



News Release

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3D Systems and Washington University Cardiology Team Help Toddler Breathe Easier With 3D Printed Heart Model

- Full color 3D anatomical model reveals the network of vessels responsible for breathing problems
- Underscores how doctors are utilizing 3D technology to advance personalized medicine and achieve better outcomes

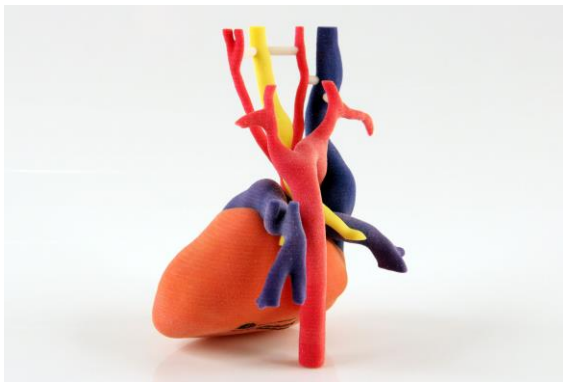
ROCK HILL, South Carolina, April 16, 2015 – [3D Systems](#) (NYSE:DDD) announced today that a 20-month-old toddler is breathing and swallowing easier thanks to a team of cardiologists and cardiothoracic surgeons at Washington University School of Medicine in St. Louis, MO, who used a full-color 3D printed replica of his heart to prepare for a delicate, 2.5 hour procedure at St. Louis Children’s Hospital.

3DS has been at the forefront of surgical planning and personalized medical solutions for almost two decades. With an end-to-end digital thread that integrates surgical simulation, training, planning, and printing of anatomical models, surgical instruments and medical devices, 3DS has helped doctors in tens of thousands of complex medical cases to achieve better patient outcomes with faster surgeries. ^{1,2,3}

Life-size, realistic models make it simpler for patients and families to grasp the details of complex medical procedures, and they provide healthcare practitioners with invaluable preparation for their work in the operating room. In this particular case, the surgical team needed to relocate heart vessels that were squeezing and compressing the toddler’s windpipe and esophagus, causing obstruction of the airway that resulted in difficulty breathing and swallowing. The printed model helped the team familiarize

themselves with the unique vessel structure they would face in surgery, and they were also able to use it when discussing the condition with the patient's parents.

Dr. Shafkat Anwar, a member of the Pediatric Cardiology team at Washington University who worked with 3DS to develop the model heart for this particular surgical procedure said, "With 3D printing, we were able to print a replica of the patient's heart anatomy, developed from medical imaging scans, and use that model to get a handle on what surgeons would be faced with in the OR and to communicate with the patient's parents and other team members."



Full-color 3D printed heart model created from medical imaging data that illustrates the vascular anatomy (blue & red) surrounding the airway anatomy (yellow).

"We are excited to see more and more patients benefitting from the use of 3D printed medical models and virtual surgical planning, especially in challenging and complex cases like this heart surgery, where the precision afforded by 3D technology is integral to the procedure's success," said Kevin McAlea, Chief Operating Officer, Healthcare Products, 3DS. "From surgical training to implants to prosthetics, 3DS' personalized medical solutions are helping provide favorable outcomes and improving quality of life."^{1,4}

To find out more about 3DS' healthcare solutions and see how 3DS is manufacturing the future, visit www.3dsystems.com.

About 3D Systems

3D Systems provides the most advanced and comprehensive 3D digital design and fabrication solutions available today, including 3D printers, print materials and cloud-sourced custom parts. Its powerful ecosystem transforms entire industries by empowering professionals and consumers everywhere to bring their ideas to life using its vast material selection, including plastics, metals, ceramics and edibles. 3DS' leading personalized medicine capabilities help lives and include end-to-end

simulation, training and planning, and printing of surgical instruments and devices for personalized surgery and patient specific medical and dental devices. Its democratized 3D digital design, fabrication and inspection products provide seamless interoperability and incorporate the latest immersive computing technologies. 3DS' products and services disrupt traditional methods, deliver improved results and empower its customers to manufacture the future now.

Leadership Through Innovation and Technology

- 3DS invented 3D printing with its Stereolithography (SLA) printer and was the first to commercialize it in 1989.
- 3DS invented Selective Laser Sintering (SLS) printing and was the first to commercialize it in 1992.
- 3DS invented the ColorJet Printing (CJP) class of 3D printers and was the first to commercialize 3D powder-based systems in 1994.
- 3DS invented MultiJet Printing (MJP) printers and was the first to commercialize it in 1996.
- 3DS pioneered virtual surgical simulation (VSS™) and virtual surgical planning (VSP®), and its leading 3D healthcare products and services help doctors achieve better patient outcomes.

Today its comprehensive range of products is the industry's benchmark for production-grade manufacturing in aerospace, automotive, patient specific medical device and a variety of consumer, electronic and fashion accessories.

More information on the company is available at www.3dsystems.com.

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