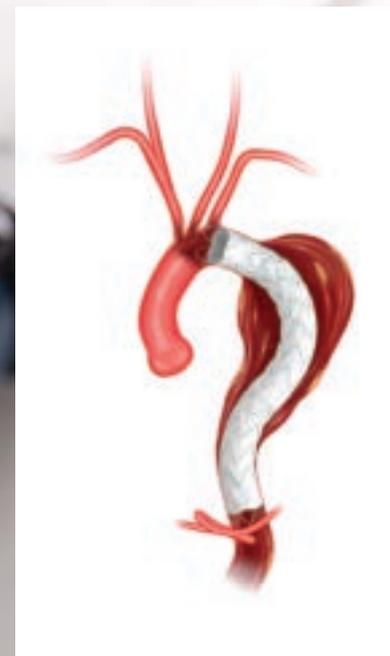


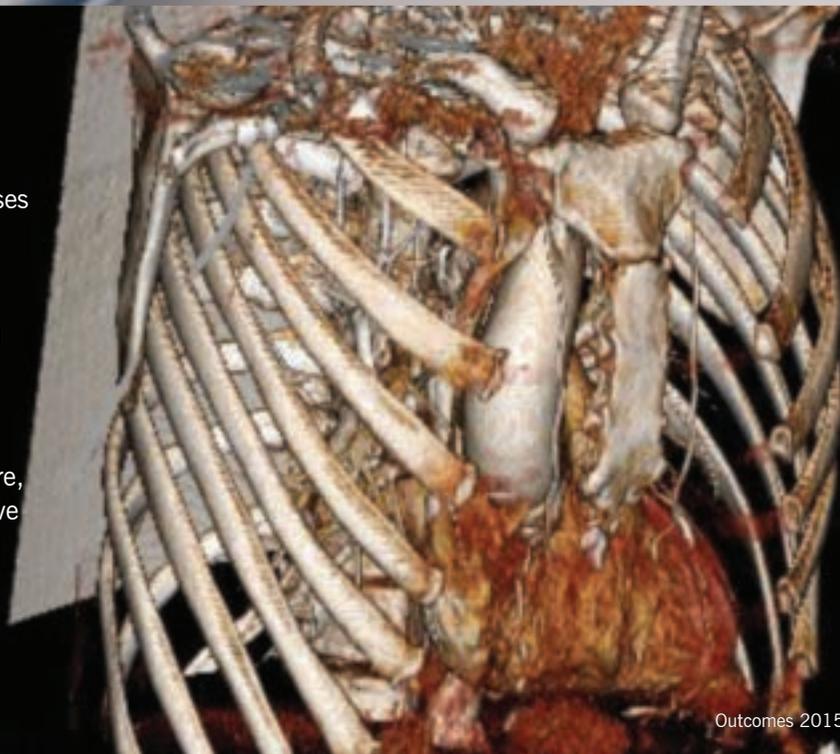
## Thoracic Endovascular Graft

In November 2015, Cleveland Clinic was the first to implant the Zenith Alpha™ Thoracic Endovascular Graft, developed by Cook Medical. The device is approved by the U.S. Food and Drug Administration for endovascular treatment of select patients with isolated lesions in the descending thoracic aorta. The graft is smaller than other devices and allows expanded treatment options for some patients who may not be eligible for treatment with larger devices.



## COMMENCE Trial

Cleveland Clinic is leading the Prospective, nOn-randomized, MulticENter Clinical Evaluation of Edwards Pericardial Aortic and Mitral Bioprostheses With a New Tissue Treatment Platform (COMMENCE) trial, which involves the use of newer bovine valve preservation techniques to treat patients with aortic valve disease. Cleveland Clinic is a leader in aortic valve replacements. Newer bioprostheses like those being studied in the COMMENCE trial hold the promise of greater durability and long-term freedom from valve failure, especially in younger patients. Data for aortic valve replacements were presented at the American Association for Thoracic Surgery Annual Meeting 2016 (May 14–18, 2016; Baltimore, MD).





### **Tatara Vascular Guide Wires**

Cleveland Clinic spin-off company, Tatara Vascular, LLC, has partnered with a commercial manufacturer in Japan to produce coronary guide wires invented by a Cleveland Clinic physician. The wires are used during catheterization procedures to place stents or during balloon angiography. The wires are more flexible and have a greater torque response compared with other guide wires. The tip has a flexible bend to help clear blocked arteries. The first in-human study was successfully completed in November 2015, and regulatory approval was received in January 2016.

### **NaviGate Stent**

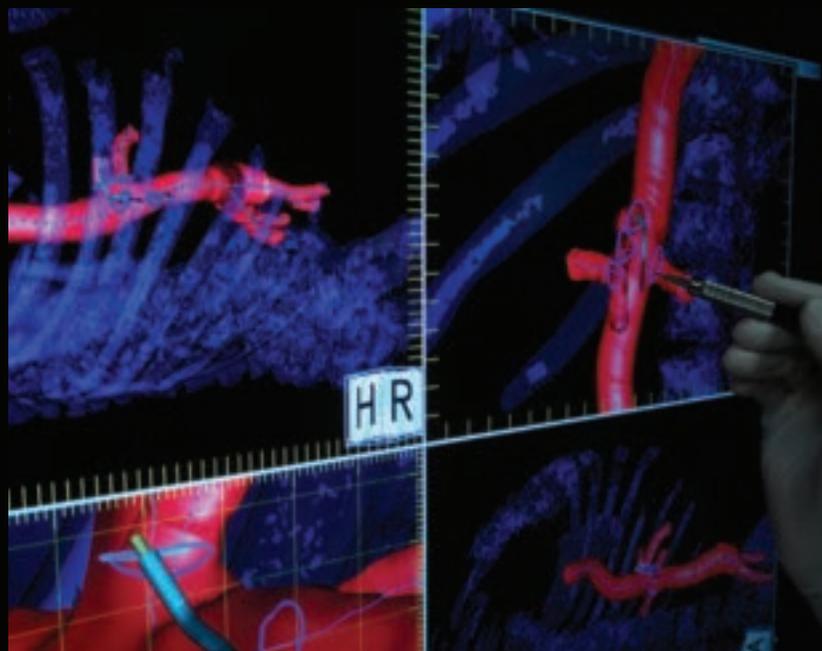
The Navi stent device is a compressible valved stent that is delivered via catheter to replace the mitral valve in patients with mitral valve disease who are ineligible for surgery. The device was developed by Cleveland Clinic researchers and produced by NaviGate Cardiac Structures, Inc. The first human implantation was successfully performed in October 2015. Up to approximately 280,000 people in the US can benefit from this technology each year.



# Innovations

## Intraoperative Positioning System

Cleveland Clinic spin-off company Centerline Biomedical Inc. is continuing development of the Intraoperative Positioning System (IOPS), developed by Cleveland Clinic researchers. The IOPS provides high-quality three dimensional visualization through the use of electromagnetic tracking to guide surgeons during minimally invasive endovascular aortic repair procedures. The technology results in reduced reliance on traditional fluoroscopy, which is based on x-rays and contrast dye, therefore providing a safer alternative.



## TMAO and Clot-Related Diseases

Cleveland Clinic research has established a relationship between high levels of trimethylamine N-oxide (TMAO) and the risk of clot-related diseases such as heart attack and stroke. Previous research showed a link between TMAO and the risk of atherosclerosis. TMAO is made by gut microbes and may be elevated in omnivores and vegans alike. However, levels of TMAO are higher in people who eat diets rich in animal products, particularly red meat, egg yolk, and high-fat dairy products. These foods contain abundant amounts of choline, a portion of which turns into TMAO as it is broken down by bacteria in the gut. This more recent research established that TMAO encourages hyper-reactive platelet function, increasing the risk of blood clots. This risk exists even after adjusting for traditional cardiac risk factors, kidney function, inflammation, medication, and cardiovascular disease.

