



MHI QUARTERLY

A quarterly report from the Minneapolis Heart Institute®

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WELCOME TO THE MHI QUARTERLY

Dear Colleague,

I am proud to introduce this new publication from the physicians at the Minneapolis Heart Institute. MHI is a vital practice and offers a range of programs that is continuously evolving. This newsletter, *MHI Quarterly* is our effort to tell you about the depth and scope of services .

We plan to use *MHI Quarterly* to highlight new programs, as well as provide regular columns featuring areas where we stand out, such as cardiovascular research, cardiovascular surgery and our exceptional CME offerings.

2005 brings a host of challenges and opportunities to the Minneapolis Heart Institute. Chief among them will be our transition to a new Heart Hospital on the campus of Abbott Northwestern Hospital.

When you receive this, we will be moving into this \$110 million facility. This building is the culmination of years of planning, followed by more than two years of construction. Although this project is nearing completion, the work is just beginning in some aspects. MHI services are scheduled to move into the Heart Hospital beginning on April 4, 2005, when the MCA Clinic will move. All cardiology units will move into the building by May 5, 2005.

An article on page 2 explores the significance of the new Heart Hospital in an interview with MCA President Randy Johnson, MD.

In addition, we are including an update on our Level 1 Heart Attack Program, which recently completed its first calendar year of operation. The program streamlines the care of patients with acute myocardial infarction so that all patients receive the most sophisticated treatment available regardless of where they are when they become ill. You can review the program’s outcomes since inception to date on page 7.

I look forward to your feedback to help us understand what kind of information you would like to see in future issues of *MHI Quarterly*.

M. Nicholas Burke, MD



MINNEAPOLIS
HEART
INSTITUTE

HEART HOSPITAL SETS NEW STANDARDS FOR CARE

The renowned cardiovascular services of Abbott Northwestern Hospital and the Minneapolis Heart Institute® have come together in the new Heart Hospital.

Construction began in October 2002 and wraps up this spring. The new 128-bed heart hospital will serve patients and their families from across the Upper Midwest. The heart hospital will provide comprehensive inpatient and outpatient cardiovascular care services in one facility.

The Heart Hospital was designed to provide the optimal care experience from the moment patients and visitors step into the building. From the piano music playing in the spacious lobby to the streamlined registration process, to every patient having a private room, the goal is to create a healing environment.

“MHI will enter a new level of patient care with the opening of the Heart Hospital,” said Randall K. Johnson, MD, president of Minneapolis Cardiology Associates.

MHI physicians played a key role in developing the Heart Hospital. Physicians lead the two-year planning process that created a building that delivers state-of-the-art cardiology services in a unique, patient-focused environment.

“With the Heart Hospital, we were able to design a facility from the ground up with more than just state-of-the-art technology. We were able to design a new care model within a space that is more comfortable and welcoming for patients and their families,” Johnson said.

The care model blends state-of-the-art technology with an emphasis on the patient experience. This includes an approach to staffing that ensures patients work with a limited number of caregivers to help develop patient relationships rather than having each patient treated by a large number of people.



The Heart Hospital stands as a new landmark of heart care and consolidates all cardiology services into one building.

The building is also designed to maximize efficiencies, such as consult rooms that are placed close to patient rooms. In many instances, patients will be able to remain in their room for tests and procedures rather than traveling up and down hallways and elevators.

Abbott Northwestern has grown into a very large campus. In the past, that has meant that sometimes patients need to travel from one end of the campus to the other for routine tests and services.

That won't be the case with the Heart Hospital. Cardiology services are being consolidated into one facility. Other features will include:

- a cardiovascular surgery center, allowing the fastest possible response time for patients requiring immediate surgery
- safe and efficient facilities for critical cardiac procedures, such as specially engineered ceilings to hold surgical lighting, oxygen hoses and anesthesia
- diagnostic, interventional and patient care equipment that are comprehensive and technologically advanced.

The heart hospital will also embrace a holistic approach to address each patient's unique physical, spiritual and cultural needs. Patients will benefit from both technological advances and a healing environment of integrative therapies, including:

- therapeutic massage
- music therapy
- guided imagery
- a lifestyle management center, where patients can learn ways to manage their heart disease
- a resource center for family members
- private patient rooms designed to promote a positive, soothing environment.

Patient rooms will also offer Internet connectivity for family members who need to conduct business.

“The Heart Hospital sets a new standard for how patient care is delivered by bringing together the best elements of high-tech health care and holistic practices,” said Johnson.

MAKING “PERIPHERAL” VASCULAR DISEASE “CENTRAL” TO CLINICAL CARE ~ by Alan T. Hirsch, MD

We all greatly value the prevention and treatment of heart disease. Thus, we recognize that the challenge for clinicians is to make “peripheral” vascular care a “central” goal of cardiovascular care. Abbott Northwestern’s Vascular Center is dedicated to helping you gain access to current clinical care strategies, effective diagnostic methods and insights from new publications, and to offering you the opportunity to participate in major vascular clinical research studies and your patients the opportunity to access advanced care approaches. In years past, valuable medical wisdom was traditionally transmitted between clinicians as “clinical pearls.” We believe that this tradition remains valuable. Thus, in each issue of this newsletter, we will offer you a selection of clinical, diagnostic, publication and research “pearls.”

The clinicians of Abbott Northwestern’s Vascular Center also believe that each patient deserves a comprehensive approach to the prevention, diagnosis, treatment and rehabilitation from vascular disease. Our team offers expertise in vascular medicine and cardiology, vascular surgery, interventional radiology and vascular nursing. A care team is best positioned to provide broad treatment choices to improve quality-of-life, preserve independence and prevent vascular disease progression. The Center provides you and your patients with access to the nationally renowned vascular research program of the Minneapolis Heart Institute Foundation. We hope you enjoy access to our care and quarterly “clinical pearls.”

Clinical Pearl

Approximately half of all abdominal aortic aneurysms can be detected by an increased abdominal aortic girth. Palpate the abdomen of all new adult patients and consider performing an abdominal ultrasound in: (a) all men over 65 who have a first order relative with a history of an aneurysm, or (b) men over 65 years who smoke (as recently sanctioned by the United States Preventive Services Task Force). The efficacy of screening strategies in women is less effective, due to the lower AAA prevalence.

Diagnostic Pearl

Critical limb ischemia (CLI) will lead to imminent limb loss without prompt revascularization and thus is similar to an “acute coronary syndrome” for the legs. Chronic CLI is heralded by ischemic rest pain, gangrene or a non-healing wound. Patients who exhibit these signs or

symptoms, and who have a resting ankle-brachial index (ABI) of less than 0.40, have CLI and should be promptly referred for vascular specialty care. Use a hand-held Doppler, your vascular laboratory or the MHI mobile vascular laboratory to establish the CLI diagnosis.

Publication Pearl

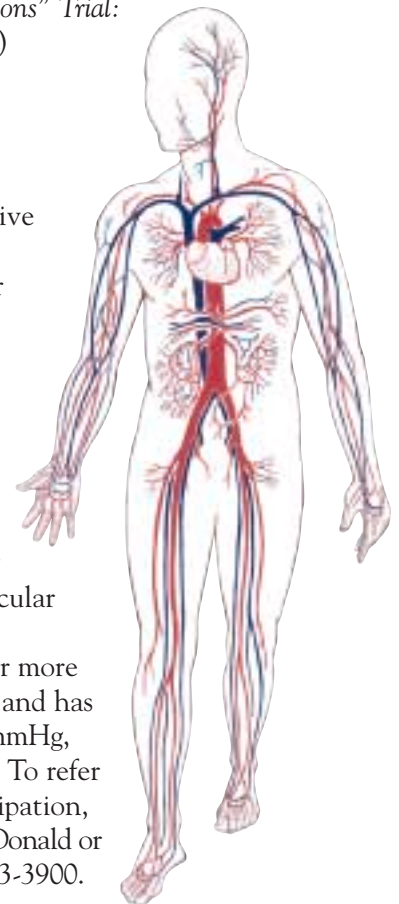
Do primary care clinicians value the ABI as a test to prevent serious illness? A survey of 886 primary care physicians and nurses offers insight that the ABI is considered equal in value to lipid assessments, mammography and other common health screening tests (*Vascular Medicine* 2004; 9: 253–260). In order to prevent heart attacks and strokes, and to save legs, order an ABI for all patients who: (a) have symptoms of claudication or CLI, (b) are more than 50 years old with a history of diabetes or smoking, (c) are younger than 50 years with diabetes and one risk factor, and (d) are over the age of 70 years.

Research Pearl

CORAL: The “Cardiovascular Outcomes for Renal Atherosclerotic Lesions” Trial:

Renal artery stenosis (RAS) is more common than recognized in the past. For individuals with RAS and systolic hypertension, does endovascular care or intensive pharmacological therapy best improve cardiovascular and/or renal outcomes?

The *CORAL Trial* is a multicenter, prospective, randomized NHLBI-funded clinical trial that will enroll more than 1,100 individuals with RAS in the United States, including Abbott Northwestern’s Vascular Center. If you suspect RAS in a patient who uses two or more blood pressure medications and has experienced an SBP > 155 mmHg, obtain a renal imaging test. To refer a patient for possible participation, please call either Holly MacDonald or Alan Hirsch, MD, at 612-863-3900.





Research at the MINNEAPOLIS HEART INSTITUTE

ANGIOGENESIS – POTENTIAL HOPE FOR PERIPHERAL ARTERIAL DISEASE

Minneapolis Heart Institute physicians are studying the effects of angiogenesis as a new treatment option for Peripheral Arterial Disease.

The angiogenesis studies aim to hasten the body's natural reaction to claudication, which is to try to grow new arteries. However, because the natural growth process is frequently insufficient, MHI is looking at ways to enhance the natural process.

CLAUDICATION – CLOGGED ARTERIES THAT RESULT IN SEVERE PAIN OR CRAMPING IN A LIMB. THE PAIN GOES AWAY WITH REST, BUT THE CONDITION GROWS PROGRESSIVELY WORSE.

“In the angiogenesis procedure, we actually inject the growth factor or gene that makes the growth factor into the leg,” said Tim Henry, MD, director of Research at the Minneapolis Heart Institute Foundation. “Our hope is collateral arteries will grow as a result of gene therapy. Everybody has natural growth factor and the potential to grow new arteries. This therapy just enhances the natural process.”

As blood vessels grow, it is possible that the flow of blood to the leg muscles may improve and in turn improve claudication symptoms or allow leg ulcers to heal.

Angiogenesis therapy differs from conventional treatments such as bypassing the blocked arteries or inserting a balloon catheter to open the blockage within the leg.

The field of angiogenesis is relatively new. The Minneapolis Heart Institute has been a leader in the field and currently is the only research center in Minnesota studying peripheral vascular angiogenesis. As a result, patients are attracted to the Minneapolis Heart Institute from around the state and

upper Midwest to participate in treatment that isn't available elsewhere.

“We provide an opportunity to patients with limited options. These are patients with significant lifestyle limitations and may be facing amputation,” Henry said.

There are two trials currently accepting patients who have peripheral arterial disease. One treats patients who have claudication and the other is for patients with critical limb ischemia.

Patients with critical limb ischemia face losing a limb. Patients who have claudication may be eligible for surgery. However, these can be high-risk procedures due to the patient's age and other risk factors. In addition, these patients have frequently already undergone bypass surgery that used the veins needed to bypass blocked arteries in the legs.

In the past, MHIF research has shown very encouraging results. The initial angiogenesis studies conducted by MHIF resulted in 80 percent of patients showing improvements in their critical limb ischemia.

CRITICAL LIMB ISCHEMIA – DEFICIENCY OF BLOOD DUE TO CONSTRICTED OR BLOCKED VESSELS. PATIENTS CAN DEVELOP SEVERE ULCERS AND MAY LOSE A LIMB.

“When you provide patients with limited options and a poor quality of life a new opportunity, it is very gratifying. A successful program like this requires a team approach including research coordinators Jo Anne Goldman and Vicki Pink. MHI physicians Alan Hirsch, Dan Lips and Yale Wang play a key role. There also has been tremendous support from the interventional radiologists and vascular surgeons,” Henry said.

TWO VASCULAR TRIALS UNDERWAY

The Minneapolis Heart Institute is currently enrolling patients in two peripheral vascular gene therapy studies and is likely to have more in the future. With an aging population overall, there are a growing number of people who could potentially benefit from these studies.

All potential participants must have an up-to-date cancer screening and an eye exam.

Other exclusion criteria include:

- patients on dialysis
- patients with recent surgery.

Patients need to be prepared to complete an extensive screening and follow-up process.

If a person qualifies for the study, they are randomized to receive the study drug or placebo, then followed over a period of time. Follow-up visits include clinic appointments at specific intervals that will consist of:

- physical exam
- pain assessments
- wound evaluations
- blood flow and tissue measurement tests
- blood chemistry profiles.

For more information about inclusion/exclusion criteria, or to refer a patient for one of the trials, please call Jo Anne Goldman, RT, RCIS, CCRC, at 612-863-3793 or Vicki Pink, RN, at 612-863-6286.

DESIGNING THE MOST EFFECTIVE CARDIAC CARE DELIVERY

Having an outreach component has always been an important philosophy for the physicians of the Minneapolis Heart Institute.

Many of MHI's physicians already had relationships with primary care doctors around the state when the practice was formed in 1981. Those relationships developed either by working in those towns or through pre-established referral patterns.

"These cardiologists have a commitment to serve patients from regional communities. We recognize that it's important for patients to stay in their own community. As a result, we are doing outreach work all the time," said Randall K. Johnson, MD and president of MCA.

MHI physicians regularly travel to more than 25 communities to see patients, provide physician consults and offer educational sessions. The physicians travel as much as 175 miles in one direction and visit towns with as few as 2,000 residents.

"We see this as complementing and adding depth to the cardiovascular care delivered by primary physicians in their communities," Johnson said.

In addition to these outreach efforts, MHI works to minimize the impact on a patient who needs to transfer to a tertiary hospital. This includes working with the referring clinic to understand all the tests and procedures the patient has already undergone, and conducting thorough follow-up when the patient ultimately returns to their own community for ongoing care.

"We know that patients want to spend as much time in their own community as they can. Their primary care doctors want that, too," Johnson said.

Patients are more comfortable recovering in their own community rather than in a strange environment hundreds of miles from their hometown. When patients have to travel to a tertiary facility, they not only get separated from their homes, they get separated from family and friends.

That added strain is just one more obstacle to recovery.

“WE KNOW THAT PATIENTS WANT TO SPEND AS MUCH TIME IN THEIR OWN COMMUNITY AS THEY CAN. THEIR PRIMARY CARE DOCTORS WANT THAT, TOO.”

In addition to these outreach efforts, MHI develops programs designed to increase patients' access to crucial procedures, no matter where they live. The Level 1 Heart Attack Program is an example of such a program. It has neutralized the difference between a patient presenting to a tertiary care center and a patient presenting to a smaller community hospital who otherwise would not have access to highly specialized care.

"What we really aspire to be is the best possible cardiac care delivery system, whether that care is delivered in smaller towns across Minnesota, or here in the Metro area," Johnson said.

MHI'S EXPERTISE ON DISPLAY

Minneapolis Heart Institute cardiologists showcased their expertise at this year's American College of Cardiology annual meeting in March. MHI cardiologists contributed to 23 presentations. MHI cardiologists are dedicated to improving cardiovascular health through education and clinical research. The following lists recent findings:

M. Nicholas Burke, MD;

Ivan Chavez, MD; Daniel Lips, MD;

Timothy Henry, MD:

- et al; Sirolimus-eluting stents are safe and effective for acute and long-term management of ST-segment elevation myocardial infarction in the "real world". *J Am Coll Cardiol.* 2005; 45(Suppl A):24A.

Bjorn Flygenring, MD; John Lesser, MD;

Scott Sharkey, MD;

Robert Schwartz, MD:

- Noninvasive imaging of coronary artery plaque rupture: Multislice computed tomographic angiographic visualization in an ambulatory patient population. *J Am Coll Cardiol.* 2005;45(Suppl A):295A.

Kevin Harris, MD; Barry Maron, MD:

- et al; Cardiovascular screening practices of major North American professional sports teams. *J Am Coll Cardiol.* 2005;45(Suppl A):180A.

Timothy Henry, MD:

- et al; Clinical evaluation of the concomitant use of bivalirudin and drug-eluting stents: Results of the prospective, multicenter ADEST study. *J Am Coll Cardiol.* 2005; 45(Suppl A):32A.

Alan Hirsch, MD:

- et al; National health care costs of peripheral arterial disease in the Medicare population. *J Am Coll Cardiol.* 2005;45(Suppl A):418A.
- et al; Utility and barriers to performance of the ankle-brachial index in primary care practice. *Vasc Med.* 2004;9(4):253-260.

- et al; Cost-effectiveness of exercise training to improve claudication symptoms in patients with peripheral arterial disease. *Vasc Med.* 2004; 9(4):279-285.

- et al; Clinical significance of a high ankle-brachial index: Insights from the atherosclerosis risk in communities study. *J Am Coll Cardiol.* 2005; 45(Suppl A):417A.

William Katsiyannis, MD:

- et al; Narrow QRS complex tachycardia: what is the mechanism? *Pacing Clin Electrophysiol.* 2004; 27(7):993-995.
- et al; Simplified peak power reserve in patients with an implantable cardioverter-defibrillator and advanced heart failure. *Am J Cardiol.* 2005;95(2):286-288.

Scott Sharkey, MD; John Lesser, MD;

Terrence Longe, MD; Barry Maron, MD:

- Acute and reversible cardiomyopathy provoked by stress in women from the United States. *Circulation.* 2005; 111(4):472-479.

Terrence Longe, MD; John Lesser, MD;

Robert Schwartz, MD:

- Early aortic intimal tear without haematoma or dissection: early diagnosis by cardiac magnetic resonance imaging. *Heart.* 2005;91(3):416.

Barry Maron, MD:

- et al; Glycogen storage diseases presenting as hypertrophic cardiomyopathy. *N Engl J Med.* 2005;352(4): 362-372.
- et al; Evidence against myocardial bridging as a determinant of sudden death in hypertrophic cardiomyopathy. *J Am Coll Cardiol.* 2005; 45(Suppl A):179A.

- Ten common questions about hypertrophic cardiomyopathy ...And misconceptions. *Cardiol Rev.* 2005;13(2):59-60.

- How should we screen competitive athletes for cardiovascular disease? *Eur Heart J.* 2005;26(5):428-30. Epub 2005 Feb 08.

- et al; Impact of postgraduate medical education on recognition of stroke. *Cardiol Rev.* 2005;13(2):73-75.

- Gender-related differences in the clinical presentation and outcome of hypertrophic cardiomyopathy. *J Am Coll Cardiol.* 2005;45(Suppl A):161A.

- et al; Evidence that hypertrophic cardiomyopathy is a disease characterized by predominantly left ventricular outflow tract obstruction. *J Am Coll Cardiol.* 2005;45 (Suppl A):161A.

Michael Mooney, MD:

- et al; The DIRECT investigators. Impact of direct coronary stenting on neointimal distribution within sirolimus-eluting stents: IVUS subanalysis from the DIRECT trial. *J Am Coll Cardiol.* 2005;45 (Suppl A):70A.

Robert Schwartz, MD:

- Stenting the venous system: The venous response to injury. *J Am Coll Cardiol.* 2005;45(Suppl A):48A.

Jay Traverse, MD:

- et al; Increased superoxide production causes coronary endothelial dysfunction and depressed oxygen consumption in the failing heart. *Am J Physiol Heart Circ Physiol.* 2005;288(1):H133-141.

LEVEL *one*

Unique Level 1 Heart Attack Program

The Level 1 Heart Attack Program just completed its first full calendar year of operation. The Minneapolis Heart Institute® at Abbott Northwestern Hospital began this unique treatment program in March 2003. This remarkable program coordinates community emergency departments with trained emergency

transportation professionals and an expert angioplasty team available 24 hours a day.

Since its inception, 452 patients have been treated through MHI's Level 1 Heart Attack Program. When compared to benchmarks, the Level 1 program shows effective reduction in mortality rates.

LEVEL 1 HEART ATTACK PROGRAM REPORT CARD
MARCH 1, 2003 - DECEMBER 31, 2004
(NO PATIENTS HAVE BEEN EXCLUDED FROM THIS REPORT)

Patients	
Total	452
Zone 1 ¹	243
Zone 2 ²	103
Abbott Northwestern ED ³	106
Male/Female	70%/30%
Average age	62.5 years
≥65	42.5%
≥85	6.9%
Transport	
Ground/air	35%/65%
Median elapsed time	
Community ED arrival to balloon inflation at ANW	
Zone 1	95 min
Zone 2	117 min
Abbott Northwestern ED	72.5 min
Cath lab arrival to balloon inflation	15.5 min

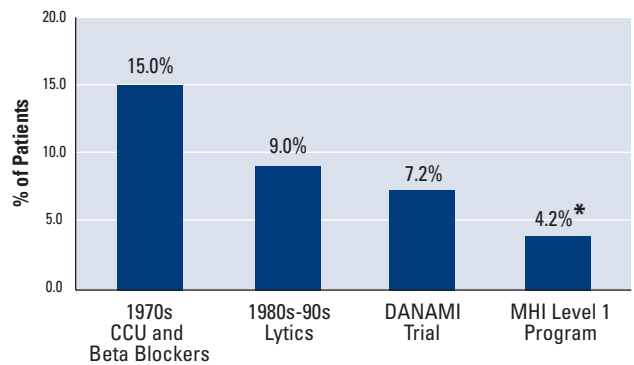
OUTCOMES

Mortality at 30 days	4.2%
Zone 1	4.1%
Zone 2	3.9%
Abbott Northwestern ED	4.6%
Stroke rate at 30 days	0
Reinfarction at 30 days	1.1%
CABG	
Immediate	2.9%
(None due to angioplasty/stent complications)	
Elective	3.1%
Hospital length of stay	3.0 days
Deaths during transfer	0
VFib arrest during transfer, all resuscitated	2.0%
Bleeding requiring transfusion	1.1%
Anterior infarction	33.3%

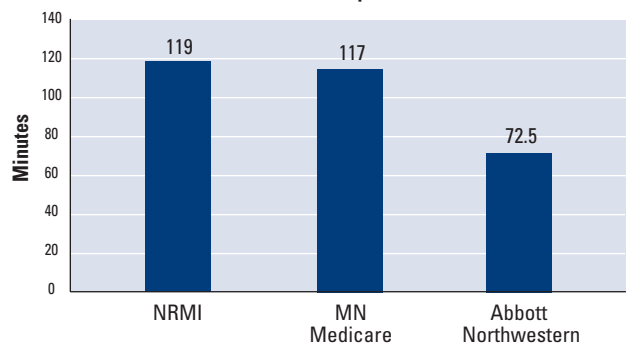
1. Zone 1: Hospitals 22-60 miles from Abbott Northwestern Hospital. No thrombolytic therapy. Immediate transfer and stenting.
2. Zone 2: Hospitals 61-170 miles from Abbott Northwestern Hospital. Half-dose thrombolytic therapy followed by immediate transfer and stenting.
3. Patients entering the Level 1 Program through Abbott Northwestern Hospital's Emergency Department.

**Level 1 data reflects all patients compared to trials with exclusions for cardiogenic shock, out of hospital arrests, etc. Only one patient who met DANAMI entry criteria has died in 22 months.*

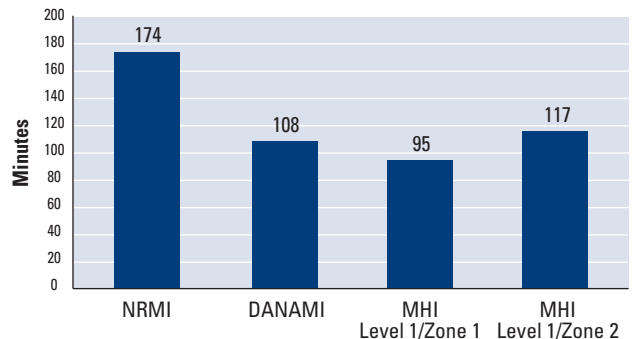
**Minneapolis Heart Institute's
 Level 1 Heart Attack Program
 30-Day Acute MI Mortality Rate Comparison**



**Comparison of Door-to-Balloon Times of Patients
 Who Presented at a Hospital with a Cath Lab**



**Comparison of Door-to-Balloon Times
 of Patients Who Presented at a Hospital Without
 a Cath Lab and Were Transferred**



CME events

Upcoming
2005

CARDIOVASCULAR PRIMARY CARE UPDATES AND CASE STUDIES

BEYOND THE BASICS

May 20, 2005

Hotel Sofitel, Bloomington, MN

Thirteen cardiologists from the Minneapolis Heart Institute will be joined by Spencer H. Kubo, vice president of Acorn Medical Inc., in this daylong conference designed to motivate and stimulate primary care physicians to become more actively involved with preventive cardiology in a variety of practice settings. The program provides tools, strategies and skills needed to influence and facilitate preventive cardiology practice.

VASCULAR MASTERS SERIES

May 23, 2005

Marquette Hotel, Minneapolis, MN

Norman R. Hertzner, MD, a vascular surgeon with the Cleveland Clinic's Department of Vascular Surgery will be the keynote speaker at this event, the second installment of the 2005 Vascular Masters Series.

Look for more information about either event by logging onto www.mplsheart.com, or call 612-863-1919.

For regular updates regarding MHI-sponsored CME events, or other program information, log onto www.mplsheart.com.

JOURNAL SCAN CUTS THROUGH THE CLUTTER

Given today's blogs and talk-radio conversations and op-ed slams, it's hard to know who to listen to, let alone who to trust. In the spirit of offering practical, trustworthy commentary on current heart-related studies in the literature, the Minneapolis Heart Institute offers MHI's *Journal Scan*.

"We take a few current, key cardiovascular articles and discuss how the results might affect the way you practice medicine," said M. Nicholas Burke, MD, managing editor of MHI's *Journal Scan*. "Sometimes we agree with the conclusions, sometimes we don't. But we try to get to the heart of the matter."

MHI's *Journal Scan* is a regular newsletter offered in print and online

(http://www.mplsheart.com/pages/MHI_JournalScan.asp) to primary care physicians in the Minneapolis Heart Institute's referral communities. The current issue appeared in March 2005 with commentary from **Yale Wang, MD, Daniel Lips, MD and M. Nicholas Burke, MD:**

- *Protected Carotid-Artery Stenting As Effective as Endarterectomy in High-Risk Patients – In the right patients, carotid stenting with the use of an emboli-protection device is equivalent to carotid endarterectomy.*
- *Primary Prevention of Cardiovascular Disease With Atorvastatin in Type 2 Diabetes in the Collaborative Atorvastatin Diabetes Study (CARDS): multicentre randomised placebo-controlled trial –*

More evidence that statins are effective at helping prevent cardiovascular morbidity and mortality.

- *Endovascular Repair of Abdominal Aortic Aneurysms Preferred Over Conventional Repair: A Randomized Trial – Is endovascular repair preferable to open repair in patients with abdominal aortic aneurysm?*
- *Using Early Invasive Management Strategies for High-risk Patients with Non-ST-segment Elevation Acute Coronary Syndromes: Results from the CRUSADE Quality Improvement Initiative. – Should an early invasive management strategy be used in more patients with non-ST-segment elevation acute coronary syndrome?*

