

3D Printing and Additive Manufacturing Transforming Health Care and Education

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3D Printing and Additive Manufacturing are not new to the world, but they are entering into new areas and impacting the world as they do so. 3D Printing and AM have been around for over 30 years, but the primary usage had been for prototyping, form, fit and function testing or manufacturing tools. Today we are seeing usage of 3D Printing by those in the health care industry and the impact of 3D Printing in this market has been significant in monetary savings, outcomes and patient and facility understanding.

Information that can be translated and 3D Printed today comes in many different forms, Stratasys technology and 3D Modeling software can translate MRI, CT and the Diacom imaging into a file format that can be converted and printed. With this technology capabilities, we have seen an increase in printing for patient care, clinical training, education, lab and operating room efficiencies and hospital innovations.

Patient Care

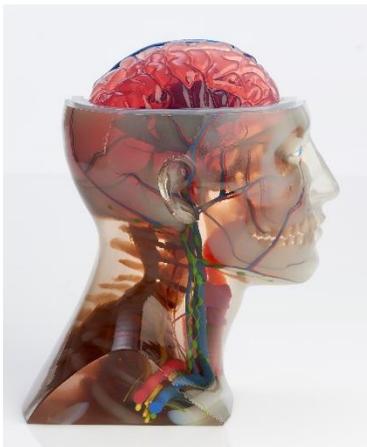
The most impactful use of 3D Printing in Patient Care has been the production of the pre surgical and planning models. The ability to print out a patient specific model which allows a doctor to walk through their procedure with an replica of what they will be seeing during the surgery. This same 3D Printed model will allow for the patient and family to understand the situation with their actual anatomy being shown rather than a model that doesn't exactly represent their specific situation.

<http://www.stratasys.com/resources/case-studies/medical/nicklaus-childrens-hospital>

Clinical Training and Education

Today most training and education is done with animal, cadaver or mannequin models. There are many limitations to these types of models from limited access, models that aren't representative of our living anatomies and the inability for customization. The benefits of 3D Printing allows for customization, the ability to train in any environment and 3D Printing can also simulate real tissue properties.

<http://www.stratasys.com/industries/medical/preclinical-testing>



Caption: This 3D Printed head shows the capabilities of 3D Printing with multiple materials and multiple colors. Printed on a Stratasys J750 3D Printer. Credit: Stratasys

Lab and Operating Room Efficiency

3D Printing technology allows one to create specific tools and trainers to be built on site and customized. We have seen this impact medical training due to the fact that more repetitions can take place when more students have access to the customized trainers. This leads to more a stronger understanding and capability.

Hospital Innovation

3D Printing has led to many breakthroughs at the hospitals where custom devices have been created for specific surgeries. This can be done because of the low cost of 3D Printing and the ability to build any type of design, revise and test iterations in a matter of days. Innovation doesn't stop at devices, 3D Printing can create real patient anatomy. Testing and practice of the device and 3D Printed anatomy is then done for statistical validation and performance assessment.



Caption: This 3D Printed vascular model is used for training and testing with blood clots. Printed on a Stratasys 3D Printer. Credit: The Jacob's Institute