Welcome

From the Chair of the Department of Cardiac Surgery

It is once again with pleasure and extreme pride that the Department of Cardiac Surgery and the Samuel and Jean Frankel Cardiovascular Center (CVC) at the University of Michigan present our outcomes over this past year. Patients are referred to our center from around the country for the treatment of critical and complex heart problems. Our CVC is a leader in collaborative care for cardiovascular diseases with specialists in cardiovascular medicine, cardiac surgery, interventional radiology, vascular surgery, critical care, and cardiac anesthesia. Our patients receive the finest treatment whether it is for complex heart disease or more common cardiac care – because there is nothing routine about cardiac care.

Over the past year alone our surgeons at the CVC, Mott Children’s and Women’s Hospital, and Ann Arbor VA Hospital have performed over 2,500 operations involving the heart and great vessels with a mortality rate well below national figures. As the specialty of cardiac surgery continues to evolve and our healthcare system prepares to meet the challenges inherent in health care reform, we feel it is important to provide you with this summary of our adult cardiac surgical outcomes. Our volume of ventricular assist device implantations, aortic and mitral valve surgeries, and the treatment of complex diseases of the aorta continue to increase. In addition, the use of minimally invasive valve techniques has grown substantially and we are now one of the busiest centers for percutaneous aortic valve implantation in Michigan and one of the busiest in the nation. Thanks to the collaboration of the many specialty teams in the University of Michigan’s Frankel Cardiovascular Center, we believe our paradigm of care is the optimal model for success both now and in the future, providing the most appropriate care for our patients.

Timely reporting and transparency remain an important responsibility of ours and we hope you find this update valuable to you and your patients.

Edward L. Bove, MD
Helen and Marvin Kirsh Professor of Surgery
Chair, Department of Cardiac Surgery
Overview

From the Section Head of Adult Cardiac Surgery

As cardiac surgery continues to advance, U-M’s Section of Adult Cardiac Surgery is playing a major role in the evolution of diagnoses and treatments for cardiac and thoracic aortic diseases. The Section and the Frankel Cardiovascular Center continue to focus on achieving the finest outcomes and the most appropriate treatment for your patients.

With a collaborative and established “Heart Team,” our Transcatheter Valve Program is recognized throughout the country for its thoughtful approach and outstanding results. Our operative treatment of valvular heart disease focuses on valve replacement and repair with valve preservation techniques through a standard, minimally invasive, or thoracotomy approach. This collaborative approach extends to treatment decisions for hypertrophic obstructive cardiomyopathy combining the expertise of our cardiologists, researchers, geneticists, and the operative expertise of our surgical team. Furthermore, our complex aortic surgical program includes both open and endovascular approaches for the ascending aorta, arch and descending and thoracoabdominal pathologies. Our role in cardiac transplantation and temporary as well as permanent assist devices for circulatory support continues to expand and offers patients and institutions throughout the region evaluation opportunities.

Our established program in the treatment of atrial and ventricular arrhythmias through standard, as well as minimally invasive approaches, allows us to provide hybrid therapies in concert with our electrophysiologists. The complex arena of pulmonary thromboendarterectomy continues to evolve at the Frankel Cardiovascular Center utilizing a team approach with our experts in pulmonary hypertension.

Procedure Distribution 2013
as well as our adult cardiac surgeons. Also utilizing the expertise of our “Heart Team” surgeons and interventionalists, we review complex ischemic heart disease patients to offer the most appropriate treatment to this group of patients.

Our tripartite mission of excellence in clinical care, education and research continues. Last year we launched our integrated six-year residency program to educate the future cardiac surgeons. At the same time we are continuing our standard two-year fellowship program which started here in 1928.

Our research arena also continues to expand and is focused on myocardial cellular dysfunction and cellular approaches for vascular, valvular and cardiac dysfunction.

Our commitment to your patients during this time of technological evolution remains our foremost goal. With our new Section of Health Services Research and Quality, we are committed to ongoing evaluation of all our outcomes, facilitating and providing the most compassionate and appropriate care for your patients.
Ischemic Heart Disease

We collaborate with our cardiologists to determine optimal treatment for patients with cardiovascular disease, whether by medical or interventional approaches. Although the number of patients considered for CABG has declined, their risks and co-morbidities have increased. Despite this, mortality at U-M for CABG is 1% for the last 5 years, significantly below the national benchmarks.

Valve Surgery

Overview

The University of Michigan continues to be a regional and national leader in valve surgery.

2013 Valve Distribution

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Valve Only</td>
<td>63%</td>
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<tr>
<td>Combined Valve</td>
<td>37%</td>
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<tr>
<td>CABG + Valve</td>
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<tr>
<td>CABG + Valve + Aortic</td>
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<tr>
<td>Aortic + Valve</td>
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2013 Primary vs. Redo Valve Distribution

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Primary</td>
<td>74%</td>
</tr>
<tr>
<td>Redo</td>
<td>26%</td>
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Aortic Valve Surgery

We maintain one of the largest practices nationally for patients with aortic valve disease and continue to be a leader nationally and internationally in the breadth and quality of care for patients with this disease. Our team offers patients complex aortic valve operations, including valve sparing approaches, stentless valves, and combined aortic valve and thoracic aortic aneurysm surgery. Our program has a three star rating by the Society of Thoracic Surgeons for isolated AVR morbidity and mortality. We are now pleased to offer new clinical trials of the latest advances in aortic valve therapy. Not only is a catheter-based TAVR option available (see page 6), but we are excited to be participating in an FDA-sponsored clinical trial for a new sutureless aortic valve (the TRANSFORM trial). This new valve is a combination of a frequently used Edwards pericardial valve which is now mounted on a metal stent frame. The stent frame is similar to that used in the TAVR Edwards Sapien valve, and allows us to anchor the prosthetic valve into position without sutures. The potential advantages of this valve include dramatically reduced aortic cross clamp and cardiopulmonary bypass times.

2013 Aortic Valve Implant Type Distribution

- **Stentless Tissue**: 19%
- **Stented Tissue**: 51%
- **Mechanical**: 5%
- **TAVR**: 25%

**Aortic Valve Distribution**

Note: excludes TAVR

- **AVR**
- **TAVR**
- **Repairs / Resuspensions**
- **Valve Sparing Roots**

14 of 1466 AVRs performed over the last five years were Apico-aortic conduit procedures
**Mitral Valve Surgery**

The U-M continues to have one of the largest mitral valve experiences in the country. Our team’s extensive experience in the operating room is a direct result of high procedure volumes, which translates into better outcomes for patients overall. This experience, coupled with our dedicated multi-disciplinary team approach, has resulted in a 99.4% repair rate over the last 5 years for patients with degenerative mitral valve disease and an overall repair rate of 75%. We have taken a leadership role in understanding indications and opportunities for patients with mitral valve disease including the treatment of mitral regurgitation associated with heart failure from both dilated and ischemic cardiomyopathies.

**2013 Mitral Valve Procedure Distribution**

- Repair: 75%
- Replacement: 25%

**2013 Operative Mortality 3.5%**

**TAVR Valve Options**

The TAVR Program offers both the FDA-approved Edwards Sapien Heart Valve and the Medtronic CoreValve FDA-sponsored clinical trial. These add to our treatment options for patients with severe aortic stenosis resulting in an improved quality of life. We are able to offer options for patients who are considered too high risk for conventional AVR, as well as those who are considered both high and intermediate risk for mortality and morbidity after conventional AVR. This unique program is structured with a heart team consisting of cardiac surgeons and interventional cardiologists with years of surgical and catheter-based experience. Working together, this team is able to provide many options to patients including conventional AVR and transcatheter AVR.
Aortic Disease

The U-M Aortic Program offers innovative treatments and has one of the lowest mortality rates in the country. This multi-disciplinary team of physicians from 6 different specialties collaborates to treat all types of aortic disease including: aortic valve disease, bicuspid aortic valve, thoracic aneurysms (including ascending, arch and descending), aortic dissection, and aortic related connective tissue disorders. Our surgeons continue to maintain one of the largest aortic practices in the U.S. and offer medical management, open surgical options, and endovascular repair of the aorta.

TEVAR

Thoracic Endovascular Aortic Repair (TEVAR) has emerged as a true alternative to open surgery for many patients suffering from diseases of the thoracic aorta. It is a life-saving option for some patients who are not optimal candidates for traditional open repair, and an important less invasive alternative for patients who are candidates for open surgery. These procedures may have less perioperative risk and can shorten hospital stays and recovery periods. Our surgeons have close to two decades of experience performing TEVAR, and maintain one of the largest practices in the U.S. for these procedures.
Heart Failure

Cardiac Transplantation

The U-M Cardiac Transplant Program is the leading cardiac transplant center in Michigan and the second largest program in the Midwest region (Illinois, Indiana, Ohio, and Michigan)*. The U-M program performs on average between 30-35 adult and 5-9 pediatric heart transplants each year. In addition, we have performed over 11 multi-organ transplants. The U-M heart transplant surgeons have performed over 900 adult and pediatric heart transplants since 1984. As a high volume and experienced center, we offer the multi-disciplinary care required to manage the complex patient population with a 3-year post transplant survival of 87% compared to an expected survival of 82%**. Over the past 5 years the operative mortality (30 day mortality) for this group of patients has been only 1.9%.

*SRTR data 7/06-12/08, **UNOS OPTN Data 2012

Extracorporeal Membrane Oxygenation (ECMO)

The University of Michigan has the largest ECMO experience in the world, and frequently hosts visitors from around the globe for education and training. Our team is capable of instituting ECMO within minutes or, under special circumstances, traveling to referring institutions to initiate ECMO for a safer transport to our center.

Hypertrophic Cardiomyopathy

The U-M has one of the few dedicated clinics and is a leader in the United States in the diagnosis and treatment of hypertrophic and other inherited cardiomyopathies. Septal myectomy is often a treatment option, improving symptoms in over 90% of patients.

The Center for Circulatory Support/VAD

The Center for Circulatory Support at U-M is one of only a few programs in the country with access to many investigational and FDA-approved VADs. With one of the largest VAD programs in the U.S., we implanted 51 long-term VADs in 2013 and are following more than 130 as long-term outpatients. Our VAD program was also recertified by the Joint Commission in the Disease Specific Care Certification for Advanced Ventricular Assist Devices.

The Ventricular Assist Device Program is managing more than 130 patients long-term at home with their devices.

Heart Transplant Volume

Extracorporeal Membrane Oxygenation (ECMO)

Adult ECMO Volume

Year | Cases
--- | ---
2012 | 26
2013 | 22

5 Year Average Operative Mortality 1.9%

Pediatric Cases

Septal Myectomy Volume

19 of the 34 myectomies performed in 2013 were for a diagnosis of Hypertrophic Obstructive Cardiomyopathy (HOCM)
This registry, called Perfusion Measures and Outcomes (PERForm), is linked with surgical data to provide an effective evaluation of the care and outcomes of our cardiac surgical patients. The PERForm registry is being utilized by cardiac surgical programs within and outside of the state of Michigan.

The Department of Cardiac Surgery at the University of Michigan continues to discover new treatments for our patients with acquired and congenital cardiovascular disease. It is our goal to set a standard which cardiac teams everywhere will strive to emulate. The establishment of a distinct Section to evaluate clinical outcomes, discover new treatments, and set health policy in cardiac care is a concerted effort towards that goal. The knowledge learned from these and other novel studies under Dr. Likosky’s leadership will improve the care of patients around the globe undergoing cardiac interventions.

Section of Health Services Research and Quality

The Department of Cardiac Surgery has developed a newly formed Section of Health Services Research and Quality. The Department recruited Dr. Donald Likosky to lead this Section, bringing his nationally regarded expertise investigating the source and consequence of variation in the surgical treatment of heart disease. He will lead efforts to evaluate traditional and novel therapies as well as approaches to the development and implementation of best practices. Dr. Likosky’s work, primarily within the context of regional and national quality improvement organizations, has created new insight into the patterns and consequences of care and reducing unwarranted variation in practices. Using this experience, he has recently developed a novel cardiovascular quality collaborative, the National Cardiac Surgery Quality IMPROVEment (IMPROMO) Network, that seeks to enhance the value of cardiovascular surgical care by developing, evaluating, and sharing best practice knowledge gained from quality improvement projects across the member organizations. He additionally has created a new cardiovascular perfusion registry that links surgical data with data elements reflecting technology and processes of cardiovascular perfusion care.

COAPT Trial/MitraClip

U-M is enrolling patients in the COAPT Trial (Clinical Outcomes Assessment of the MitraClip Percutaneous Therapy for Extremely High-Surgical-Risk Patients). This trial is a multi-center study that will examine the safety and efficacy of percutaneous mitral valve repair using the MitraClip device in addition to standard care for mitral regurgitation and heart failure (device group) compared to treatment with standard care alone (control group).

The COAPT Trial targets patients who have symptomatic functional mitral regurgitation (>3+) due to cardiomyopathy of either ischemic or non-ischemic etiology that could require mitral valve repair or replacement surgery but are not optimal surgical candidates, are NYHA Class II to ambulatory Class IV and have an ejection fraction > 20%.

SURTAVI

U-M is now enrolling patients in the Medtronic SURTAVI trial which is evaluating the CoreValve transcatheter aortic valve in patients at intermediate risk for open AVR. Selection of the intermediate risk patient will be based on the STS mortality risk.
Quality and Safety

Cardiac Surgery at the University of Michigan is committed to providing the highest quality and the safest patient care. Our multi-disciplinary team sets quality goals and empowers clinical areas to work on improvements for better patient care.

We continue work on blood conservation techniques to reduce a patient’s exposure to blood products. Team communication with a brief and debrief during operative procedures has led to increased understanding of conservation goals and transfusion triggers. The surgical teams are committed to collaboration and all team members have received formal group medical team training (MTT).

Patient and Family-Centered Care

We believe providing the ideal patient care experience stems from a partnership between patients, their families, and physicians and staff. The Frankel Cardiovascular Center created a patient and family-centered care program (PFCC) to partner with patients and families by giving them a voice in order to improve care for all patients and family members.
Research
### Research Highlights Fiscal Year 2013

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<thead>
<tr>
<th>Faculty</th>
<th>Sponsor</th>
<th>Project Title</th>
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<tr>
<td><strong>Steven F. Bolling</strong>&lt;br&gt;Estech</td>
<td><strong>Ablation for the Treatment of Concomitant Atrial Fibrillation in Non-Paroxysmal Patients (ATTAC-AF)</strong>&lt;br&gt;AtriCure, Inc.</td>
<td>Clinical Outcomes Assessment of the MitraClip Percutaneous Therapy for High Surgical Risk Patients (The COAPT Trial)</td>
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<td><strong>Edwards Lifesciences</strong>&lt;br&gt;Medtronic, Inc.</td>
<td><strong>Maga Contour 3D Tricuspid Annuloplasty Ring</strong>&lt;br&gt;Cherry Marketing Institute</td>
<td>Protective Mechanisms of Cherry Intake on Gout-Like Flare Initiation and Propagation</td>
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<td><strong>Y. Eugene Chen</strong>&lt;br&gt;NH R01HL117491</td>
<td><strong>CTEF and HDL Function in Cardiovascular Diseases</strong>&lt;br&gt;NH R01HL114038</td>
<td>Regenerating Blood Vessels Using iPS Cells</td>
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<td><strong>Medtronic, Inc.</strong>&lt;br&gt;NH R01HL068878</td>
<td><strong>PPAR-gamma and Vascular Lesion Formation</strong>&lt;br&gt;NH R01HL105114</td>
<td>Nitro-Fatty Acids and Nrf2 in Vascular Remodeling</td>
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<td><strong>G. Michael Deeb</strong>&lt;br&gt;Medtronic, Inc.</td>
<td><strong>Medtronic CoreValve U.S. Pivotal Trial</strong>&lt;br&gt;Medtronic, Inc.</td>
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<td><strong>Medtronic, Inc.</strong>&lt;br&gt;Medtronic, Inc.</td>
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<td><strong>Medtronic CoreValve Continued Access Study (Extreme Risk Patients)</strong>&lt;br&gt;Medtronic, Inc.</td>
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<td><strong>Himanshu J. Patel</strong>&lt;br&gt;Edwards Lifesciences</td>
<td><strong>Multi-Center Experience With the Rapid Deployment EDWARDS INTUITY Valve System FOR Aortic Valve ReplaceMent (TRANSFORM Trial)</strong>&lt;br&gt;Cook Group, Inc.</td>
<td>Zenith TX2 TAA Endovascular Graft Post-Approval Study&lt;br&gt;Gore, W. L. &amp; Associates, Inc.</td>
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<td><strong>Richard L. Prager</strong>&lt;br&gt;AHRQ 1 R01 HS 022535 01</td>
<td><strong>Optimizing Prevention of Healthcare-Acquired Infections After Cardiac Surgery</strong>&lt;br&gt;AHRQ 1 R01 HS 022535 01</td>
<td>Evaluation of the GORE TAG Thoracic Branch Endoprosthesis in the Treatment of Proximal Descending Thoracic Aortic Aneurysms&lt;br&gt;AHRQ 1 R01 HS 022535 01</td>
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<td><strong>Zhong Wang</strong>&lt;br&gt;NH 7 R01 HL 109864 02</td>
<td><strong>Epigenetic Control of Multipotent Cardiac Progenitor Cell Differentiation</strong>&lt;br&gt;NIH 7 R01 HL 109864 02</td>
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<td><strong>Bo Yang</strong>&lt;br&gt;AATS Graham Foundation</td>
<td><strong>Modeling the Smooth Muscle Dysfunction by Creating NOTCH1 Mutation in Human Induced Pluripotent Stem (iPS) Cells</strong>&lt;br&gt;NIH 7 R01 HL 109864 02</td>
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SELECT PUBLICATIONS 2012-2013


Edward L. Bove, MD

Dr. Edward L. Bove is a Professor in the Department of Cardiac Surgery and an internationally recognized expert in the treatment of complex congenital heart disease. He received his undergraduate degree from Holy Cross College and his medical degree from Albany Medical College, completing his training in general and cardiothoracic surgery at the University of Michigan and the Hospital for Sick Children in London. Dr. Bove joined the faculty at the University of Michigan in 1985 as the director of the Division of Pediatric Cardiovascular Surgery. Dr. Bove became head of the Section of Cardiac Surgery in 1999 and the first Helen and Marvin Kirsh Professor of Surgery in 2005. He became the first Chairman of the Department of Cardiac Surgery in 2012.

Dr. Bove has received support for his research from the American Heart Association; the National Heart, Lung and Blood Institute; the National Institutes of Health; and the Leducq Foundation. He has been honored by the Alumni Association at Albany Medical College and has received the S.M. Perren Award from the European Society of Biomechanics. He has held a number of named lectureships here and abroad and has served on numerous councils and committees including the American Heart Association, the Society of Thoracic Surgeons, the American Association for Thoracic Surgery, and the American Board of Thoracic Surgery. Dr. Bove serves on a number of editorial boards, has published over 300 articles, as well as book chapters and edited two textbooks.

Richard L. Prager, MD

Dr. Richard L. Prager is a Professor of Cardiac Surgery. He received his undergraduate degree from the University of Pennsylvania in Philadelphia and completed medical school at the State University of New York, Downstate in Brooklyn, New York in 1971. His general surgical and thoracic surgical training were completed at the University of Michigan in 1978.

He began his career at Vanderbilt University, Nashville, Tennessee as an Assistant Professor in the Department of Cardiac and Thoracic Surgery in 1978 with interests in adult cardiac, as well as general thoracic surgery. He returned to Ann Arbor in 1983 and joined the Cardiac and Thoracic Surgical Group at St. Joseph Mercy Hospital. During this time, St. Joseph Mercy Hospital was selected a HCFA demonstration hospital for coronary artery bypass and Dr. Prager was the Medical Director of this project. Over the ensuing years, he became the Associate Head of the Department of Surgery, Head of the Section of Cardiac and Thoracic Surgery and the Medical Director of the Mercy Health Services Cardiovascular Network. In 1999, he moved to the University of Michigan as a Professor of Surgery and Head, Section of Adult Cardiac Surgery with ongoing interests in adult cardiac surgery, health outcomes research, patient safety, organizational efficiencies, and education.

Dr. Prager leads the Michigan Society of Thoracic and Cardiovascular Surgeons Quality Collaborative Initiative and is Chair of the Society of Thoracic Surgeons Council on Quality, Research and Patient Safety. He is a Director of the Frankel Cardiovascular Center and recently assumed the role of Program Director of the Thoracic Surgery residency. He is the 2014 President of the Southern Thoracic Surgical Association.
Alvise F. Bernabei, MD

Dr. Alvise F. Bernabei is an Assistant Professor of Surgery in the Department of Cardiac Surgery at the University of Michigan. He obtained his medical degree and general surgery training from Wayne State University School of Medicine. He completed his Cardiothoracic Surgery residency, Thoracic Transplant/Aortic Surgery Fellowship, and Research at the University of Pennsylvania.

Dr. Bernabei began his surgical career as the Assistant Chief of Cardiothoracic Surgery at Cook County Hospital and Director of Lung Transplantation at the Rush Presbyterian St. Luke's Medical Center in Chicago. Dr. Bernabei returned to Detroit as the Director of Thoracic Aortic Surgery and Thoracic Transplantation of Henry Ford Health System.

Dr. Bernabei practices at Crittenton Hospital in Rochester, Michigan. His past clinical practice has encompassed the full spectrum of adult cardiovascular and thoracic surgery including extensive experience with thoracic transplantation, left ventricular assist devices, aneurysms, and dissections. His current clinical focus is on valve repair or replacement, coronary artery bypass, minimally invasive atrial fibrillation ablation, and lung cancer surgery.

He is a member of the Society of Thoracic Surgeons.

Steven F. Bolling, MD

Dr. Steven F. Bolling is a Professor of Surgery in the Department of Cardiac Surgery at the University of Michigan. Both his undergraduate and medical school education were completed at the University of Michigan. Following this, he trained in general and thoracic surgery at Johns Hopkins.

He joined the Cardiac Surgery faculty at the University of Michigan in 1986 and helped create and direct the multi-disciplinary mitral valve clinic. He is an active participant in all the major cardiac surgical societies and a recognized expert in mitral valve surgery. He is the author of over 350 peer-reviewed publications and holds numerous grants, including NIH, AHA, and industry grants.

He is the Director of the Myocellular Biology Laboratory. His research is in the molecular biology of heart failure, with a special interest in myocyte signal transduction.

G. Michael Deeb, MD

Dr. G. Michael Deeb is a Professor in the Department of Cardiac Surgery. He completed General Surgery at the University of Pittsburgh in 1980 and his Thoracic Surgery and transplantation residency at the University of Pittsburgh in 1982. Dr. Deeb’s academic career started at Temple University Hospital as an Assistant Professor of Surgery where he established the heart and lung transplantation program.

In 1986 he moved to the University of Michigan and became the Director of the Heart Transplant Program, and established the Lung Transplant and Artificial Devices Programs. He was the first surgeon to successfully perform a heart/lung transplant, single and double lung transplant and insert a total artificial heart and an implantable mechanical assist device in the State of Michigan. In 1990, he was appointed Director of the Adult Cardiac Surgery Service at the University of Michigan Medical Center. He established the aortic program at the University of Michigan in 1995 and was instrumental in the formation of IRAD, an international registry of aortic diseases at the University of Michigan. In 1996 he was appointed the Director of the Multi-disciplinary Aortic Clinic and Co-Director of the Heart Care Program at the University of Michigan. In 2004, Dr. Deeb was installed as the first Herbert Sloan Collegiate Professor of Cardiac Surgery. In 2007, University of Michigan Medical School awarded him the Dean’s Award for Outstanding Clinician.

He is active in all cardiac surgical professional societies. His clinical interests include adult cardiac surgery with emphasis on aortic valve disease, and thoracic aortic disease including aortic aneurysm and dissection.

Y. Eugene Chen, MD, PhD

Dr. Eugene Chen is the endowed Frederick Huetwell Professor of Cardiovascular Medicine and the Vice-Chair for Basic and Translational Research in the Department of Cardiac Surgery. The long-term goal of Dr. Chen’s research program in vascular medicine is elucidating the molecular basis of obesity/diabetes-induced cardiovascular diseases (CVD) and stroke, and developing new drugs/technologies to study and treat diabetes and CVD.

Dr. Chen is the Director of the Center for Advanced Models for Translational Sciences and Therapeutics (CAMTraST). CAMTraST researchers produce gene knockout and knockin transgenic animals in non-rodent species (e.g. rabbits and pigs) using advanced technologies such as Zinc Finger Nuclease (ZFN), Transcription Activator-Like Effector Nuclease (TALEN), and Somatic Cell Nuclear Transfer (SCNT). CAMTraST also has the technology platform for Embryonic Stem Cells (ESC) and Induced Pluripotent Stem Cells (iPSC). He has significant support through multiple NIH grants and has over 120 publications.
Frank L. Fazzalari, MD

Dr. Frank L. Fazzalari is an Assistant Professor of Cardiac Surgery at the University of Michigan. He established and is Director of the University of Michigan Cardiac Surgery Program at Crittenton Hospital in Rochester, Michigan.

Dr. Fazzalari attended the University of Michigan, completing his B.S. studies in 1986. He received his medical degree from the University of Michigan Medical School in 1990, and completed his General Surgery residency at the University of Michigan Hospitals in 1996. During that time, his laboratory and clinical research interests included heart and lung failure and support systems. He completed a Critical Care Fellowship as well as an ECLS/ECMO Fellowship at the University of Michigan.

He completed his Cardiothoracic Surgery residency at Michigan General Hospital/Johns Hopkins University in 1998. He also holds a Master of Business Administration degree with distinction from the University of Michigan Ross School of Business.

Dr. Fazzalari’s interests include adult cardiovascular and thoracic surgery. His current research interests are focused on the economics of health care delivery. He serves on the Michigan Society of Thoracic and Cardiovascular Surgeons Quality Committee. He is a fellow in the American College of Surgeons, a member of the Society of Thoracic Surgeons, the American Heart Association, and the Harvard Club of New York.

Jonathan W. Haft, MD

Dr. Jonathan W. Haft is an Associate Professor of Cardiac Surgery and Anesthesia at the University of Michigan. He is Board Certified in General Surgery, Cardiothoracic Surgery, and Surgical Critical Care. His clinical interests include adult cardiac surgery, mechanical circulatory support, heart transplantation, critical care and Extracorporeal Membrane Oxygenation (ECMO).

Since 2005, he has been the director of Michigan’s ECMO program, which provides support for approximately 100 patients per year. He is also the Associate Director of the Cardiovascular Center Intensive Care unit. He serves on the Advisory Board for the International Society of Cardiothoracic Surgical Critical Care and is on the Board of Directors of the American Society of Artificial Internal Organs. His clinical research relates to mechanical circulatory support and heart transplantation, and his basic research interests relate to the development of novel technology for extracorporeal life support. In 2010 he was appointed Chief of the Cardiothoracic Surgery Service at the Veterans Administration Ann Arbor Health System.

He is the principal investigator on an NIH funded project to develop a novel ventricular assist device, and is the co-investigator on an NIH funded grant related to development of an implantable artificial lung.

Donald S. Likosky, PhD

Dr. Donald S. Likosky is an Associate Professor in the Department of Cardiac Surgery at the University of Michigan, and the Section Head of Health Services Research and Quality. He is also a faculty member at the Center for Healthcare Outcomes and Policy. He is the Director of the International Consortium for Evidence-Based Perfusion (ICEBP), and the Research Director for the PERFusion Measures and Outcomes (PERFom) registry, a cardiovascular perfusion registry.

Dr. Likosky’s primary research interest is in improving neurological outcome of cardiac surgery. His previous work has focused on quantifying a patient’s risk of stroke secondary to CABG surgery as well as identifying the principal mechanism of these strokes. Current work focuses on: (1) reducing neurological injury secondary to cardiac surgery by identifying opportunities for redesigning intra- and post-operative processes of clinical care; (2) understanding the relationship between technical and non-technical skills and their impact on clinical outcomes; and (3) assessment and diffusion of new technologies into clinical practices. He is the principal investigator on an R01 through the Agency for Healthcare Research and Quality focused on reducing healthcare acquired infections.

Dr. Likosky has published in and outside of cardiac surgery, is a Fellow of the American Heart Association, and participates in numerous professional committees of the American Heart Association and Society of Thoracic Surgeons.

Mahender Macha, MD, FACS

Dr. Mahender Macha is an Associate Professor of Cardiac Surgery. He completed both his undergraduate education and his medical school at the University of Michigan. His general surgery residency was at the University of Pittsburgh and his cardiothoracic training at Stanford University. He began his career as an Assistant Professor of Surgery in the Division of Cardiothoracic Surgery at Temple University, and moved to the University of Michigan’s program at Allegiance Health in Jackson, Michigan in 2007.

His clinical interests are in adult cardiac surgery, heart failure and ventricular assist devices, and his research interests parallel his clinical interests with publications in the area of gene transfer and stem cell delivery in the settings of myocardial compromise.
Vincent A. Simonetti, MD

Dr. Vincent A. Simonetti is an Assistant Professor of Surgery, specializing in adult heart surgery and practicing at the University of Michigan’s Cardiac Surgery program at Allegiance Health System in Jackson, Michigan.

Dr. Simonetti completed his training in cardiothoracic surgery at Wayne State University School of Medicine and The Detroit Medical Center and spent an additional year as a clinical and research fellow in Cardiopulmonary Transplantation at Henry Ford Hospital. He held positions in New Jersey and Pennsylvania before returning to Michigan in 2007.

Francis D. Pagani, MD, PhD

Dr. Francis D. Pagani earned his MD and PhD at Georgetown University. Following his Thoracic Surgery residency at U-M, he joined the faculty here in 1995. He was named the Otto Gago Professor of Cardiac Surgery in 2008. He is the Surgical Director of the University Michigan’s Heart Transplant Program and the Surgical Director for the Center for Circulatory Support.

Dr. Pagani’s clinical expertise includes treatment of hypertrophic cardiomyopathies, valvular heart disease, heart transplantation and mechanical circulatory support. His research focuses on the use of mechanical circulatory support in the treatment of advanced heart disease and the use of stem cell transplantation for myocardial regeneration.

Dr. Pagani is a Co-Principal Investigator of the NIH funded REVIVE-IT trial. He is active in national societies and serves on several committees including the Journal of Heart and Lung Transplantation as an Editorial Board Consultant, the International Society for Heart and Lung Transplantation Board of Directors, and the Society of Thoracic Surgeons as Chairman for the Workforce on Surgical Treatment of End-Stage Cardiopulmonary Disease.

Himanshu J. Patel, MD

Dr. Himanshu J. Patel is an Associate Professor of Cardiac Surgery. He received his undergraduate degree at The Johns Hopkins University in 1988 where he completed medical school in 1993. His general surgery training was completed at University of Rochester School of Medicine, Strong Memorial Hospital in Rochester New York in 2000 and his Thoracic Surgery residency was completed at the University of Michigan Hospital in Ann Arbor, Michigan in 2002. He then completed a fellowship in Thoracic Transplantation/Adult Cardiac Surgery and joined the faculty as an Assistant Professor of Surgery in 2003 at the University of Michigan. From 2004 to 2010 he was Chief of the Cardiothoracic Surgery Service at the Veterans Administration Ann Arbor Health System. He also completed an Endovascular Surgery Fellowship at the Cleveland Clinic in 2005.

His clinical interests include the field of adult cardiac surgery with emphasis on aortic valve disease including both open and percutaneous approaches, thoracic aortic disease including aortic aneurysms, and thoracic aortic endovascular surgery. His research interests revolve around outcomes of open and endovascular aortic procedures and he is a member of all major cardiac surgical societies.

Matthew A. Romano, MD

Dr. Matthew A. Romano is an Assistant Professor of Cardiac Surgery and the Assistant Director of the multi-disciplinary Mitral Valve Clinic. He joined the faculty in 2009 following the completion of thoracic surgery and surgical critical care residencies at the University of Michigan. He received additional advanced training in the surgical treatment of complex valvular heart disease and heart transplantation. His clinical interests and expertise include minimally invasive valve surgery, atrial fibrillation, percutaneous and catheter-based valve therapies, and heart failure.

His research is focused on mitral valve disease, atrial fibrillation and heart failure, and the short-term and long-term outcomes of operative approaches for patients with these problems.
Margaret V. Westfall, PhD

Dr. Margaret V. Westfall is an Associate Professor of Cardiac Surgery and Associate Professor of Molecular and Integrative Physiology with an appointment in Biomedical Engineering. Her undergraduate education was at Colorado College, she earned an MS at the University of Montana and a PhD from Loyola University Stritch School of Medicine in Chicago.

Her research interests include the influence of troponin I phosphorylation by protein kinase C on contractile function in failing and non-failing hearts, as well as protein expression in failing human hearts. Both of these areas received NIH funding.

She is on the editorial boards of the American Journal of Physiology Heart and Circulation and the Journal of Molecular and Cellular Cardiology, and is an active member of the Basic Science Research Collaborative team at the University of Michigan Cardiovascular Center.

Zhong Wang, PhD

Dr. Zhong Wang is an Assistant Professor and Principal Investigator in the Department of Cardiac Surgery and the Cardiovascular Research Center, University of Michigan. He obtained his PhD from the Oregon Health and Science University and did his postdoctoral training at the University of California, Berkeley. He was a Principal Investigator at Massachusetts General Hospital, Harvard Medical School and Harvard Stem Cell Institute before he moved to Ann Arbor and is principal investigator on an NIH grant.

The Wang laboratory is focusing on two research areas. One research interest is to dissect how epigenetic events determine stem cell self-renewal and differentiation. In particular, deciphering the molecular mechanisms guiding directed differentiation of stem cells into desired mature cell types in heart. The other research focus is to explore novel strategies in producing cardiac stem cells and cardiomyocytes from both patients and animal models and assessing the therapeutic potential of these cells in large animal models.

Bo Yang, MD, PhD

Dr. Bo Yang joined the University of Michigan as an Assistant Professor of Cardiac Surgery in 2011. He received his general surgery training at the University of Arizona and his cardiothoracic training at Stanford University. His clinical interests and expertise span the range of complex adult cardiac surgical procedures, including aortic surgery (valve sparing aortic root replacement, repair of aortic dissections and aneurysms, and thoracoabdominal aneurysms), heart valve repair and replacement, and coronary artery disease.

Dr. Yang’s research interests currently focus on patient-specific tissue-engineered vascular grafts or conduits utilizing induced pluripotent stem cells (iPSCs), as well as an additional focus on the mechanisms of aneurysm formation using patients’ iPSCs to model aortic aneurysms. He has an active research lab investigating these issues.
The Veterans Administration Ann Arbor Healthcare System provides care to nearly 22,000 veterans in Southeast Michigan and Northwest Ohio. The VA Hospital offers numerous specialty care programs, including a cardiac care center. It also has a comprehensive research program in many areas of study, including cardiovascular disease. As a teaching facility, the VA Hospital provides training to more than 1100 students and health care professionals each year. The University of Michigan’s Cardiac Surgery faculty operate at the Ann Arbor VA where nearly 200 cardiac operations are performed each year.

The University of Michigan Health System (UMHS) delivers cutting edge research and premier patient care. U-M is ranked among the best in the nation by U.S. News and World Report in a broad range of adult and pediatric specialties. In recent years, UMHS has received a number of top quality honors from organizations including the Leapfrog Group, Thomson Reuters, AARP and the American Hospital Association.

Allegiance is a community-owned and locally-governed health system that has served the Jackson community and surrounding counties since 1918. The Allegiance Heart and Vascular Center has partnered with the University of Michigan to provide high quality cardiac surgery and features a Cardiac Universal Bed Unit designed to create a healing environment and to emphasize patient comfort and family privacy as much as to incorporate modern technology. The Center has a strong emphasis on innovation and measuring and reporting outcomes.

Crittenton Hospital Medical Center offers the communities of Oakland, Macomb, and Lapeer counties the highest quality cardiac surgery. Since first opening its doors in 1967, Crittenton has taken pride in enhancing the health status of the community it serves by offering compassionate, quality medical care. The unique partnership with the Department of Cardiac Surgery at the University of Michigan allows Crittenton Hospital to offer a comprehensive cardiac surgical program.

The University of Michigan’s commitment to care is not limited to our local community. From collaborative outreach and shared surgical services, U-M faculty members work in conjunction with physicians and researchers at partner institutions to create a network of innovation, communication, and education.

Allegiance Health
Jackson, MI

Crittenton Hospital Medical Center
Rochester, MI

University of Michigan Health System
Ann Arbor, MI

The Veterans Administration Ann Arbor Healthcare System
Ann Arbor, MI
Transfers/Referrals
Appointments

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