News Release

3D Systems Corporation
333 Three D Systems Circle
Rock Hill, SC 29730

www.3dsystems.com
NYSE: DDD

Investor Contact: Stacey Witten
Email: Stacey.Witten@3dsystems.com

Media Contact: Alyssa Reichental
Email: Press@3dsystems.com

3D Systems' Personalized Surgery Tools Enable Surgeons to Operate on the Smallest Patients

- Virtual Surgical Planning (VSP®) software tools provide surgeons with unprecedented precision and control in previously inoperable cases
- Integrated 3D planning and printing combine as the digital thread to create a virtual-to-actual operating room in which surgeries can be planned, tested, refined and delivered economically

ROCK HILL, South Carolina – April 23, 2014 – [3D Systems](#) (NYSE:DDD) announced today that its Medical Modeling™ Virtual Surgical Planning (VSP®) technology – the combination of its production grade 3D printing and personalized surgery tools – has enabled surgeons to conduct complex surgical procedures on newborn and infant patients with more confidence in safety and success.

VSP allows surgeons to capture a digital model of the patient directly from an MRI or CT scan and work with 3DS' Medical Modeling experts to create a detailed surgical plan and then 3D print physical models and custom surgical guides from 3DS' biocompatible stereolithography (SLA) materials. By accessing 3DS' entire
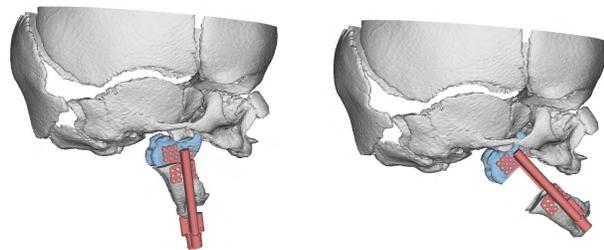

Figure 1 "The great advantage of 3D technology is you can actually do surgery before you get to the operating room," said Dr. Tepper in a video documentary posted on Everyday Health.

personalized digital thread from perceptual devices like its TouchX™ haptic, VSP software tools and the guidance of its expert team of biomedical engineers, surgeons can virtually plan and physically practice critical steps of an operation before a patient ever sets foot in the operating room.

In a representative case, experts from 3DS' personalized surgery team used VSP technology to assist Oren Tepper, M.D. attending surgeon, Division of Plastic and Reconstructive Surgery, Montefiore Medical Center, in planning and conducting groundbreaking surgery on a young girl, Jayla Vargas. Jayla was born with an undersized jaw that inhibited her breathing. Traditionally, in such cases, surgeons have been unable to perform the series of surgeries required to reshape a child's jaw due to the pain and risks associated while the patient is very young. However, utilizing VSP technology Dr. Tepper successfully corrected Jayla's jaw much earlier than is typical, at one month old as opposed to 6 years old, and spared her additional years of living with a tracheostomy, a surgically created opening in the windpipe to allow proper breathing.

 "VSP represents the latest development in the 3D printing-enabled personalized surgery revolution," said Andy Christensen, Vice President, Personalized Surgery and Medical Devices, 3DS. "The ability to work seamlessly from a proprietary digital thread to a virtual and, ultimately, an actual world gives surgeons never-before-possible precision and control. Specifically relating to distraction osteogenesis surgery (surgery to lengthen part of the anatomy, in this case the lower jaw) this technology provides the possibility to reduce costs across the healthcare system by providing care at an earlier stage for patients who would traditionally require a longer-term tracheostomy." Christensen continues, "Studies in this area on traditionally-guided (non-VSP) surgeries show that distraction osteogenesis compared with tracheostomy can result in significant economic savings." [Reference 1]

"VSP has not only helped make surgical procedures more precise, but offers the potential to change the scope of what is surgically possible," said Dr. Tepper. "In the case of lower jaw lengthening procedures for children, the surgeon can plan the operation on the computer first, and identify any problems before getting to the operating room."

Watch this video to see how one single VSP surgery has changed Jayla's life forever.

Learn more about 3D Systems commitment to *manufacturing the future* today at www.3dsystems.com.

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Reference

1. Kohan E, Hazany S, Roosaeian J, Allam K, Head C, Wald S, Vyas R, Bradley J: Economic advantages to a distraction decision tree model for management of neonatal upper airway management. Plastic and Reconstructive Surgery, 2010 Nov;126(5):1652-64.

About 3D Systems

3D Systems is a leading provider of 3D printing centric design-to-manufacturing solutions including 3D printers, print materials and cloud sourced on-demand custom parts for professionals and consumers alike in materials including plastics, metals, ceramics and edibles. The company also provides integrated 3D scan-based design, freeform modeling and inspection tools and integrated 3D planning and printing digital thread that for personalized surgery and patient specific medical devices. Its products and services replace and complement traditional methods and reduce the time and cost of designing new products by printing real parts directly from digital input. These solutions are used to rapidly design, create, communicate, prototype or produce functional parts and assemblies, empowering customers to *manufacture the future*.

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 Color-Jet-Printing (CJP) class of 3D printers and was the first to commercialize 3D powder-based systems in 1994.

- 3DS invented Multi-Jet-Printing (MJP) printers and was the first to commercialize it in 1996.

Today its comprehensive range of 3D printers is the industry's benchmark for production-grade manufacturing in aerospace, automotive, personalized surgery, medical devices and a variety of consumer, electronic and fashion accessories.

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