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Customized Knee Replacement Depends on Surgeon's Skill, Not Implant Design, Study Finds

While the choices of knee implants are plentiful, the success of total knee replacement surgery still is dependent on the surgeon's skill, Henry Ford Hospital researchers say.

Researchers found that utilizing a series of common but nuanced surgical techniques is far more important to customizing the fit of a patient's implant than the implant's design.

The findings will be displayed at the annual meeting of the American Academy of Orthopaedic Surgeons Feb. 15-18 in San Diego.

"Customized knee implants will not replace the need for precise, methodical surgical skill," says Jason Davis, M.D., a Henry Ford Joint Replacement Surgeon and the study's Lead Author. "While improving outcomes will continue to evolve, getting back to the basics of surgery is still paramount to successful knee replacement."

Since the first knee replacement was performed in 1968, the procedure has greatly improved as have the design of implants. More than 580,000 knee replacements (an estimated two-thirds of patients are female) are performed each year in the United States, according to the AAOS, and more than 150 implant designs are available including ones that are gender- and patient-specific.

Relying on data collected from more than 20 joint replacement surgeons at an Orthopaedic Specialty Hospital, researchers identified several surgical techniques that take into account a patient's individual knee characteristics and ensure that the implant is properly aligned and balanced with ligaments and soft tissue.

For instance, a gap-balancing technique provides better stability and overall functional performance. Several techniques aim to restore the "soft tissue personality" of the knee beyond just bone replacement. Another technique involves resecting the femur so the implant does not hang over the two sides of the bone. Additionally, researchers offer ways to enable surgeons to safely "downsize" components intraoperatively when needed while improving the balance of the knee.

"Customizing the surgery can be done effectively without the inventory or cost associated with gender- or patient-specific implants," Dr. Davis says. "By using some of these techniques surgeons can take steps to ensure the proper fitting of an individualized knee replacement."