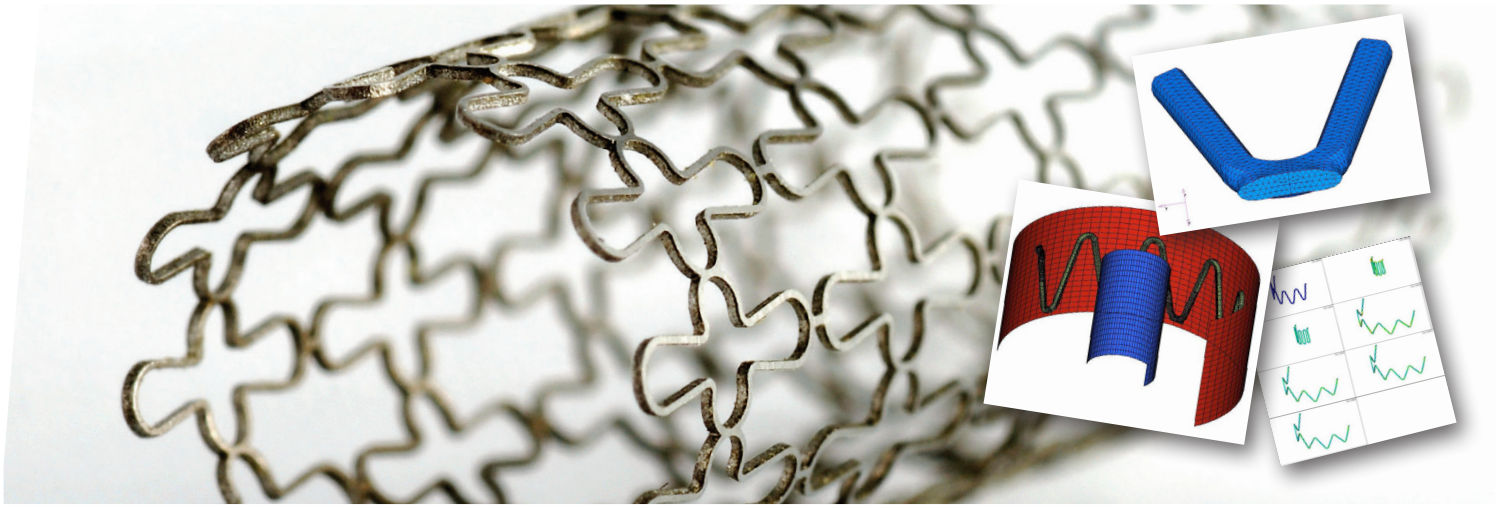
Altair | ProductDesign

case study

Medtronic

Reducing Medical Stent Stress by 71%

Medtronic designs and manufacturers medical devices used the world over. Traditionally, computer aided engineering (CAE) and virtual simulation were not fully utilized within the industry as the verification process for often microscopic components was too slow. When designing a new medical stent (an expandable mesh inserted into a patient's artery to keep it open) Medtronic wanted to improve the design and speed up the validation process.



solution

Altair ProductDesign worked closely with Medtronic's own engineers and developed a baseline model of the new stent. After assessing the design for structural characteristics such as stiffness, stresses and fatigue performance, an optimization process was developed to enhance the product's performance. By morphing the baseline model, a total of five different geometric shapes were created with a further sixty design variables identified. These variables were fed into Altair's optimization software within HyperWorks to determine the best possible design for the stent.

result

The new process allowed Medtronic to perform assessments on sixty design variations in a single night, a big improvement over the previous process which had taken several days to get the same result. The optimization technology allowed Altair ProductDesign and Medtronic to quickly identify the best performing design variation which had 124% improved stiffness and 71% reduced stress over the initial product. By working with Altair ProductDesign, Medtronic has developed a simulation led process which allows it to produce better performing products and bring them to market faster than was previously possible.