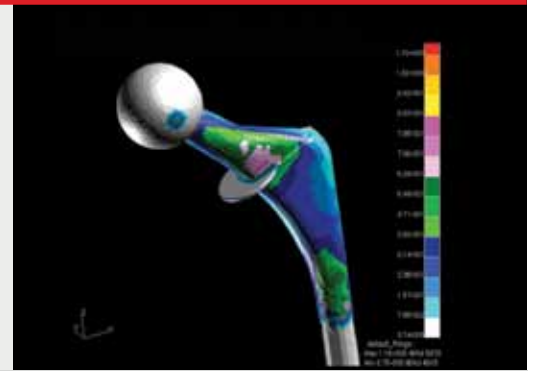


Simulation Services for the Biomedical Industry

Global Engineering Services



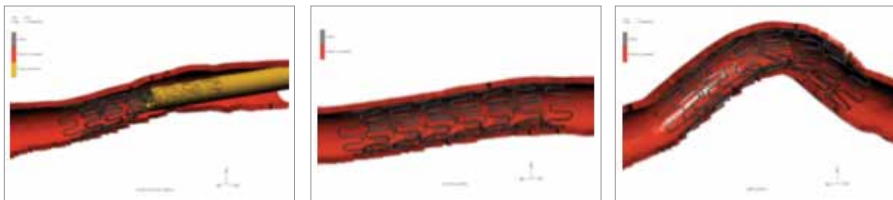
Advanced Simulation Services

MSC Services is your partner in performing cost-effective advanced simulation for your research, system development, and system validation efforts. MSC has a 50-year history of providing consulting services to industry, including aerospace, automotive, biomedical, energy, electronics, machinery, and many others. With more than 400 field engineers worldwide, MSC has the skills and capacity to understand and overcome your challenges. MSC Services has expertise in structures, impact, blast, motion, controls, fluids, thermal, fatigue, and advanced materials. No one knows how to apply MSC simulation products better than MSC. MSC Services is an extension of your engineering team enabling you to obtain the skills you need when you need them.

Our goal is to enable you to maximize the value of your computer-aided design and engineering investments. Whatever your needs, we work with you to identify and implement customized solutions ranging from technical support and enterprise training to engineering services and custom software development.

Methods Development and Application

Simulation can be applied to a wide range of product development, manufacturing challenges, and qualification/certification programs. The use of simulation can reduce time-to-market, product development cost, and risk. It does this by reducing the need for testing, including in vivo testing, by rapidly evaluating design alternatives and by providing data on product performance that no testing can provide. However, it is not always obvious how to apply simulation to achieve the desired efficiency and accuracy required for product development and device approval. Development of standardized, validated, and repeatable methods and practices is necessary. In addition to routine analytical services, we will work with your staff to put in place processes to obtain reliable results from your simulation.



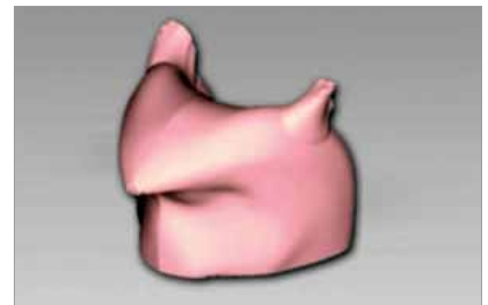
Shape Memory Alloy Stent

Focus on:

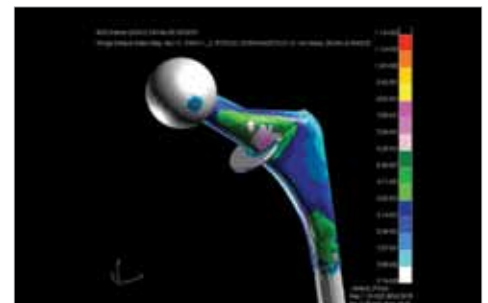
- Durability
- Reliability
- Drop Testing
- System Level Performance and Optimization
- Multi-Disciplinary Analysis

Broad Biomedical Expertise:

- Orthopedic
- Ocular
- Cardiovascular
- Soft Tissue Simulation
- Packaging
- Joint Replacement
- Electronic Systems
- Biomechanics
- Manufacturing Simulation



Tongue Model with Individual Muscles



Hip Implant Contact Stress

Training and Technology Transfer

MSC offers a full range of training courses in locations throughout the world. These courses address the needs of new users of our simulation products and the needs of long time users who want to apply more advanced features. If our public classes do not meet your needs, MSC can prepare a custom training curriculum to be delivered at your facility.

Sometimes a training course is not sufficient to get your staff up and running simulation with the efficiency you need. When that happens, technology transfer through one-on-one time with MSC's consulting engineers is recommended. MSC's engineers will provide instruction in the topics you need, using your simulation models and techniques to illustrate how to address your particular needs with maximum efficiency.

This technology transfer can be in-person and on-site, or it can be done remotely through telephone or web conferencing. The content can be what you want: from advanced simulation techniques to more fundamental engineering topics. Our expertise will be transferred to your own organization.

Staff Augmentation

MSC's experienced team of engineers can provide the skills you need to get the job done. If you have a short-term need for simulation, or have a job that requires a skill set that you do not have in-house, MSC engineers can do it for you. Typical projects can be simple design trade studies or full-scale engineering analyses with reports ready for submittal to the FDA and other regulatory bodies.

Recent projects have included:

- Tongue motion and muscle control
- Shape memory and stainless steel vascular stent crimp, wrapping, and pulsatile/articulation fatigue
- Biomedical electronic system thermal simulation
- Orthopedic spine device
- Orthopedic plates and screws
- Ablation catheter
- Human body on a hospital bed
- Transient dynamic motions of a contact lens on a human eye
- Laser bonding



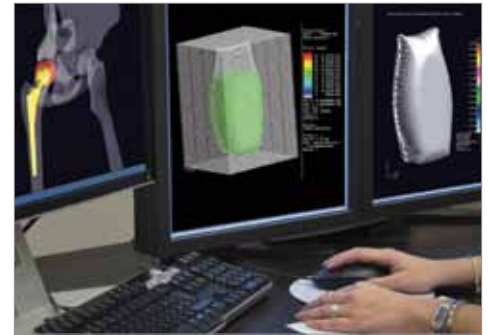
MSC Software Engineering Services Solution Framework

Key Benefits:

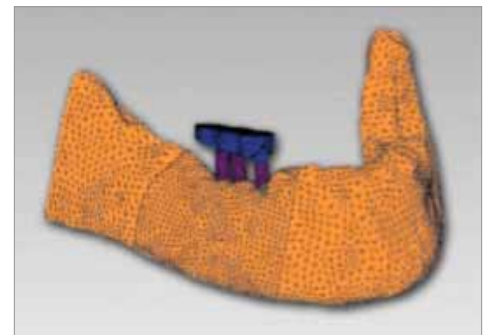
- Get specialized expertise when you need it
- Rapidly develop new methods for applying simulation to your designs
- Automate your simulation processes to provide consistency and repeatability
- Reduce the time and expense required to assess and evaluate the performance of new biomedical devices.



Biomechanics Simulations



Joint Replacement & Drop Test Studies



Dental Implant Simulation

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