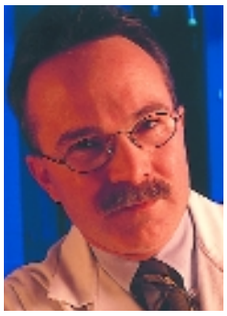
New England Heart Institute
Atrium
FALL 2001
Benefit from the experience.

Electrophysiology Procedures Reduce Sudden Cardiac Deaths

The implantation of a cardioverter defibrillator (ICD) in the chest of Vice President Dick Cheney this summer brought new attention to the life-threatening danger of cardiac arrhythmias that can lead to sudden cardiac death (SCD), which kills between 300,000 and 400,000 people in the U.S. each year. This statistic, coupled with the fact that patients who suffer cardiac arrest have only a five to ten percent survival rate, has led to increased interest in the prevention of SCD.


Bruce G. Hook, MD, FACC

The New England Heart Institute is the only facility in southern New Hampshire, and one of only two centers in the state, with a comprehensive electrophysiology program. This service is provided by Dr. Bruce G. Hook and Dr. Connor J. Haugh, two Board-certified electrophysiologists specially trained in the diagnosis and management of patients with cardiac arrhythmias. In many patients, cardiac arrhythmia does not occur as an isolated condition, but coexists with other types of heart disease, such as coronary artery disease or congestive heart failure.

"One of the advantages of the New England Heart Institute is we have a comprehensive array of services available to treat patients with advanced

Electrophysiology *continued on page 5*

Dr. Louis Fink Named New Medical Director

Louis I. Fink, MD, FACC, became the new Medical Director of the New England Heart Institute following the July retirement of J. Beatty Hunter, MD, FACC. Dr. Fink graduated from Yale University summa cum laude and received his medical degree from the University of Pennsylvania where he was a member of Alpha Omega Alpha. He completed his internal medicine residency and his cardiology fellowship at the Hospital of the University of Pennsylvania. He is Board certified in internal medicine, geriatrics, cardiology, critical care medicine and interventional cardiology. Dr. Fink is also past president of the medical staff and of the American Heart Association's northern New England affiliate.

NEHI Compares Beating Heart Surgery to Conventional Coronary Bypass Surgery

In March, at the 65th annual Scientific Meeting of the Japanese Circulation Society in Kyoto, Japan, attended by 10,000 people, Yvon R. Baribeau, MD, FACS, of the New England Heart Institute presented his findings on the comparison of conventional coronary artery bypass (CCAB) surgery and off-pump coronary artery bypass (OPCAB) surgery. Dr. Baribeau was the first heart surgeon in New England to perform OPCAB or beating heart surgery, in January 1996.

The presentation highlighted the results from 863 CCAB and 644 OPCAB surgeries performed by Dr. Baribeau and his NEHI colleague, Benjamin M. Westbrook, MD, FACS, over two-and-a-half years. Dr. Baribeau discussed their approach to beating heart surgery, including preoperative carotid artery screening, epiaortic examination of the aorta at surgery prior to mobilization (OPCAB) or cannulation (CCAB), and continuous brain saturation monitoring to define a baseline level and keep the brain properly perfused during surgery.

Beating heart surgery at NEHI yields positive results

"Our results with beating heart surgery were very positive," says Dr. Baribeau, "showing that our stroke rate was very low, as was our complication rate and, most importantly, our transfusion rate was reduced by 40 percent compared to conventional heart surgery. We also had a slightly lower postoperative atrial fibrillation rate."


Yvon R. Baribeau, MD, FACS

One finding that is of great interest is that 75 percent of strokes occurred postoperatively. While few numbers exist in the literature, Dr. Baribeau suspects the stroke rate is more evenly distributed in operative and postoperative causes. He believes that their aggressive preoperative approach (carotid disease and brachial gradient) and operative approach (epiaortic and transoesophageal ultrasound), with tactical

NEHI Beating Heart *continued on page 3*

New England Heart Institute
OF CATHOLIC MEDICAL CENTER
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INSIDE ATRIUM

CATHOLIC Medical CENTER

Case Study: Treating Renal Artery Stenosis

Atherosclerotic renal artery stenosis (RAS) is an under-recognized cause of resistant hypertension and renal insufficiency. Renovascular hypertension tends to be an asymptomatic process that is difficult to diagnose, but the renal ischemia caused by this narrowing of the artery can have serious consequences: loss of renal mass from reduced blood flow with eventual renal failure. With over 50 million people in the U.S. suffering from hypertension, correctly diagnosing renovascular hypertension is critical to preserving a patient's kidney function and adequately managing blood pressure.

"The earlier renal artery stenosis is recognized and treated, the opportunities for renal preservation and blood pressure control are increased," says William A. Bradley, MD, FACC, Director of the Cardiac Catheterization Laboratory at New England Heart Institute. "The goal is to restore blood flow to the kidney, hopefully preserving size and function."

Challenges of diagnosing renal artery stenosis

Physical examination of a patient with renal artery stenosis is often unrevealing. An abdominal or flank bruit may be present, indicating renal artery stenosis, but its absence does not rule out the condition. Noninvasive studies may be helpful as initial screening tests. Their sensitivity and specificity, however, are less than ideal. Renal duplex is limited by acoustic windows, difficulty in obtaining adequate Doppler signals, and the possibility of multiple renal arteries. A magnetic resonance angiogram (MRA) has a greater sensitivity and specificity, but false positives are a problem and there is no ability to measure translesional gradients. Renal arteriography is the most definitive test in diagnosing RAS when the index of suspicion is high. Pressure gradients can be obtained and catheter-based revascularization can often be performed at that time.

"When a patient is on two or three blood pressure medications and still does not have adequate blood pressure control, one may want to evaluate the patient for renal artery stenosis," says Dr. Bradley.

Prevalance of renovascular hypertension

- < age 50 with hypertension: 5%
- > age 50 with hypertension: 15%
- > age 50 with hypertension and coronary artery disease or peripheral vascular disease: 53%
- > age 50 with hypertension, coronary artery disease or peripheral vascular disease, and renal insufficiency: 66%

"Lack of awareness of the frequency of this entity leads to under diagnosis and therefore less effective therapy. Untreated, an ischemic kidney may reduce in size by 50 percent in two to four years, with worsening renal function in half of patients and total occlusion in 12 percent of patients during this same time period."

While medications may control a patient's hypertension, once renal artery stenosis has been diagnosed, inserting a stent in the narrowed artery is the most effective way to restore blood flow to the kidney. Patients at NEHI undergoing this procedure have initial success of nearly 100 percent, with improved or stabilized renal function in 78 percent of patients and improved hypertension in greater than half of patients.

In summary, atherosclerotic renal artery stenosis is more common than previously realized. Physicians should have a high level of suspicion when blood pressure control is difficult. Appropriate treatment involves restoring adequate blood flow to the involved kidney. This can now be accomplished with minimally invasive techniques such as renal artery stent deployment with excellent long-term results.

For more information on renovascular hypertension, contact Dr. Bradley at 603.669.0413.

NEHI Renovascular Hypertension Case Study

Patient: Female, age 53

History: long history of hypertension, smoker, asymptomatic

BP: 180/96 mmHg

Anti-hypertensive regimen:
- Hydralazine 50 mg qid
- Hydrochlorothiazide 25 mg qd
- Lotrel 20 mg qd
- Toprol XL 100 mg bid
- Catapres 0.1 mg bid

Evaluation and diagnosis:
- Physical exam normal with no abdominal or flank bruit
- Abdominal ultrasound showed atrophic right kidney
- MRA showed significant bilateral renal artery stenosis with right renal atrophy
- Renal angiography showed occluded right renal artery with renal atrophy (fig. 1 & 3) and 80 percent stenosis of the left renal artery with preserved renal size (fig. 2 & 4)

Treatment:
- Balloon angioplasty and 6 mm stent deployment of left RAS at the time of the renal angiogram (fig. 5)
- Patient tolerated procedure well; discharged next day

One-month office follow-up:
- BP: 122/70 mmHg off Catapres
- Asymptomatic
- Stop Hydralazine and reduce other medications as determined by BP readings

This case highlights several aspects of renovascular hypertension. Blood pressure control was inadequate on multiple medications prompting evaluation for RAS. When identified, it was appropriately managed with catheter-based revascularization with excellent clinical results. The natural history of untreated RAS is also illustrated. The right renal artery was occluded and the corresponding kidney was atrophied and nonfunctional.

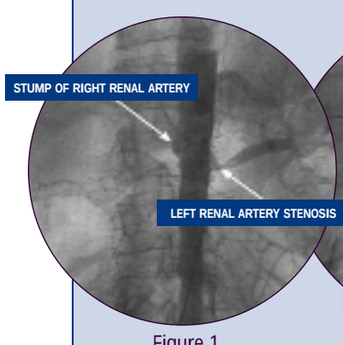


Figure 1

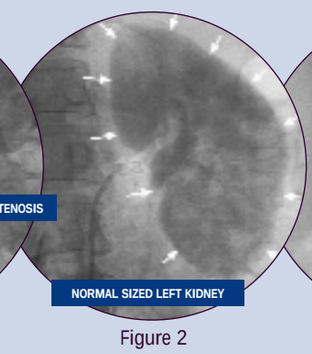


Figure 2

Figure 3

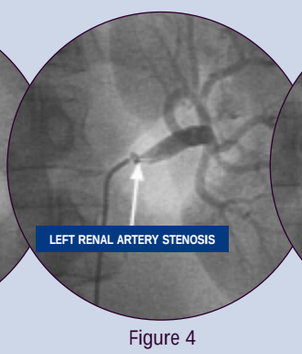


Figure 4

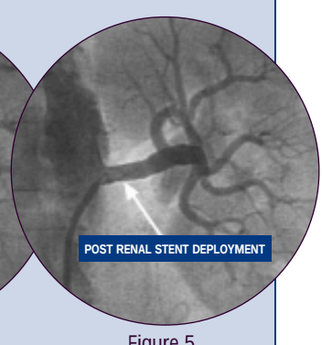


Figure 5

New Cholesterol Treatment Guidelines

The National Cholesterol Education Program Adult Treatment Panel III (ATP III) report released in mid-May outlines revised recommendations for the treatment of patients with high blood cholesterol. According to Mary P. McGowan, MD, Director of the Cholesterol Management Center at the New England Heart Institute, these new guidelines will assist physicians in more effectively treating patients with cardiovascular disease and those at risk for the disease.

A major focus of ATP III is aggressive LDL-lowering therapy for particular types of patients and the prevention of coronary artery disease in patients with multiple risk factors. While the updated clinical guidelines continue to recommend a total blood cholesterol level <200, the new recommendations include:

- LDL cholesterol <100 mg/dL as optimal
- HDL cholesterol <40 as low and ≥60 high (previously <35 low)
- Triglyceride level <150 (previously <200) as it is now recognized as an independent predictor of heart disease risk

Cardiovascular disease high risk factors

While ATP II called for LDL cholesterol of <100 mg/dL in patients with peripheral vascular disease and cerebral vascular disease, ATP III includes diabetes as one of these coronary artery disease equivalents that require special attention. "Because persons with diabetes are at very high risk for developing overt cardiac disease, the new guidelines recommend treating people with diabetes as aggressively as people with established cardiac disease," says Dr. McGowan.

The new guidelines also encourage physicians to estimate a patient's 10-year risk for developing cardiovascular disease by utilizing the Framingham Point Scores, which assess points for age, total cholesterol, smoking, HDL cholesterol and systolic blood pressure. According to Dr. McGowan, patients with a greater than 20 percent risk of developing coronary artery disease over the next 10 years should be treated as aggressively as patients who currently have the disease.

Additional major risk factors for developing coronary artery disease include cigarette smoking, BP ≥140/90 mmHg, family history of premature coronary artery disease (male relative <55 years, female relative <65 years), and age (men ≥45 years, women ≥55 years).

Importance of diet, exercise

In addition to utilizing LDL-lowering drug therapy, the new guidelines place more emphasis on treating patients with diet and exercise, especially patients with metabolic syndrome who tend to be at increased risk for cardiovascular disease. Metabolic syndrome includes any three of the following characteristics: abdominal obesity, triglycerides >150, HDL cholesterol <40 mg/dL in men and <50 mg/dL in women, BP≥ 130/85 mmHg, and fasting glucose ≥110 mm/dL.

"Patients with metabolic syndrome are at high risk for developing cardiovascular disease and should be treated aggressively with diet and exercise as these will make a major difference for them," says Dr. McGowan. "They should also be placed on blood pressure medication, treated with aspirin, placed on triglyceride medications if they have high triglycerides, and given LDL-lowering medications in some cases." Soluble fiber, soy protein and neutraceuticals like plant stanol margarines such as Benecol and Take Control can lower cholesterol through diet, adds Dr. McGowan.

"Although there is a big push for diet and exercise, there is also recognition that most people with heart disease, diabetes or one of the cardiovascular equivalents are also going to require medication," says Dr. McGowan. "If someone has cardiac disease or they are hospitalized following a heart attack, put them on cholesterol-altering medication and institute diet and exercise at the same time."

For more information on the new guidelines, consult the National Heart Lung Blood Institute website at www.nhlbi.nih.gov or contact Dr. McGowan at 603.663.6549.

Susan Upton Lynch, MD

Dr. Lynch Joins Cholesterol Management Center

Susan Upton Lynch, MD **Specialty: Pediatric Obesity**

Susan Upton Lynch, MD, who has a special interest in pediatric obesity, joined the staff of the Cholesterol Management Center in September and will be seeing patients on a part-time basis. Dr. Lynch was graduated from Mt. Holyoke College and earned her medical degree from the University of Massachusetts Medical School. She completed a pediatric internship at Boston Floating Hospital for Infants and Children and a pediatric residency at Dartmouth-Hitchcock Medical Center. Most recently, she has been on staff as a pediatrician at Lahey-Hitchcock Clinic in Concord.

NEHI Beating Heart Surgery *continued from page 1*

intervention accordingly (carotid endarterectomy, extraaortic cannulation, atrial thrombectomy and OPCAB), is realizing positive results.

An advantage of beating heart surgery, according to Dr. Baribeau, may be maintaining a patient's neurocognitive function following surgery. Recent research has suggested that as many as 50 percent of patients placed on a heart-lung machine may have some subtle neurocognitive changes after five years. "Beating heart surgery may be lowering neurocognitive dysfunction by avoiding the heart-lung machine," says Dr. Baribeau. "We hope to soon embark on a multi-center project to study this. "

Conclusions

OPCAB is comparable to CCAB therapy in the short term but has the advantage of lower blood utilization than with conventional coronary bypass surgery.

Epiaortic ultrasound and preoperative carotid management allow for a low stroke rate in both groups with the majority of strokes occurring postoperatively.

Long-term psychometric studies and intraoperative randomization of patients are needed to determine the potential neurocognitive dysfunction following CCAB surgery.

For more information on this study and beating heart surgery, contact Dr. Baribeau at 603.663.6340.

Pioneering Cholesterol Management Care

The Cholesterol Management Center of New England Heart Institute provides patients with a single center for exercise and education information, medication, nutritional advice from a dietician, and medical advice from physicians and a nurse practitioner trained in the management of hyperlipidemia.

Mary P. Mcgowan, MD

The advantages to patients in having of all these services under one roof are multifold.

"With everything centralized in one location, we do tend to have a much better success rate," says Dr. Mary P. McGowan, Director of the Cholesterol Management Center, "and we probably have a much greater knowledge of neutraceuticals or nutritional supplements."

Dr. McGowan claims they are able to help patients who have intolerances to cholesterol-lowering medications with products that can lower cholesterol dramatically, although not as dramatically as medications. "Knowing how to institute dietary changes, which supplements work in combination with weight loss, and the appropriate medications, gives us an edge," adds Dr. McGowan.

LDL Apheresis, revolutionary clinical trials set Center apart

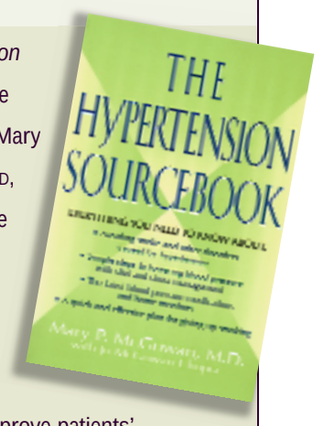
A procedure performed at the Cholesterol Management Center that is not performed at other hospitals or clinics in the area is LDL Apheresis, a dialysis procedure that removes cholesterol from the blood. Patients who have markedly elevated cholesterol levels who have not been responsive to maximum medications or tolerated medications or lifestyle changes benefit from LDL Apheresis, which is performed every two weeks.

The Cholesterol Management Center is also the only site in the state to take part in a large number of clinical trials. "We get access to medications that are going to revolutionize the field of cholesterol metabolism long before the medications are on the market," says Dr. McGowan.

The Center is currently involved in clinical trials with medications that have the potential to lower LDL cholesterol by 60 to 75 percent. One medication in particular that has normalized patients' LDL cholesterol levels without any adverse side effects is slated to be on the market in July 2002.

The Cholesterol Management Center is also likely to become involved in clinical trials aimed at improving triglycerides and HDL cholesterol levels.

For more information on Cholesterol Management Center programs or clinical trials, contact Dr. McGowan at 603.663.6549.



The Hypertension Sourcebook, the latest book by Mary P. McGowan, MD, outlines lifestyle changes – diet, exercise and supplements – that can dramatically improve patients' blood pressure. Also included are an evaluation of the latest blood pressure medications, a foolproof plan for smoking cessation, and a section on special patient populations. Dr. McGowan's next book, *50 Ways to Lower Your Cholesterol*, is due out in February 2002.

Cardiac Rehab Program Nationally Recognized

The Cardiovascular Wellness Phase II Cardiac Rehabilitation Program at NEHI received three-year certification in July from the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR). NEHI's certification application was one of only six chosen from 207 applications to be showcased at AACVPR's mid-September national conference.

Patients at NEHI's Cardiac Rehabilitation Facility learn to manage the risk factors of heart disease.

Several years ago, NEHI's cardiac rehabilitation program shifted from a "one-size-fits-all" approach to case management geared to each patient's individual risk factors, says Janet Troski, RN, MSN, Department Director of Cardiovascular Wellness. Following an assessment of a patient's medical history, cardiac risk factors and medications, the patient fills out a personal goal sheet for cardiac rehabilitation, which is incorporated into an Individualized Plan of Care developed by staff for each patient. Areas of concentration, developed through American Heart Association and AACVPR guidelines, include risk factor knowledge, exercise, lipid management, weight control, blood pressure management, stress management, smoking cessation and diabetes management.

Managing cardiac risk factors

The six- to eight-week rehabilitation session – monitored by cardiac rehabilitation and exercise specialists, a dietician, and smoking cessation and stress management counselor – includes assignment to a nurse, monitored exercise sessions three days a week and educational classes.

"People are frightened when they learn they have heart disease," says Troski. "Through the program they learn what they can or can't do, and how to live with heart disease. It's a progressive disease: if they don't manage the risk factors, they will be back. If they do manage the risk factors, they can slow the progression and have a very high quality life."

At the end of the cardiac rehabilitation program, a progress letter outlining the patient's success in the cardiac rehabilitation program is sent to the patient, his or her cardiologist and primary care physician. With new knowledge of how to manage their risk factors, patients have a fuller understanding of their condition and ask more informed questions of their primary care physician, making it easier for physicians to effectively treat them.

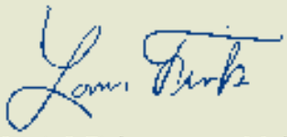
For more information on the cardiac rehabilitation program at NEHI, contact Janet Troski at 603.663.6177. ☐

Message from the Medical Director

Since the July retirement of J. Beatty Hunter, MD, FACC, I have been privileged to lead the New England Heart Institute. Our group of 17 cardiologists includes Board certified electrophysiologists, Board certified interventional cardiologists, and members with particular expertise in noninvasive cardiology and cholesterol management.

Our goal at the New England Heart Institute, as it has been since our inception in 1996, has been to provide superior referral cardiology services for patients and their physicians. As a resource for referring physicians, we assist in restoring patients to cardiologic health before returning them to the care of their physicians. We are also more than happy to provide continuing cardiologic care should this be requested. We actively participate in a variety of clinical research trials and are thus able to make leading-edge technologies available to our patients.

I look forward to facilitating the continued growth of cardiology services at Catholic Medical Center, as well as at our referral hospitals. As Medical Director, I plan to combine my duties with patient care and cath lab responsibilities. I look forward to meeting and/or speaking with you in the upcoming months and invite you to contact me at any time with questions about our programs or suggestions about how we can better meet the needs of your patients.



Louis I. Fink, MD, FACC, Medical Director

Electrophysiology Procedures *continued from page 1*

heart disease, from catheter-based techniques to innovative cardiac surgical procedures," says Bruce G. Hook, MD, FACC, Director of the NEHI Cardiac Electrophysiology Laboratory. "This allows patients with serious cardiac arrhythmias to have all aspects of their cardiovascular care coordinated under one roof, an important consideration when patients and their referring physician are seeking cardiac care for their patients."

Implantable defibrillators decrease mortality

Depending on the type and seriousness of a patient's arrhythmia, electrophysiologists may choose to treat the problem with antiarrhythmic medications, an ICD or catheter ablation. Two randomized clinical trials, one conducted at over 100 centers in the U.S. and Canada, including the New England Heart Institute, documented that an ICD placed in high-risk patients who have never experienced a serious cardiac arrhythmia can reduce SCD and total mortality. The MUSTT trial, in particular, determined that in patients treated with an ICD, there was a 27 percent reduction in risk of cardiac arrest or death from arrhythmia.

As a result of the clinical trial data, Dr. Hook and fellow NEHI electrophysiologist Connor J. Haugh, MD, FACC, have increased the use of the ICD in treating patients with serious arrhythmias. Manufacturers of the device have also added special features, reduced the size and increased the device's longevity, making it a more acceptable therapy for patients. And, as seen in the case of Vice President Cheney, patients may be discharged from the hospital less than 24 hours after an implant procedure.

Potential ICD candidates

Patients with any of the following conditions are candidates for an implantable defibrillator:

- Coronary artery disease
- Previous myocardial infarction
- Nonsustained ventricular tachycardia
- Inducible sustained ventricular tachycardia at electrophysiology study

NEHI electrophysiologists also have the unique ability to eliminate cardiac arrhythmia with catheter ablation, a minimally invasive catheter-based procedure that utilizes radio frequency current to cauterize the area in the heart that is responsible for the arrhythmia. Drs. Hook and Haugh have performed over 750 catheter ablation procedures since 1993, with an overall success rate of greater than 95 percent.

New electrophysiology lab to meet demand

NEHI electrophysiologists perform about 1,000 procedures a year, including the implantation of 150 ICDs and 200 pacemakers. The high volume of the program has led the hospital to build a second electrophysiology laboratory, a sophisticated biplane fluoroscopy unit that is scheduled to open early next year. The new lab will provide increased visualization of the heart during complex procedures and allow for an expanded scope and expeditious timing of procedures.

The large number of procedures, and the presence of two electrophysiologists, has given NEHI staff an opportunity to conduct much clinical research on cardiovascular disease. NEHI physicians are currently involved with over 15 clinical trials. "Conducting clinical research is an important mission at the New England Heart Institute," says Dr. Hook. "It gives us the opportunity to offer new treatment strategies to our patients before the treatments are widely available. We are proud to be recognized as a center with the expertise necessary to address these important clinical questions."

For more information on electrophysiology procedures or current clinical trials at New England Heart Institute, contact Dr. Hook at 603.663.6894.

David J. Goldberg, MD

NEHI Welcomes Dr. Goldberg

David J. Goldberg, MD **Specialty: Interventional and Nuclear Cardiology**

David J. Goldberg, MD, recently joined the staff at the New England Heart Institute. Dr. Goldberg earned his medical degree from Tufts University School of Medicine and completed his residency at Yale-New Haven Hospital and his fellowship in cardiovascular medicine at Yale University School of Medicine, where he completed a fourth year in interventional cardiology. He is a member of the American College of Cardiology, American Medical Association and American College of Physicians. His areas of particular expertise include interventional and nuclear cardiology.

Transmyocardial Revascularization Brings Relief to Intractable Angina

Until relatively recently, physicians had a choice of only three modalities in treating a patient's angina: medical therapy, stent therapy and coronary artery bypass surgery. For some patients, none of these modalities offer patients satisfactory symptom-free lifestyles. Following a five-year clinical trial, the FDA approved transmyocardial revascularization (TMR) approximately two years ago as a new modality for treatment of angina. TMR is now also a Medicare-approved procedure.

Since early this year, New England Heart Institute cardiothoracic surgeons have performed TMR on six patients, all who are now free of angina symptoms. "We view TMR principally as an adjunct to stent therapy or coronary artery bypass therapy, even though it could be performed as a standalone procedure," says David C. Charlesworth, MD, FACS.

Patients who can be treated with TMR include those with ongoing angina in areas of viable heart muscle where the coronary arteries to the area are not suitable for bypass surgery. The primary artery may be very small calibered or so diseased that no blood flows through the artery. The oxygen deprivation of muscle in the area can cause debilitating angina pain.

TMR Patient Inclusion Criteria

- Viable ischemic areas unsuitable for PTCA or CABG alone
- Stable patient with severe angina refractory to medical management
- Left ventricle ejection fraction >25%

TMR Patient Exclusion Criteria

- Primary symptom CHF
- Left ventricular ejection fraction <25%
- Unsuitable for thoracotomy
- Angina equivalent dyspnea
- Recent Q-wave MI
- Left ventricular mural thrombus in area of proposed treatment

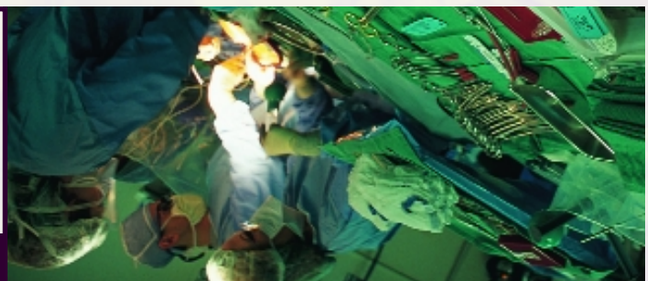
Source: Eclipse TMR Holmium Laser System

How TMR works

During transmyocardial revascularization, surgeons at NEHI use a laser to drill a grid of holes one centimeter apart, from the outside to the inside of the ventricle. Although the exact mechanism is unknown, the controlled energy of the laser is believed to create vertical channels that connect with horizontal channels in the heart muscle. Patients have reported immediate and substantial relief of their angina pain by a full category, with ongoing relief even one year after the procedure.

"We think TMR will be used more and more as we find it can be very important, even in small areas of the heart that are not good bypass areas," says Dr. Charlesworth. "There may be patients who have been told they have coronary artery disease with disabling angina, but there is nothing that can be done for them because they aren't candidates for bypass surgery or angioplasty. These patients may want to be evaluated for TMR therapy."

For more information on transmyocardial revascularization, contact Dr. Charlesworth at 603.663.6340.



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