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## Technology Review: Modeling & Simulation for Biomedical Device Design



Biomedical device design is facing increasing product complexity while prototype building and testing can take months. The inherent risk in new medical product development can be mitigated through a deeper understanding of the design properties and functions achieved through modeling and simulation.

Modeling capabilities for the design of various devices from respiratory (inhalers), pacemakers, MIT/CT scanners, to cardiovascular and microfluidic devices will be discussed. The importance of Fluid Structure Interaction (FSI) modeling will also be addressed.

The implicit coupling of STAR-CCM+ and Abaqus enables our customers to model such complex problems, from heart valves, stents and grafts, to lung models. Specifically for blood flow simulations, tight or implicit coupling between the structural solver and the CFD code due to the small density ratios between fluid and solid is required. As these technologies advance, the potential of modeling and simulation to reduce clinical trial time can become a real game changer in biomedical device design.

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