MEDICAL BREAKTHROUGHS
RESEARCH SUMMARY

TOPIC: 3D HIP REPLACEMENT SURGERY
REPORT: **MB #4742**

BACKGROUND: Hip arthroplasty, or hip replacement, is a common procedure in orthopedic surgery that involves removing damaged parts of the hip joint and replacing them with a prosthetic usually made of metal, ceramic, or really hard plastic. This surgery is usually done to combat pain and restore functions to the joint that may have been lost. This is usually caused by osteoarthritis, wear-and-tear, rheumatoid arthritis, an overactive immune system and inflammation, or osteonecrosis, which occurs when the hip isn't getting enough blood supply. Indicators for hip replacements may include pain-- even when on medication, difficulty walking, sleeping, getting dressed, going downstairs, or standing up.
(Source: https://www.mayoclinic.org/tests-procedures/hip-replacement/about/pac-20385042)

PAST TECHNIQUES: In the 1970s, hip replacement options were limited to very few sizes. Surgeons would grind down patients' bones to fit the premade prosthetics. These were based on average weight, height, and gender. While this was often effective at treating the problem, patients typically had long recoveries and numerous follow-ups. It is far more obvious today that there is an extremely wide variety of bodies in an endless number of shapes and sizes. Surgeons currently are doing more to account for the nuances of each patient's personal anatomy.
(Source: https://www.hss.edu/conditions_total-knee-replacement-one-size-does-not-fit-all.asp)

NEW TECHNOLOGY: While major advancements have been made in 3D modeling of hips, imaging of patients' bone structure, and the variety of prosthetic sizes, the most surprising advancement might be the benefit of customized tools. Surgeons not only need the prosthetic to match up to the patient's personal anatomy but also need to place it in the exact right position to optimize the outcome. This, however, requires tools that until recently, surgeons did not have. 3D printed guides based on the patient's actual anatomy now allow doctors to place the hip as perfectly as it is modeled on the computer. So not only is 3D modeling and printing changing the way we customize prosthetics but the way we customize the tools to optimize those prosthetics.
(Source: Terry Allen Clyburn, MD, Orthopedic Surgeon, Houston Methodist Hospital)

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If this story or any other Ivanhoe story has impacted your life or prompted you or someone you know to seek or change treatments, please let us know by contacting Marjorie Bekaert Thomas at mthomas@ivanhoe.com