



ORTHOPAEDIC
JOINT REPLACEMENT

AESCULAP® PATIENT INFORMATION
YOUR NEW HIP JOINT

YOUR NEW HIP JOINT

INFORMATION ABOUT ARTIFICIAL HIP JOINT REPLACEMENTS



DEAR PATIENTS AND FAMILIES,

worldwide millions of patients undergo a hip joint replacement surgeries in a year. Making it one of the most commonly performed joint replacement procedures. But each one of those operations involves a patient with her or his own story – a unique individual with specific pain, specific worries, and specific limitations in everyday life.

Your doctors and hospital staff will consult you before the procedure, and when the time comes, they will take excellent care of you and do whatever they can to support you on your path to recovery.

This brochure is designed to guide you through the "before, during and after" of the artificial hip implantation process. It will help you understand the depth of the treatment, delivers you answers to the question you may have and prepare you for the conversation with the health care professional. In addition the brochure also explains the benefits artificial hip joints will offer you – along with a few things you'll need to be cautious about.

This journey is all about helping you enjoy everyday activities without pain and giving you greater freedom of movement, to help restore your quality of life.

YOUR NEW HIP JOINT

INFORMATION ABOUT ARTIFICIAL HIP JOINTS



CONTENTS

I THE HIP JOINT

- | | |
|---|----|
| 1. How it works; types of motion | 6 |
| 2. Reasons for hip replacement surgery | 8 |
| 3. Diagnosis and conservative treatment methods | 10 |

II. IMPLANTS

- | | |
|-----------------------------------|----|
| 1. History | 12 |
| 2. Fixation options and materials | 12 |
| 3. Acetabular implants | 14 |
| 4. Hip stem implants | 16 |
| 5. Articulation | 18 |

III THE OPERATION

- | | |
|----------------------------------|----|
| 1. Preparation for the operation | 20 |
| 2. Important items | 20 |
| 3. Check-in day at the hospital | 22 |
| 4. The surgical procedure | 22 |
| 5. The prosthetic joint | 24 |

IV AFTER THE OPERATION

- | | |
|---------------------------|----|
| 1. Your first steps | 26 |
| 2. Physiotherapy | 26 |
| 3. Your endoprosthesis ID | 26 |
| 4. Follow-up examinations | 26 |

V LIVING WITH YOUR NEW HIP JOINT

- | | |
|-----------------------------------|----|
| 1. General notes on everyday life | 28 |
| 2. Tips and tricks | 30 |
| 3. Sports | 32 |

VI AESCULAP AG

- | | |
|---------------------------|----|
| 1. About the manufacturer | 34 |
|---------------------------|----|
-

I | THE HIP JOINT

STRUCTURE OF THE HIP JOINT

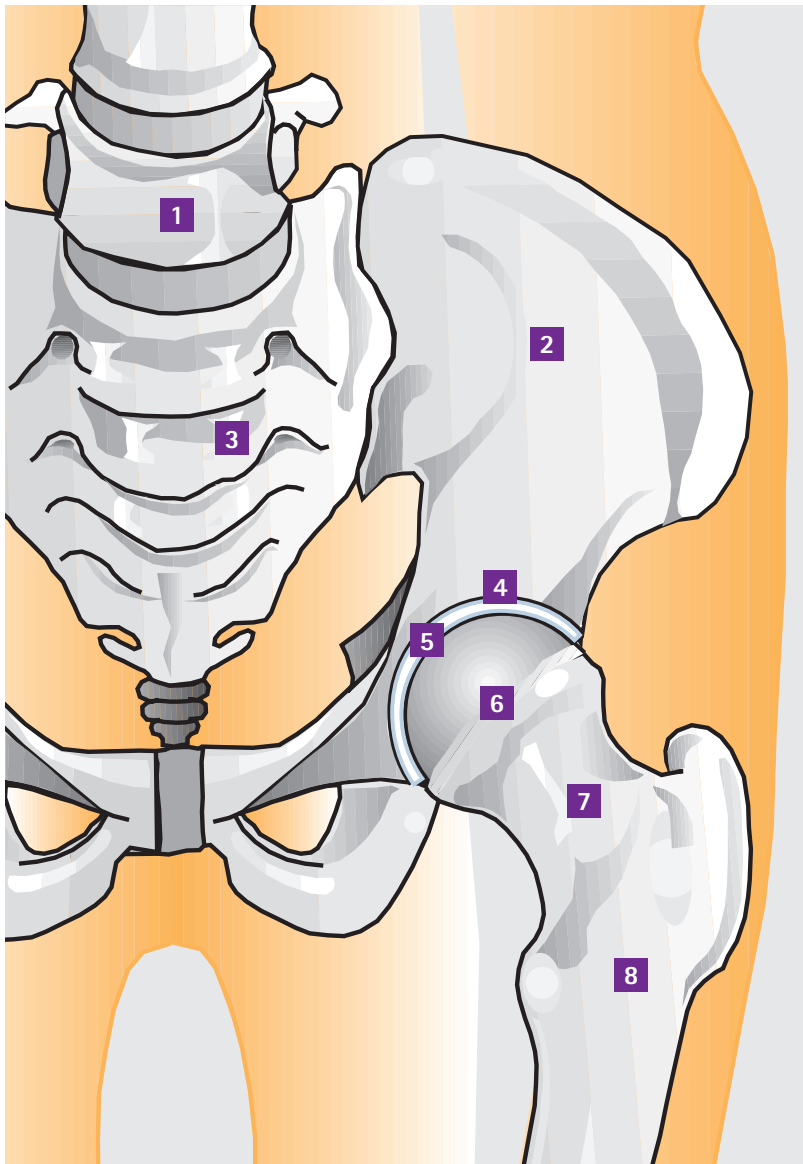
The hip joint primarily serves to connect our upper bodies to our musculo-skeletal systems, and is important for our movement.

1. HOW IT WORKS; TYPES OF MOTION

Structure

Natural hip joints are made up of the head of the femur (thigh bone) and the acetabulum, which is the hip socket in the pelvis. Our muscles rotate the femoral head in different directions within the acetabulum, which allows us to walk. Because hip joints can move in so many different ways, they are also known as "ball-and-socket" joints.

In healthy joints, both the femoral head and the acetabulum are covered with a layer of cartilage. The cartilage and the synovial (joint) fluid act as a lubricant to help the joint move smoothly.



Schematic diagram

- 1 Spinal column
- 2 Pelvis
- 3 Sacrum (tail bone)
- 4 Acetabulum
- 5 Layer of cartilage and synovial fluid
- 6 Femoral head
- 7 Femoral neck
- 8 Femur



I | THE HIP JOINT

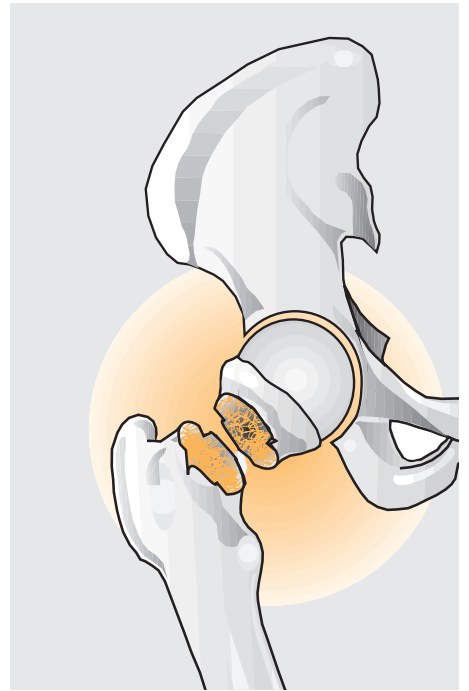
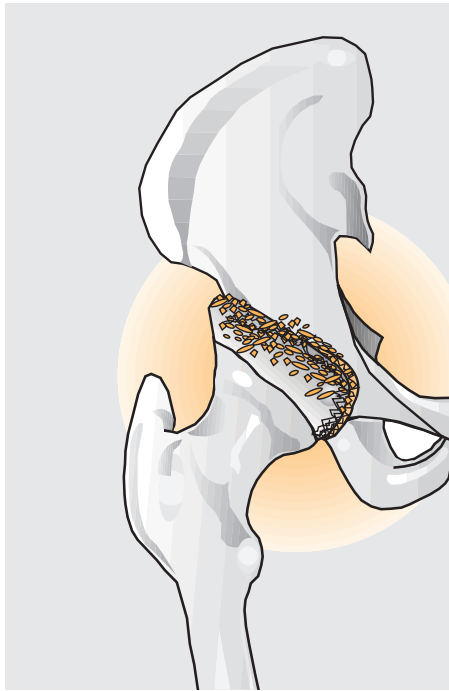
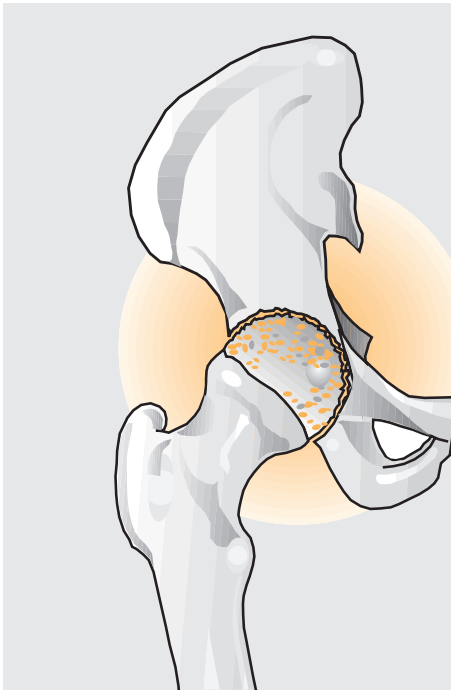
REASONS FOR HIP REPLACEMENT SURGERY

2. REASONS FOR HIP REPLACEMENT SURGERY

As so many hip joints replacement surgeries are performed worldwide since decades, it can be called a standard procedure.

Some of the most common reasons for hip replacements include:

- A** Arthritis – wear and tear of the cartilage surrounding the joint – is far and away the most common reason for hip replacements. Arthritis tends to develop over a longer period of time, as the protective layer of cartilage gradually wears down with use. In the end, the acetabulum and the femoral neck are in direct, bone-to-bone contact. This is partially comparable to driving on your wheel rims, and often results in pain when walking, standing or resting.
Femoral head necrosis, on the other hand, involves the bone itself “withering away”, which damages the hip joint and causes pain and discomfort. Unlike arthritis, femoral head necrosis can occur suddenly with no identifiable cause, and progress very rapidly; it can also be a later result of a previous bone break.
- B** Hip dysplasia is a congenital condition, meaning it is present at birth. In hip dysplasia, the femoral head does not fit smoothly into the acetabulum. This causes the cartilage layer to wear down more quickly on one side, often when patients are still young.
- C** Falls or accidents can result in femoral neck fractures, which are another common reason for joint hip replacement surgeries. As we age, our bones gradually lose density and strength, increasing our risk of fractures.



A Hip arthritis and hip head necrosis

B Arthritis due to hip dysplasia

C Femoral neck fracture

I | THE HIP JOINT

DIAGNOSTICS

3. DIAGNOSIS AND CONSERVATIVE TREATMENT METHODS

To help them select the right treatment for you, doctors take X-rays to determine what condition your bones are in; they also run different functional tests to identify your hip joint's specific limitations with natural motion. The most common symptom of hip joint wear and tear is pain, especially when walking or bearing additional weight. Many patients alter the way they move in order to "spare" the joint, but this can cause undue stress on muscles and joints, or even lead to changes in muscle and tendon structures. Targeted conservative treatment can help delay joint replacement surgery becoming necessary. This usually involves a combination of prescription pain medication and physiotherapy targeted at any current blockages.

Over time, however, most patients experience progressively intensifying pain, until eventually it begins affecting their day-to-day activities; many often the so called rest pain at night is observed, too.

After you've decided which hospital or surgeon should perform the surgery, healthcare professionals will work with you to make the necessary preparations like:

- Patient consultation sessions
- Setting an operation date
- Performing X-rays
- Using X-rays to plan operation and select implant sizes
- Selecting and presenting appropriate prosthetic options
- Choose the adequate anaesthesia and pain management concept



II | IMPLANTS

DIFFERENT OPTIONS FOR THE SURGERY

1. HISTORY

A number of major steps have been made in the field of hip replacement surgery over the past 40 years. Nowadays, surgeons have access to sophisticated implant systems made of high-quality materials, which are implanted using well established surgical techniques. Modern implants adapt more effectively than ever to the patient's individual bone situation and the forces acting upon them, allowing excellent joint reconstruction.

Endoprosthetics are designed to imitate the original joint as closely as possible, although they can never be an identical substitute for natural hip joints. That also means that implants aren't intended to remain in place forever. If and when replacing the artificial joint becomes necessary, there are a wide range of options available.

2. FIXATION OPTIONS AND MATERIALS

Generally speaking, endoprosthetic components are secured using one of two methods: cementless and cemented. Some hybrid methods use a combination of the two.

When treating a fracture, the prosthetic stem is usually implanted along with a so called bipolar head, while keeping the acetabulum as it-is. The advantage with this method is that the existing hip socket does not require additional preparation before implantation.

Most cementless implants are made of a titanium forge alloy; some have porous surfaces and /or a bone growth-promoting coating to help the bone and the implant grow together more effectively.

Cemented prosthetic components are made of a cobalt-chromium forge alloy, and are uncoated.

Each individual prosthetic component is available in a wide range of dimensions and /or diameters, which allows surgeons to tailor the implant to fit the patient's individual anatomy.

So, which implant types and fixation methods are right for you? That depends on your initial situation, the composition of your bones, and your activity level. Your doctor will consider several additional factors when selecting an implant that will meet your needs.

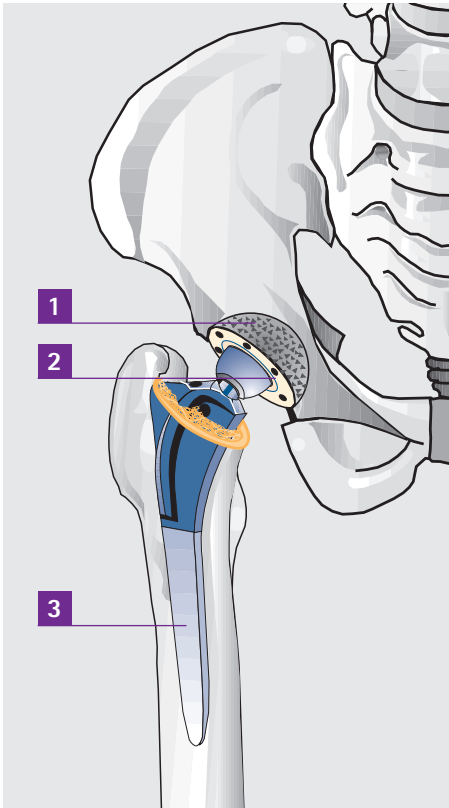


Diagram: complete hip endoprosthesis, cementless

- 1 Acetabular implant
- 2 Sliding pairs
- 3 Hip stem

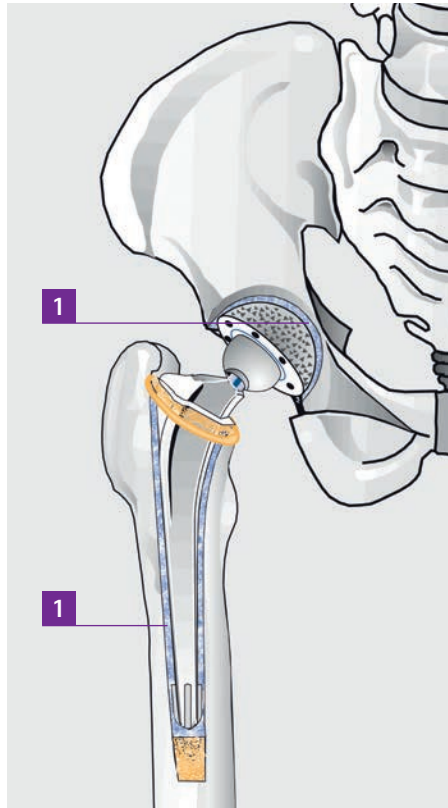
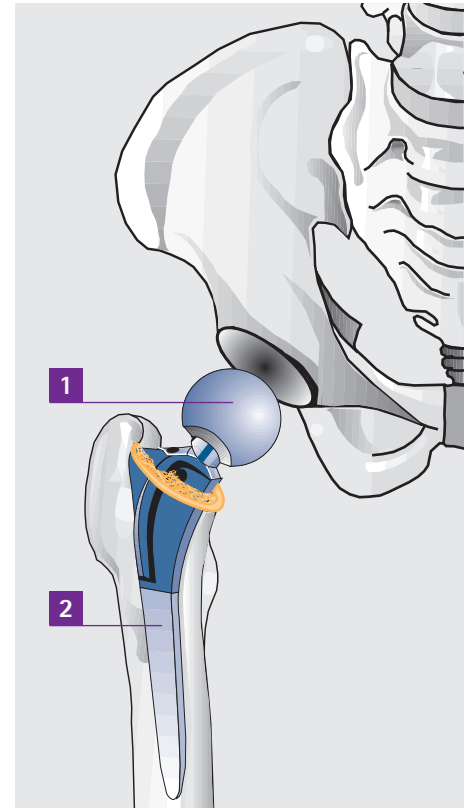


Diagram: complete hip endoprosthesis, cemented

- 1 Bone cement



Partial endoprosthesis with bipolar head

- 1 Bipolar head
- 2 Hip stem

II | IMPLANTS

DIFFERENT OPTIONS FOR THE SURGERY

3. ACETABULAR IMPLANTS

After carefully preparing the area, the surgeon places the acetabular implant into the original hip socket. Surgeons have a wide range of models and fixation options available.



A Cementless

Cementless fixation involves inserting an extra inlay into the metal outer shell – a part of the articulation.

Press-fit cups

are larger by a specific diameter so that they will fit tightly into the acetabulum.

Example
Plasmacup® SC



Example
Plasmafit®



Self-contained acetabular system with different types of acetabular cups, designed to be used with a variety of articulation pairs.
In use for more than a decade.

- Coating creates rough surface structure to ensure good bone-to-implant contact
- Optional locking holes

Threaded cups

are screwed into the pelvis.

Example
Screw cup SC



Special incision properties ensure maximum bone-surface contact.

- Counter-rotational edge angle
- Sophisticated edge design on cutting edges

B Cemented

In cemented fixation, the acetabular cup is made of polyethylene, which is anchored into place using a special bone cement.

Polyethylene cups

Example
PE Cup Vitelene®



Structured outer surface for optimum cement hold.

- Inner X-ray ring
- Tried and tested material

II | IMPLANTS

DIFFERENT OPTIONS FOR SURGERY

4. HIP STEM IMPLANTS

Each time you take a step, the hip stem implant directs that force into the thigh bone, to which the prosthesis head is attached. There are two main types of implants: short-stem prostheses and straight-stem prostheses.



A Short-stem prostheses

This modern prosthetic design is shorter and smaller, which helps conserve bone as well as important muscle structures and soft tissues. Short-stem prostheses are only effective in patients with good bone quality.



Example
Metha® short-stem prosthesis

This prosthesis is anchored further up on the thigh bone.

- Individual joint reconstruction
- Bone growth-enhancing coating
- Wide range of implants

B Straight-stem prostheses

Straight-stem prostheses are the most commonly used types of hip stem implants. There are many different varieties available to accommodate thigh bones of almost any shape and size. They can be implanted using either cemented or cementless methods.

Straight-stem implants are tried and tested – they have been in use for more than 30 years.



Example
TRJ®, TrendHip® and Excia® T hip endoprostheses



Example
Bicontact® hip endoprosthesis

Different versions are available to treat patients with thighs of all different sizes and shapes.

- Conservative surgical procedure
- Cementless, coated versions
- More than 30 years of clinical experience

II | IMPLANTS

DIFFERENT OPTIONS FOR THE SURGERY

5. ARTICULATION

In cementless fixation, the acetabular inlay and the prosthesis head form the articulation. With cemented PE cups or dual-cup systems, the prosthetic head rotates directly in the acetabular cup. The way these two parts interact allows you to walk, because it means that the femoral head can rotate in the socket in all directions.

Articulations are made from different materials, and can be combined in several different ways, which are described below.



A Ceramic head – ceramic inlay

This articulation combination creates the least amount of wear, and also offers the most bio-compatibility – the smooth, scratch-resistant surfaces are easy for the body to keep moist, which helps prevent friction. However, in rare cases (e.g., due to a fall), there is a chance of the ceramic breaking.

B Ceramic head – polyethylene inlay /

C Metal head – polyethylene inlay

Polyethylene is the most commonly used inlay material, so surgeons have the greatest amount of experience with it. It makes an excellent articulation component, especially in combination with ceramic heads.



III | THE OPERATION

PREPARATION

1. PREPARATION FOR THE OPERATION

Allergies

If you have any allergies that you are aware of, be sure to let your treating physician know about them well in advance. These might include allergies to specific metals, reactions to medications, or certain synthetic materials such as latex.

Other conditions

If you are receiving treatment for any other medical conditions, you will need to notify your doctor before the day of the operation, so that the surgical team has time to make any necessary adjustments

Anesthesia and autologous transfusions

Operations may be performed under general anesthesia or partial anesthesia (e.g. spinal anesthesia). Your anesthesiologist will consider any other conditions you may have when deciding which type of anesthesia is right for you. There are several different ways of compensating for blood loss during the operation. All types of anaesthesia follow the objective to make you stand up to your new joint as quick as possible. In addition with an dedicate pain management the time in hospital bed is limited.

2. IMPORTANT ITEMS

Your hospital stay

Preparing to leave for the hospital always raises the same question: what should I pack? This list will get you started.



Personal items:

- Toiletries
- Pajamas
- Bathrobe
- Casual clothes/athletic wear
- Flat, slip-resistant footwear to help you walk immediately after the operation
- Tennis shoes, slippers
- Any necessary medications
- Books, magazines
- Contact information for friends and family
- Some cash

Things the hospital will need:

- Your X-rays
- Any examination or medical reports
- Referral information
- Health insurance card
- Allergy pass, implant pass (if any)
- Current medication plan

III | THE OPERATION

THE PROCEDURE

3. CHECK-IN DAY AT THE HOSPITAL

The day before – In other cases directly on the day of the surgery

Most patients are admitted to the hospital the day before their operations. Options to have admission on day of your surgery are existing, too. After the receptionist has taken down your personal information, you will be brought to the medical ward. Later, you and your anesthesiologist will discuss anesthesia for your operation, and find out (for example) whether you are taking any additional medications or have any other ailments. Nurses and aides will be available if you have any other questions.

Because of the anesthesia, you will not be allowed to eat or drink anything for a certain number of hours before your operation. You may be given a mild sedative or anti-anxiety medication before surgery, if necessary.

4. THE SURGICAL PROCEDURE

Accessing the joint

After the anesthesia has taken effect and the surgical team has finished making preparations, the area is washed and the first incision is made. The muscle and soft tissue underneath are gently pushed to one side, exposing the hip joint. A variety of operation methods are used.

Less-invasive procedures are more and more popular, because they preserve individual muscle and tendon structures. The "less-invasive" refers not to the length of the visible incision, but to the way the soft tissue under the skin is handled.

Most operations take between 45 and 120 minutes.



III | THE OPERATION

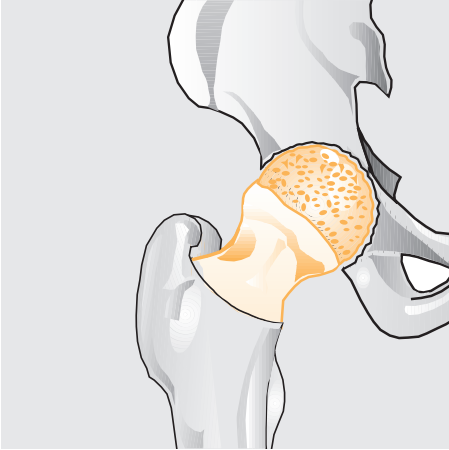
AFTER THE SOFT TISSUE HAS BEEN OPENED, THE AREA IS PREPARED AS FOLLOWS:

5. THE PROSTHETIC JOINT

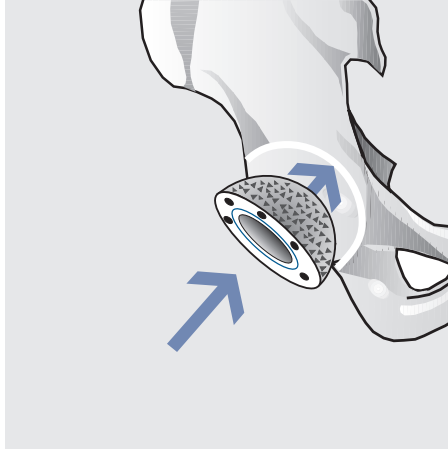
- A** The unhealthy femoral head is removed by separating the femoral neck from the femur.
- B** The surgeon reams the acetabular bed little by little, shaping it so that the implant will fit perfectly.
- C** The acetabular cup implant is placed into the prepared area, along with the inlay for cementless implants.
- D** The surgeon gradually reams the femoral medullary canal (the bone-marrow cavity in the thigh bone) to prepare it for the implant. The hip stem implant is inserted with or without bone cement, depending on the procedure being used.
- E** The prosthesis head is attached to the stem.
- F+G** The stem / head component and the cup component are brought together.

After that, the surgeon checks whether the new joint functions properly before suturing the patient's muscles and soft tissue as needed, and then closing the wound. A tube can be placed into the wound so that any pooling blood can flow out.

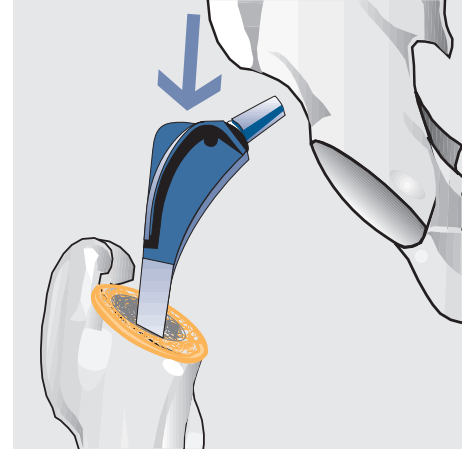
The tube will be removed around 1–2 days after surgery.



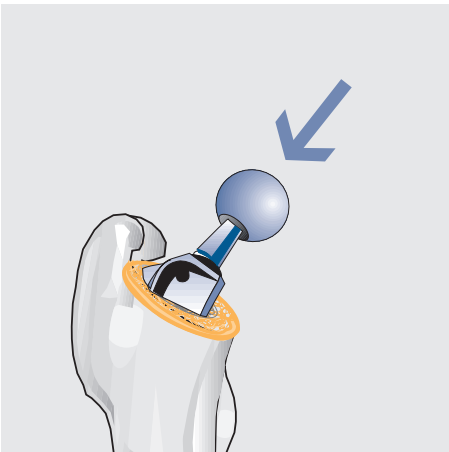
A+B Removing the unhealthy femoral head



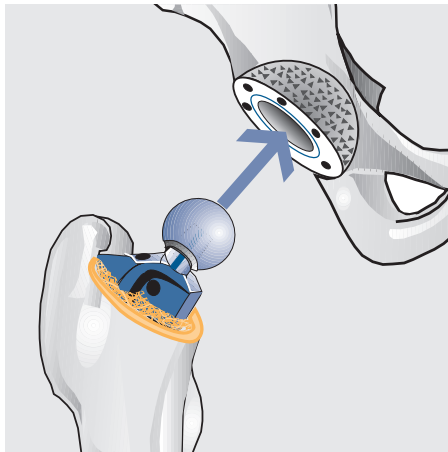
C Fixation of the artificial acetabular cup



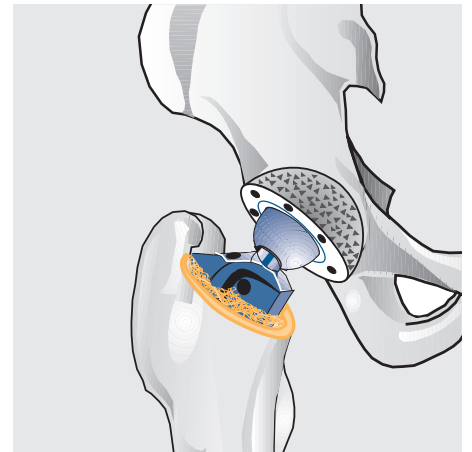
D Inserting the prosthesis stem into the femur



E Attaching the prosthesis head to the stem



F+G Joining the prosthetic thigh components and the acetabular cup



IV | AFTER THE OPERATION

REHABILITATION

1. YOUR FIRST STEPS

Depending on the hospital's protocol just on the day latest one day after your surgery, medical staff will assist you as you step on your new artificial joint for the first time. You can take your first steps with the help of crutches or a walker. Over time, new therapeutic activities will gradually be added to your physiotherapy program, as you work on sitting, walking, and climbing stairs with your new joint.

2. PHYSIOTHERAPY

Several days later, you will be discharged from the hospital and begin physiotherapy with a professional specializing in patients with artificial hips. The specialist will help you work your way toward putting full weight on the new joint and prepare to resume your normal day-to-day activities.

3. YOUR ENDOPROTHESIS ID

Be sure to bring your endoprosthesis ID whenever you travel, especially if you will be passing through airport metal detectors, as your implant may set them off. The ID identifies you as a person with a prosthetic implant, and contains stickers documenting the specific implants you have received. Your follow-up examination appointments will be entered here, too. Keep your ID somewhere safe, or carry it with you.

4. FOLLOW-UP EXAMINATIONS

Hip replacement surgery normally allows patients to enjoy a pain-free life again, with greater freedom of movement. To help maintain your implant as well as possible, be sure to schedule regular follow-up checkups with your doctor. He or she take X-ray of the area to determine how well the implant components are integrating into or onto the bones, and will test your joint function.



V | LIVING WITH YOUR NEW HIP JOINT

USEFUL INFORMATION

1. GENERAL NOTES ON EVERYDAY LIFE

Follow-up care and your behavior after the operation are both key to the long-term success of your replaced joint. After you finish learning new habits and exercises during the rehabilitation process, you are ready to return to your usual routine, with all the situation-specific challenges and physical stresses it may involve.

Your bones will adapt to the prosthesis over a period. In other words, it will take several weeks for your bone to grow around the implant surface and / or finish transforming inside. For that reason, avoid putting excess weight on the prosthesis during that adjustment period.



V | LIVING WITH YOUR NEW HIP JOINT

USEFUL INFORMATION

2. TIPS AND TRICKS

A few advices that may help make life with an artificial joint easier for you, especially during the first six months:

Avoid:

- Abrupt or jerky movements
- Endurance sports, climbing stairs frequently
- Standing too often or for excessively long periods
- Crossing your legs
- Sitting on deep sofas or lounge chairs
- Excessive / disproportionate weight gain
- Lifting heavy loads

Recommendations for making everyday life easier:

- Good, flat, slip-resistant footwear
- Shoes with Velcro closures or elastic laces
- Clear away any potential tripping hazards, such as clutter or rug corners
- Use seat cushions as boosters

Sexuality

Artificial hips do not significantly restrict intimacy in general. In the beginning, however, take care to move only in ways that do not cause you pain, and avoid angling your hips by more than 90°. Make sure that your partner does not put their weight directly on the recovering joint.



V | LIVING WITH YOUR NEW HIP JOINT

SPORTS

3. SPORTS

Once the prosthesis components have grown together with the bones, the joint will be very stable. Even so, artificial joints are not the same as natural ones, and patients will need to follow certain restrictions, for example when it comes to sports. Physical activity is a good thing in every aspect, but you know what they say about “too much of a good thing”.

Try to avoid sudden, sharp impacts such as jumping from heights, and use caution with repetitive straining or activities that require a wide range of motion.

Recommended activities:

- Cycling
- Swimming
- Hiking, Nordic walking
- Cross-country skiing
- Gymnastics
- Dancing (ballroom/Latin styles)

Activities to consider after consulting your doctor:

- Golf
- Jogging (on soft tracks or forest paths)
- Strength training

Less advisable activities (consult your doctor):

- Ball sports/team sports like soccer, handball, basketball...
- Squash
- Horseback riding
- Tennis
- Alpine skiing

This list is by no means a blanket recommendation – every patient is different. Your age, your previous sports experience, and your overall level of fitness all play a role. If you have any further questions, please talk to your doctor.



1. ABOUT THE MANUFACTURER

The name AESCULAP® is synonymous with surgical expertise. With over 150 years of experience, AESCULAP® is still setting standards in the surgical world. Its network of around 14,200 employees worldwide, including approximately 3,550 at its headquarters in Tuttlingen, Germany, combining their knowledge to develop products and solutions for all core operating-theatres processes. Whether for surgical instruments, suture material, microneedles, implants, or sterile containers – AESCULAP® is continuously researching and developing new innovations that represent medical progress.

As part of B. Braun Melsungen AG, which is and remains a family-run company, the Aesculap division brings tradition and modernity together through a wealth of joint arthroplasty experience stretching back over 4 decades.

As Germany's largest manufacturer of orthopedic implants, AESCULAP® relies on close cooperation with doctors and hospitals, and is firmly committed to continuously building upon its high standards in order to ensure ever-greater patient safety.

Its Tuttlingen production site is one of the most modern joint implant manufacturing facilities in Europe, and produces components for artificial hip and knee joint replacement, spinal implants and screws, plates, and nails for bone fractures. The manufacturing facility in Tuttlingen has its own state-of-the-art biomechanical lab, where implants undergo a wide range of stress tests.

Bicontact®, for example, represents one of the world's leading endoprosthetic hip stem systems; it has been in clinical use for over 30 years, and draws upon experience. Today, nearly one in five hip implants in Germany bears the AESCULAP® name.

Sharing Expertise is B. Braun's commitment to sharing its medical knowledge, experience, and expertise with its partners in dialog; it also represents the company's promise to use that expertise effectively and continue building upon it.



AESCULAP® – a B. Braun brand

Aesculap AG | Am Aesculap-Platz | 78532 Tuttlingen | Germany
Phone +49 7461 95-0 | Fax +49 7461 95-2600 | www.aesculap.com

The main product trademark "Aesculap" and the product trademarks "Bicontact", "Excia", "Metha", "Plasmacup", "Plasmafit", "TrendHip", "TRJ" and "Vitelene" are registered trademarks of Aesculap AG.

Subject to technical changes. All rights reserved. This brochure may only be used for the exclusive purpose of obtaining information about our products. Reproduction in any form partial or otherwise is not permitted.