For more information about the Bluhm Cardiovascular Institute, visit heart.nmh.org.
To our Colleagues and Patients

We are proud to share the Clinical Activities and Outcomes Report from Northwestern Memorial Hospital’s Bluhm Cardiovascular Institute. This report highlights many aspects of our performance for 2008 and we hope that it will serve as a valuable resource for you.

At the Bluhm Cardiovascular Institute, we evaluate our clinical outcomes so that we can fully understand how our treatments and procedures benefit our patients. We offer the latest advances in cardiovascular care including innovative treatment, promising research and multidisciplinary support. We regularly review and evaluate our clinical outcomes and, based on the results, develop methods to monitor and improve the healthcare we offer to our heart and vascular patients.

Our clinical excellence, comprehensive programs and superior clinical outcomes have again been recognized at the national level. U.S. News & World Report ranks our Heart and Heart Surgery program among the nation’s best and as the highest-ranked program in Illinois.

Throughout this report, we share stories from many of the patients who have been referred to us for specialized care and treatment. Close cooperation with referring physicians is a critical component of the high quality care we provide and we strive to constantly ensure that patients, especially those at high-risk, can benefit from a highly coordinated approach.

We are committed to open communication with referring physicians and progressive clinical care that strives to investigate new technologies, medications, techniques and devices while offering our patients the most advanced treatment available in a healing environment that is designed to respond to the patient’s needs.

Our hope is that physicians and patients alike will find this report educational, informative and useful when planning cardiovascular care. Please know that when you need advanced treatment, the nationally recognized experts at the Bluhm Cardiovascular Institute are available to evaluate and respond to your medical needs.

Contact Us
Bluhm Cardiovascular Institute of Northwestern Memorial Hospital – Leadership

Patrick M. McCarthy, MD
Director, Bluhm Cardiovascular Institute
Charles J. Davidson, MD
Medical Director, Bluhm Cardiovascular Institute
Robert O. Bonne, MD
Vice Chair, Department of Medicine, Director, Center for Cardiovascular Quality and Outcomes
Northwestern University
William M. Parides, MD
Associate Director, Bluhm Cardiovascular Institute
Center for Atrial Fibrillation
Jeffrey S. Goldberger, MD
Medical Director, Center for Atrial Fibrillation
Richard Lee, MD
Surgeon Director, Center for Atrial Fibrillation
Center for Coronary Disease
Charles J. Davidson, MD
Medical Director, Center for Coronary Disease

Center for Heart Valve Disease
Robert O. Bonne, MD
Medical Director, Center for Heart Valve Disease
Patrick M. McCarthy, MD
Surgeon Director, Center for Heart Valve Disease

Center for Heart Failure
William G. Collins, MD
Medical Director, Heart Transplantation and Mechanical Assistance
Edward C. McKenzie, Jr., MD
Surgeon Director, Heart Transplantation and Mechanical Assistance

Center for Vascular Disease
William H. Parides, MD
Surgeon Director, Center for Vascular Disease
Paul L. Stone, MD
Medical Director, Center for Vascular Disease
Mark E. Filikian, MD
Elastic, Control and Peripheral Artery Intervention
Mark S. Morcos, MD
Co-Director, Thoracic Aortic Surgery Program
S. Choi Kamilos, MD
Co-Director, Thoracic Aortic Surgery Program

For more Information, please contact the Bluhm Cardiovascular Institute

Bluhm Cardiovascular Institute Physician Access Line 888-662-8467
Bluhm Cardiovascular Institute Outpatient Clinic 312-695-5714
Program in Cardiovascular Regenerative Medicine, 312-695-8072

Clinical Trials Unit of Northwestern 312-221-4000
Center for Women’s Cardiovascular Health Information Line 312-695-3274

For additional copies of this report, please send request to BCIW.info@northwesternmedicine.org
Northwestern Memorial Hospital’s Bluhm Cardiovascular Institute—At A Glance

- For 2009, *U.S. News & World Report* ranks our Heart and Heart Surgery program among the nation’s best and as the highest-rated program in Illinois.

- Our outcomes for heart failure patients rank better than the U.S. national rate for 30-day hospital mortality for heart failure patients.

- Innovative, minimally invasive treatments through our Center for Vascular Disease include endovascular stent grafting techniques for aortic aneurysms and carotid artery disease. Delivery of these treatments occurs in a new state-of-the-art vascular operating room.

- We rank among the nation’s best for survival of valve, coronary artery bypass and other cardiac surgeries by the industry’s most stringent outcome monitors.

- Our Medicare-approved Heart Transplant program, a Blue Distinction Center for Transplants and an Optum Health Center of Excellence, is ranked as one of the top 20 programs in the country and as the No. 1 program in Illinois.

- Our Medicare Destination Therapy Ventricular Assist Device program has been awarded a Certificate of Distinction honor from The Joint Commission as a result of our VAD procedure volume, exceptional level of expertise among specialists and excellent outcomes.

- Our state-of-the-art cardiac catheterization labs perform advanced, leading-edge treatments 24/7 with the goal of providing minimally invasive options to all cardiovascular patients.

- Our Center for Heart Valve Disease was the first program in Illinois to successfully replace a diseased aortic valve minimally invasively through the transapical approach.

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Laura McNamara had a family history of heart disease but was shocked to learn that she needed heart surgery at age 38.

“I first noticed something was wrong during my first pregnancy,” says Mrs. McNamara. “I began experiencing tightness in my chest, shortness of breath and irregular heart rhythms, especially when lying down.”

When her symptoms increased during her second pregnancy, she came to the Bluhm Cardiovascular Institute’s Center for Heart Valve Disease for treatment. Testing revealed she had bicuspid aortic valve disease (BAV), a condition that can lead to complications including restricted blood flow, valve leakage, infection and conditions of the aorta.

It is estimated that 1 to 2 percent of the population are born with a two-cusp aortic valve instead of the normal three-cusp valve. Most of these individuals develop a complication related to their BAV within their lifetimes.

Repairing a faulty valve often provides the best long-term outcome for restoring proper valve function and has the added benefit of not requiring a patient to need blood-thinning medications. Mrs. McNamara underwent successful heart valve repair surgery performed by Patrick M. McCarthy, MD, chief of the Division of Cardiothoracic Surgery and director of the Bluhm Cardiovascular Institute of Northwestern Memorial Hospital and the Heller-Sacks Professor of Surgery at Northwestern University Feinberg School of Medicine.

Shortly after Mrs. McNamara’s surgery, her mother, Joanne Kennedy, decided to seek treatment for a different heart condition. “I realized something was wrong with my heart a while back when my husband was in the hospital for heart surgery,” explains Mrs. Kennedy. “They were asking him questions about his symptoms and I kept answering ‘yes’ that I was experiencing those same things.”

Mrs. Kennedy, 66, had taken medication to manage her mitral valve disease for many years, but had become tired and short of breath. In patients with mitral valve disease, the valve either leaks blood backward or becomes thickened and narrowed. Either of these conditions can lead to heart failure.

After going through the surgical experience with her daughter, Mrs. Kennedy said she felt ready to consider surgery for herself. “I felt very much at ease with the entire team,” Mrs. Kennedy said. In October of 2008, Dr. McCarthy surgically repaired Mrs. Kennedy’s mitral valve. Mother and daughter both are doing well and are thrilled to be back to exercising and running their family home improvement business.
We are among the leaders in percutaneous heart valve intervention for heart valve disease and the first in Illinois to place a percutaneous aortic heart valve through the transapical approach (See page 18).

Distribution of Cardiac Surgery Procedures
Calendar Year 2008

The distribution of cardiac procedures highlights the complexity of services performed at the Bluhm Cardiovascular Institute. Overall, 60% of procedures were complex valve operations, meaning more than one procedure performed during the same operation, i.e., valve operation +/- coronary artery bypass surgery (CABG).

Operative Mortality for Cardiac Procedures
Calendar Year 2008

For complex valve procedures for both the aortic and mitral valves, the Bluhm Cardiovascular Institute consistently has performed better than national benchmarks for operative mortality.

Heart Valve Selected Information
Calendar Year 2008

The Bluhm Cardiovascular Institute repairs mitral valves in more than 92% of cases. Bioprosthetic valves were used in 100% of mitral and aortic valve replacements. This is significantly higher than the national benchmarks.

Isolated Aortic Valve Replacement and Mitral Valve Repair In-Hospital Mortality
Calendar Years 2006 – 2008

Historically and consistently, the in-hospital mortality for aortic and mitral valve surgery has been 0%, exceeding database comparisons.
“I can call Suzanne Wallace anytime I need anything. She has made this experience much easier than I thought it would be.”

Lindsay Ledford with Suzanne Wallace, APN/C-NP
“I knew something was wrong when I couldn’t even walk slowly without stopping to catch my breath,” recalls Lindsay Ledford. She was only 23 when diagnosed with hypertrophic cardiomyopathy (HCM) and heart failure.

HCM is a genetically determined heart disease that causes the heart muscle to thicken, lessening its ability to supply oxygen-enriched blood to the body. Both her mother and her grandmother suffered from the disease.

Seeking treatment, Ms. Ledford came to the Bluhm Cardiovascular Institute’s Center for Heart Failure, where she received help from two highly experienced healthcare professionals: a surgeon and a nurse specialist. She met with cardiac surgeon Edwin C. McGee, Jr., MD, and Suzanne Wallace, APN/C-NP, an advanced practice nurse and Ventricular Assist Device (VAD) coordinator at the Bluhm Cardiovascular Institute.

Ms. Ledford was placed on the waiting list for a heart transplant after the medical team met with her and reviewed her medical history. She was told that she needed a VAD, a mechanical device that takes over the pumping action of a diseased heart to stay alive while waiting for a new heart, but she chose not to have the VAD procedure and went home. “The idea of surgery and the technology involved with the VAD scared me,” says Ms. Ledford. “I thought I could wait it out until I got a transplant.”

However, she suffered a cardiac arrest with multi-system organ failure. As soon as her body recovered, Dr. McGee implanted a VAD, which was her only chance for survival until she received a heart transplant. With the VAD, Ms. Ledford was able to resume many of the activities she enjoys.

Ms. Ledford received her heart transplant in June of 2009. Today, she is doing well and regaining her active lifestyle.

“I can call Suzanne Wallace anytime I need anything,” says Ms. Ledford. “She’s the one who taught me how to use the VAD and how to change the dressings. I’m really comfortable talking with her. She made this experience much easier than I thought it would be.”

---

**Excellence in Nursing Care**

“The enthusiasm of those involved with the Heart Transplant and VAD programs at the Bluhm Cardiovascular Institute is exciting. We are energized about what we are able to offer patients with progressive heart failure.”

Edwin C. McGee, Jr., MD

---

**Edwin C. McGee, Jr., MD**

Surgical Director
Heart Transplantation and Mechanical Assistance
Bluhm Cardiovascular Institute of Northwestern Memorial Hospital
Assistant Professor Northwestern University
Feinberg School of Medicine
Heart Transplant and VAD Volume
Calendar Years 2006 – 2008

The Heart Transplant program has grown by 23% since inception. Likewise, the volume of the VAD program has doubled in size since 2006.

Illinois Heart Transplant Volume
Calendar Year 2008

The volume for the Heart Transplant program has significantly increased over the past five years, placing our program as the top volume program in Illinois in 2008.

Source: www.optn.transplant.hrsa.gov
Dates: January 1 – December 31, 2008

"Our Heart Transplant program has become the largest in Illinois with excellent outcomes and has achieved Medicare approval for destination therapy for our VAD program. These accomplishments are a testament to the collaborative and clinical expertise that we offer to all heart failure patients."

William G. Cotts, MD
Medical Director
Heart Transplantation
and Mechanical Assistance
Bluhm Cardiovascular Institute of Northwestern Memorial Hospital
Associate Professor
Northwestern University
Feinberg School of Medicine
In 2008, Northwestern Memorial Hospital had the highest volume of heart transplants in Illinois.

Heart Transplant and VAD Survival

Our comprehensive program, including both heart transplant and VAD, has achieved outstanding outcomes. The Kaplan-Meier Survival Curves below illustrate the excellent one- and three-year survival rates for our patients.

Heart Transplant Survival*

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<thead>
<tr>
<th>Survival Time</th>
<th>1-Year Survival</th>
<th>3-Year Survival</th>
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<tbody>
<tr>
<td>1-Year</td>
<td>96%</td>
<td>92%</td>
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<tr>
<td>2-Year</td>
<td></td>
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<tr>
<td>3-Year</td>
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*Includes two heart-kidney candidates

LVAD as Bridge to Transplant Survival

<table>
<thead>
<tr>
<th>Survival Time</th>
<th>1-Year Survival</th>
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</thead>
<tbody>
<tr>
<td>1-Year</td>
<td>94%</td>
</tr>
<tr>
<td>2-Year</td>
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Program Highlights

- The Bluhm Cardiovascular Institute ranks better than the U.S. national rate for 30-day mortality for heart failure patients.

- Our Medicare-approved Heart Transplant program, a Blue Distinction Center for Transplants and an Optum Health Center of Excellence, is ranked as one of the top 20 programs in the country and as the No. 1 program in Illinois.

- Our Medicare Destination Therapy Ventricular Assist Device program has been awarded a Certificate of Distinction honor from The Joint Commission as a result of our VAD procedure volume, exceptional level of expertise among specialists and excellent outcomes.
“They really focused on making sure I was comfortable with the procedure and understood why it needed to be done. They took great care of me.”

Robert Castillo
An Approach Defined by Our *Patients First* Mission

Four years ago, when Robert Castillo was 60, he underwent successful quadruple coronary artery bypass surgery at Northwestern Memorial. It was at this time that he also was diagnosed with an abdominal aortic aneurysm that needed to be monitored.

An aneurysm is a widening or bulging of part of the wall of the aorta, commonly occurring in the abdominal area. A ruptured aneurysm can be life-threatening. “Having heart surgery and discovering the aneurysm was a stroke of luck and probably saved my life,” Mr. Castillo now says.

Every six months after heart surgery, Mr. Castillo continued to see vascular surgeon Mark K. Eskandari, MD, at the Bluhm Cardiovascular Institute’s Center for Vascular Disease. Dr. Eskandari continued to monitor his condition to determine if and when intervention was necessary. “This year when I went to have the aneurysm checked, Dr. Eskandari found it had grown to the point where it was time to do something about it,” Mr. Castillo says.

Dr. Eskandari performed an endovascular stent graft repair to prevent a rupture. Endovascular stent grafting is a minimally invasive procedure during which a catheter containing a stent graft is threaded through an artery in the groin, then placed inside the aneurysm. The graft is then expanded and when it is in correct position, it cuts off the blood supply to the aneurysm, which will no longer enlarge in size.

Twenty-four hours after Mr. Castillo’s endovascular stent graph repair, he was able to go home. “Everyone was so professional and so helpful,” says Mr. Castillo. “They really focused on making sure I was comfortable with the procedure and understood why it needed to be done. They took great care of me.”
Lower Extremity Bypass Mortality
Calendar Year 2008

The Center for Vascular Disease’s mortality rates for lower extremity bypass historically have been better than national comparisons. Again in 2008, lower extremity bypass had a 30-day mortality of 0% compared to 3.3% nationally.

Carotid Artery Disease Procedure Volume
Calendar Years 2001 – 2008

The Center for Vascular Disease has shown a significant increase in both carotid endarterectomy and carotid stenting procedural volume over the last eight years.

*NHDS/NIS = National Hospital Discharge Survey/National Inpatient Sample 2003

“The Center for Vascular Disease includes a multidisciplinary team of physicians, nurses and other staff from different specialties rendering expert opinions that benefit patients. Treatment ranges from lifestyle intervention and exercise programs to the latest in balloon angioplasty and endovascular and open surgical techniques.”

William H. Pearce, MD
Surgical Director
Center for Vascular Disease
Bluhm Cardiovascular Institute of Northwestern Memorial Hospital
Chief
Division of Vascular Surgery
Violet R. and Charles A. Baldwin Professor of Vascular Surgery
Northwestern University
Feinberg School of Medicine
Carotid Artery Endarterectomy and Stenting
Mortality and 30-Day Stroke Outcomes
Calendar Years 2006 – 2008

The mortality rate and 30-day stroke incidence were 0% for both carotid artery endarterectomy and stenting at the Bluhm Cardiovascular Institute in 2008. These results are better than those reported nationally.

Mortality

3 %

Endarterectomy

Stenting

2

1

Society of Vascular Surgery*

Northwestern Memorial Hospital

Society of Vascular Surgery*

Northwestern Memorial Hospital

30-Day Stroke Outcomes

4 %

Endarterectomy

Stenting

2

1

Society of Vascular Surgery*

Northwestern Memorial Hospital

Society of Vascular Surgery*

Northwestern Memorial Hospital

*Society of Vascular Surgeons Vascular Registry.
ATRIAL FIBRILLATION

A Team Approach for Comprehensive Treatment

Years ago, Christine Zastrow was diagnosed with mitral valve prolapse, a condition in which the mitral valve does not close completely. However, during a recent annual checkup, she was surprised to be diagnosed with atrial fibrillation, an irregular heartbeat resulting from abnormal electrical signals in the atria, or upper chambers of the heart.

“I had not experienced any symptoms,” says Ms. Zastrow, 53. “I’ve been playing tennis since I was a young girl and I was still playing three or four times a week.”

In individuals with atrial fibrillation, the atria quiver instead of squeeze to eject blood from the heart with each heartbeat. As a result, the amount of blood ejected from the heart is decreased and may not be enough to meet the needs of the body. Atrial fibrillation can lead to a higher risk for stroke, heart attack or heart failure.

After undergoing a few unsuccessful procedures at another hospital to treat her atrial fibrillation, Ms. Zastrow began researching other options. Ultimately, she decided to find out if she was a candidate for the Classic Maze procedure, which is considered to be the “gold standard” for treating her condition. With this approach, the surgeon creates barriers in the atria that force electrical signals to travel in a normal pattern to restore the heart rhythm.

She chose to seek treatment at the Bluhm Cardiovascular Institute’s Center for Atrial Fibrillation. Here, atrial fibrillation is treated with a team approach that includes consultation with a range of specialists such as electrophysiologists, cardiologists and cardiac surgeons. The center is led by medical director Jeffrey J. Goldberger, MD, and surgical director Richard Lee, MD. Dr. Goldberger is a cardiac electrophysiologist on the medical staff at Northwestern Memorial, the director of Cardiac Electrophysiology Research and professor of Medicine at the Feinberg School. Dr. Lee is a cardiac surgeon on the medical staff at Northwestern Memorial and associate professor of Surgery at the Feinberg School.

“I did some research and learned that the Bluhm Cardiovascular Institute has some of the best results with this procedure,” Ms. Zastrow explains.

In September of 2007, Ms. Zastrow underwent a Classic Maze procedure and a mitral valve repair.

“My heart has been in a normal rhythm ever since the surgery,” she says. “I don’t even think about it anymore. I’m back to playing tennis and having fun!”

“I’m back to playing tennis and having fun!”

Christine Zastrow
Percentage of Patients with Diagnosis of Atrial Fibrillation Treated at Time of Mitral Valve Surgery
Calendar Year 2008

Patients often present with an initial diagnosis of atrial fibrillation and, in the course of the preliminary evaluation, mitral valve disease is found. At the Bluhm Cardiovascular Institute, atrial fibrillation surgery was performed in 88% of mitral valve surgery patients with a previous history of atrial fibrillation. By comparison, the Society of Thoracic Surgeons average was 54%. It is beneficial to patients to eliminate atrial fibrillation and its risks.

Treatment Options for Atrial Fibrillation

Non-Surgical Options

**Catheter Ablation**—Catheter (radiofrequency) ablation is a minimally invasive treatment option for atrial fibrillation. This procedure involves inserting catheters (tubes) into the heart and locating the abnormal pathway which is then destroyed with radiofrequency energy.

Surgical Options

**Traditional or Classic Maze Procedure**—During this procedure, multiple incisions are made in the right and left atria. As the incisions heal, a scar is formed, preventing conduction of abnormal electrical signals that trigger atrial fibrillation. A “maze” of scars directs the impulse through a single path.

**Mini-thoracoscopic Approach**—The mini-thoracoscopic approach is performed by placing scar lines around the pulmonary veins to isolate abnormal electrical signals via small incisions on the sides of the chest. This procedure is performed on the beating heart using various energy sources.

**Hybrid Maze**—The Hybrid Maze is performed in two stages. Stage I is the mini-thoracoscopic approach as described above. Stage II uses a catheter to make the remaining lesions of the “maze” from the inside of the heart. If atrial fibrillation returns after Stage I, the patient returns to receive Stage II.

---

“Cardiac surgeons and electrophysiologists at Northwestern Memorial perform a combined medical/surgical evaluation and assessment to determine whether medication, surgery, catheter ablation or hybrid approaches are the most appropriate for each patient.”

Bradley P. Knight, MD

**Bradley P. Knight, MD**

*Director*
Cardiac Electrophysiology
Bluhm Cardiovascular Institute of Northwestern Memorial Hospital

*Professor*
Northwestern University
Feinberg School of Medicine

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“Changing my mindset and involving experienced physicians in my life helped me make a complete turnaround. I feel like I’ve gotten my life back.”

Daniel Hayes
Daniel Hayes was an active runner and in the best shape of his life, having run four marathons in the past four years. He was 38 and training for the 2008 Chicago Marathon when he began to experience a heartburn-like sensation.

“It only happened when I was running and got my heart rate up past a certain point,” he recalls.

Concerned, he came to the Bluhm Cardiovascular Institute’s Center for Coronary Disease where a cardiac catheterization revealed that his left anterior descending coronary artery was 90 percent blocked in two places. The condition could have led to a fatal heart attack.

“Coronary artery disease typically is caused by atherosclerosis, a slow process in which deposits of fat, cholesterol and calcium build up inside the artery,” says interventional cardiologist Charles J. Davidson, MD.

To open up narrowed or blocked arteries, interventional cardiologists perform percutaneous coronary interventions and place a stent in the artery to keep it open and restore blood flow.

In June of 2008, physicians placed a stent inside Mr. Hayes’ left anterior descending coronary artery. A few weeks later, he received a second stent. Six weeks later, he began cardiac rehabilitation.

Today, Mr. Hayes continues with his cardiac rehabilitation and works out at the gym. He wants to return to marathon running when he can, but is thrilled to have just completed the Soldier Field 10-mile run.

“I wasn’t always this active,” he says. “Eight years ago, I made a commitment to exercise, eat right and get in shape. I made dramatic lifestyle changes because I wanted to feel better about my physical appearance.

“As it turns out, if I hadn’t started exercising and losing weight, as well as seeing the physicians at the Bluhm Cardiovascular Institute, I probably would have suffered a heart attack. Changing my mindset and involving experienced physicians in my life helped me make a complete turnaround. I feel like I’ve gotten my life back.”

“Coronary artery disease remains one of the leading causes of death in the United States. The Bluhm Cardiovascular Institute offers the latest in medical management, surgical options and cardiac rehabilitation services to encourage heart-healthy lifestyles for our patients.”

Charles J. Davidson, MD
Medical Director
Bluhm Cardiovascular Institute of Northwestern Memorial Hospital
Medical Director
Cardiac Catheterization Laboratory
Professor
Northwestern University
Feinberg School of Medicine
Percutaneous Coronary Artery Intervention Mortality
Calendar Year 2008

The incidence of mortality at the Center for Coronary Disease following percutaneous coronary artery intervention is comparable to that in national registries.

Diagnostic Cardiac Catheterization and Percutaneous Coronary Artery Intervention Complication: Myocardial Infarction
Calendar Year 2008

The Center for Coronary Disease demonstrated a low incidence of myocardial infarction, outperforming national registries comparisons for both diagnostic cardiac catheterization and percutaneous coronary artery intervention.
Operative Mortality for Coronary Artery Bypass Graft Surgery
Calendar Years 2007 – 2008

The operative mortality for CABG is superior, exceeding national comparisons.

---

Isolated Coronary Artery Bypass Graft Surgery: Percent of Internal Mammary Artery Grafts Used
Calendar Year 2008

It is widely accepted that it is beneficial to bypass a blocked coronary artery with arteries rather than veins. At the Center for Coronary Disease, multiple arterial grafts are routinely used for first-operative CABG surgery, exceeding national comparisons.

---

Initial Ventilation Time After Coronary Artery Bypass Graft Surgery
Calendar Year 2008

Patients at the Bluhm Cardiovascular Institute require less time on a ventilator after CABG than the national average.
High-Quality Research Trials Advance Patient Care

Retired from a career that included coal mining and working with heavy machinery, Irvin Lafferty was 91 and suffering from heart valve disease.

“I was having chest pain and pressure that worried me,” says Mr. Lafferty, who was diagnosed with a stenotic aortic valve that was not allowing enough blood to leave his heart, a condition that can lead to heart failure.

Heart valve disease is typically treated with open heart surgery to repair or replace a diseased valve. While Mr. Lafferty’s advanced age made open heart surgery too risky, he was able to find another option at Northwestern Memorial, an academic medical center hospital where innovative treatment options are offered through clinical research trials.

Mr. Lafferty consulted with Patrick M. McCarthy, MD, and Charles J. Davidson, MD, co-principal investigators of the PARTNER Trial: Placement of AoRtic TraNscathetER Valves. In this trial, Drs. McCarthy and Davidson combine minimally invasive surgical techniques and catheter-based technology to bypass the need for conventional open heart surgery. In January of 2009, Mr. Lafferty became the first person in Illinois to undergo a procedure known as transapical transcatheter aortic valve implantation, currently offered only to participants with aortic valve disease and no other medical options.

Additional physicians at Northwestern Memorial involved in the placement of the prosthetic valve include interventional cardiologist Nirat Beohar, MD, and S. Chris Malaisrie, MD, a cardiac surgeon on the medical staff at Northwestern Memorial and assistant professor of Surgery at the Feinberg School.

“I enjoyed the honor of being the first,” says Mr. Lafferty. “I might have died without this surgery. My physicians say the new valve could be good for at least 20 years and I’m hoping to live those 20 years.”
The Bluhm Cardiovascular Institute is the first in Illinois to place a percutaneous aortic heart valve through the transapical approach.

THE PARTNER TRIAL: Placement of AoRtic TraNscathetER Valves Trial
With Cohort B as Continued Access

Physicians and researchers at Northwestern Memorial’s Bluhm Cardiovascular Institute are investigating a new percutaneous technique, a minimally invasive approach through the skin, for implanting a prosthetic artificial valve inside the stenotic aortic valve. This investigational trial—the PARTNER Trial: Placement of AoRtic TraNscathetER Valves—is offered only to participants considered high risk or too ill to undergo conventional open heart surgery. In January of 2009, Irvin Lafferty became the first person in Illinois to receive an artificial valve through the transapical approach offered by the PARTNER trial.

Placement of the prosthetic valve incorporates elements of both the catheterization laboratory and a traditional operating room. The procedure uses expandable-stenting technology that allows insertion of the prosthetic valve while the heart is still beating, eliminating the need for cardiopulmonary bypass and its associated risks.

Delivery of the prosthetic valve is done either with the transfemoral approach through the leg, or the transapical approach between the ribs of the chest. During delivery, the prosthetic valve remains compressed until it reaches the aortic valve, at which time it is expanded with a balloon and opened within the diseased aortic valve. The delivery catheter is then removed and the transcatheter valve has replaced the native valve and functions in its place.

The prosthetic valve is an investigational device, which means it is being studied and is not for sale commercially. Data is being collected on the valve for potential approval by the Food and Drug Administration.

Percutaneous Aortic Valve

“Patients too frail to undergo traditional open heart surgery are now able to receive a new heart valve through participation in the PARTNER Trial: Placement of AoRtic TraNscathetER Valves trial. The Bluhm Cardiovascular Institute is proud to participate in this trial and to be the first in Illinois to place a prosthetic heart valve through the transapical approach.”

Nirat Beohar, MD

Nirat Beohar, MD
Interventional Cardiologist
Bluhm Cardiovascular Institute of Northwestern Memorial Hospital
Associate Professor
Northwestern University
Feinberg School of Medicine
Gene and Autologous Stem Cell Therapies

Regenerative medicine is a rapidly developing field that seeks to regenerate damaged tissue in the body. While conventional medicine attempts to improve the function of damaged tissue with medication or surgery, regenerative medicine seeks to grow new cardiac and vascular tissue in a number of ways. Regenerative medicine approaches being investigated in our Program in Cardiovascular Regenerative Medicine include:

- **Gene therapy**, which attempts to increase the production of naturally occurring proteins or nucleic acids. This approach relies on the insertion of genes into diseased cells and tissues to increase production of factors that can aid in tissue repair.

- **Autologous stem cell therapy**, which attempts to regenerate and replenish tissue by increasing the supply of naturally occurring reparative cells at sites of damage. This approach relies on the phenomenon of plasticity, autologous stem cells from one tissue generating specialized cells of another tissue.

Douglas W. Losordo, MD, is director of the Program in Cardiovascular Regenerative Medicine at the Feinberg Cardiovascular Research Institute at Northwestern University. It is through his years of experience in basic and clinical research that potential new therapies are being developed and tested in clinical research trials for participants with advanced forms of cardiovascular disease, including coronary artery disease, heart failure and vascular disease.

If you would like to obtain more information about the clinical research trials conducted through our Program in Cardiovascular Regenerative Medicine, please call 312-695-0072.

**SPECT Findings**

Progressive improvement in perfusion at rest and post-stress from baseline to six-month followup

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<thead>
<tr>
<th>Baseline</th>
<th>3 months</th>
<th>6 months</th>
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<tbody>
<tr>
<td>Stress</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rest</td>
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“**As cardiovascular physicians, we are reminded every day that there are patients for whom current therapies are not working. Fortunately, our understanding of the process by which the body can repair itself is growing at an amazing pace, resulting in therapies designed to save lives and improve the quality of life.**”

Douglas W. Losordo, MD
**Cardiac Surgery**

**Evaluation of the HeartWare® Ventricular Assist System for the Treatment of Advanced Heart Failure**

Principal Investigator: Edwin C. McGee, Jr., MD

This research study is evaluating a new heart assist device, the HeartWare® Ventricular Assist System (HVAD™ Pump), in participants suffering from end-stage heart failure and who require circulatory assistance while awaiting a heart transplant. The HVAD Pump is a miniaturized mechanical blood pump and is the smallest full support pump currently available.

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**C-Pulse™ Implantable Counterpulsation Pump (ICP)**

Principal Investigator: Edwin C. McGee, Jr., MD

The purpose of this research study is to evaluate a new heart assistance device, known as C-Pulse. The C-Pulse device works to assist the heart to pump blood, rather than “replacing” the heart function; it does not contact the blood and can be safely turned on or off as required. The C-Pulse is an experimental device, which means it is not yet approved by the Federal Food and Drug Administration in the United States.

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**An Evaluation of the Cardioblate® Closure™ Device in Occlusion of the Left Atrial Appendage (LAA)**

Principal Investigator: Richard Lee, MD

This investigational study will evaluate whether the Cardioblate Closure Device can be used to occlude the Left Atrial Appendage (LAA) and to further understand the study device performance. The sponsor of this study has developed the Cardioblate Closure Device, which will close off the LAA with a small band, much like a rubber band. This small band will be placed around the LAA to stop blood from moving in and out of the appendage, thus potentially reducing the formation of blood clots.
Cardiology

Defibrillators to Reduce Risk by Magnetic Resonance Imaging Evaluation (DETERMINE trial)

Principal Investigator: Jeffrey J. Goldberger, MD

Sudden Cardiac Death (SCD) is a sudden, unexpected death that occurs when electrical impulses in a diseased heart become very irregular. This abnormal heart rhythm causes the heart to suddenly stop beating. The purpose of this study is to see if cardiac MRI results can predict Sudden Cardiac Death, and if implantable cardioverter defibrillator (ICD) therapy in combination with medical therapy improves survival in participants with coronary artery disease compared to medical therapy alone.

CHAMPION: CardioMEMS™ Heart Sensor Allows Monitoring of Pressure to Improve Outcomes in NYHA Class III Heart Failure Patients

Principal Investigator: William G. Cotts, MD

This research study is looking for participants who have been diagnosed with heart failure. The purpose of this study is to evaluate an investigational system, the CardioMEMS™ HF Pressure Measurement System, which has been developed for use in medical management of participants suffering from heart failure. Participants will use the home monitoring unit to transmit pulmonary artery pressure measurements to a secure Web site for physicians to review.

STILETT( Syndrome X Trial: Identifying underlying Endothelial dysfunction and Testing Treatment Outcomes in women study)

Principal Investigator: Martha Gulati, MD

This research study is looking for women who have chest pain and are scheduled for a coronary angiogram to determine if coronary artery disease (CAD) is present. The purpose of this study is to compare the effectiveness of standard medical therapy versus usual care in women with chest pain, coronary endothelial dysfunction and unblocked coronary arteries.

For a complete list of clinical trials visit heart.nmh.org/cvclinicaltrials

All of the devices are for investigational use only.
The Clinical Trials Unit of Northwestern was established in 2005 to provide the infrastructure necessary to assist investigators in performing high quality clinical research trials.

Vascular Disease

Carotid Angioplasty and Stenting vs. Endarterectomy in Asymptomatic Subjects with Significant Extracranial Carotid Stenotic Disease (ACT I)

Principal Investigator: Mark K. Eskandari, MD

ACT I is sponsored by Abbott Vascular Devices and is a randomized, controlled, multi-center trial to demonstrate the non-inferiority of carotid artery stenting (CAS) using the Emboshield Embolic Protection System with the Xact® Carotid Stent System when compared to carotid endarterectomy (CEA) for the treatment of asymptomatic extracranial carotid stenotic disease.

The U.S. Study for Evaluating Endovascular Treatments of Lesions in the Superficial Femoral Artery and Proximal Popliteal by Using Protege Everflex Nitinol Stent System III — DURABILITY II

Principal Investigator: Heron E. Rodriguez, MD

This research study is looking for participants who have been diagnosed with a narrowing in the arteries that are located in the leg between the groin and the knee, resulting in poor blood flow to the leg. This study places an investigational stent (Protege Everflex) in the area of narrowing in the leg to help keep the artery open.

Descending Thoracic Aortic Aneurysm Endovascular Repair Post Approval Study (THRIVE)

Principal Investigator: Mark K. Eskandari, MD

This study is a prospective, nonrandomized five-year trial examining the post-market performance of the Talent Thoracic Stent Graft System for endovascular repair of aneurysms and penetrating ulcers of the descending thoracic aorta.

*For a complete list of clinical trials visit heart.nmh.org/cvclinicaltrials*
Cardiac Behavioral Medicine

Treatment for cardiovascular disease is most successful when it focuses on the physical, emotional and behavioral health of the patient. Northwestern Memorial’s Bluhm Cardiovascular Institute offers the Cardiac Behavioral Medicine service, which includes comprehensive care in the evaluation and treatment of patients with cardiovascular disease.

Cardiac Behavioral Medicine helps patients and their families adjust to a diagnosis of cardiovascular disease and provides support for patients who require cardiovascular surgery. Patients are educated about the role of emotions and stress in cardiovascular health. They learn new ways of relaxing and coping so that their heart is not harmed by daily stress. Techniques include strategies that facilitate behavior change, improve coping strategies, minimize stress and change ways of thinking, such as those associated with anxiety and depression.

Kim R. Lebowitz, PhD
Director
Cardiac Behavioral Medicine
Bluhm Cardiovascular Institute of Northwestern Memorial Hospital
Assistant Professor
Northwestern University
Feinberg School of Medicine

“Emotional well-being is important because depression and stress impact the quality of a person’s life and can increase the chance of a future cardiovascular event. The Cardiac Behavioral Medicine service is a unique and important program to help ensure the best results for our patients.”

Kim R. Lebowitz, PhD

The Cardiac Behavioral Medicine program was featured nationally on ABC’s Good Morning America in October of 2008.

Patient Satisfaction

Hospital Consumer Assessment of Healthcare Provider and Systems (HCAHPS) is a national standardized survey of hospital patients created to capture a patient’s experience during a given hospital stay. The survey results are publicly reported on the Centers for Medicare and Medicaid Services Web site for all participating hospitals. The graph on the right highlights results for Northwestern Memorial compared to state and national averages in 2008. For a complete list of results, refer to www.hospitalcompare.hhs.gov.

How do Patients Rate the Hospital Overall?

[Graph showing comparison of Northwestern Memorial Hospital, average for all reporting hospitals in the United States, and average for all reporting hospitals in Illinois]

Worst to Best Scoring (0=Worst)
To our Colleagues and Patients

We are proud to share the Clinical Activities and Outcomes Report from Northwestern Memorial Hospital’s Bluhm Cardiovascular Institute. This report highlights many aspects of our performance for 2008 and we hope that it will serve as a valuable resource for you.

At the Bluhm Cardiovascular Institute, we evaluate our clinical outcomes so that we can fully understand how our treatments and procedures benefit our patients. We offer the latest advances in cardiovascular care including innovative treatment, promising research and multidisciplinary support. We regularly review and evaluate our clinical outcomes and, based on the results, develop methods to monitor and improve the healthcare we offer to our heart and vascular patients.

Our clinical excellence, comprehensive programs and superior clinical outcomes have again been recognized at the national level. U. S. News & World Report ranks our Heart and Heart Surgery program among the nation’s best and as the highest-rated program in Illinois.

Throughout this report, we share stories from many of the patients who have been referred to us for specialized care and treatment. Close cooperation with referring physicians is a critical component of the high quality care we provide and we strive to constantly ensure that patients, especially those at high risk, can benefit from a highly coordinated approach.

We are committed to open communication with referring physicians and progressive clinical care that strives to investigate new technologies, medications, techniques and devices while offering our patients the most advanced treatment available in a healing environment that is designed to respond to the patient’s needs.

Our hope is that physicians and patients alike will find this report educational, informative and useful when planning cardiovascular care. Please know that when you need advanced treatment, especially those at high risk, can benefit from a highly coordinated approach.

Contact Us

Bluhm Cardiovascular Institute of Northwestern Memorial Hospital – Leadership

Patrick M. McCarthy, MD
Director, Bluhm Cardiovascular Institute
Charles J. Davidson, MD
Medical Director, Bluhm Cardiovascular Institute
Robert O. Bonow, MD
Co-Director, Thoracic Aortic Surgery Program
S. Chris Malaisrie, MD
Co-Director, Thoracic Aortic Surgery Program
Mark D. Morasch, MD
Surgical Director, Center for Atrial Fibrillation
Jeffrey J. Goldberger, MD
Medical Director, Center for Atrial Fibrillation
William H. Pearce, MD
Co-Director, Bluhm Cardiovascular Institute
Richard Lee, MD
Surgical Director, Center for Atrial Fibrillation
William H. Pearce, MD
Director, Carotid and Peripheral Artery Interventions
Douglas W. Lorusso, MD
Director, Proponent in Cardiovascular Regenerative Medicine
Jeffrey J. Goldberger, MD
Medical Director, Center for Heart Valve Disease
Robert O. Bonow, MD
Surgical Director, Heart Transplantation
Medical Director, Center for Vascular Disease
William H. Pearce, MD
Surgical Director, Center for Vascular Disease
Mark E. Edelman, MD
Director, Carotid and Peripheral Artery Interventions
Mark D. Messina, MD
Co-Director, Thoracic Aortic Surgery Program
S. Chris Malaisrie, MD
Co-Director, Thoracic Aortic Surgery Program

For more information, please contact the Bluhm Cardiovascular Institute

Bluhm Cardiovascular Institute Physician Access Line 866-418-0056
Bluhm Cardiovascular Institute Outpatient Clinic 312-695-2114
Program in Cardiovascular Regenerative Medicine 312-695-0072

Clinical Trials Unit of Northwestern 312-695-4000
Center for Women’s Cardiovascular Health Information Line 312-MYHEART (694-3278)

For additional copies of this report, please send request to BCVI_info@nmh.org

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Division of Public Relations, Marketing and Physician Services
Northwestern University
Feinberg School of Medicine

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For more information about the Bluhm Cardiovascular Institute, visit heart.nmh.org