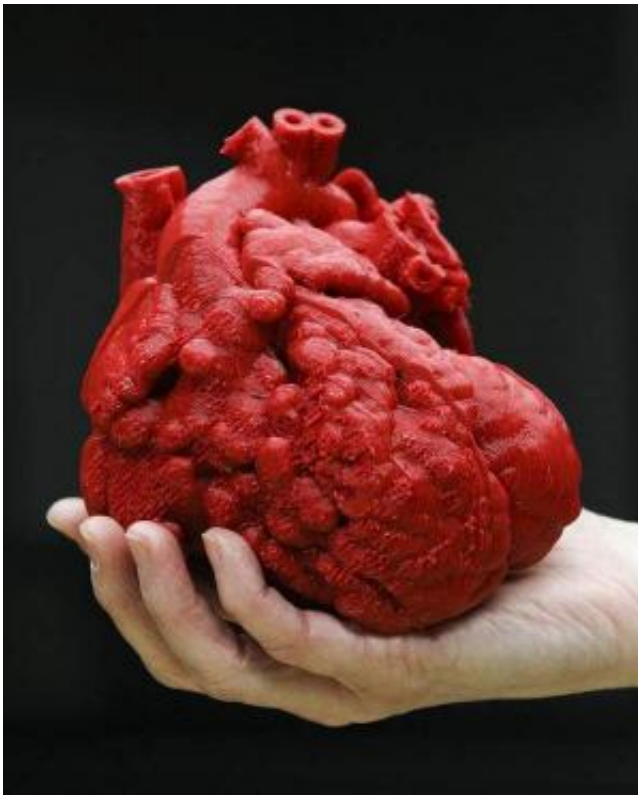


# Doctor uses printed 3D heart to assist in infant heart surgery

February 25 2014, by Bob Yirka

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Credit: The Courier-Journal

Louisville Kentucky cardiothoracic surgeon Erle Austin has performed successful heart repair surgery on a 14 month old infant named Roland Lian Cung Bawi—heart surgery on such a young patient is not unheard of, of course, what's new is that Austin was able to map out his surgical approach using a nearly exact model of the patients heart—it had been

printed on a 3D printer.

Young Roland had been born with four congenital [heart](#) defects—doctors had known since before he was born that his heart had problems. Fixing them all would prove to be a challenge. When it came time to plan the [surgery](#), Austin consulted with other surgeons and found each of them had different ideas on the best way to fix the heart. The ideal approach would involve the least amount of cutting and suturing—but that can be hard to plan using only conventional scanning techniques. Looking for more precision, Austin turned to the engineering school at the University of Louisville—they'd been researching different kinds of 3D printing technology. Researchers at the University worked with radiologists at Kosair Children's Hospital to create a means for converting data from a CT scan of Roland's heart to data that could be used with a 3D printer. The two seemed a perfect match as CT scanning uses the same basic idea as 3D printing—it takes pictures of slices and puts them together on a computer screen to form a whole, and 3D printing is achieved by laying down one layer or "slice" of material at a time.

The 3D printing team used a MakerBot Replicator 2X, to print the heart (in three pieces) at twice its normal size—they also used a flexible type of plastic known as "Ninja Flex" instead of ABS—it allowed the surgeon to bend the finished heart in ways that resembled a real human heart. Printing the heart took approximately 20 hours at a cost of roughly \$600.

Austin told local news reporters that the printed heart let him plan the surgery in ways he'd never experienced before—it allowed for a single surgery (this past February 10) and greatly reduced cutting and suturing, which ultimately led to a much quicker recovery for Roland, who by all accounts is now doing just fine.

**More information:** via [The Courier-Journal](#)

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