3D Printed Heart Model Helps Surgeons Save Baby's Life

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Materialise, a world leader in software for segmenting medical image data and 3D Printing, played a pivotal role in helping surgeons save a baby boy's life through the use of a 3D printed heart model. Kosair Children's Hospital was presented with a case of a 14 month old with four congenital heart defects. The complexity of the defects made planning the surgery difficult without 3D visualization and a physical model.

This is when Dr. Phillip Dydynski, Chief of Pediatric Radiology at Kosair Children's Hospital, turned to Materialise's team and the Mimics Innovation Suite for support. The software suite allows you to import medical images (such as CT or MRI), segment the desired anatomy, and produce a 3D model. Together with Dr. Dydynski, Materialise used the Mimics Innovation Suite to generate an optimized 3D model of the myocardium and prepared the file of the child's heart for 3D printing.

Dr. Dydynski commented, "*The Mimics Innovation Suite segmentation tools played a key role in creating the 3D model needed for printing*."

The Mimics Innovation Suite was used to accurately represent the child's cardiovascular anatomy, scale it to a larger size for better visualization and section the model into three pieces so that internal structures could be analyzed as well. The .stl file was then sent to the University of Louisville's J.B. Speed School of Engineering for 3D printing. The model produced all owed the surgeon to study the
model and use it as a tool while planning the best approach with the surgeons. The 3D model allowed for a simplified surgical approach to repair all the defects, allowing for an easier post-operative recovery. The baby is doing well and is expected to make a full recovery.

"*Without the expert guidance of Dr. Dydynski and the software technology of Materialise, the 3D modeling and case planning would not have been possible*," said Todd Pietila, cardiovascular engineering expert at Materialise. "*It was an honor and rewarding experience to support the surgical team a t Kosair Children's Hospital in planning this complex procedure and ultimately have an influence on the positive clinical outcomes for this young patient*."

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About Materialise
With its headquarters in Leuven, Belgium, and branches worldwide, Materialise has been playing an active role in the field of Additive Manufacturing (AM) since 1990. In addition to having the largest capacity of AM equipment in Europe, Materialise also enjoys a stellar reputation as a provider of innovative software solutions. They have used their experience and expertise to create a better and healthier world through their involvement in AM for industrial and medical applications, and by providing biomedical and clinical solutions such as medical image processing and surgical simulations. Materialise has developed unique solutions that make a world of difference for its many customers with their prototyping, production, and medical needs. These customers range from large companies in the automotive, consumer electronics, and consumables sectors; to famous hospitals, research institutes, and clinicians; to individual consumers interested in bringing their own unique creations to life through i.materialise or who want to purchase a celebrated .MGX design.

Regulatory Information:
Mimics Innovation Suite currently consists of the following medical device software components: Mimics version 16 and 3-matic version 8 (released 2013). Mimics is intended for use as a software interface and image segmentation system for the transfer of imaging information from a medical scanner such as a CT scanner or a Magnetic Resonance Imaging scanner. It is also used as pre-operative software for simulating /evaluating surgical treatment options. 3-matic is intended for use as software for computer assisted design and manufacturing of medical exo- and endo-prostheses, patient-specific medical and dental/orthodontic accessories and dental restorations.
HeartPrint models are not intended to be used as a medical device. Models cannot be sterilized and therefore cannot be taken into the surgical theatre. Materialise Belgium – Technologielaan 15 – 3000 Leuven – Belgium Materialise USA - 44650 Helm Court - Plymouth, MI 48170 – USA
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