



## Strengthening our clinical and research resources

The Peter Munk Cardiac Centre further enhanced its international position as a leader in the advancement of cardiac medicine with three important appointments.

These recent appointments represent exciting new resources in the vital areas of patient care, leading-edge scientific research and world-renowned clinical education. All three were made possible by endowments, and serve as excellent examples of how donor support can contribute directly to innovations in cardiac care that will benefit patients both in the present and the future.

### *Alfredo & Teresa DeGasperis Chair in the Surgical Management of Heart Failure: Dr. Vivek Rao*



Dr. Rao

As Surgical Director of the Heart Transplantation and Mechanical Circulatory Assistance Program, Dr. Rao's clinical focus is on the surgical treatment of end-stage heart failure. He completed his medical and surgical training at the University of Toronto and a fellowship in cardiac transplantation and

mechanical circulatory support at Columbia-Presbyterian Hospital in New York before joining University Health Network (UHN).

His clinical expertise and strong research reputation make him an ideal candidate for the Chair - one of three established by the DeGasperis Family - which requires "a champion in the management of patients with heart failure through the use of mechanical circulatory assist devices and heart transplantation."

"This position will allow me to support the continuing education of team members in the mechanical support of patients with advanced heart failure," Dr. Rao notes.

"By ensuring our cardiology fellows, surgical fellows, perfusion therapists, nurse practitioners and nurses continue to advance their knowledge, we can ensure they are better equipped to provide the appropriate level of care in this highly complex field."

### *Reuben & Florence Fenwick Family Professorship in the Medical Management of Heart Failure: Dr. Heather Ross*



Dr. Ross

A graduate of the University of British Columbia and Dalhousie University, Dr. Ross completed her post-doctoral fellowship in cardiac transplantation at California's Stanford University before becoming Medical Director of the Cardiac Transplant Program at UHN in 1997. She obtained her Masters in Bioethics at the University of Toronto.

"This professorship is a dream come true," Dr. Ross notes. "It is an incredible gift from the Fenwick family that will support the study of advanced heart failure."

"It allows me to devote time to academic issues, as well as important research. It will help UHN to provide a truly clinical and research oriented training program in advanced heart failure for the next generation of cardiologists."

continued on back page.

## ABOUT THE PMCC: A CENTRE OF CARDIAC EXCELLENCE

The Peter Munk Cardiac Centre (PMCC) is the premier cardiac centre in Canada. Each year, approximately 17,000 patients receive innovative and compassionate care from the PMCC's world-renowned multidisciplinary heart team. The PMCC is based at Toronto General Hospital, a member, along with Toronto Western Hospital and Princess Margaret Hospital, of University Health Network. All three are teaching hospitals affiliated with the University of Toronto.



# HEART HEALTH

## The role of nutrition in heart disease

### REDUCING RISKS THE KEY TO SECONDARY PREVENTION

#### By Margaret Brum, RD, BASc

Good nutrition is integral to heart health at all times, and can play a vital role in secondary prevention – the reduction of the risk of complications or additional problems in people with heart disease.

Secondary prevention has been shown to decrease coronary artery disease morbidity and mortality by 20–25%.

Nutrition intervention strategies include educating and motivating people to adopt and maintain healthy lifestyles and healthy eating patterns, achieve and maintain ideal body weight and limit or emphasize specific foods/nutrients to minimize known cardiovascular risk factors. These are typical elements of secondary prevention programs, like the one offered through the multidisciplinary Cardiac Care and Heart Health Program at Toronto Western Hospital (For more information, call 416-603-5268).

Whether you are recovering from heart disease, or simply interested in maintaining a healthy lifestyle, a multi-factorial lifestyle approach to reducing cardiovascular risk is recommended.

#### A heart healthy diet

Higher intakes of saturated and trans fats, and dietary cholesterol raise low density lipoprotein (LDL or "bad") cholesterol in the blood. An elevated LDL cholesterol increases the risk of developing coronary heart disease (CHD).

A healthy diet can reduce cholesterol levels, as well as blood pressure and excess weight. Table 1 presents a 'Heart Healthy' diet.

The goal should be to consume less than 200 milligrams of dietary cholesterol per day. While we need cholesterol in order to function normally, the body 'makes' enough, so we don't need to get more from food.

Reducing saturated fat intake to less than 7% of total calories can reduce LDL cholesterol by 8–10%. For individuals with heart disease, Table 2 presents a chart to help in establishing a saturated fat intake goal.

#### Meal planning tips

An example of a healthy breakfast is a high fibre cereal with 1% milk, and half-a-cup of fresh or frozen fruit (e.g., berries).

For healthy lunches or dinners that provide a nutritional balance, consider dividing the plate into quarters. Vegetables should take up one-half of the plate, grain products should take up a quarter, and the final quarter should be devoted to the meat and alternatives group.

Complete the meal with a fruit and/or a glass of milk or 175g of yogurt depending on daily caloric requirements.

The *UHN Shopper's Guide to Healthy Eating* booklet written by UHN dietitians is a useful resource. Copies are available through UHN's dietitians.

#### Weight management

Being overweight has a negative effect on cholesterol levels. Weight loss can help lower LDL cholesterol and increase HDL ("good") cholesterol, lower blood pressure, and can help significantly in controlling blood sugar levels in diabetics. For example, in overweight individuals, a 10lb reduction in weight can reduce LDL cholesterol by 5–8%.

Body Mass Index (BMI) is used to determine an individual's 'healthy' weight, and to show the level of health risk associated with being overweight. BMI is measured as weight in kilograms divided by height in metres squared. A BMI of 18.5 to less than 24.9 is associated with less risk of heart disease (see Table 3).

A waist circumference of less than 40 inches for men and less than 35 inches for women is also associated with less health risk.

#### Lifestyle changes

Other healthy lifestyle changes that can reduce your cardiovascular risk profile include regular exercise, smoking cessation and stress management strategies.

For more information on heart health visit the UHN Heart and Circulation Program website at: [www.uhn.ca/patient/health\\_info/h/heartandcirculation.asp](http://www.uhn.ca/patient/health_info/h/heartandcirculation.asp)

*Margaret Brum, RD, BASc is a Clinical (Cardiology) Dietitian at the Cardiac Care and Heart Health Clinic, Toronto Western Hospital.*

### Table 1 - The Heart Healthy Diet

#### Grain Products

- Choose whole wheat, rye, or pumpernickel instead of white bread.
- Starchy vegetables such as potatoes and corn are included in this group.
- Choose high fibre cereals.

#### Fruits and Vegetables

- Choose one fruit with each meal.
- Have vegetables (cooked or raw) with lunch and dinner.

#### Milk Products (2-3 servings per day)

Examples of one serving:

- 8 oz (250 mL) of skim or 1% milk or calcium-fortified soy beverage.
- 175 g of fat-free yogurt.

#### Meat and Alternatives

- Have between 4-6 cooked ounces per day of lean meat, skinless poultry, fish, skim milk cheese or legumes.
- Have fish (not fried) 2-3 times per week.
- Have legumes (dried beans and peas or lentils) or tofu 1-2 times per week.  
A half-cup of each of legumes or 100g (1/4 to 1/3 block) of tofu is equal to 1 oz. of meat, poultry or cheese.
- Choose cheese that is 7% M.F. (milk fat) or less.

#### Fats and Oils (no more than 4-8 servings per day)

Examples of one serving:

- 1 teaspoon (tsp) or 5 mL of a liquid oil such as extra-virgin olive oil or cold-pressed/expeller pressed canola oil.
- 1 tsp of a non-hydrogenated regular margarine or 2 tsp of a diet/light margarine.
- Nuts (e.g., 8 almonds or 2 whole walnuts) or 3 tablespoons (tbsp) of sunflower seeds in the shell.
- 1/8 medium avocado.
- 7 olives.
- 1 tbsp of regular salad dressing or light peanut butter.
- 1 tbsp light or 1/2 tbsp regular mayonnaise.



### Table 2 - Saturated Fat Intake for Persons with Heart Disease

#### If You Consume:

1,500 calories per day or less  
2,000 calories per day or less  
2,500 calories per day

#### Your Goal Is To:

Eat 12 grams of saturated fat or less per day.  
Eat 16 grams of saturated fat or less per day.  
Eat 19 grams of saturated fat or less per day.

### Table 3 -Body Mass Index

Classification	BMI (weight in kg/[height in m <sup>2</sup> ])	Health Risk
Extreme Obese Class III	Greater than or equal to 40	Extremely High
Obese class II	35-39.9	Very High
Obese Class I	30-34.9	High
Overweight	25-29.9	Increased Risk
Healthy Weight	18.5-24.9	Normal
Underweight	Less than 18.5	Moderate

## CARDIAC SURGERY

### Tracking and setting the standards of care

#### PMCC CONTINUES TO LEAD THE WAY IN SURGICAL OUTCOMES

*As the premier cardiac care facility in Canada, the Peter Munk Cardiac Centre (PMCC) has earned a global reputation in all aspects of cardiac medicine. One of the Centre's core areas of expertise is in cardiac surgery. The PMCC has one of the finest surgical records in the world, routinely performing the most complex and high-risk procedures.*

*Here, Dr. Tirone David, Head, Division of Cardiovascular Surgery and the Melanie Munk Chair in Cardiovascular Surgery outlines some of the latest developments in cardiac surgery.*



Dr. Tirone David, the Melanie Munk Chair in Cardiovascular Surgery, helps keep the PMCC at the forefront of cardiac care.

**Coronary Artery Bypass Graft (CABG):** The annual number of percutaneous coronary interventions (PCI) has surpassed the number of CABGs in Ontario. Although the annual number of patients having CABG in Ontario has not yet declined, this phenomenon has been documented in the U.S., where the CABG rate is higher than in Canada.

The appropriateness of this trend has been recently challenged by a study by Dr. E. Hannan and collaborators published in the *New England Journal of Medicine* (2005;352:2173-83). The authors used New York State cardiac registries to identify 37,212 patients with multivessel disease who underwent CABG and 22,102 patients with multivessel disease who underwent PCI from January 1, 1997, to December 31, 2000. They determined the rates of death and subsequent revascularizations within three years after the procedure in various groups of patients according to the number of diseased vessels and the presence or absence of involvement of the left anterior descending coronary artery. The rates of adverse outcomes

were statistically adjusted to account for differences in patients' severity of illness before revascularization.

Risk-adjusted survival rates were significantly higher among patients who underwent CABG than among those who received a stent in all of the anatomical subgroups studied. The authors concluded that in patients with two or more diseased coronary arteries, CABG is associated with higher adjusted rates of long-term survival than stenting.

**Surgery for Heart Valve Disease:** There are two types of heart valves: mechanical and tissue valves.

Mechanical valves are durable but require lifelong anticoagulation (use of blood thinners), which is associated with a constant risk of bleeding. The level of anticoagulation is regulated through a blood test called international normalized ratio, or INR. Self-monitoring of INR has been available in Europe for several years and is now well established, so that the risk of anticoagulation is reduced. Although the machine used to test INR at home is available in Canada, government health plans do not cover the cost of the equipment or the reagent required for the test.

Tissue valves do not require anticoagulation, but they are not as durable as mechanical valves. The quest for a durable tissue valve is alive and well. The so-called "third generation tissue valves" have been available for over a decade and the results are very encouraging. They indeed seem to be more durable than the original pig valves. Newer tissue valves are chemically treated to prevent calcification of their components, a process that makes them more durable.

Since we do not have a perfect artificial heart valve, every effort is made to save the patient's own valves when they malfunction and require surgical correction.

The results of heart valve repair at the Peter Munk Cardiac Centre have been nothing short of outstanding. We recently reported the late outcomes of mitral valve repair for mitral valve prolapse at the annual meeting of the American Association for Thoracic Surgery in San Francisco. Over 90 per cent of all patients were free from re-operation or valve failure 15 years postoperatively. Similarly, the long-term results of aortic valve repair in patients with aneurysms of the aortic root have been excellent.

## BEHIND THE SCENES

### From the lab to the clinic

#### PMCC'S SCIENTISTS COMBINE CLINICAL AND RESEARCH EXPERTISE

The vast majority of the world's major medical advances started in a lab somewhere.

Every clinician who uses a new medication or technique to treat a patient recognizes the value of the basic science behind it. At the Peter Munk Cardiac Centre (PMCC), the clinicians frequently do more than simply acknowledge the importance of lab work; they also participate.

"There are very few centres anywhere that have this kind of a concentration of clinicians involved in basic scientific research," notes Dr. Mansoor Husain, Associate Director, Cardiac Intensive Care Unit, Toronto General Hospital and Scientist, Division of Cellular and Molecular Biology.

Dr. Husain is one of those clinicians. While his clinical duties demand much of his attention, the majority of his time is spent in the laboratory, conducting or supervising molecular research in cardiac and vascular diseases. After receiving his medical education and clinical training in Edmonton and Toronto, respectively, Dr. Husain honed his research skills in the Program of Excellence in Cardiovascular Biology at the Massachusetts Institute of Technology (MIT) before joining UHN in 1997.



Dr. Mansoor Husain's research focus is on regenerative medicine – therapies that utilize the heart's own cells and tissues.

Since then, he has received a Clinician-Scientist Award from the Canadian Institutes of Health Research, a Career Investigator Award from the Heart & Stroke Foundation of Ontario and was recently presented with a *Premier's Research Excellence Award*. His team at UHN has earned an international reputation for tissue-specific gene regulation, including the landmark identification of an enzyme involved in a specific immune response that causes heart rhythm problems.

#### Focus on regenerative medicine

"Our overall goal is to translate our discoveries in the lab into novel treatments with the potential to benefit heart patients around the world," Dr. Husain explains. "Currently, our focus is on regenerative medicine... therapies that utilize the heart's own cells and tissues."

It is complex work that requires considerable resources, both material and intellectual. "The team includes four PhD students, two postdoctoral fellows, and three technicians," he notes. "The PMCC has become well-known for this type of research, so we are able to attract bright minds from across Canada and the world."

There are several highly promising projects currently underway. "Our work with genetically engineered mice is one example," says Dr. Husain. "By using a process called conditional regulation we have been able to control the expression – or turn on and off – a specific gene in a mouse's heart that causes a fatal heart condition called sudden death, that is very similar to what humans experience. By creating and studying this mouse model we are able to learn about the human disease. We can apply the same techniques to other conditions."

Exciting progress is also being made in other areas. "We have recently stumbled on a molecule that is involved not only in the growth, but also the contraction, of muscle cells located in the walls of blood vessels – something that can cause high blood pressure," Dr. Husain states. "This represents an entirely new pathway to high blood pressure that was not known before."

"These types of discoveries are tremendously important," he continues. "They represent the vital first steps toward designing and testing genetic therapies that can treat a number of serious heart conditions, first in mouse models, then in humans."

The next challenge, of course, is to translate the discoveries in the lab into treatments in the clinic. "It can be a long, painstaking process," Dr. Husain notes. "But the PMCC's approach of combining clinical experience with basic research expertise is the right one. It's vital to bring these two equally important perspectives together. It enhances the research and expedites results."

## CARDIOLOGY

# Advancing the frontiers of interventional cardiology

### PMCC PROGRAM CONTINUES RICH TRADITION

Toronto's tradition of innovation in the field of interventional cardiology is alive and well.

Since the first angioplasty procedure at Toronto General Hospital almost a quarter of a century ago, researchers and clinicians have pushed the frontiers of this vital specialty. And that tradition continues today at the PMCC.

"Interventional cardiology implies percutaneous – or through the skin – treatment of various heart conditions," explains Dr. Vlad Džavík, Director, Cardiac Catheterization Laboratory and Interventional Cardiology. "It is a treatment process that does not require surgery, and an important option in the overall treatment scheme for patients with heart disease."

The PMCC's interventional cardiology program currently employs nine interventional cardiologists, a team of skilled nurses and a nurse coordinator, utilizing two state-of-the-art labs, as well as a short-stay facility for patients. Altogether, the program handles approximately 2,100 percutaneous procedures and 250 adult congenital heart disease (ACHD) cases each year.

"Our main focus has traditionally been on coronary artery disease (CAD) and ACHD," says Dr. Džavík. "About 20 years ago, a high percentage of CAD cases required complex bypass surgery. Now, percutaneous interventions, such as balloon angioplasty and stenting are common. In fact, new technology and techniques, including many pioneered here, have allowed for the treatment of more complex conditions, and certain patients that even bypass surgery could not help. We've made similar progress in the treatment of ACHD."

#### Targeting valve repair

Recently, advances in interventional cardiology have opened up a new field of therapy – valve repair. "This is an exciting new area for us," Dr. Džavík notes. "It stemmed from the need to help patients with valve problems who were simply too sick or too 'high-risk' for surgery. We also hope to apply our experiences to patients who are not so high-risk, but may still benefit from an interventional approach. Interventional cardiologists will collaborate more closely with surgeons, so we can determine the best approach for each individual

– percutaneous treatment, surgery, or even both in the same patient."

Dr. Džavík points out that the PMCC was recently involved in an important 'first' in this area; a new procedure to repair a severe leaky valve (see next page).

This is just one example of how the PMCC is continuing to expand the horizons of interventional cardiology. "We are active in a number of crucial areas," he comments. "We are leading the field in outcomes research. We are leading, along with colleagues in New York, a major international study of patients who still have a closed artery following a heart attack, as well as a study looking at how to improve survival in patients with cardiogenic shock, the most severe form of heart attack.

"We are also one of two Canadian centres, along with the Montreal Heart Institute, participating in the trial of a device for treating valve problems that may revolutionize treatment and significantly reduce mortality."

At the same time, Dr. Džavík and team are working to improve the clinical efficiency of the program. "We'd like to find ways to expedite treatment and reduce waiting lists," he says. "And we hope to establish a primary percutaneous procedure for patients with acute myocardial infarction, or heart attack. Interventional cardiology has much to offer."



Dr. Vlad Džavík notes that the PMCC is leading the way in a number of crucial areas of research in interventional cardiology.

## Pioneering procedures

"The close collaboration between all of the departments here – cardiology, cardiac surgery, anesthesiology, perfusion, medical imaging and nursing – has really allowed us to be at the forefront of research in percutaneous valve technology, allowing us to repair or replace valves without surgery," notes PMCC interventional cardiologist Dr. Eric Horlick.

One such procedure took place in late November. Dr. Horlick, Dr. Leonard Schwartz, and Dr. Melitta Mezody repaired a leaky mitral valve using a newly developed 'clip' to join the tips of the leaflets of the mitral valve together." This type of repair has been done surgically for 15 years, using a method called the Alfieri stitch," Dr. Horlick explains. "This is the first time it has been done percutaneously in Canada."

And further advances lie immediately ahead. "In the new year we hope to perform a percutaneous aortic valve replacement using a valve sewn into a stent," says Dr. Horlick. "This will allow us to treat patients in whom surgery would be very high risk, or even not possible."

## PETER MUNK CARDIAC CENTRE - CLINICAL & RESEARCH REPORT

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Dr. Vladimír Džavík

Dr. Eric Horlick

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# PMCC IN THE NEWS

## Brazilian Ball Breaks Records

The 2005 *Brazilian Carnival Ball* raised a spectacular \$2.2 million – the most in its history – for the PMCC.

The Ball is the largest 'Carnival'-style event held outside Rio de Janeiro and one of the premier fundraising events in Toronto, with dancers and costumes flown in directly from Brazil.

"We are enormously grateful to TD Waterhouse and RBC Capital Markets, our Presenting and Premier Sponsors," says Linda Goldsack, Co-Chair of the *Brazilian Carnival Ball* Committee, along with Irit Shay and Colleen Kennedy.

"And, of course, to the sell-out crowd of over 1,800 guests."

Proceeds from the Ball will support programs in Cardiology, Cardiovascular Surgery and Vascular Surgery.

## Dr. Ross and Dr. Rao featured on *The Nature of Things*

Dr. Heather Ross, Dr. Viv Rao and their teams at UHN's renowned heart transplant program were featured on the season premiere of *The Nature of Things* on CBC television in October.

Hosted by Dr. David Suzuki, the segment 'Change of Heart' followed the UHN teams for several weeks as they tried to achieve the best outcome for four transplant patients. The segment was filmed at Toronto General Hospital and offered an intimate behind-the-scenes look at the heart transplant program.

Both Dr. Ross and Dr. Rao recently received prestigious appointments at the PMCC that will allow them to continue their leadership in cardiac care (see front page).



## A Royal Rededication

Their Royal Highnesses The Earl and Countess of Wessex were honoured guests at the rededication of the PMCC in June. The royal couple met many of the staff, including Dr. Viv Rao, who explained the intricacies of the left ventricular assistive device - more commonly known as the mechanical heart.

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## McEwen Chair in Cardiac Regenerative Medicine: Dr. Rüdiger von Harsdorf



Dr. von Harsdorf

For Dr. von Harsdorf, the challenge and opportunity offered by this position were more than enough to entice him to move his family from Berlin, where he was Asst. Medical Director and Professor, Internal Medicine, Dept. of Medicine, Charite Hospital.

His Chair was created as part of a larger gift from Rob and Cheryl McEwen for the establishment of the McEwen Centre for Regenerative Medicine.

"I'm very excited," Dr. von Harsdorf says. "There is an excellent environment here, and I can sense the opportunities. Regenerative medicine is complex, and still in its very early stages. Our task will be to advance our scientific understanding and clinical knowledge toward the development of molecular and regenerative therapies that will improve outcomes and quality of life for people with heart conditions."

Dr. von Harsdorf will apply his strong research background in molecular control of pathologic and regenerative growth of the failing heart to advancing the field of regenerative medicine, using the body's own cells to repair damaged organs.

For more information on how you can help support the PMCC, contact:

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