

TOTAL HIP SURGERY: IN YOUR FUTURE?

By: Pamela H Caudell, RN, CNOR, ACSP

Objectives

1. Define arthroplasty
2. Discuss rationale for having a total hip
3. Describe cleaning methodologies for total instruments

Hip replacement surgery is also called a total hip arthroplasty or a THA. This involves removing the damaged hip and replacing it with an implant also called a prosthesis. There are basically four components to a prosthesis set. They are: the ball component which is made of metal or ceramic, the socket and the liner which is made from either ceramic, plastic or metal; the femoral (thigh) component and sometimes a neck extension. The implants are biocompatible; meaning they are accepted by the body and are resistant to corrosion. Cemented implants are held in place with bone cement. Uncemented implants have textured surfaces that allow new bone to grow into the implant, securing it in place.

The goal of hip replacement surgery is to relieve pain and increase the mobility and function of a damaged hip joint. Before thinking about surgery, though, your doctor may recommend other treatments, such as pain medications, physical therapy, exercise, and use of a cane or walker. If these treatments are not enough, hip replacement may be the right option for you.

Conditions that can damage the hip joint, sometimes requiring hip replacement surgery, include:

- Osteoarthritis
- Rheumatoid arthritis
- Broken hip
- Bone tumor
- Osteonecrosis, which occurs when there is inadequate blood supply to the ball portion of the hip joint

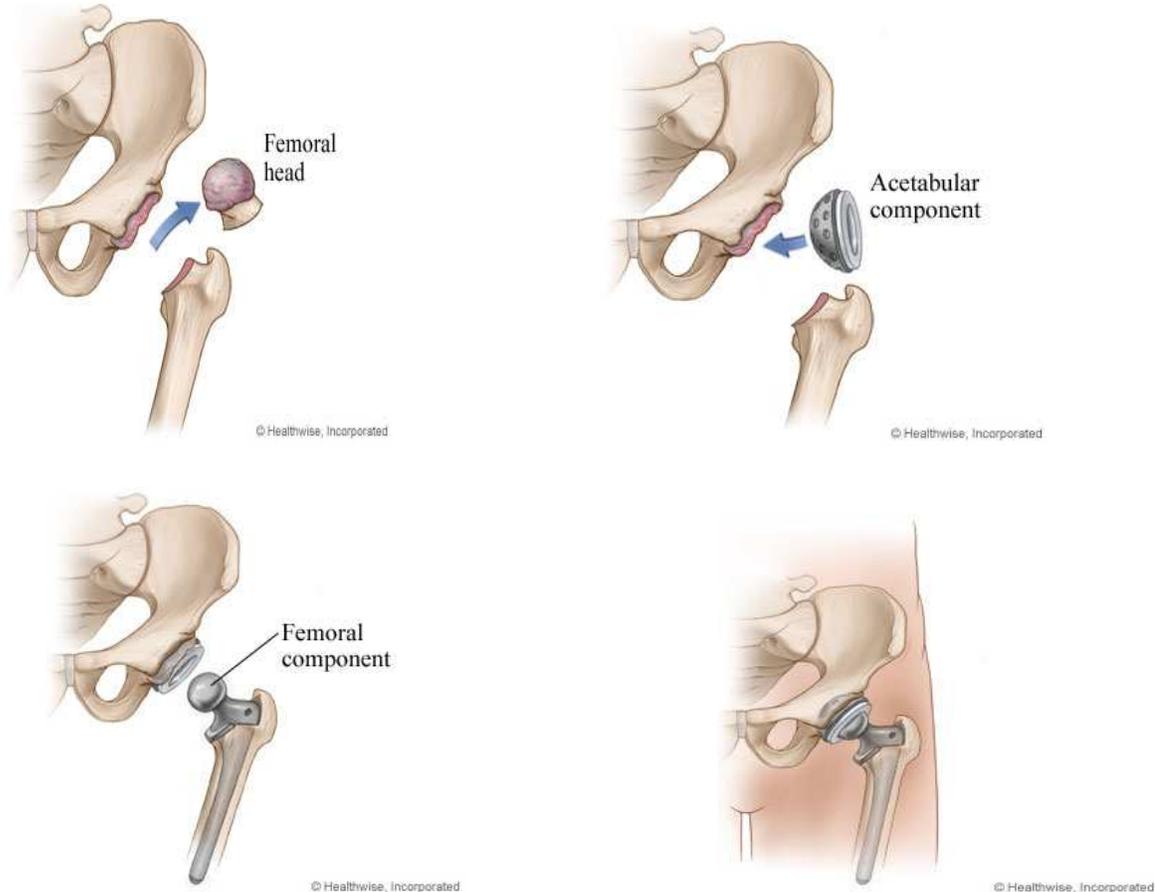
Symptoms that might lead you to consider hip replacement include:

- Persistent pain, despite pain medication
- Pain increased by walking, even with a cane or walker
- Poor sleep due to pain
- Difficulty going up or down stairs
- Trouble rising from a seated position
- Inability to participate in formerly enjoyable activities because of pain



The pictures above show the damage that osteoarthritis can do to a hip. The picture on the left shows the damage to the joint when the cartilage that lines the joint and protects the hip is eroded and bone rubs against bone. The insert shows what a normal hip looks like. The x-ray shows what the hip looks like when it's destroyed as opposed to the other normal side.

The following pictures show the progressive surgery needed to replace the hip with a prosthesis.



To perform a hip replacement, your surgeon:

- Makes an incision over the front or side of your hip, through the layers of tissue
- Removes diseased and damaged bone and cartilage, leaving healthy bone intact
- Implants the prosthetic socket into your pelvic bone, to replace the damaged socket
- Replaces the round top of your femur with the prosthetic ball, which is attached to a stem that fits into your thighbone.

The new, artificial joint is designed to mimic the natural, gliding motion of a healthy hip joint. Techniques for hip replacement are evolving. As surgeons continue to develop less invasive surgical techniques, the hope is that these techniques might reduce recovery time and pain compared with standard hip replacements. However, the results are too new to adequately say one technique is better than the other.

I thought from the central sterile side, this might help you understand the importance of what you do. I have personally had this surgery and I was very concerned about the sterility of the instruments since I was now the patient and had no control. However, one thing that kept going thru my mind was the knowledge the people working in central sterile take very personally the sterility of all the instrumentation they process. So no worries.

Orthopedic surgery requires instruments which are heavy and have multiple components, articulating or rotating parts, removable handles, plastic replacement parts, and series of gauges or other measuring devices in graduated sizes. Devices are usually supplied in sets and subdivided into trays and cases in which the devices may be arranged by size or in the order needed for a specific surgical procedure. There are generally multiple trays in order to hold the number of instruments needed to perform surgery. It is imperative all the trays sent in from the various vendors be checked for completeness before they are processed.

Since most sets of instruments come to central sterile from another facility, the instruments need to be put through the complete process from decontamination to sterilization and storage. To maintain instruments properly it is important to consider the following information and processing instructions:

- Warnings and precautions
- Instrument set completeness and functionality
- Reprocessing limitations and or restrictions
- Preparation for reprocessing at the point of use
- Preparation for cleaning (including assembly/ disassembly as necessary)
- Cleaning, disinfection and drying
- Maintenance, inspection, testing and lubrication
- Sterile packaging
- Sterilization
- Storage

Each company should be able to supply Central Processing with all the aforementioned information in order to be able to handle the instrumentation in the appropriate manner. Each company has their own information sheet that should be applied to their instrumentation only. Each company is just a little different in the handling of their instruments so each processing area should have a copy of instructions. The two statements below are taken from two different company instructions. You can see they are both similar in the area of removing the instrumentation from trays prior to cleaning.

At point of use, soiled instruments must be removed from metal or polymer trays and moistened to prevent debris from drying before transportation to the reprocessing area for manual and/or automated cleaning procedures. Do not clean soiled instruments while in polymer or metal trays. Instrument trays, cases and lids must be cleaned separately from soiled instruments.¹

Stryker Orthopaedics trays and cases are intended for transport and storage of re-usable instruments. They are not designed for cleaning and disinfection in the fully assembled state. The instruments must be removed from the tray for adequate cleaning results.²

Cycle Type Prevacuum/ Pulsating Vacuum	Temperature 132°C / 270° F	Expose Time 4 minutes	Minimum Dry Time 30 minutes	Minimum Cool Time 30 minutes
Prevacuum/ Pulsating Vac- uum ³	134°C / 273° F	18 minutes	30 minutes	30 minutes

Method Moist heat sterilization according to ANSI/AAMI ST 79
 Cycle Pre-Vacuum (Pre-Vac)
 Temperature 132°C (270°F)
 Exposure Time¹ 4 minutes (minimum)
 Drying Time² 30 minutes (minimum, in chamber)⁴

From the tables above, you can see there are still some differences in the sterilization statements from each of the two different vendors.

But, here again, you can see it is important to check with each manufacturer to see what their recommendations are for their instruments. There are certain things that need to be followed no matter what type of instrument you are preparing for sterilization. Cleaning and disinfection is always the first step. All multi-part components should be broken down into all the pieces taking care to not lose any of the parts. Keep in mind some of the pieces have areas that will need to be cleaned manually, and it is critical that they always follow the manufacturers’ instructions when processing them. Many instruments require manual cleaning because bone, tissue and, in some cases, cement can become so embedded in the instruments they must be cleaned with brushes before automatic washing.

Since instruments are placed directly upon bone and may be exposed to cement, meticulous inspection of all surfaces of each instrument for residual bioburden is imperative. All trials must also be carefully inspected because surgeons may try several sizes to determine that which is best. Femoral and tibial trials, femoral impactors, and large drill bit ends are examples of instruments that are difficult to visually inspect. Central Service employees should use a lighted magnifying glass to view these items, and they may request that a co-worker provide a “double-check” for the most challenging instruments.

The facility is responsible for the reassembly, inspection, and packaging of the instruments after they are thoroughly cleaned in such a manner that will ensure steam sterilant penetration and adequate drying time must also be provided. Provisions for protection of any sharp or potentially dangerous areas of the instruments should also be recommended by the hospital. The Sterilizer Manufacturer’s instructions for operation and load configuration should be followed explicitly. Maintenance of sterile package integrity is generally event related. If a sterile wrap is torn, perforated, shows any evidence of tampering or has been exposed to moisture, the instrument set must be cleaned, repackaged and sterilized.

References:

1, 3 Zimmer Instrument Care, Cleaning, Maintenance and Sterilization Instructions,

2, 4 Instructions for Cleaning, Sterilization, Inspection and Maintenance of Orthopedic Medical Devices, Stryker, 2012,

Training Manual for Health Care Central Service Technicians, 5th edition



