The Virtua Cardiologist Issue 2, Winter 2021

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Welcome to the second edition of The *Virtua Cardiologist*. Despite the challenges posed by the COVID-19 pandemic, we've seen significant progress and growth in cardiology.

One area of particular pride is structural heart, which experienced higher volumes and improved quality outcomes. We had a 21 percent growth overall for the program, having done 156 procedures in 2019 and 196 in 2020. Compared to 2019, our mortality rate declined from 2.7 percent to 1 percent; cardiac event rate went from 2.7 percent to 0.5 percent; vascular complication rate dropped from 2.7 percent to 2 percent; and hemorrhage rate went from 1.3 percent to 0.5 percent.

We are looking forward to 2021, which should be an exciting year for cardiology at Virtua. In fact, we look forward to expanding our cardiovascular team, and anticipate the onboarding of two new cardiac intensivists at Virtua Our Lady of Lourdes. The addition of these two highly experienced physicians to our team will enhance the care and outcomes of our most complex cardiac patients.

More to come in our spring issue, and if you have any suggestions or contributions to share, please contact Vincent Spagnuolo, MD, at VSpagnuolo@virtua.org.
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Summit Highlights: Interventional Cardiology

At Virtua's cardiovascular services summit in October, the capabilities and achievements of the teams delivering heart and vascular care at Virtua were on display. Presenting were representatives from each of our Councils, including congestive heart failure, cardiothoracic surgery, clinical cardiology, heart rhythm specialists, and structural heart. Due to a patient emergency, Adam Levine, DO, FACC, FSCAI, FACOI, was unable to present on behalf of Virtua's Interventional Cardiology Council, so we have summarized his report here:

Cardiogenic Shock

Both within and outside of the cardiac critical care unit, we are focusing on a team approach to this emergency condition, with a coordinated strategy involving interventional cardiology, cardiothoracic surgery, and the CCU staff. System-wide education is focusing on early recognition of this acute cardiac-based circulatory insufficiency to the brain, kidneys, and other vital organs.

Among treatments that reverse this urgent condition, our heart team can insert and manage supplemental circulation using the Impella cardiac pump device (Impella CP, Impella RP, or Impella 5.0). The team places these left ventricular assist devices endovascularly, via the femoral artery, advancing this catheter with its tiny pump across the aortic valve. A micromotor in the device spins and pulls blood from the left ventricle and pushes it through a narrow tubular housing to pump it into the base of the aorta, in order to support blood supply to the coronary arteries and throughout the body. With a maximum pumping capacity of approximately one-half of that of a normal heart, the Impella can temporarily support patients whose heart capacity has failed.

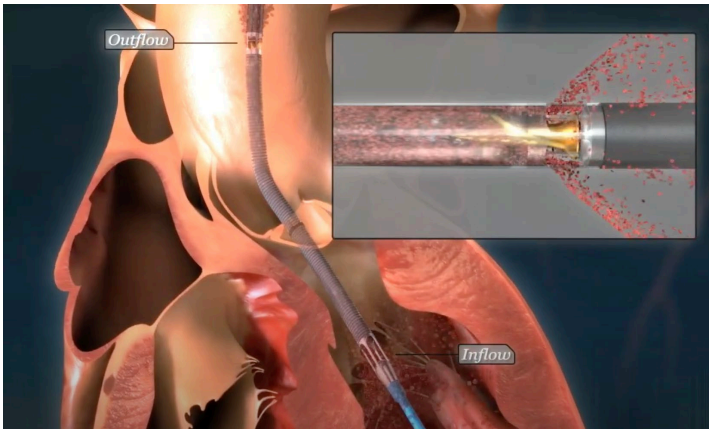


Illustration of the Impella pump.

In 2020, we performed 56 Impella implants, a significant increase from the previous year.

Other patients in cardiogenic shock may receive emergency care with the Protek Duo device (a dual-lumen cannula inserted percutaneously via the internal jugular vein, with the distal outflow lumen positioned in the main pulmonary artery and the proximal inflow lumen positioned in the right atrium providing extracorporeal membrane oxygenation and right heart support). Some patients may also benefit from application of conventional ECMO.

“Unfortunately, mortality rates for cardiogenic shock can be as high as 50 percent,” said Dr. Levine. “Our team’s goal is to significantly reduce that figure across all Virtua hospitals.”

FFR-CT Evaluation

Virtua has established a multidisciplinary group to investigate the value of fractional-flow-reserve computed tomography (FFR-CT). This newer cardiac imaging approach, still in the early stages of clinical implementation in the U.S., provides a vessel-specific calculation of coronary artery blood flow. As a view into coronary artery disease, FFR-CT might be an alternative to, or advancement in, noninvasive screening tools for cardiac catheterization—possibly offering better predictive value of CAD impact than traditional coronary CT angiography.

Metrics that the IC Committee is also tracking include:

- Combined patient volume for the cardiac catheterization laboratories
- Mortality rates
- Door-to-balloon time for stat angioplasties
- Daily on-time start rate for interventions within the cardiac cath labs.

Mitral Valve Procedures Among Highlights of Structural Heart Capabilities at Virtua

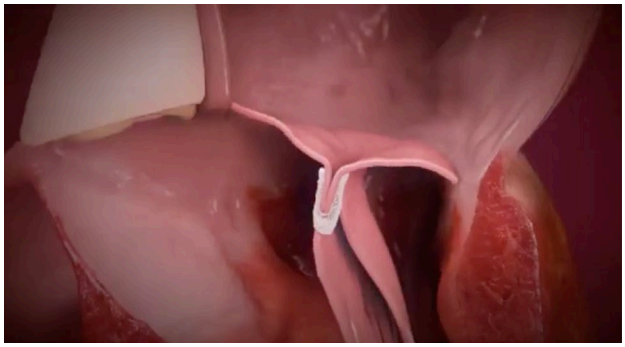
By Kirk McMurty, MD

Mitral valve disease is one of the most common valvular conditions in the U.S. Its main manifestations are mitral stenosis or mitral regurgitation. Mitral regurgitation (MR) is the most prevalent form of mitral valve disease in developed countries, affecting approximately 10 percent of people 75 years of age and older than. Left untreated, severe MR is associated with poor outcomes and repeat hospitalizations due to congestive heart failure, new-onset atrial fibrillation, and pulmonary hypertension.

A valve that the Structural Heart team uses for for transcatheter aortic valve replacement (TAVR) has been adapted and approved for transcatheter valve-in-valve replacement of the mitral valve, a procedure in in which the replacement valve pushes the native valve leaflets to the side when placed and immediately takes over their function.

Mitral regurgitation is, in turn, categorized into two broad categories: primary and secondary MR. The most common etiology of secondary MR is as a sequela of coronary artery disease that causes dysfunction of the left ventricle and thereby affects the mitral valve apparatus. Primary MR is due to a dysfunction of the mitral valve leaflets in some way, or due to loss of leaflet coaptation from a dilated mitral annulus.

The majority of primary MR is repairable, either surgically or endovascularly. The Structural Heart team at Virtua has special focus and achievement in mitral valve disease, including as an early implementer of transcatheter mitral valve replacement (TMVR). In 2019, the team performed the first TMVR in a pregnant woman. For several years, we have also been using a mitral valve clip to nonsurgically correct mitral valve leaflet coaptation in the treatment of MR.



Cutaway animation image shows the MitraClip after catheter-based placement.

Virtua's Structural Heart team offers the full complement of valve treatments, as well as heart-wall and chamber-defect procedures, the latter of which can also sometimes be performed by catheter-based interventions. Such less-invasive structural heart procedures can be especially important for patients who are not candidates for surgery. In addition, conducting operations in our hybrid laboratory permits us to switch from a catheter-based procedure to an open surgical procedure, if and as necessary, in the same room with all equipment and staff available and no need to move the patient.

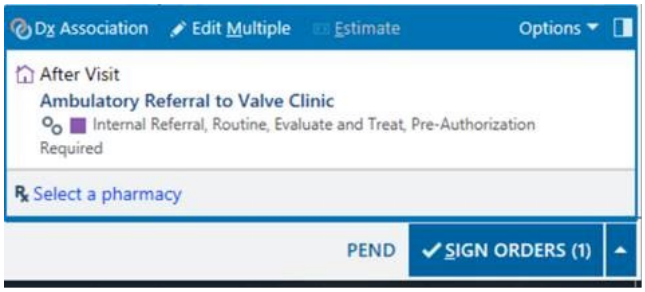
In the last year, we have performed more than 65 procedures on mitral valves. Our multidisciplinary Structural Heart team is involved with the work-up and diagnosis, as well as procedure recommendations for all patients with valvular heart disease.

Cardiac Catheterization Volume at Virtua Memorial Hospital

As noted in our previous issue, we have focused on communicating our increased interventional capacity and resources in Mount Holly. The facility supported approximately 400 cases in 2020. The committee is seeking to promote access and referrals to this location. With legislation just signed by NJ Gov. Phil Murphy, we now have a pathway to establishing Memorial as a center for elective angioplasty, in addition to its current capabilities.

Valve Clinic Launches

The much-anticipated Virtua Health Valve Clinic is now open! Our new program provides a one-stop-shop for the seamless referral and treatment of your patients who may need a valve procedure.



How does it work? Choose the "Ambulatory Referral to Valve Clinic" option in Epic. A member of Cardiovascular Navigation team will reach out and screen the patient for urgency, expediting diagnostic testing and appointments with one of our interventional cardiologists or CT surgeons. The team will evaluate your patient, determine the best structural or surgical treatment — such as TAVR, MitraClip, or mitral valve repair — coordinate pre-admission testing, and schedule the procedure.

Throughout the process, the team remains in close contact with you, closing the gap and minimizing the time from referral to treatment.

For any questions regarding this process or how the team can best serve your patients, contact Stephen Bechtel at SBechtel@virtua.org or 856-325-4290, or Theresa Sousa at TSousa@virtua.org.

Silver Award for Get with the Guidelines

The American Heart Association has awarded Virtua with a **Silver Plus "Get With The Guidelines" award** for Heart Failure (GWTG-HF), improving upon our previous Bronze award earned last year. GWTG-HF awardees demonstrate compliance for 12 consecutive months in a calendar year in the areas of heart failure management and treatment. Thanks to all of the providers, nursing, and ancillary staff who work together to ensure we are providing the best and safest care. Congratulations and please share with your colleagues and team! We are now going for the **GOLD**!

Patient Videos Attest for Virtua's Cardiac Excellence

We all know that the greatest endorsement of a program is a patient testimonial. Despite the pandemic, Virtua has continued to emphasize the importance of seeking care, particularly in an emergency. In this series of videos, Virtua Cardiology plays a key role in helping patients overcome their fears and resistance, and working together in partnership to return patients to their home and family.

- A series of falls sent Charlene Walls to Troy Randle, DO, who diagnosed heart block. Ms. Walls has advice for patients who are worried about COVID-19, don't wait to get the care you need.
- Pain in his shoulder and arm wasn't a red flag for Dean Eson. But, as his pain worsened, he struggled over the decision to seek care. His primary care physician Rick Levine, MD, obtained a same-day appointment with John Hamaty, DO, who convinced Dean that he needed immediate hospital intervention, which was provided by Adam Levine, DO. Together they worked seamlessly to give Dean the emergency care he needed.
- Gene Miller had similar COVID-19 concerns, and as he noted "denial" that kept him from getting emergency care for his evident heart attack symptoms. The Marlton emergency room team got Gene to Virtua Our Lady of Lourdes, where Anthony Smeglin, MD, performed an unusual and complex interventional procedure that saved Gene's life. Gene "paid it forward" when he passed that experience and knowledge on to a family member, who's life was saved through quick intervention.

Cardiology for Primary Care Symposium Success

Congratulations to the team who organized this year's "**Cardiology for Primary Care**" symposium. This annual event (now in its 10th year) is in partnership with Rowan SOM, and provides the cardiology programming for their six-block CME series. While this year the program was held via livestream only, over 170 clinicians joined for the session, which featured talks by Vivek Sailam, MD, Maria Duca, MD, Talya Spivack, MD, and Peter Bulick, DO.

Cures Act Reminder

A reminder that Virtua has recently gone live with its implementation of the **21st Century Cures Act**. Patients will now have greater access to their health record, via MyChart. The mandate goes into effect nationally on April 5, but Virtua elected to move forward ahead of schedule, in order for patients to benefit from the increased transparency. To prepare its providers for these changes, Virtua has provided clinicians with a resource site, as well a recorded webinar. The biggest change is the release of providers' notes, previously not shared, and test results that could arrive to the patient's MyChart account before their provider has had a chance to see and review. Please make yourself familiar with the Act if you have not done so already.