

## 3D-Printed Aortas Advise Doctors on Best Choice for Heart Patients

Patient-specific models in high-tech heart simulator test options, prevent complications

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The Ohio State University Wexner Medical Center

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### NEWS PACKAGE



<b>SUGGESTED TEASE</b>	<p>NEW RESEARCH USING 3-D PRINTERS ALLOWS DOCTORS TO SIMULATE A PATIENT'S HEART TO FIND THE BEST OPTIONS BEFORE SURGERY. THE DETAILS ARE COMING UP IN HEALTH NEWS.</p> <hr/> <p>3-D PRINTERS ARE USED TO MAKE EVERYTHING FROM TOYS TO TOOLS, BUT THERE ARE NEW APPLICATIONS BEING EXPLORED IN THE MEDICAL FIELD. A COLLABORATION BETWEEN ENGINEERS AND DOCTORS TAKES THE LATEST RESEARCH FROM THE LAB TO THE OPERATING ROOM, HELPING HEART DOCTORS MAKE MORE INFORMED CHOICES THAT ARE CUSTOMIZED FOR EACH PATIENT. BARB CONSIGLIO HAS THE DETAILS.</p> <hr/>
<b>ANCHOR LEAD</b>	<p>(Nats - left ventricle simulator) :02</p> <p>"This is a patient's 3D printed aorta." :04</p> <hr/> <p>IN THIS LAB, ENGINEERS ARE ABLE TO SIMULATE EXACTLY WHAT HAPPENS IN A SPECIFIC PATIENT'S HEART. :05</p> <p>"So what the simulator is currently doing right now is imposing physiological flow and pressure through the patient's aortic valve." :08</p> <hr/> <p>IT'S A STATE-OF-THE-ART MODEL THAT ALLOWS EXPERTS TO PREDICT COMMON COMPLICATIONS IN AORTIC VALVE SURGERIES – SUCH AS LEAKS, CORONARY BLOCKAGES AND BLOOD CLOTS – GIVING PATIENTS LIKE BERNICE BELCHER (BELTCH-er) A GREATER CHANCE FOR A FULL RECOVERY. :12</p>
<p><b>(PACKAGE START) -----</b>  <b>CG: Courtesy: The Ohio State University Wexner Medical Center</b>  <b>:00 - :03</b>  <i>(Dasi in lab)</i></p> <p>Shots of left ventricle simulation</p> <p><i>(Dasi in lab explaining heart simulator)</i></p> <p>Shots of simulations and engineers observing</p> <p>Shots of Bernice talking to daughter</p>	

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<p><b>CG: Bernice Belcher</b> <b>Had a heart valve replacement</b></p> <p>Shots of Bernice talking to daughter</p> <p>Shots of engineers and surgeons collaborating</p> <p>Shots of 3D printed aorta</p>	<p><i>"I trusted my physician, and I felt that they knew what they were doing." :06</i></p> <p>BERNICE IS THRIVING AFTER HER HEART PROCEDURE THANKS TO A UNIQUE COLLABORATION BETWEEN DOCTORS AND ENGINEERS PRIOR TO SURGERY.</p> <p>EXPERTS AT THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER USED CT-SCANS TO CREATE A 3-D PRINTED MODEL, AN EXACT REPLICA OF BERNICE'S AORTA. THEY CONNECTED IT TO A HEART SIMULATOR, AND REPRODUCED THE CONDITIONS OF HER HEART AND BLOOD FLOW. :19</p>
<p><b>CG: Dr. Scott Lilly</b> <b>Ohio State Wexner Medical Center</b></p> <p>Shots of collaboration meeting</p> <p>Shots of Dr. Lilly in surgery</p>	<p><i>"The ability to try and predict which valve will rest in there the most effectively, have the least amount of leak and not impinge upon adjacent structures is critical." :10</i></p> <p>DOCTORS AND ENGINEERS THEN DISCUSS THE RESULTS TO CONFIDENTLY CHOOSE THE BEST APPROACH, VALVE AND PLACEMENT FOR THE PATIENT – AVOIDING COMPLICATIONS THAT SOMETIMES ARISE AFTER THE VALVE IS IMPLANTED. :10</p>
<p><b>Dr. Lilly (CG'd earlier)</b></p>	<p><i>"This 3D reconstruction modeling has directly informed the way we attack some procedures." :05</i></p>
<p><b>CG: Prasad Dasi, PhD</b> <b>Ohio State College of Engineering</b></p> <p>Shots of Bernice taking blood pressure, filling out heart health calendar</p>	<p><i>"By doing these experiments, we are able to come up with the best possible scenario for that patient." :05</i></p> <p>IT'S WORKING FOR BERNICE, WHO SAYS SHE HASN'T FELT THIS GOOD IN YEARS, AND IS TAKING CONTROL OF HER HEART HEALTH TO KEEP IT THAT WAY.</p> <p>AT OHIO STATE WEXNER MEDICAL CENTER, THIS IS BARB CONSIGLIO REPORTING.:08</p>
<p><b>(PACKAGE END) -----</b></p> <p><b>ANCHOR TAG</b></p>	<hr/> <p>IN ADDITION TO THE CUSTOM 3-D MODELING, OHIO STATE'S BIOMEDICAL ENGINEERS ARE ALSO DEVELOPING NEW TYPES OF SYNTHETIC VALVES THAT WILL BE MORE DURABLE AND COST-EFFECTIVE THAN CURRENT OPTIONS.</p>

### SOCIAL MEDIA

<p> <b>Share it! Suggested tweet:</b></p> <p> <b>Suggested post:</b></p>	<p>Doctors and engineers <a href="https://twitter.com/OSUWexMed">@OSUWexMed</a> work together to find the best options for patients needing a new heart valve. An exact 3D replica of the patient's aorta and valve structure is printed and tested in a lab to predict and avoid complications. <a href="http://bit.ly/2FdGpJs">http://bit.ly/2FdGpJs</a></p>
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	<hr/> <p><a href="#">The Ohio State University College of Engineering</a> and <a href="#">The Ohio State University Wexner Medical Center</a> are working together to give patients the best possible outcomes after heart valve replacement surgery. See how 3D printing and a high-tech heart simulator are used to prevent complications and help doctors make the best choice for their patients. <a href="http://bit.ly/2FdGpJs">http://bit.ly/2FdGpJs</a></p>
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**EXTRA BITES**

<p><b>CG: Dr. Scott Lilly</b> Ohio State Wexner Medical Center</p>	<p>Dr. Lilly explains what the models can help doctors predict: <i>“That can help us try and predict how the valve will rest inside a given patient. It will help us determine whether or not there might be compromise of a coronary artery by the prosthesis. It can help us predict whether or there’s going to be a considerable amount of leak around the valve.”</i></p>
<p><b>CG: Prasad Dasi, PhD</b> Ohio State College of Engineering</p>	<p>Dr. Lilly explains how each valve and patient case is unique: <i>“Each of these valves are a little bit different, and every patient is a little bit different. Sizes are different, The location of the calcium and hardening of the valve is different.”</i></p> <hr/> <p>Dasi explains how the simulations help doctors make choices: <i>“All of these scenarios can be run through a computational model or through experimental modeling and give the physician a variety of options and also give them insight into how these valves would work in each patient.”</i></p> <p>Dasi says this method will improve the future of cardiac care: <i>“I think in the future when we have this as a routine part of the whole therapy, surgeons will be more confident in terms of the choice that has been made for the particular patient.”</i></p> <p>Dasi explains how the simulation is individualized: <i>We are able to control the precise contraction and expansion as well as control the pressures exactly to match how the patient has presented in the clinic in our lab with the patient’s own 3D model.”</i></p> <hr/> <p>Bernice describes the difference before and after her surgery: <i>“I could tell that my body was not getting the level of oxygenation of blood through my body where it was like a smooth...I had more energy, you know, I had more energy.”</i></p>

**CG: Bernice Belcher**  
**Had a heart valve replacement**

Bernice describes the morning she knew something was wrong:  
*I tried getting up again, and the dizziness was a little worse, and that's when I called my daughter and said, 'Something is going on.'*

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