



BEARING SURFACES IN ARTIFICIAL HIP JOINTS

What are bearing surfaces?

Bearing surfaces are the moving parts of an artificial hip joint that glide against each other during activity. In a normal hip the bearing surfaces are made of cartilage, which has become worn and damaged as a result of arthritis.

What different bearing surfaces are available?

Three main bearing surface materials are available – polyethylene plastic, metal and ceramic. For Total Hip Replacement, any of these bearing materials can be chosen and often a “hybrid” combination of bearing materials is selected (a common example being a ceramic head bearing against a polyethylene socket). Hip Resurfacing is currently only available with metal-on-metal (MoM) bearings, however early testing has begun with ceramic resurfacing devices.

What is the best bearing material?

In modern orthopaedic practice, all bearing surface materials used for hip joint replacement and resurfacing are extremely wear resistant. There are however differences between bearing materials that need to be considered when selecting implants for any particular person as individual requirements may vary.

What are the advantages and disadvantages of a polyethylene bearing?

The most frequently used designs of Total Hip Replacement use a metal or ceramic ball gliding against a polyethylene (plastic) socket. These bearing couples have proven good long-term results and reliable outcomes. While older types of polyethylene have been susceptible to excessive wear, modern manufacturing methods have drastically improved the durability of polyethylene bearings. Polyethylene bearings can be manufactured into dislocation resistant implant designs, do not squeak, and are crack resistant.

What are the advantages and disadvantages of a metal-on-metal (MoM) bearing?

MoM refers to when both bearing surfaces (ball and socket) are manufactured from metals. MoM bearings have been used in Total Hip Replacements for over 40 years. MoM bearings are very strong and durable with a significant reduction in wear rates compared to conventional polyethylene plastic bearings. Metal bearings are suitable to be manufactured into dislocation resistant large diameter & bone preserving implant designs such as Hip Resurfacing. When both bearing surfaces are made of metal there is a risk of “allergic” reactions to the cobalt and chromium contained within the implants. The incidence very much depends on which device, the composition of the metals used and how the device was manufactured. The chance of adverse reaction to the Birmingham Hip Resurfacing is approximately 1 in 100. Squeaking can occur with MoM bearings, but it is uncommon and usually temporary.

What are the advantages and disadvantages of a ceramic-on-ceramic (CoC) bearing?

CoC refers to when both bearing surfaces (ball and socket) are manufactured from ceramics. Ceramic is a very low friction and durable bearing material. Ceramic wear particles are “inert”, meaning they are well tolerated by the body in comparison to polyethylene or metal wear particles. Modern ceramics have an extremely small risk of chipping or breaking (1 per 100,000). Rarely CoC bearings can squeak or click, this can be permanent.

What is a dual mobility bearing?

Dual mobility Total Hip Replacements feature two bearing interfaces instead of a traditional single (ball and socket) interface. In this situation, all three bearing materials may be used (ceramic, polyethylene and metal). Used extensively in France, Dual mobility implants are both wear resistant and very dislocation resistant.

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