

# ▶ **ALTAIR FOR HEALTHCARE**

[altair.com/healthcare](https://altair.com/healthcare)



Simulation can be the key to understanding complex issues, unlocking medical breakthroughs, and getting the latest advancements to the public faster, safer, and making them more broadly accessible. Altair helps medical companies across the world design better products, improve patient care, and reduce costs with simulation-driven design. Our simulation and optimization tools enable device designers and manufacturers to deliver quality and reliability while meeting regulatory standards, and our data analytics technologies empower healthcare providers to make faster, more informed decisions.

## ENHANCING DEVICE DESIGN

Medical and wellness devices must be designed to withstand the structural and operational requirements associated with normal use, sterilization, and misuse, all while balancing weight and cost considerations. Market demands for increased functionality, connectivity and miniaturization mean that all devices require the simulation of multiple physics to be successful, and be optimized for all structural, thermal, electrical, electromagnetic and manufacturing criteria.



Altair and Nolato developed an end-to-end product design and manufacturing process POC for a hand-held insulin auto-injector

## REDUCING CLINICAL TRIALS

Simulation can speed up clinical trials by satisfying the testing of variables virtually. Multiple variants can be efficiently tested at a massive scale without human or animal testing. Replacing even one variable with simulation could mean saving months of testing time and help get products to the market faster than the competition.

## ORTHOPEDIC IMPLANTS AND REPLACEMENT STRUCTURES

Altair OptiStruct™ is the industry leader in optimization technology for strong, yet lightweight designs. Applied to optimize orthopedic structures, it is used to develop lattice-designed, 3-D printed components, ideal for osseointegration and promoting vascularization.

Patients with specific maladies can now be treated with custom-design implantable structures. Such replacement devices can be manufactured using 3D-printed resorbable biomaterials and serve as a temporary solution until the body grows its own tissue in replacement.



Solid-lattice hip prosthesis developed  
with OptiStruct®



## PROSTHETICS AND ORTHOTICS DESIGN: MELDING OPTIMIZATION WITH ADVANCED MANUFACTURING

Altair simulation technology is widely used in the design of optimized structures in prosthetic and orthotic design, where custom fit is essential to a comfortable supportive structure. Clinicians and engineers have the ability to easily model patient-specific geometry with Altair HyperMesh™, optimize the shape of the device to achieve the desired load transfer with OptiStruct, and understanding the manufacturing process of polymers with Altair Inspire Mold and Altair Inspire Print 3D. This all adds up to custom successful fit for the patient, and ensured function of the device, and ideally a shorter time to wellness.



## SAFETY IN A CONNECTED ENVIRONMENT

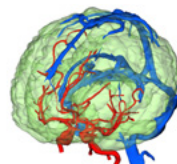
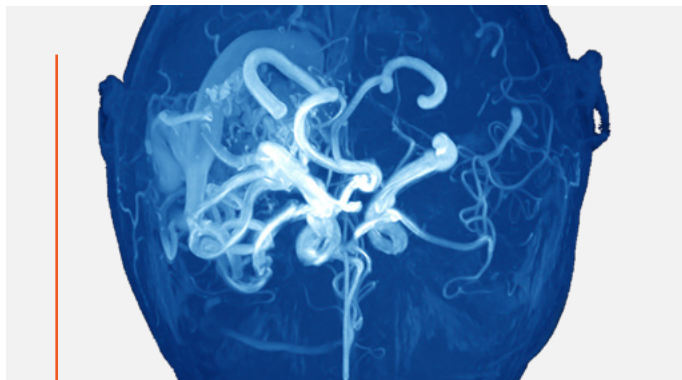
It is required that connected devices meet RF exposure standards to avoid adverse health effects. Computer simulations can carry out radiation performance evaluations that consider not just user position, posture, gender, age and height but the power, frequency and interaction of multiple devices.

## SIMULATING THE COMPLEX PHYSICS OF THE HUMAN BODY

Whether it's importing external or internal patient scan data, HyperMesh® has been a critical tool used by clinicians and engineers to accurately model the complex geometry of the human body.

Using shape optimization and elasto-plastic simulation, Altair can model complex biological systems such as the delicate structural behavior of intravascular stents within blood vessels. Vascular deformation and blood flow analyses can be performed to understand, predict, and prevent disorders.

Further, Altair technology has been extensively applied to biomechanics, like studying injury thresholds for brain concussion in automotive safety and other applications within the field of sports medicine.



Altair simulation has been applied to model cerebral blood flow to diagnose, study, and treat blood vessel disorders in the brain

## EXECUTE INSIGHTFUL CLINICAL ANALYTICS

Clinical analytics requires the blending of disparate data from clinical trials, patient records, equipment resources, staffing information and financial data. Altair Knowledge Works accelerates this process by enabling physicians and researchers to quickly join and analyze disparate data that informs improved patient care and supports data-driven medical advancements

Altair data analytics tools are used across the healthcare field for a variety of critical functions including improving claim denial management, tracking and measuring healthcare operations KPIs, automating electronic medical records system migrations, and more.

# HELPING THE INNOVATORS INNOVATE, DRIVE BETTER DECISIONS, AND TURNING TODAY'S PROBLEMS INTO TOMORROW'S OPPORTUNITIES.



## ALTAIR TRENDING IN:

Additive Manufacturing  
Autonomous & ADAS  
Big Data  
Cloud Computing  
Data Transformation  
Digital Twin  
e-Mobility

Exascale  
GPU Solutions  
Lightweighting  
Machine Learning  
Mechatronics  
Smart Product Development  
5G



**Simulation helps us to understand,  
find proof and evidence where  
previously we were just guessing.**

And it provides the foundation on which you are able  
to find completely new ways of treating a condition.”

**Naveed Parvez, Andiamo**



Altair is a global technology company that provides software and cloud solutions in the areas of product development, high performance computing (HPC) and data analytics. Altair enables organizations across broad industry segments to compete more effectively in a connected world while creating a more sustainable future.

To learn more, please visit [altair.com](https://altair.com)

