The Computerworld Honors Program

Honoring those who use Information Technology to benefit society

Final Copy of Case Study

YEAR:
2012

STATUS:
Laureate

Organization:
OhioHealth

Organization URL:
www.ohiohealth.com

Project Name:
Transcatheter Aortic Valve Replacement

What social/humanitarian issue was the project designed to address? What specific metrics did you use to measure the project's success?

Severe aortic stenosis is a condition in which the heart valve between the left ventricle of the heart and the aorta is narrowed, thus resulting in impeded delivery of blood to the body. It is a condition that affects at least 100,000 people in the United States. About half of those people will die from the condition within two years if left untreated. The standard treatment is open-heart valve replacement, but about one-third of patients are ineligible for open-heart surgery and half are at high risk for the surgery. This project involved clinical trials for the percutaneous implantation of a specially designed valve through a small opening in the femoral artery without having to open the chest wall to remove the diseased valve. Sized at less than one-fourth of an inch, the replacement valve is threaded through the arteries and deployed in the native valve, where it takes over the valve's function. Our nomination focuses on the information technology which enabled the clinical procedure to take place successfully. In order to track the program's success, we created a database of patients referred for the evaluation of Transcatheter Aortic Valve Replacement (TAVR). This database tracks referral date, procedures performed, and treatment received. Since January of 2011, we have received referrals of over 200 patients to evaluate for TAVR. This has yielded a "halo" effect of downstream revenue for the institution, but most importantly, this has given the patients we serve access to the latest treatments.

Please describe the technologies used and how those technologies were deployed in an innovative way. Also, please include any technical or other challenges that were overcome for the successful implementation of the project.

The primary clinical technology was the valve itself, which was implemented with help from our Imaging Engineering, Clinical Engineering, and perioperative teams. The information technology that enables use of the clinical technology includes: a) Implementation of advanced clinical information system for complete physiologic/hemodynamic monitoring and information gathering as well as medical image review within the dedicated surgical suite. The information system facilitates clinical data acquisition and analytical assessment during the procedure. It is used for nursing documentation and physician reporting. The clinical applications team at OhioHealth developed specific menus with the appropriate data to submit as part of the clinical trials for this device. This application development was in turn approved by the vendor for the clinical technology. b) Integration technology with workflow that unites information, applications, image processing, and storage within one cohesive image management application. c) Integration with multiple monitor boom to allow physicians to switch views tableside in order to display specific patient data (i.e., images, waveforms, vital signs) collected from the various applications used during the procedure. Simultaneously, this data was made available from a slave monitor for viewing by the anesthetist. d) Implementation of ability for medical staff outside of the operative suite to watch and listen to the procedure from a remote location for education purposes. The only challenge was time-related: making sure we met the deadlines for inclusion in the clinical trials.

Please list the specific humanitarian benefits the project has yielded so far.

Severe aortic stenosis primarily affects older people and typically develops between the ages of 50 and 70. Many of these patients are unable to tolerate open-heart surgery due to other health issues. The therapeutic footprint of open-heart surgery on these patients is so onerous that it can create bad outcomes. With this new implant, patients can be home in two to three days, instead of five to seven, with no restrictions on their activities. The technology was approved for use in the United States by the Food and Drug Administration in 2010. The OhioHealth Structural Heart Disease Patient Evaluation & Research Center, where this technology has been implemented, provides innovative cardiovascular medicine, multi-disciplinary physician collaboration, and ground-breaking treatments and research to patients at OhioHealth. OhioHealth is recognized as a leader in revolutionary treatment of stroke, peripheral vascular disease and cardiovascular conditions such as heart valve disease and coronary artery disease. The Medtronic Core Valve is used for treatment of patients who are diagnosed with severe aortic stenosis and deemed inoperable or high risk for traditional surgical aortic valve replacement. This catheter-based delivery for aortic valve replacement offers these frail patients an option for treatment that would not otherwise be available. Due to the fact it is in a clinical trial, we are unable to share results at this time. However, we were recently selected as a site for the newly FDA approved Edwards Sapien Valve. This valve was evaluated in the PARTNER trial (PARTNER Trial Cohort B results: http://www.nejm.org/doi/full/10.1056/NEJMoa1008232). Of high importance is the fact that we are the only center in Ohio to offer access to both the Core Valve clinical trial and the FDA approved Edwards Sapien Valve.

Please provide the best example of how the project has benefited a specific individual, enterprise or organization. Feel free to include personal quotes from individuals who have directly benefited from the work.

The patient was an elderly male business owner whose health was deteriorating due to aortic stenosis and severe lung disease. He was taken to the operating room for surgical aortic valve replacement. Upon opening the sternum, it was determined he had a porcelain aorta. Continuing with the invasive surgery would be catastrophic. As a result, he was enrolled into the TAVR clinical trial. He underwent a successful implant and is now celebrating his 50th year in business.

Another patient was an elderly woman deemed inoperable due to her frail state, cardiovascular disease, and stroke history. She was married and living independently, but her health was declining. She was enrolled into the TAVR clinical trial. Since her implant, she and her husband celebrated their 70th wedding anniversary. Her story will be featured next month in the Ladies Home Journal. The patient's family provided "testimony" of her experience with our program. The author wrote, "Outstanding communication and consideration were demonstrated toward the patient and family members during this very complex and lengthy procedure. Our interaction with Greta (program coordinator) began over one year ago and she has consistently been the epitome of professionalism and care for our mother and family. All of her expertise, care, and communication resulted in our experience with the procedure and Riverside being far superior to our experiences with [a competitor]. We will heartily refer others to her and this program. Thank you Greta and team!!" As an organization, OhioHealth's Structural Heart Disease Patient Evaluation & Research Center has elevated our reputation in the community around patient care and research. Often, these patients have multiple issues, which previously meant they had to see different specialists. The Center brings all of these specialties together under one roof to make care delivery faster and less complicated for our patients.