

A Breakthrough in Custom Medical Implants with Creo

New medical approaches combined with innovative technologies are transforming how medical professionals treat patients. In this case study, we will explore how a young patient's life was changed through the use of PTC Creo's extensive capabilities.

Bioactive printed implants are the future of implants! The development of complex implantable printed materials, together with powerful additive manufacturing and simulation software, enables us to introduce smart implants to the surgical world.

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CHALLENGES

When a young cancer patient with a rare and aggressive tumor required the removal of her scapula, doctors knew they needed to proceed with caution. Traditional surgical approaches risked leaving the patient without shoulder function, significantly impacting her quality of life. Medical professionals needed to design a personalized scapula implant that would restore mobility. Simultaneously, this implant had to balance the complex requirements of the medical, engineering, and manufacturing industries. In addition to meeting these requirements, the implant needed to meet rigorous certification standards and be compatible with advanced surgical techniques.

SOLUTION

The collaborative efforts of Tel Aviv Medical Center, PTC, and Hexagon brought a groundbreaking approach to this medical challenge. Utilizing Creo for 3D modeling and additive manufacturing, the team designed a titanium scapula implant customized to the patient's unique anatomy. This implant included advanced lattice structures to support tissue ingrowth for improved stability.

Additionally, it used optimized mechanical properties to ensure durability while minimizing weight. Creo's simulation tools verified its load-bearing capacity and fit accuracy to achieve natural shoulder movement. Furthermore, additive manufacturing techniques minimized distortion and ensured high-quality production. Lastly, certification tools like VGSTUDIO MAX verified the print quality and complex structural properties to ensure it was durable. This personalized solution ensured the implant would seamlessly integrate into the patient's anatomy while enhancing long-term functionality.

RESULTS

Conducting surgery with this implant was a resounding success. The personalized implant fit precisely into the patient's anatomy. The patient restored mobility in their shoulder within just days of the surgery. Additionally, the patient's swift recovery enhanced their quality of life and displayed how successful this new personalized approach truly was. Furthermore, this success set a benchmark for a new standard in healthcare. It proved medical professionals can integrate advanced engineering, additive manufacturing, and medical expertise into personalized medicine. Through this case, personalized healthcare took a giant leap forward, showcasing the power of innovation in reshaping patient outcomes.



PREVENTED THE LOSS OF MUSCLE FUNCTION WITH PERSONALIZED



RESTORED MOBILITY WITHIN DAYS



SET A BENCHMARK FOR MEDICAL PROFESSIONALS