. Commonly you will have a spinal or epidural anaesthetic in combination with a general anaesthetic or heavy sedation. This means that local anaesthetic is injected around the nerves in the spine. This makes the legs go to sleep for about three hours and takes away any pain. The general anaesthetic or sedation helps you sleep while the operation is being done. Minor complications such as nausea and vomiting are quite common but are usually easily controlled and settle within 1-2 days. The details of your anaesthetic can be discussed with your anaesthetist.

Blood transfusion

Almost all patients undergoing hip and knee joint replacement require a blood transfusion. Most people accept blood from a blood bank. There is the option of collecting your own blood. It may then be given back to you if needed.

Donated blood

In this circumstance you accept blood donated by another individual. In New Zealand this is very safe. Donated blood is screened for many infections such as HIV/AIDS, Hepatitis A, B, C, and syphilis. The risk of catching HIV/AIDS from New Zealand blood is extremely small - probably close to 1 in a million. The risk of catching hepatitis is not known but may be 1 in 5000 to 1 in 25,000. In fact, most problems relate to clerical errors and overall catastrophic complications are very unusual.

Self donated or autologous blood

In this circumstance you attend the blood bank and donate 1 or 2 units of blood. This is stored and is given back to you during or after the operation if required. You can rapidly manufacture more blood to replace the donated blood and on occasion you may not need to have the blood given back. When you donate blood you need iron tablets to assist your body to replace the blood.

The blood bank makes a charge if you donate your own blood. This is currently about \$200 per unit. If you use blood donated by someone else there is no charge. There is no facility for directed donation i.e. you cannot arrange for a family member or friend to donate blood for you.

What happens during surgery?

Your nurse will accompany you to the theatre floor and will transfer your care to a theatre nurse who will identify you and check you in. This will occur in a pre-anaesthetic room from where you will be wheeled to the operating room or theatre. Once you are asleep a catheter will be passed i.e. a small tube will be passed into your bladder so that you will not have to worry about passing urine. The catheter is usually removed 24 - 48 hours after surgery.

An antibiotic will be given to you immediately before the surgery. This will continue for 24 - 48 hours after the surgery and will help to minimise the risk of infection.

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Once the surgery is completed you will transfer to the Recovery Room and from there back to the ward. Sometimes you may be transferred to a special care area or high-dependency unit for 12 - 24 hours before returning to the ward. You may have a drain coming out adjacent to your wound. This is a small plastic tube which lets out excess blood and is removed 24 - 48 hours later.

What happens after surgery?

You will stay in bed for 12 - 36 hours after surgery. You will generally be free to move around in the bed. You will be encouraged to move your toes, feet and legs to assist circulation and minimise the risk of clot formation.

About 24 hours after your surgery your drain and catheter will be removed. You will then be assisted out of bed and will walk with crutches but taking some weight through the operated leg. Your physiotherapist will help you and will teach you how to get in and out of bed, and in and out of a chair and up and down stairs. In the case of hip joint replacement, your physiotherapist will guide you with dressing, toileting and bedding in a way to minimise the risk of dislocation (see dislocation below). You will also need to sleep with a pillow between your legs and use a high lavatory seat for about six weeks.

In the case of knee joint replacement, emphasis is placed on quadriceps (thigh muscle) strength and knee bending. Some surgeons use a CPM (continuous passive motion) machine which bends and straightens the knee for you. This is not essential however and most people do very well without it.

You will go home about five days after your surgery when you are independent with your crutches. Your surgeon will advise you when to arrange follow-up. You will be using your crutches for six weeks and you should do this even though you may wish to discard them sooner.

Six weeks following surgery you will be feeling confident and most of the discomfort related to the surgery will have gone. Some people continue to experience discomfort for 6 - 12 weeks following a knee joint replacement surgery in particular. By 6 weeks you will be able to return to most normal activities such as driving, bicycling and golf. Sexual activity can be resumed when comfortable about this time. You will see your surgeon for follow up 2 - 6 weeks after surgery.

In the long term you may be reviewed by your surgeon 2 or 3 times during the first 2 years after your surgery and then at intervals of 2 - 3 years thereafter. X-rays are taken and wear of the joint is monitored. Should the joint wear or become loose it may need to be changed or revised.

In the absence of complications an artificial joint will last for 10 years in most individuals and may last for many years more. Occasionally the artificial joint will wear or loosen earlier.

Recovery after joint replacement

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For the first 6 - 12 weeks after surgery there is a small risk of the artificial hip coming out of joint. This occurs if you bend or rotate the hip too far. After 3 months you should still never bend the hip excessively, but the risk is less.

You should always avoid sofas, soft armchairs, low chairs, low beds

Consider sitting on a stool in the shower rather than taking a bath

DO NOT bend your hip beyond 90 degrees

DO NOT cross your operated leg over the midline

DO NOT lean forward while sitting in a chair

DO NOT sit on a chair that does not have arms

DO NOT lean forward while sitting in bed

DO NOT sit on lavatory that does not have handles or side-arms to assist standing

To get up or sit down: extend the foot of the operated leg and use your arms to support your body.

To pick things up from the floor: support your body with one arm, kneel directly on the knee of your total hip leg.

To reach your foot: you cannot reach your foot by flexing your hip or by crossing your knee, or by flexion and internal rotation. You may reach your foot by placing it under your opposite knee. You may put your ankle over your opposite knee. You may need to have somebody else to assist you to cut toe nails.

These limitations do not apply following knee joint replacement.

Anaesthesia for total joint replacement

The aim of anaesthesia is to eliminate pain during the course of the operation. This is commonly achieved with a combination of a spinal or epidural anaesthetic and a general anaesthetic.

With a spinal anaesthetic, local anaesthetic is placed with a needle adjacent to the nerves in the lower back. These nerves are temporarily blocked and pain is eliminated. The temporary block of function lasts 2 - 3 hours although may be prolonged when an epidural is used. Local complications in the back and spine following epidural or spinal anaesthetics are rare. Catastrophic complications are extremely rare.

A light general anaesthetic is commonly used in combination with the local techniques to keep you comfortable during the 1 - 2 hours that the surgery will require. If you have had

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major back problems in the past, you and your anaesthetist may elect to use a general anaesthetic alone.

The overall risk of anaesthesia is small. The risk of dying under general anaesthetic when a patient is fit and young is probably about 1 in 250,000. This risk increases a little in older individuals and will increase with other factors such as blood pressure problems, heart or lung disease or a previous stroke.

When associated disease such as elevated blood pressure are well controlled the risk of a catastrophic complication such as a stroke, a heart attack or dying is small. These risks can be discussed with your family doctor, surgeon and anaesthetist.

Complications of total hip replacement surgery:

Infection in joint replacement

Infection in joint replacement is relatively uncommon and the risk is between 1 in 50 and 1 in 150. Infection is usually caused by bacteria which reside normally on the skin or in the environment. They may also be transmitted in the blood stream from other sites, for example, from the mouth, bladder, or a skin infection. Infections may occur within a few weeks of surgery or they may occur weeks, months or years later. Some patients are more at risk of infection than others e.g. patients with rheumatoid arthritis and those who have had previous hip surgery.

Infection is of great concern to both patient and surgeon. Everything is done to minimise the risk of infection although it cannot be eliminated altogether. Antibiotics given for 24 - 48 hours during and after surgery have been proven to decrease the risk of surgery and are routinely used. The operating theatre is a filtered clean-air environment and the limb is washed, prepared with antiseptic solution and covered with sterilised drapes. Your surgeon and surgical assistants wear masks, sterilised gowns and two pairs each of sterilised gloves which are frequently changed. Some operating rooms will have special air conditioning and filters (lamina flow) and your surgical team may wear space-suit like gowns. These latter techniques are not definitely proven to decrease the risks of infection but are reasonable to use if available.

To minimise the risk of infection occurring months or years after the surgery antibiotics should be taken at appropriate times. For example a skin infection around a toe or finger should be seen by your family doctor and treated with antibiotics, as should a bladder infection. If you are having dental treatment beyond a simple procedure you should have antibiotics and if you are having any other surgery e.g. a gallbladder operation, then that surgeon should be told about your artificial joint and antibiotics given.

Should an infection occur your surgeon will have a protocol to manage this. This management will depend on a number of factors including the time interval since the original surgery. Further surgery is almost always necessary as are appropriate antibiotics.

Dislocations and instability

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Your own hip is held in place with very strong ligaments and will only come out of joint (dislocate) with major violence such as in a car accident. An artificial hip is held in place by your own muscles. Stability also depends on the position in which the hip is placed by you and your surgeon.

The risk of your artificial hip dislocating is about 1 in 100. This is most likely to occur within the first 6 -12 weeks after the surgery and particular care is taken during this period with sleeping, washing, bending and toileting. After this period the risk lessens but some precautions remain important. Your physiotherapist will instruct you while you are in hospital (see recovery above).

If your hip should come out of joint it must be replaced i.e. placed back in joint. This often requires a very brief general anaesthetic and the leg is firmly pulled until the artificial hip drops back into place. You may be able to avoid further problems by avoiding at risk positions. On occasions recurrent dislocation or instability can be a major problem and further surgery is needed. Your surgeon would then try to alter the position or dimensions of your artificial hip to decrease the risk of dislocation.

Nerve and vessel injury

Adjacent to the hip are a number of nerves and blood vessels which supply the leg and foot. One of these nerves, the sciatic nerve, is vulnerable to injury and on rare occasions this may result in weakness or loss of feeling about the foot.

Leg length alteration

In general the length of the legs can be maintained within 10mm of ideal. On some occasions, particularly in the presence of deformity about the hip, significant leg length differences may occur. Sometimes a compromise must be reached between leg length alteration and stability of the hip joint. You may not notice a minor leg length alteration - 5 mm or less. An alteration of 10mm or more may be balanced by a simple heel raise.

Clot formation and lung problems

The formation of small clots in the legs is very common following major surgery including joint replacement. Small clots confined to the veins of the calf do not usually present a problem. Occasionally a clot can extend into veins above the knee and there is a risk that these clots could break up and then travel to the lung resulting in major problems. Everything is done to minimise the risk of this clot formation and extension. In particular, you will be encouraged to move your toes and legs as much as possible immediately after the surgery. You will be standing and walking within 24 - 36 hours of your surgery. These things encourage the circulation and decrease the risk of clots. There is no definite opinion on the best additional method to minimise clot formation. Some methods used in New Zealand include special stockings, regular aspirin, injections or blood thinners, and on occasion taking tablets for thinning the blood. All methods have their potential benefits and risks, and will be discussed by your surgeon.

Stiffness

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Stiffness following joint replacement surgery would not generally be considered a complication however following knee joint replacement in particular the range of knee bend may be less than before surgery. Usually the benefits gained from the loss of pain more than counterbalance any small loss of movement.

Drug reaction

Significant side effects or reactions to drugs are unusual in joint replacement patients. Occasionally the blood thinning medications described above may result in loss of fluid or bleeding from the wound.

Urinary and bowel problems

After you have been anaesthetised and before surgery has started a catheter or tube is placed in the bladder to drain urine. This remains in place for 36 hours and is removed once you are walking. It is unusual to have urinary problems subsequently. On occasion men in particular may have difficulties passing urine and the catheter may be replaced. In the very unlikely event that you are unable to pass water without the catheter in place, a urologist would be consulted.

The medications given particularly for pain relief may result in a degree of constipation. It is often better to anticipate this problem in advance. If you have not cleared your bowels well on the day of surgery you may be advised to have a gentle microlax enema. In the unlikely event you become constipated following surgery then laxatives will be useful.

Wrong side surgery

On the day of surgery your surgeon will see you and ask you to indicate which hip or knee is being replaced. This question is asked regardless of previous discussions and a marker is then used to indicate the site of surgery. You will have also completed a consent form and on the consent form you will have stated the side and site of surgery. When you get to the operating room the surgeon will take note of the mark on the limb. Staff will also check the consent form and may ask you again to confirm this. Once you are asleep again the site of surgery is checked against the x-ray of the region. The chance of this type of error occurring is extremely small.

Conclusion

Joint replacement surgery has transformed the lives of hundreds of thousands of people world wide. Ninety five percent of patients will proceed through surgery without trouble and can expect a long lasting and comfortable joint.