Dr. Bal in the News

Gender-specific knee replacements?

Want to learn more about gender-specific knee replacements? Videos courtesy of Zimmer Inc.

Labeled illustrations of healthy and unhealthy knees, Illustration of a knee implant in place: Video

Interview with Eileen Greenwood, Zimmer Gender Knee patient: Video

Interview with Robert Booth, M.D., one of the developers of the Gender Knee, and video from surgery: Video

In total knee surgery, the end of the thigh bone has somewhat different shapes in men and women. Also, since women usually have wider pelvic bones (for childbirth), the knee cap tracks differently in men versus women. These are simply facts of life, related to different bone structures in men versus women.

Recognizing these anatomic differences has led some implant companies such as Zimmer to develop two different lines of implants for total knee replacements, each suited specifically to either male or female patients. Until recently, only one style and shape of implants was available for both genders. And in the past, just one style went into the left and right knees. Now, there are specific implants not only for the left versus the right knee, but also for men versus women.

Is this beneficial, or is this just another marketing ploy hyped up by an implant manufacturer? In truth, there is benefit to the surgeon and patient alike by having gender-specific implants for knee replacements.

Implanting total knee components made for the male bony anatomy into women took some work from the surgeon in most cases. Sometimes, the components would be too big in one dimension and not the other. To make the implants fit; more bone would have to be removed in some patients, particularly females. In others, some overhang of metal components would have to be accepted. It was a bit like screwing in a light bulb not quite right for the socket, although the threads were a match. It worked, but it was not the optimal solution.

Figure 1. The bone in the front of a woman’s knee is typically less prominent than in a man’s. Traditional

Traditional Knee

Zimmer Gender Solutions Knee
implants have a thickness in front that may end up feeling “bulky”, which may result in pain and a decrease in range of motion. The Zimmer® Gender Solutions™ Knee has a thinner profile to accommodate this anatomical difference between women and men.

The greatest benefit of gender-specific knees is in women who desire knee replacement surgery. They benefit since less bone is removed, the implants are customized to their anatomy, the surgeon does not have to compromise between sizes during surgery, and the outcomes in terms of mobility, pain-relief, and knee cap tracking are likely to be better.

For most men, gender-specific implants may make little difference, although individual anatomy variations are such some men are better off with gender-specific implants as well. The reason is that the surgeon has a wider range of implant size and shape options, allowing a more precise fit in each patient, whether male or female.

Figure 2. The angle between the hip and the knee affects how the kneecap moves over the thighbone when the knee is in motion. Women have a distinct shape, which frequently results in a different angle between the hip and the knee when compared to men. The Zimmer® Gender Solutions™ Knee accounts for this difference, allowing for more natural movement.

In summary therefore, beyond the marketing and promotional hype, there is a definite benefit to gender-specific total knee implants. While not revolutionary, they represent an evolutionary step in the continual progress towards better total knee implants that promise better outcomes for patients.

Figure 3. The Zimmer® Gender Solutions™ Knee has a contoured shape to more closely match the narrower anatomy of a woman’s knee. This contouring provides for a more precise fit and may prevent the implant from overhanging the bone and potentially pressing on or damaging surrounding ligaments and tendons.
In our practice, we routinely use gender-specific total knee implants to try and customize the implant to the specific patient, gender, and anatomy type. This is our standard for all patients undergoing total knee replacements.