

MEDICAL BREAKTHROUGHS **RESEARCH SUMMARY**

TOPIC: FROM GAMING TO THE O.R.: MIXED REALITY FOR SHOULDER REPLACEMENT SURGERY
REPORT: **MB #5134**

BACKGROUND: Shoulder replacement removes damaged areas of bone and replaces them with parts made of metal and plastic, which are called implants. This surgery is called shoulder arthroplasty. The shoulder is a ball-and-socket joint. The round head, or ball, of the upper arm bone fits into a shallow socket in the shoulder. Damage to the joint can cause pain, weakness and stiffness. About 53,000 people in the U.S. have shoulder replacement surgery each year, according to the Agency for Healthcare Research and Quality. This compares to more than 900,000 Americans a year who have knee and hip replacement surgery.

(Sources: <https://www.mayoclinic.org/tests-procedures/shoulder-replacement/about/pac-20519121>
<https://orthoinfo.aaos.org/en/treatment/shoulder-joint-replacement/#:~:text=Today%2C%20about%2053%2C000%20people%20in,for%20Healthcare%20Research%20and%20Quality.>)

DIAGNOSING: Shoulder replacement symptoms include, but are not limited to, loss of motion or weakness in the shoulder, severe shoulder pain that interferes with every day life, and/or moderate to severe pain at rest, or difficulty sleeping. Doctors can make a diagnosis by performing x-rays or CT scans.

(Source: [https://www.mountainstateorthopedic.com/blog/shoulder-replacement-symptoms-and-treatments#:~:text=Loss%20of%20motion%20or%20weakness,rest%20\(or%20difficulty%20sleeping\).](https://www.mountainstateorthopedic.com/blog/shoulder-replacement-symptoms-and-treatments#:~:text=Loss%20of%20motion%20or%20weakness,rest%20(or%20difficulty%20sleeping).))

NEW TECHNOLOGY: At Summit, shoulder surgeons including Dr. Freehill are using computer 3D modeling technology to convert a patient's preoperative imaging studies to a 3D computer model. Using that model, Dr. Freehill said, "We can conduct a virtual simulation of the surgery, test different implants to see how they fit, and determine how the implant would be best positioned within the shoulder itself. Using this technology, we can predict the implant type, how it will be seated, and even generate a special guide to align the implant optimally during shoulder replacement surgery."

(Source: <https://www.summitortho.com/2022/03/22/new-options-for-shoulder-replacement/>)

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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