Introduction

An arthroscopy is a surgical procedure that Orthopaedic surgeons use to visualize, diagnose and treat problems inside a joint. Since this technique became available in the 1970's, thousands of patients have preferred it to other types of surgery because the scars are smaller, the hospital stay is shorter and recovery is faster.

The word arthroscopy comes from two Greek words, "arthros" meaning joint, and "skopein", meaning to look. The term literally means "to look within the joint". In an arthroscopic examination, the Orthopaedic surgeon makes a small incision in the patient's skin and then inserts a pencil sized fibre-optic telescope, called an arthroscope, into the joint. The arthroscope has a small miniature lens and a lighting system that magnifies and illuminates the structures inside the joint.

The arthroscope varies in size from 2.5 to 5.0 millimeters in diameter. Light is transmitted through fibre-optic cables to the end of the arthroscope, which is inserted into the joint. By using a small video camera and a television screen the surgeon can see the inside of the joint.

The video camera attached to the arthroscope displays the image of the joint on the television monitor. The enlarged image on the screen allows the surgeon to look directly at the joint, determine the extent of the injuries, and then perform the particular surgical procedure, if one is necessary.

Diagnosing joint injuries and disease begins with a thorough medical history and physical examination. Sometimes x-rays and laboratory tests are required to help diagnose the problem. Further diagnosis using arthroscopy may be required because it gives a precise, direct view of the affected bones and soft tissues (including the ligaments and cartilage).

With the arthroscope, surgeons can see more of the joint than is possible with a large incision made during an "open" operation. In addition, areas that are sometimes difficult to see on an x-ray can be seen during arthroscopy.

A joint usually contains dense, pad-like structures called menisci (or cartilages) and fibre-like connecting tissue called ligaments. The cartilages and ligaments cushion the bones and stabilize the joint so that the joint can move easily without pain. Additional stability and the ability to control movement are provided by tendons and muscles, which are attached to the bones on each side of the joint.

Scope of Surgery

Disease and injuries can damage bones, cartilage, ligaments, muscles and tendons. Some of the most frequent conditions found during diagnostic arthroscopic examination of joints are:

- Torn or abnormal cartilage
- Torn ligaments
- Loose fragments of bone or cartilage
- Damaged joint surfaces
- Inflammation of the joint lining
- Misarranged bones (such as the kneecap).

Even though the inside of most joints can be viewed with the arthroscope, only a few joints are frequently examined with this procedure. The knee is by far, the most common joint examined. Others include the shoulder, elbow, ankle, hip and wrist. As engineers make advances in electronic technology and Orthopaedic surgeons develop new surgical techniques, other joints may be viewed and treated with arthroscopy in the future. It is sometimes possible to video the arthroscopic findings inside a joint at the time of surgery. With digital systems it is possible to download images to files.
Risks Related to Surgery

The key benefit of arthroscopic surgery of the knee is the quick recovery time.

As with any operation there are risks involved in undergoing the surgery. The recommendation of surgery is based upon the belief that the perceived benefit outweighs the potential risks involved.

The potential for risk is often dependent on age and the presence of preexisting disease.

Complications occur infrequently and most are minor and treatable.

The potential risks of surgical operations include:
- Perioperative death (very rare and often related to pre-existing medical conditions
- Bleeding, hemorrhage or haematoma formation inside the knee joint
- Infection in the knee or associated with the wound
- Thromboembolism or clots forming in the leg veins

*If there are any concerns relating to the potential risks these should be raised with the surgeon prior to surgery.*

Post-operative Instructions

Following your operation you will have some discomfort in your knee that will settle over a few weeks. This discomfort should be controlled by taking mild pain-killers such as aspirin or paracetamol regularly. Severe pain should not occur. If pain is severe, persistent, and not controlled by taking pain-killers orally, or if there is interference with the supply of blood to your toes, contact your Orthopaedic Surgeon without delay. (If he is unavailable then contact your family doctor, or the Emergency Department of your nearest hospital for advice).

Warning signs of serious complications include:
- Fever & Chills
- Tense swelling in the knee
- Increasing redness around the knee
- Increasing pain in the calf muscle
- Shortness of breath
- Chest pain

**Key emergency contact telephone numbers:**

- Southern Cross Hospital (06) 356 5180
- Aorangi Hospital (06) 357 8164
- Palmerston North Hospital (06) 356 9169

At Home

It will not be possible for you to drive your own car home. Please arrange for a responsible relative or friend to take you home from hospital. It would be preferable for someone to remain with you for the first 24 hours after the operation.

For the first 24 hours you should remain on bed rest with the leg elevated to minimize swelling and discomfort.

You should actively contract your thigh muscles at regular intervals every hour so that your control of the leg returns rapidly. It is not necessary at this stage to begin bending the knee.

When you get out of bed to go to the toilet you may take as much weight as you can tolerate through the leg that has been operated on.

If necessary, apply an ice-pack to the knee to help to minimize swelling.

The outer bandage may be removed at 24 hours and the small puncture holes can be covered with Band-Aids.
Stopping and Restarting Medications in the Perioperative Period

Some drugs and medicines taken for medicinal purposes may interfere with your anaesthetic and surgery. Even herbal remedies purchased over-the-counter may lead to problems around the time of surgery eg. Feverfew, Ginger & Garlic prolong clotting times and may lead to bleeding complications, Ephedra may cause increased blood pressure and heart beat irregularities.

With some medications the risk of stopping may be greater than the risk of continuing, so it is important to discuss your medications with your family doctor, surgeon and anaesthetist before surgery.

The following is a guide for stopping and restarting medications that you may be taking:

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<tr>
<th>Medication</th>
<th>When to Stop</th>
<th>When to Restart</th>
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</thead>
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<tr>
<td>Herbal Remedies</td>
<td>1-2 weeks before surgery</td>
<td>When the risk of bleeding from surgery has diminished</td>
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<tr>
<td>Aspirin</td>
<td>7 days before surgery</td>
<td>When the risk of bleeding from surgery has diminished</td>
</tr>
<tr>
<td>Warfarin</td>
<td>7 days before surgery</td>
<td>When the risk of bleeding from surgery has diminished</td>
</tr>
<tr>
<td>Non-steroidal Anti-inflammatory Drugs (NSAIDs)</td>
<td>2-3 days before surgery</td>
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<tr>
<td>Oral Contraceptives</td>
<td>4-6 weeks before surgery</td>
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<tr>
<td>Hormone Replacement Therapy</td>
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<tr>
<td>Oral Diabetes Medication</td>
<td>Withhold on the morning of surgery</td>
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<tr>
<td>Anti-epileptic Medication</td>
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<td>Cardiovascular Drugs</td>
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<td>Pulmonary Drugs</td>
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<td>Antidepressants</td>
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Important Information on Drug Interactions

It is extremely important to disclose all medications including over-the-counter drugs, nutritional supplements and vitamins, alcohol, tobacco and illicit drugs to your surgeon and anaesthetist as there are numerous possible drug interactions that may occur in your treatment, some of which may lead to harm.

*If you have any questions related to the medications that you are currently taking then please discuss this with your surgeon or anaesthetist before surgery.*
After the First 24 Hours

After the first 24 hours you can increase your activity within the limits of comfort.
Avoid vigorous activity, prolonged walking, standing for long periods and sporting activities.
The bulky bandage may be removed after 24-48 hours and a light elastic bandage applied to
support the knee.
If there are no stitches you may then bath or shower but keep the wounds clean and covered
until they are healed. If you have stitches keep them clean, dry and covered.
If you have a sedentary job you may return to work within the first week. If your job is active or
requires prolonged standing you may return to work after the third or 4th week.
It is reasonable to expect that by six to eight weeks you should be able to engage in most of
your former physical activities as long as they do not involve significant weight-bearing impact.
Twisting maneuvers may have to be avoided for a longer time.

Follow Up

At 10-14 days after surgery you will be reviewed and the sutures (if any) will be removed.
A knee support may be used.
You should continue with an exercise programme at home.
You should expect the swelling and discomfort to have settled by 6-8 weeks following surgery
and you may then return to sporting activities if you wish.
Physical exercise and rehabilitation will play an important role in your final outcome.
A formal physical therapy program may also add something to your final result although most
patients do not require the ongoing supervision of a physical therapist following arthroscopic
surgery.

Long Term Outcome

Although arthroscopy can be used to treat many problems, you may have some activity limita-
tions even after recovery.
The outcome of surgery will often be determined by the degree of injury or damage found in
your knee.
If your knee has been damaged from sport or other activity and there is damage to the normally
smooth cushioning surface of the joint, then full recovery may not be possible.
You may be advised to find a low impact alternative form of exercise.
Professional athletes have a much better potential for recovery because of the “over-
development” of their muscles.
Post-operative Exercise Program

**Early Rehabilitation Phase**

**Range of motion.**

Active and passive exercises to obtain full extension are initiated immediately following surgery. Gentle mobilization of the joint into full extension may be necessary in the first three weeks if the joint is stiff and passive range of motion is less than 0 degrees of extension. Full active extension should be achieved by 14 days post-operatively. Flexion exercises can be done within the first few days following surgery and should reach 120 degrees by the second post-operative week. If passive range of motion is limited and the extremes of motion feel stiff, mobilization of the joint into flexion may be required. Patella mobility is important and should be encouraged in all directions in the early post-operative period.

**Swelling**

In the early stage swelling is best managed with ice, compression, elevation, motion and restricted ambulation with or without crutches. Compression can be maintained using an elastic bandage.

**Pain**

Early post-operative pain is managed with simple analgesia, ice packs and anti-inflammatory medication, together with gentle exercise, patella mobilization and static quadriceps contractions.

**Intermediate Rehabilitation Phase.**

During the 3-6 week stage range of motion should be full with the possible exception of the end range of flexion. After six weeks any limitation of range of motion should be treated aggressively. By six weeks the swelling in the knee and any effusion should have subsided. Possible causes of persistent knee effusion include excessive early activity, re-injury, patello-femoral joint irritation, recurrent meniscus tear, infection or fracture. The strength of the injured knee should be 50 to 60% of normal after three weeks. Quadriceps and hamstring balance needs to be attained before progressing to isokinetic exercise programs.

**Neuromuscular re-education.**

Mechanoreceptors that detect joint position are located in the knee and exercises to assist neuromuscular control, proprioception and balance should begin as soon as you are comfortable with weight bearing. Muscle stimulation and biofeedback may be helpful. After you can actively activate your muscles, balance exercises can begin beginning with single leg stance progressing to knee bending and heel raising. Wobble-boards and balance-boards will all further develop neuromuscular re-education.

**Late Rehabilitation Phase**

**Functional Retraining.**

Functional retraining can begin as soon as you have a normal gait pattern with strengthening exercises geared primarily to your individual requirements.

The goals of rehabilitation include:

- pain relief,
- reduction of swelling,
- increase of range of motion,
- strength,
- neuromuscular re-education,
- functional retraining

Initially the full range of motion is the most important goal.