



henryford.com
1-877-434-7470

CARDIO BEAT

PUBLISHED BY HENRY FORD HEART & VASCULAR INSTITUTE

SPRING 2019

Celebrating 10th Anniversary and Advancements in Cardiac Catheterization Laboratory

As Henry Ford West Bloomfield Hospital (HFWBH) celebrates its 10th anniversary, a reflection of the advancements made to the cardiac catheterization laboratory is a reminder of the significant progress. Originally designated as a diagnostic-only laboratory, one that could only take pictures of the coronary arteries, it grew to be capable of caring for emergency heart attack patients by 2013.

After successfully meeting quality assurance measures and demonstrating community-based needs, further expansion and capability followed. “We now perform therapeutic procedures, namely balloon angioplasty and stenting, on nearly all patients of the cardiac catheterization lab,” explains Gerald Koenig, M.D., Ph.D., research director for the Cardiac Catheterization Laboratory at Henry Ford Hospital and catheterization lab medical director at Henry Ford West Bloomfield Hospital.



Gerald Koenig, M.D., Ph.D.

Through rigorous quality metrics established by national regulations and state-based certificate of need guidelines, the HFWBH cardiac catheterization lab has been recognized as an exemplary model and has met or exceeded all the recognized standards. “We now have the ability to meet the demands of the hospital’s and clinic’s inpatient and outpatient requirements, to best serve the West Bloomfield community,” explains Dr. Koenig.

Continued on page 3

1000th 3D Print Patient Treated While Broadcast Live



William W. O’Neill, M.D., and Dee Dee Wang, M.D., used 3D printing to guide Lillian Keavey’s mitral heart valve replacement.

Lillian Keavey, a 72-year-old from northern Michigan, became Henry Ford Health System’s 1000th patient treated with the aid of 3D printing technology.

“I was very glad to be chosen to have it done because the alternative was another open-heart surgery, and I wasn’t looking forward to that,” said Lillian. “There’s a three-month recovery, whereas this one is just two weeks.”

Continued on page 4

»» INSIDE

PARTNER 3 TRIAL: TAVR HAS BETTER RESULTS THAN AORTIC VALVE SURGERY (SAVR)

CEREBROVASCULAR INJURIES ASSOCIATED WITH BLOOD PRESSURE DERANGEMENTS

DR. AKSHAY KHANDELWAL NAMED BOARD CHAIR FOR THE AMERICAN COLLEGE OF CARDIOLOGY

STAFF UPDATE

Mahender Macha, M.D., and Vincent Simonetti, M.D., have been leading the cardiac surgery program at Allegiance over 10 years. The surgeons became part of the Henry Ford Allegiance Medical Group as part of the Central Market over two years ago.

They are both actively involved and working with Tiberio Frisoli, M.D., structural heart interventional cardiologist, to expand the Henry Ford Center for Structural Heart Disease TAVR program to Henry Ford Allegiance Health in Jackson.

Mahender Macha, M.D., F.A.C.S.

Cardiothoracic Surgery

MEDICAL SCHOOL EDUCATION

University of Michigan - School of Medicine, Ann Arbor, MI

RESIDENCIES & FELLOWSHIPS

University of Pittsburgh School of Medicine, Pittsburgh, PA
Residency, General Surgery, Chief Resident

University of Pittsburgh School of Medicine, Pittsburgh, PA
Cardiothoracic Research Fellow

Stanford University School of Medicine, Stanford, CA
Cardiothoracic Surgical Resident and Fellow

BOARD CERTIFICATIONS

American Board of Thoracic Surgery

American Board of Surgery

RESEARCH INTERESTS

Dr. Macha's research interests include: adult cardiac surgery, heart failure, heart and lung transplantation, ventricular assist devices and thoracic aortic surgery.



Mahender Macha, M.D., F.A.C.S.

Vincent A. Simonetti, M.D., F.A.C.S., F.A.C.C.P.

Cardiothoracic Surgery

MEDICAL SCHOOL EDUCATION

Wayne State University - School of Medicine, Detroit, MI

RESIDENCIES & FELLOWSHIPS

Henry Ford Hospital, Detroit, MI
General Surgery Residency

Wayne State University/Detroit Medical Center, Detroit, MI
Cardiothoracic Surgery

Henry Ford Hospital, Detroit, MI
Cardiopulmonary Transplantation Clinical/Research Fellow

BOARD CERTIFICATIONS

American Board of Thoracic Surgery

American Board of Surgery

National Board of Medical Examiners

RESEARCH INTERESTS

Dr. Simonetti's research interests include: aortic aneurysm repair, aortic valve replacements, coronary artery bypass graft, left ventricular assist devices, and mitral valve surgery.



Vincent A. Simonetti, M.D., F.A.C.S., F.A.C.C.P.

Celebrating 10th Anniversary and Advancements of Cardiac Catheterization Laboratory

Continued from page 1



Gerald Koenig, M.D., Ph.D., Medical Director of Henry Ford West Bloomfield Hospital's Cardiac Cath Lab.

“With increased access, growth and capabilities, came the demands to treat more complex and sicker patients. This includes patients with severe and complicated acute heart attacks, often with cardiac arrest and shock,” says Dr. Koenig. “As a means to help treat these patients, the HFWBH cardiac catheterization laboratory expanded its capability and incorporated the use of the latest and most advanced technologies in mechanical support devices to replace or assist the pump function of the left and/or right ventricles of the heart.”

These devices include the Abiomed Impella® heart pump, a percutaneous microaxial pump to assist the left ventricle, and TandemHeart (CardiacAssist, Inc.), a percutaneous extracorporeal pump capable of performing temporary cardiopulmonary bypass to support both ventricles and the lungs.

Dr. Koenig explains, “The next step in advancing the capabilities of the cardiac catheterization laboratory, in conjunction with the Pulmonary Embolism Response Team (PERT) team, will be incorporating an array of interventional therapies to treat intermediate or high risk patients with acute pulmonary embolism (PE), a clot in the lungs.

Acute PE is currently the third leading cause of cardiovascular death in the United States, resulting in 100,000 deaths annually, as estimated by the Centers for Disease Control. Available techniques for invasive treatment include the FDA-approved EKOS (BTG/Boston Scientific), a catheter-directed and ultrasound-assisted catheter-based system to deliver thrombolytic, or clot-busting treatment; and the newer FlowTriever system (Inari, Inc.), a catheter-based mechanical thrombectomy device for the removal of a clot directly from the lung arterial vasculature to restore blood flow.

The HFWBH cardiac catheterization laboratory continues to expand its capabilities and functions in providing the highest level of care to its patients. The hospital and staff are committed to provide the latest technologies to the local community in improving outcomes from life-threatening cardiac conditions.

To refer patients to Henry Ford West Bloomfield Hospital Interventional Cardiology, call 248-661-7022.

1000th 3D Print Patient Treated While Broadcast Live

Continued from page 1

Cardiologist Dee Dee Wang, M.D., imaging expert and medical director of 3D Printing at Henry Ford Innovations, helped design the print cardiologists used to plan for the patient's new mitral heart valve procedure on March 27.

"When you hold it in your hand it becomes more intuitive rather than just on a screen," said Dr. Wang. "Our brains understand that better, and that's invaluable for a surgeon going into a surgery or a cardiologist going into a procedure."

The 3D model allowed Cardiologist William W. O'Neill, M.D., director of the Henry Ford Center for Structural Heart Disease, and Cardiologist Tiberio Frisoli, M.D., to visualize the patient's heart from inside before the procedure began. The 3D model assisted with choosing a properly sized valve and knowing how to best position it inside the patient's heart.

"The most important part is the planning," said Dr. O'Neill. "There's integral planning that's involved with sizing the valve, assuring that the positioning is accurate and there is no potential for obstruction of blood flow within the heart. The procedure is amazing. And with the aid of 3D printing, it is incredibly effective and very safe with the proper planning. We've become a leader in medical 3D printing, thanks to Dr. Wang and Henry Ford Innovations."

Lillian's procedure was broadcast live to about 400 interventional cardiologists attending the Scottsdale Interventional Forum in Scottsdale, Ariz.

The U.S. Food and Drug Administration recently commercially approved the use of the Edwards Sapien 3 valve for mitral valve-in-valve replacement. Doctors at Henry Ford Health System, led by Dr. O'Neill, have been using the valve in this application for about five years, with the aid of 3D printing.



Dr. Wang explains to Lillian how a 3D print of her heart will assist in her mitral heart valve replacement.



Lillian appreciates being chosen as the 1000th 3D print patient and thanks Dr. O'Neill and Dr. Wang.

In addition to cardiology, Henry Ford Health System uses 3D printing for vascular aneurysm planning, oncology planning, cranial-facial reconstruction and orthopedics at Henry Ford, said Eric Myers, product designer and technical director for 3D printing at Henry Ford Innovations. Marianne Rollet, imaging operations coordinator at Henry Ford's Center for Structural Heart Disease, uses computer programs and two-dimensional, black and white CT scans to guide 3D printers to create 3D models made of light-sensitive polymers.

"It provides the doctors a whole new level of understanding of the intricacies and details within the body," Myers said. "Dr. Wang and I developed this program five years ago, and now we're at the 1000th patient. I'm very proud of that. I'm so glad we've been able to help so many people."

Henry Ford's 1000th 3D print patient, Lillian Keavey, was referred by Alpena, Mich., Cardiologist Dr. Abraham Salacata. She had been experiencing shortness of breath and decreased stamina. The symptoms led to her diagnosis of mitral valve stenosis – and the need for a new mitral valve.

Lillian said she is looking forward to resuming daily walks with her daughter and her daughter's dog, Jojo. They've walked every day for years, except when it is under -10 degrees – so Jojo's paws don't get too cold. "I'm looking forward to getting back to the things I normally do."

To learn more about the work Dee Dee Wang, M.D., and Henry Ford Innovations are doing, visit HenryFord.com/innovations.

Partner 3 Trial: TAVR Has Better Results Than Aortic Valve Surgery (SAVR)

Many patients who need a new aortic heart valve can have it safely implanted through a catheter rather than open heart surgery, say study results announced at the American College of Cardiology's Annual Scientific Sessions in New Orleans in March, the largest annual gathering of cardiologists in the world.

The Partner 3 trial results compared transcatheter aortic valve replacement, or TAVR, in low-risk patients with symptomatic severe aortic stenosis to patients who underwent surgical aortic valve replacement (SAVR). The trial involved 1,000 patients, including patients at Henry Ford Hospital, and was led by Columbia University Cardiologist Martin B. Leon, M.D. The results showed TAVR was superior to SAVR at reducing death, stroke, or re-hospitalization at one year in low-risk patients.

"This isn't just a paradigm shift; it's a complete flip on its edge," said Janet "Gigi" Wyman, DNP, nurse practitioner and manager of the Henry Ford Center for Structural Heart Disease, who was part of the panel responding to the study results. The results were also published in the *New England Journal of Medicine*.

"When I saw news of the first TAVR ever, the medical skeptic in me thought 'This will never work,'" Dr. Wyman said. "TAVR will now eventually become the first choice for aortic valve repair and replacement for the vast majority of patients. This is going to mean a seismic shift in our approach to discussions with patients, internal operations and future planning."

Patients in the Partner 3 study had a mean age of 73-years-old and experienced symptoms of advanced aortic stenosis, including shortness of breath, chest pain, fainting or palpitations. Those who underwent TAVR were suitable for access through a blood vessel in the groin and had a low risk for complications. Patients who were frail, had a bicuspid valve or left ventricular ejection fraction of less than 30 percent, recently experienced a heart attack or had other medical issues were excluded. The patients were randomized 1:1 for surgical or catheter-based valve replacement with a SAPIEN 3 valve manufactured by Edwards LifeSciences.

One year after their procedure, approximately 8.5 percent of TAVR patients experienced death, stroke or re-hospitalization, compared to 15.1 percent of surgical patients. TAVR patients often spent less than 24 hours in the hospital then returned quickly to normal life,

compared to days of hospitalization and weeks of recuperation for those who underwent surgery.

"Although the trial for low-risk patients is complete, FDA approval is still pending for TAVR to be commercially available for low-risk patients," Wyman said.

Studies estimate about 12.4 percent of people in the United States have aortic stenosis, with 3.4 percent of those being severe and needing treatment. The Henry Ford Center for Structural Heart Disease is a leading valve repair and replacement center in the Midwest, offering the most devices, both FDA-approved and investigational, available for patients.

"With our aging population and the continued refinement of our techniques and devices, use of this technology will only continue to expand to the benefit of our patients," said Dr. Henry Kim, medical director of the Edith and Benson Ford Heart & Vascular Institute. "Bill O'Neill was prescient of this revolution in how we treat structural heart disease. Now, our large, experienced team and state-of-the-art center is poised to treat all patients in need of a new valve." William W. O'Neill, M.D., is director of the Henry Ford Center for Structural Heart Disease.



Janet Wyman,
D.N.P., R.N.-C.S.

Cath Labs and Clinics Expand

The Henry Ford Center for Structural Heart Disease includes multiple heart catheterization laboratories. These include two hybrid catheterization labs and operating rooms, or Hybrid ORs at Henry Ford Hospital; and one Hybrid OR at Henry Ford Macomb Hospital in Clinton Township.

TAVR Clinics are available at Henry Ford Macomb Hospital and Henry Ford Allegiance Hospital in Jackson - with TAVR procedures expected to be available at both hospitals with the Henry Ford team within the next few months.

Henry Ford Health System Brings Effective Arrhythmia Procedure to Macomb County

The first atrial fibrillation ablation procedure at Henry Ford Macomb Hospital was performed in December by Electrophysiologist Madar Abed, M.D. When the heart’s electrical system malfunctions and causes an irregular heartbeat, there is an increased risk of stroke or heart failure.

“With the use of advanced ablation catheters that decrease the risk of complications, we are able to perform atrial fibrillation ablation at minimal risk with excellent outcomes. In fact, ablation has become the number one choice for treatment of atrial fibrillation,” said Ali Shakir, M.D., medical director of Electrophysiology at Henry Ford Macomb Hospital. “We are pleased to provide this cutting-edge procedure to our community through the Heart & Vascular Institute at Henry Ford Macomb Hospital.”

During an ablation procedure, cardiologists access the heart through the vein in the leg. They use an electrified wire to ‘burn’ tiny areas of the heart experiencing electrical malfunction, rendering them obsolete. After the procedure, those areas no longer affect the patient’s heartbeat, so it returns to normal.

Symptoms of an atrial fibrillation generally include heart palpitations, fatigue and shortness of breath. Medication

has many potential side effects and does not cure the disease. An atrial fibrillation ablation can provide significant relief of these symptoms and a better overall quality of life.

“With technological advances, we can now correct electrical short circuits that we couldn’t just 10 years ago,” said Sam Kazziha, M.D., chief of Cardiovascular Services at Henry Ford Macomb Hospital. “Our brand-new electrophysiology lab is equipped with state-of-the-art technology, including a 3-D mapping system to accurately map the source of the atrial fibrillation and perform successful ablations.”

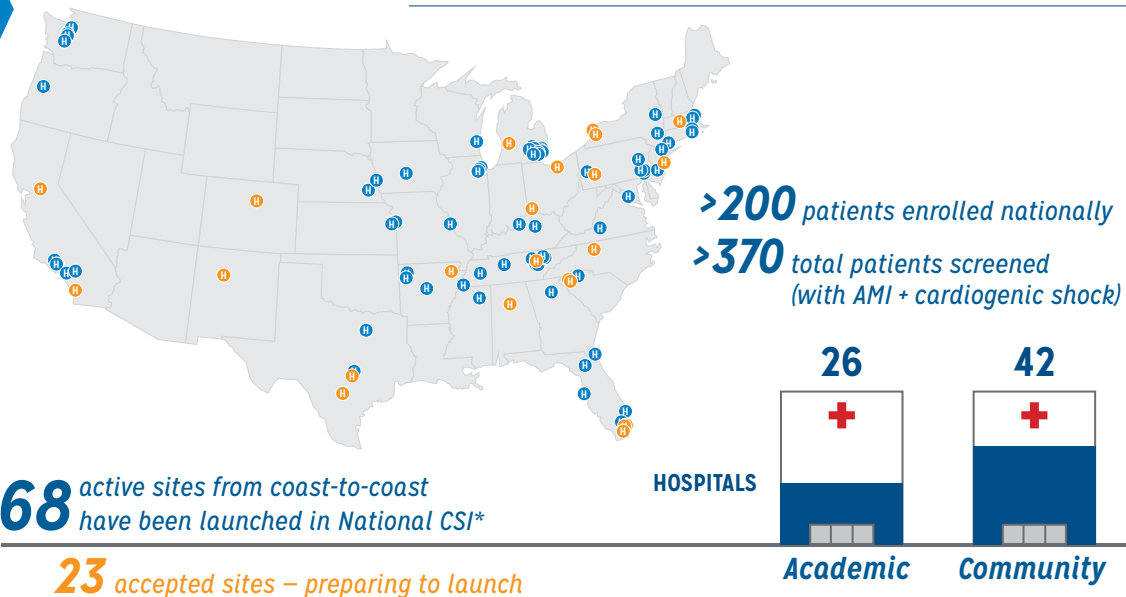
Atrial fibrillation ablation is one of a variety of electrophysiology services offered at Henry Ford Macomb. Others include pacemaker implant and cardiac defibrillator implant to prevent sudden cardiac death and treatment of congestive heart failure.

Henry Ford Macomb Hospital’s electrophysiology team of physicians include Madar Abed, M.D, Ali Shakir, M.D., and Waddah Maskoun, M.D.

To request an appointment, please call 800-532-2411.

UPDATE

NATIONAL CSI: CLINICAL SITES & ENROLLMENT



In July 2017, the National Cardiogenic Shock Initiative (National CSI) was established to move the Detroit Cardiogenic Shock Initiative to a national platform. Following a screening process, hospitals across the country have been added to the registry and receive on-site training.

William W. O’Neill, M.D., medical director of the Henry Ford Center for Structural Heart Disease, along with Cardiologist Babar Basir, D.O., provide education on the treatment protocol of acute myocardial infarction complicated by cardiogenic shock using the Impella® heart pump. Michael Hacala, RCIS, EMT-P, is the study coordinator of the National CSI. For more information, visit henryford.com/cardiogenicshock.

Cerebrovascular Injuries Associated with Blood Pressure Derangements

Primary medical management for uncomplicated acute Type B aortic dissection (ATBAD) is aggressive anti-impulse therapy. This involves reducing both heart rate and blood pressure with the goal of decreasing aortic wall shear stress. Patients with severe chronic hypertension, who may develop dysregulation of the microcirculation in organs, such as the brain, heart, and kidneys that are sensitive to broad fluctuations in systemic blood pressure, are at risk due to organ malperfusion with induction of rapid well-controlled blood pressure therapy. The incidence of cerebrovascular injury (CVI) in ATBAD ranges between three percent and seven percent.

A retrospective analysis was performed on patients who presented to Henry Ford Hospital with ATBAD between 2003 and 2012. Per the Stanford classification, ATBAD was defined as any dissection limited to the descending aorta, diagnosed by computed tomography angiography or transesophageal echocardiography. The dissection was considered acute if the time between symptom onset and presentation to the hospital was less or equal to 14 days.

A total of 112 patients were identified. The average age was 61 years; 64 percent were male, and 59 percent were African American. Twenty patients required operative intervention (14 thoracic endovascular aortic repairs and six open). CVI occurred in 13 patients (11.6 percent): nine were hypoperfusion related (six diffuse hypoxic brain injuries and three watershed infarcts), two were procedure related (both thoracic endovascular aortic repairs), one was an intracranial hemorrhage on presentation, and one was a probable embolic stroke on presentation.

30 Day mortality in CVI vs. non-CVI patients

| | Non-CVI Patients (n=99) | CVI Patients (n=13) | P value |
|------------------|-------------------------|---------------------|---------|
| 30-Day mortality | 6% | 54% | < .001 |

Blood pressure fluctuations in hypoperfusion-related CVI vs. non-CVI patients

| | Non-CVI Patients (n=99) | Hypoperfusion-CVI Patients (n=9) | P value |
|-----------|-------------------------|----------------------------------|---------|
| MAP in ED | 120 mm Hg | 142 mm Hg | .034 |
| Δ MAP | 15 mm Hg | 59 mm Hg | < .001 |

CVI patients had demographics and comorbidities comparable to those of the non-CVI patients. CVI was associated with operative intervention (54 percent vs. 13 percent; $P = .002$).

The tables indicate 30-day mortality was significantly higher in CVI patients (54 percent vs. 6 percent; $P < .001$). Patients who suffered a hypoperfusion brain injury had a higher mean arterial pressure (MAP) on presentation to the emergency department (142 mm Hg vs. 120 mm Hg; $P = .034$) and a significantly greater reduction in the Δ MAP (59 mm Hg vs. 15 mm Hg; $P < .001$) by the time they reached the intensive care unit compared with the non-CVI patients.

Conclusions drawn from this series were: CVI in ATBAD is more frequent than previously reported and is associated with increased mortality. The most common causes are related to cerebral hypoperfusion. Higher MAP on presentation and greater decline in MAP are associated risk factors for hypoperfusion-related CVI. A less aggressive approach to lowering MAP in ATBAD warrants further study in an attempt to reduce CVI in ATBAD.

“This is a study that challenges conventional wisdom,” explains Loay Kabbani, M.D., vascular surgeon at Henry Ford Hospital. “Most doctors who treat dissections want the blood pressure to be controlled quickly and brought down to a low level. What we showed was doing so increased the risk of stroke, therefore our recommendations is to bring the blood pressure down slowly.”

Key Henry Ford Hospital contributors to this study were Daniel Miller, M.D., vascular neurologist; Mitchell Weaver, M.D., vascular surgeon; and Khaled Abdul-Nour, M.D., cardiologist.

The complete study can be found in *J Vasc Surg*, Nov. 2018; 68:1308-13.

DOI: <https://doi.org/10.1016/j.jvs.2018.01.056>

For a consultation on a patient with aortic dissection, call Henry Ford Vascular Services at 313-916-3153.



Loay Kabbani, M.D.

To connect with a Henry Ford physician, call:

Heart & Vascular Institute
1-877-434-7470

Center for Structural
Heart Disease
1-855-518-5100



Heart & Vascular Institute
Henry Ford Hospital
2799 West Grand Boulevard
Detroit, MI 48202

© 2019. All rights reserved.

UPDATE

Dr. Akshay Khandelwal Named Board Chair for the American College of Cardiology

Henry Ford Cardiologist Akshay Khandelwal, M.D., was named chair of the American College of Cardiology (ACC) Board of Governors and secretary of the Board of Trustees, the main governing body of the ACC, for 2019-2020.

Dr. Khandelwal, an interventional cardiologist at Henry Ford Health System, began his term March 18, with recognition at the ACC's 68th Annual Scientific Session in New Orleans. He will lead 66 governors from chapters representing all 50 states, the District of Columbia, Puerto Rico, Canada, Mexico and the U.S. Uniformed Services.

"The ACC's chapters serve as a voice of the cardiovascular community at the local level," said Dr. Khandelwal, who sees patients at Henry Ford Hospital and Henry Ford West Bloomfield Hospital. "I am honored to do my part to help the cardiovascular community achieve our shared mission of transforming cardiovascular care and improving heart health, not just here in the United States but around the world."



Akshay Khandelwal, M.D.



AMERICAN COLLEGE of CARDIOLOGY