



PETER MUNK CARDIAC CENTRE

CLINICAL & RESEARCH REPORT

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Continuing a tradition of leadership, innovation and discovery

Welcome to the first issue of *Clinical & Research Report*, a newsletter that will provide you with updates on the latest research and news from the Peter Munk Cardiac Centre, as well as useful, practical information on the prevention and treatment of heart disease.

The Centre is home to the Peter Munk Cardiac Program – one of Toronto General Hospital's (TGH) flagship programs. The Centre officially opened in 1997, thanks to the vision and generosity of Peter and Melanie Munk.

Since its inception, the program has already helped to advance cardiac care, and has continued the TGH's rich history of innovation and discovery in treating heart disease. A history that dates back to 1935, with the first clinical use of heparin.

Today, a team of exceptionally talented and dedicated physicians, surgeons, nurses and staff continues this world-renowned tradition of excellence. With your support, their efforts have made the Peter Munk Cardiac Centre an invaluable resource and leader in the treatment of heart disease, not only in Toronto, but in Canada and, indeed, the world.

Dr. Christopher Feindel, Medical Director
Peter Munk Cardiac Centre Program
University Health Network



PHOTO: BILL MILNE PHOTOGRAPHY

ABOUT THE PMCC: A CENTRE OF CARDIAC EXCELLENCE

The Peter Munk Cardiac Centre (PMCC) is the premier cardiac centre in Canada, with a global reputation for patient-centered care, leading-edge research in cardiac medicine and surgery, and advanced education programs. 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

Women underestimate Canada's number one killer

CARDIOVASCULAR DISEASE MORE FATAL THAN CANCER

By Joan Ivanov, RN, MSc, PhD

Cardiovascular (CV) disease is the major cause of death in North America. This condition, which includes coronary artery disease (CAD) and cerebral vascular disease (stroke), accounts for well over one-third of all deaths in the country, killing more Canadians than all cancers combined. And, despite what most of us may think, cardiovascular disease is an equal opportunity killer.

In fact, CV disease may pose an even greater risk to women – partly because they are unaware of its dangers. And those dangers are very real. The number of deaths due to CV disease in Canadian women has steadily increased since 1950. In 2000, for the first time, more women died as a result of this condition than men.

As startling as these statistics are, the reasons for increased deaths in women are still largely unknown. And the risks are too often not recognized. A Heart and Stroke Foundation of Canada survey of women showed that CV disease was generally perceived as “a middle-aged men’s disease”. Only 17% of women surveyed recognized it as the leading cause of death among women (most thought breast cancer posed the greatest risk). Perhaps even more disconcerting, however, was the fact that half of women over the age of 45 years indicated that their physicians had never spoken to them about CV disease. This failure to

recognize the dangers of CV disease in women has unfortunately translated into clinical practice. For example, women have been less likely to be offered cardiac procedures compared to men. After adjusting for age, Ontario men were 30% to 50% more likely than women to have a cardiac diagnostic test, such as a stress test or heart scan.

Women often under treated

Even after diagnosis, women seem to be treated differently than men. One Ontario study showed that women who had a heart attack received fewer coronary angiograms, fewer coronary artery bypasses, and fewer percutaneous coronary interventions compared to men. Women were also less likely than men to be seen by a cardiologist within the first year following a heart attack.

One suggested reason for this poor record is that some primary care physicians fail to diagnose CAD in their female patients or, if they do, fail to refer them on to more sensitive diagnostic testing and specialized care. There is also the possibility that the women themselves are refusing to undergo further testing and/or treatment.

Early diagnosis essential

The Peter Munk Cardiac Centre (PMCC) actively encourages women to seek early diagnosis and treatment for CV disease. Currently, approximately 20% of coronary artery bypass

operations at the Centre are performed on women. This rate is a reflection of the number of female patients referred to surgery, and not any selection bias, because once a woman has had a cardiac catheterization, her access to coronary intervention is the same as for men.

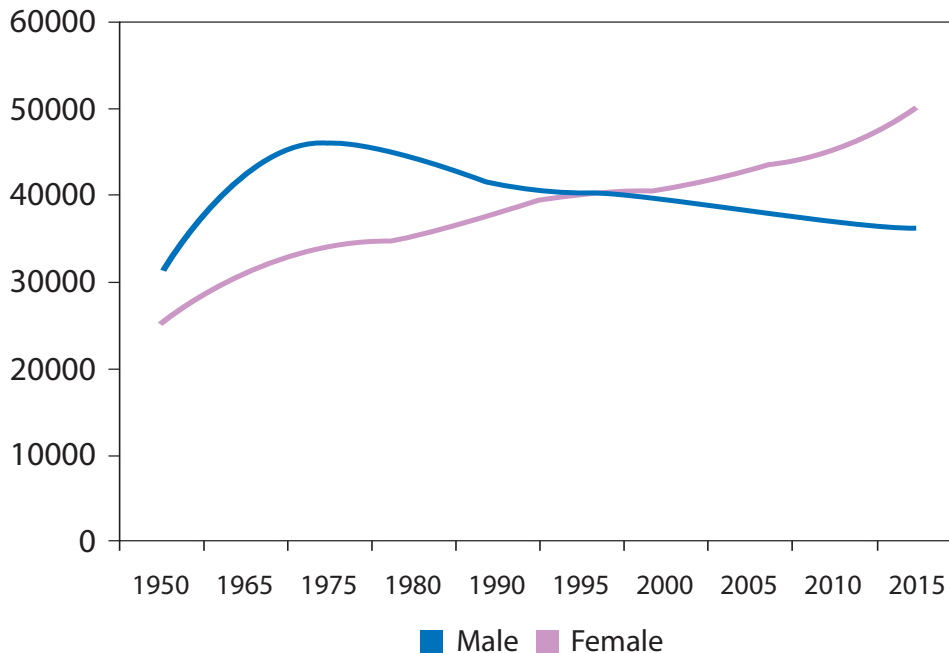
Because women are usually diagnosed later in their disease than men, women having surgery tend to be older, have more severe symptoms of coronary disease, and have more risk factors, such as diabetes, hypertension, and congestive heart failure. As a result, women who undergo surgery often have more complications than men.

Cardiac surgery at PMCC has one of the finest records in the world for coronary artery bypass surgery, surpassing international outcome standards. Unfortunately, due to the above mentioned risk factors, women have a higher rate of operative death than men, even at PMCC.

Increased awareness, earlier diagnosis and referral are vital in helping the surgeons and physicians at PMCC, and around the world improve the outcomes of CV disease in women.

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NUMBER OF CARDIOVASCULAR DEATHS BY SEX ACTUAL AND PREDICTED, CANADA, 1950-2015



Source: Health Canada (unpublished)

What Can Women Do?

- **Be Aware:** Learn about the modifiable risk factors that are associated with coronary artery disease, such as smoking, obesity, a lack of exercise, high cholesterol, blood sugar control (for diabetics), blood pressure control, and stress reduction.
- **Be Proactive:** Changes in lifestyle may help prevent or reduce the serious consequences of cardiovascular disease.
- **Be an Advocate:** Ask your physician to talk to you about heart disease. Ask to have blood work done, including cholesterol levels, and check your blood pressure. If you are experiencing any symptoms, ask your physician to do a stress test or heart scan.
- **Be Safe:** Become familiar with the signs of a heart attack and act quickly to get medical help. (*Editor's note:* Visit the Heart and Stroke Foundation of Canada website at www.heartandstroke.ca for more information on the signs and symptoms of a heart attack).

For women only

Women's Heart Clinic offers specialized care

In addition to acknowledging the dangers, the experts at the Peter Munk Cardiac Centre (PMCC) also recognize the unique challenges of diagnosing and treating CV disease in women.

As a result, the Centre established the Women's Heart Clinic in 1997. The clinic is open Tuesday afternoons between 1:00 and 4:00 p.m. to female patients referred by their family physician or other specialist.

"Cardiovascular disease is the leading cause of death among women, and we treat it very seriously," explains Dr. Susan Lenkei-Kerwin, who has been the clinic's director since it opened. "And because many women are more comfortable discussing their health with other women, our staff is entirely female, including the three physicians who work in the clinic."

The clinic takes a multidisciplinary approach, and patients who are referred are given a complete work-up. "Each patient is interviewed, given a thorough exam and receives the necessary tests," Dr. Lenkei-Kerwin says. "Our job is to rule-in or rule-out heart disease. If any problems or potential problems are detected, we refer the patient to the appropriate resources."

The Women's Heart Clinic has been busy since it opened, but aims to see all referrals within four weeks.

"Once you've been told you may have a heart problem, you are naturally going to be anxious," says Dr. Lenkei-Kerwin. "You need to be taken care of."

BEHIND THE SCENES

Pathology provides the clues

PMCC'S CARDIAC PATHOLOGISTS HELP IMPROVE OUTCOMES

Pathology lies at the very root of the treatment of human illness, including cardiovascular disease.

Much of the pathologist's knowledge comes from the study of human tissue and other bodily materials. In fact it is with pathology's best known procedure – the autopsy – that the majority of us are most familiar. At the Peter Munk Cardiac Centre (PMCC), however, the cardiovascular pathologist's role involves much more than determining how a patient died. As Dr. Jagdish Butany, Consultant Cardiovascular Pathologist/Director Autopsy Services explains, his specialty today is much more about life than death.

"Our role is to provide our surgeons and clinicians with the information they need to do the best job they can," Dr. Butany states. "The information we provide helps to guide the decisions they make. They are constantly looking at our findings and working with us to come up with the best solutions for their patients."

The expertise of the Centre's cardiovascular pathologists has benefited more than just the patients that pass through the PMCC. One of the department's key contributions is its input into the artificial valves and other prosthetic devices used in heart surgery.

Often this input involves a certain amount of detective work, examining evidence, looking for clues and following leads – even though they may be at a



Dr. Jagdish Butany notes that, today, the specialty of pathology is "much more about life than death."

microbiological level. That, in turn, involves the assets of any good detective: instinct, attention to detail and persistence.

Pathology investigates

Dr. Butany recounts one particular case that first came to light in the PMCC's early days. "About eight years ago we began to notice some problems involving one of the most widely used mechanical heart valves," he recalls. "The implanted mechanical heart valves were showing evidence of dysfunction, infection and thrombosis at a much higher rate than ever before. It turned out that some parts had been modified, and it was this 'new' batch of valves that was not functioning

LANDMARKS - A brief history of the Peter Munk Cardiac Centre

- 1997 Peter Munk Cardiac Centre officially opens at Toronto General Hospital.
- 1997 First successful volume reduction, a surgical procedure to reduce enlarged hearts in patients suffering from congestive heart failure.
- 1999 University Health Network is formed, linking three leading hospitals: Toronto General, Toronto Western and Princess Margaret.
- 1999 First clinical trial evaluating strategies to treat sleep apnea in patients with heart failure.

normally. We saw four such cases in six months, after the surgeons had removed them. I contacted the manufacturer repeatedly, and was told that no one else was having such a problem. However, in the next few months, there were three more cases. I tried to get in touch with the Medical Devices branch of Health Canada, with no success. After contacting the Food and Drug Administration in the U.S., I received a call from the Chief of Cardiac Surgery at a U.S. hospital, saying that they had no similar problem."

Dr. Butany and his team continued with their investigation, however. Their efforts resulted in a review at another Canadian centre that revealed a significant number of cases of similar problems with the valve in question. "We then received reports of similar problems from the UK," he notes. "It was becoming clearer that this valve was associated with a higher incidence of problems. Based on our findings, Dr. Tirone David, the Head of our Division of Cardiovascular Surgery, made the decision to stop using the valve. In fact, the PMCC was the first centre in the world to do so."

Finally, the persistence paid off. Almost 18 months after PMCC ceased to use it, the problems with the valve were acknowledged and it was withdrawn from the market on January 25, 2000. The end result was improved patient safety and better clinical outcomes.

Today, the expertise of the PMCC's cardiovascular pathologists continues to be held in high regard. Data from tissue studies by Dr. Butany and his PMCC colleagues, Dr. Myron Cybulsky and Dr. Avrom Gotlieb, is being applied to the design and improvement of valves and prosthetics used around the world.

LEADING THE WAY

- The PMCC is an internationally recognized teaching centre for cardiac anesthesiologists. "We train anesthesiologists from around the world in the specific challenges of cardiac anesthesia," notes Dr. Patricia Murphy, Clinical Director, Cardiac Anesthesia. "Right now, we have cardiac anesthesia fellows from Japan, China, Germany, Italy, Israel, Ireland, Yugoslavia, Poland and Australia training here."
- During 2003/2004, the PMCC's cardiovascular surgeons and scientists:
 - Published 58 papers in peer-reviewed journals;
 - Were invited to present at 55 universities/institutions around the world; and
 - Were involved in 32 research projects.
- Dr. Tirone David, Head, Division of Cardiovascular Surgery and the Melanie Munk Chair in Cardiovascular Surgery, is the current President of the American Association for Thoracic Surgery (AATS). Only three non-Americans have served as President of this prestigious association. All three have been from PMCC.
- The RBC Financial Group Chair in Cardiovascular Nursing Research, established in 2002 at the PMCC, is the first of its kind in Canada. The Chair will further the PMCC's goal of establishing the world's leading academic cardiac nursing program.
- Regeneration of a damaged heart is no longer a dream, according to Dr. Richard Weisel, PMCC cardiac surgeon and Director of the Toronto General Research Institute. His team has recently received approval from Health Canada to start the first clinical trials of cell transplantation to restore function to hearts damaged by injury such as a heart attack. The scientists are also developing techniques to repair damaged hearts using a new process called tissue engineering. This process combines the addition of beneficial genes to stem cells with the use of biomaterials which dissolve in the body to improve the benefits of cell replacement therapy.

- 2001 Development of an innovative new pig valve and aorta to replace the diseased aortic root.
- 2002 First successful ABIOMED (mechanical assist device) bridge to transplant in Canada.
- 2003 Peter Munk Cardiac Centre gets a new home in a state-of-the-art Clinical Services Building and Ambulatory Centre.
- 2004 Dr. Tirone David, Head of Division of Cardiovascular Surgery, is elected President of the American Association for Thoracic Surgery.
- 2005 Brazilian Carnival Ball designates its proceeds to Peter Munk Cardiac Centre.

Meeting the challenges of Adult Congenital Heart Disease

TCCCA SETS WORLD STANDARD AND ATTRACTS LEADING SPECIALISTS

The Toronto Congenital Cardiac Centre for Adults (TCCCA) in the Peter Munk Cardiac Centre (PMCC) is world renowned for its treatment and research expertise in adult congenital heart disease, or ACHD. In fact, it is the largest – and oldest – centre of its kind in the world, and has been rated as providing “the gold standard” of care for adults with congenital heart disease by the National Institutes of Health.

The TCCCA is a major North American referral centre. Over 8,000 patients have been treated, and over 3,000 patients are actively under the care of its specialists. The quality of care and innovation of the TCCCA is a natural draw, not only for patients, but for leading clinicians and researchers in the field of ACHD.

One such expert is Dr. Candice Silversides, who joined the staff in November of 2004. For Dr. Silversides, it is something of a return engagement. A Winnipeg native, Dr. Silversides originally did her fellowship in ACHD and echocardiography at the TCCCA, before moving to Harvard University and the Beth Israel Deaconess Medical Center in Boston.

Return to Toronto

After two years working with ACHD patients in Boston, she made the decision to return to Toronto and the Peter Munk Cardiac Centre. “For one thing, I married another Canadian, so it made sense to come home,” she laughs. “But, above all, the ACHD program here is excellent, and there is a terrific opportunity to do productive work, both in the clinic and through research opportunities.”

A particular area of interest for Dr. Silversides is the pregnancy and heart disease research partnership between the ACHD program and the University of Toronto Pregnancy and Heart Disease Research Program. “There were dramatic improvements in congenital heart defect surgery in children in the 70’s and on,” she explains. “As a result, we are now seeing women

with ACHD in their 20s and 30s – the prime child bearing years. We need to understand and help pregnant women overcome the special challenges that ACHD presents.”

Experience in dealing with pregnancy and ACHD is just one example of the clinical expertise of the ACHD program – a clinical expertise that results in referrals from all over the country.



Dr. Candice Silversides with portraits of just a few of the noted clinicians from around the world who have studied ACHD at the Peter Munk Cardiac Centre.

“Cases that are too complex for other centres are referred to us for intervention or surgery,” Dr. Silversides notes. “We really do have a unique level of expertise and clinical resources. For example, we have 10 cardiologists with special training in ACHD. Most other centres will have one, if any. Our radiologists have ACHD training and are able to acquire and interpret more complicated diagnostic images. Our patient liaison specialist, Jeanine Allen, is a nurse practitioner with a tremendous background in working with patients with ACHD.”

“And of course, there is our surgical team,” she adds. “They have a great deal of experience in congenital

heart defects. One of the program's surgeons, Dr. Bill Williams, from the Hospital for Sick Children, performs surgery on adults in their 20s or 30s, some of whom he performed initial surgeries on during childhood."

Teaching the world

Overall, there are about 40 people who work in the ACHD program, including physicians, nurses, other health professionals, support staff and, of course, research and clinical fellows. The educational aspect is

important, and the scope and reputation of the program attracts students and fellows from around the world.

"We have photographs of the people who have trained here running along the walls," says Dr. Silversides. "There have been a lot of them, and from virtually everywhere. I think it says something about our program when you note how many of them were senior clinicians who came here to learn from us, and how many have gone on to become leaders in the field of ACHD."

What is ACHD?

Congenital heart disease (CHD) is caused by a structural problem, or defect, in a baby's heart that is present at birth. An estimated 1% of all live-born infants – approximately 4,600 babies born each year in Canada – have a congenital heart defect.

While this condition is still the leading cause of death from birth defects during the first year of life, improvements in cardiac surgery and treatment of infants and children with CHD over the past few decades have dramatically reduced mortality rates.

Today, most patients reach adulthood, but carry with them the lingering effects of their heart defect. The result is a rapidly growing population of men and women with adult congenital heart disease (ACHD).

There are an estimated 110,000 Canadians currently living with ACHD. Each year, approximately 1,700 patients are treated at the Peter Munk Cardiac Centre.

Treatment is based on the severity of the condition. Some patients require little treatment. Others may need to be treated with medications, invasive procedures or surgery. Most adults with congenital heart disease need to be monitored and take precautions throughout their life.

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PMCC IN THE NEWS

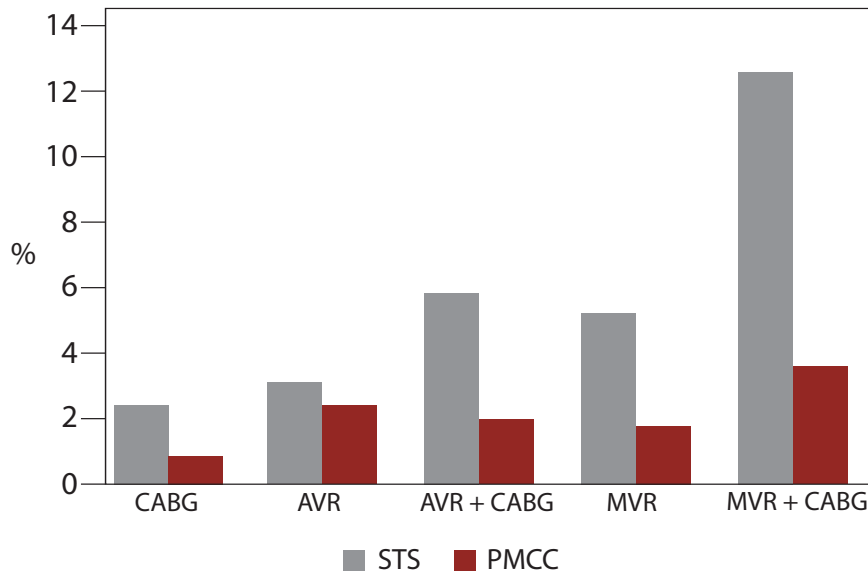
OPERATIVE MORTALITY RATES LOWER AT PMCC

Operative mortality for coronary bypass and heart valve procedures performed at the Peter Munk Cardiac Centre (PMCC) is significantly lower than the benchmarks set by the Society of Thoracic Surgeons (STS).

Cardiac surgery at PMCC has one of the finest records in the world. Overall, operative death at PMCC is below the universally accepted benchmark of 2% as established by the STS. The STS represents more than 4,800 cardiovascular surgeons worldwide. Their benchmarks have been developed from the STS' comprehensive database of cardiac surgical outcomes, containing information from hundreds of thousands of patients and more than a million heart bypass cases.

The PMCC's record is particularly impressive when you consider that the Centre's cardiovascular surgeons routinely handle some of the most difficult, complex, and high-risk patients in North America.

OPERATIVE MORTALITY



STS = Society of Thoracic Surgery Database

PMCC = Peter Munk Cardiac Centre - UHN (2003)

CABG = Coronary artery bypass graft surgery

AVR = Aortic valve surgery

MVR = Mitral valve surgery

"CARING IS CRUCIAL," DR. DAVID TELLS AATS

Dr. Tirone David emphasized the importance of 'caring' in his speech to attendees at the recent 2005 Meeting of the American Association for Thoracic Surgery (AATS) in San Francisco.

In his address as President of the AATS, Dr. David told members that, "...a surgeon's clinical outcomes are a function of knowledge, judgment, dexterity, caring and attention to detail. Caring is crucial in the delivery of patient care. Caring involves a genuine interest in the patient's well being as well as a conscious effort to cause no harm. I believe that caring is one of the most important aspects of the work ethic surrounding the practice of medicine."

The AATS represents the world's foremost cardiothoracic surgeons.



Dr. Tirone David

There is always an answer. We'll find it.

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

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