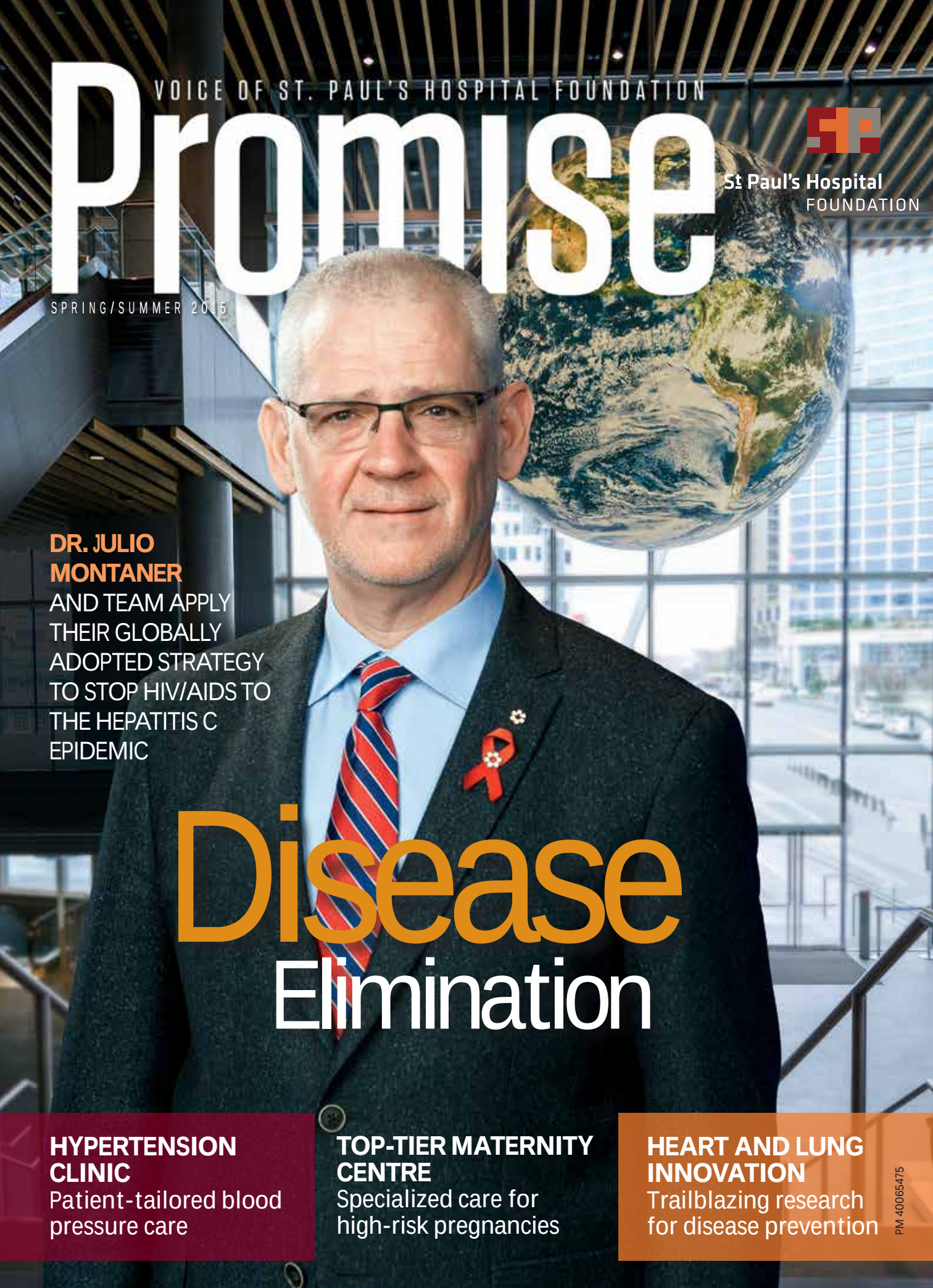
VOICE OF ST. PAUL'S HOSPITAL FOUNDATION

Promise

St Paul's Hospital FOUNDATION

SPRING/SUMMER 2015



DR. JULIO MONTANER AND TEAM APPLY THEIR GLOBALLY ADOPTED STRATEGY TO STOP HIV/AIDS TO THE HEPATITIS C EPIDEMIC

Disease Elimination

HYPERTENSION CLINIC
Patient-tailored blood pressure care

TOP-TIER MATERNITY CENTRE
Specialized care for high-risk pregnancies

HEART AND LUNG INNOVATION
Trailblazing research for disease prevention

PM 40065475

Reaching New Heights

As a provincial health care resource, St. Paul's reach extends beyond the hospital itself and into every corner of BC. We see that reach in the form of the patients who come to us from around BC, in our outreach programs to support patients in their own communities, and through game-changing research and teaching that impacts care around the province and beyond.

The return of the International AIDS Society (IAS) Conference to Vancouver this summer is a reminder of how far St. Paul's innovations extend. Since the conference was last in Vancouver, in 1996, breakthroughs pioneered by the BC Centre for Excellence in HIV/AIDS (BC-CfE) at St. Paul's Hospital have nearly eradicated the epidemic in BC. With an end to the global pandemic potentially on the horizon, the BC-CfE is now setting its sights on additional targets (page 8).

St. Paul's has had a similar impact in areas such as addictions, kidney and heart. The provincial Heart Centre at St. Paul's, for example, is home to many "firsts" in the treatment of heart disease. We have featured many of these achievements in past issues of *Promise*, such as last issue's focus on transcatheter heart valve procedures, an alternative to open-heart surgery pioneered at St. Paul's and now practised around the world.

This issue spotlights a few more examples of our leadership in heart health, including: BC's first dedicated Hypertension Clinic (page 20); the collaboration between our heart, kidney and maternity departments to care for some of our province's most complex pregnancies (page 14); and innovative research taking place at the Centre for Heart Lung Innovation at St. Paul's (page 12).

Of course, none of this would be possible without the support of our donors, who give St. Paul's the ability to create these health care innovations. We are grateful to you for helping us reach out to those in need. Thank you.

David Poole
Chair, St. Paul's Hospital Foundation
Senior Management Consultant, Scotiabank

Dick Vollet
President and CEO
St. Paul's Hospital Foundation

Photo: Brian Smith

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St Paul's Hospital FOUNDATION
Inspired care.
ST. PAUL'S HOSPITAL
PROVIDENCE HEALTH CARE

inside

COVER

FEATURES

DEPARTMENTS

COVER: (Dr. Julio Montaner) by Brian Smith/Providence Health Care Media Services

» **To find out how** you can support care, research and teaching at St. Paul's Hospital, please contact St. Paul's Hospital Foundation at 604-682-8206 or visit *www.helpstpauls.com.*

New Laser for Cardiovascular Surgery

Cardiovascular surgeon Dr. Jamil Bashir holds the scope of an excimer laser, which he uses for specialized heart procedures at St. Paul's.

In the last issue of *Promise*, we highlighted the excimer laser, technology that plays a key role in specialized procedures at the provincial Heart Centre at St. Paul's Hospital. Since then, donors have helped complete a campaign to purchase a state-of-the-art laser to ensure patients with pacemakers and other implanted devices continue to receive the best care.

The excimer laser creates a micro-thin beam of light that can cut through human tissue without generating any heat. It is used to remove wires, called leads, that connect pacemakers and other implanted devices to a patient's heart. Unlike alternative surgeries, only a tiny incision in a patient's chest is required to perform a lead extraction using the excimer laser.

"We're really excited," says Dr. Jamil Bashir, a cardiovascular surgeon at St. Paul's provincial Heart Centre. "I'm still in the early stages of my career and I'm looking forward to having new equipment that's going to allow me to provide reliable care to patients for another 20 years or more."

The excimer laser has been used to perform 70 to 80 lead extractions each year at St. Paul's, one of the largest programs of its kind in Canada.

"Having a new laser will allow us to continue to provide specialized care to patients from throughout the province," says Bashir, who notes that many of his patients are from outside the Lower Mainland. "This laser has a huge impact on patients' lives."

Last year's Strike Out Heart Disease – a partnership between the Vancouver Canadians baseball team and St. Paul's Hospital Foundation – played a key role in the purchase of the new excimer laser by raising $100,000 from donations and sponsorships.

In 2015, Strike Out Heart Disease will return with another slate of events and initiatives to support St. Paul's, with proceeds going towards a fundraising campaign to acquire a new MRI (Magnetic Resonance Imaging) scanner for St. Paul's. The new scanner will be faster, which will help to reduce wait times for patients.

Strike Out Heart Disease is presented in partnership with:

Sponsored by:

Photos: Brian Smith

Ebola Angel

In January 2015, Jasmine McEachern volunteered to join the emergency response efforts in Sierra Leone following the outbreak of Ebola in that country. McEachern, a primary care nurse at the John Ruedy Immunodeficiency Clinic and clinical research associate at the BC Centre for Excellence in HIV/AIDS at St. Paul's Hospital, spoke to *Promise* upon her return from six weeks in Lunsar, a town in the northern province of Sierra Leone.

How did your work at St. Paul's influence your decision to go to Sierra Leone?
My experience working in HIV care at St. Paul's was a big factor in my decision to go to Sierra Leone. Ebola, as with HIV, is a virus that has raised a lot of fear, but behind the scary headlines there are people with families, loved ones and jobs who need our help.

How did the skills you acquired at St. Paul's assist with your work in Sierra Leone?
In HIV care, active listening is a big part of what I do: asking people how they're doing and how I can help them. I have become more aware of the emotional needs of people and this was the skill I used most in Sierra Leone.

What were some of the patient care challenges you faced?
We worked in three big tents in Sierra Leone: one for expected, one for probable and one for confirmed Ebola cases. It was such a challenging environment, but that also led to some very innovative and creative care. We couldn't use a stethoscope because of the protective gear we had to wear, so we only used blood pressure cuffs. It really made me thankful for what we have at St. Paul's.

Has this experience changed your perspective on your work at St. Paul's?
It has definitely motivated and inspired me to keep firing towards my goals, to keep trying to emulate the really amazing people that I have worked with and to keep expecting more from myself and working really hard.

2014 Lights of Hope Campaign

St. Paul's Hospital Foundation's 2014 Lights of Hope campaign raised an outstanding $2.62 million for the hospital's greatest needs, exceeding our goal of $2.5 million and setting a new record for the second year in a row. Thank you to the many members of the public, the business community, grateful patients, friends and the St. Paul's Hospital family for showing their support for world-leading care, research and teaching at St. Paul's Hospital.

CALENDAR OF EVENTS

Vancouver Canadians Scotiabank Night for St. Paul's

Tuesday, August 18, 2015
www.helpstpauls.com/events/strike-out-heart-disease

Brilliant!

Saturday, September 26, 2015
www.helpstpauls.com/events/brilliant

Pioneering Disaster Care

Staff at St. Paul's Hospital performs a drill to prepare to respond to patient needs during a disaster.

The shock of a disaster, such as an earthquake or plane crash, can take a devastating mental and physical toll on individuals. That's why St. Paul's Hospital is taking a leadership role by pioneering a hospital-based team that supports individuals and sta, along with families seeking loved ones, during a disaster.

"The Disaster Psychosocial Response Team provides practical care and support to individuals a ected by a disaster," says Dr. Suja Srikameswaran, professional practice leader for Psychology at St. Paul's and co-chair of the hospital's Disaster Psychosocial Response Team (PSRT).

"We assess the needs of individuals, and provide support and reunification services to friends and family members who accompany loved ones to hospital."

Dr. Suja Srikameswaran co-chairs the Disaster Psychosocial Response Team at St. Paul's.

Psychosocial casualties – people su ering from intense shock, fear and anxiety capable of producing physical symptoms – can inundate hospitals during disasters, such as Hurricane Katrina in New Orleans in 2005. St. Paul's is addressing this challenge through PSRT.

Formed in 2009, PSRT is an interdisciplinary and collaborative team consisting of sta from spiritual care, social work, psychology, occupational therapy, physiotherapy, nursing and the Centre for Practitioner Renewal, which supports health care workers in the workplace.

The team conducts emergency drills to practise the systems and plans it develops. During the 2011 Stanley Cup riots, it put practice into action, providing psychological first aid and family reunification to 20 community members.

To share their systems with others, the PSRT developed a handbook, the first of its kind in Canada, which outlines procedures for a hospital to provide a psychosocial response during a disaster. Already, the team has received requests for their handbook from other health authorities in BC, along with hospitals in Washington State and Oregon.

"The response to this program has been overwhelmingly positive," says Srikameswaran. "We are very proud to be able to o er this to the community." ■

Photos: Brian Smith

Great Ways to Give

To help St. Paul's please use the enclosed form or consider giving in the following ways:

Monthly gifts

Automatic payments from your credit card or bank account are convenient and save the time and money required to mail in donations.

Honour a loved one

Make a gift in honour of a family member, friend, doctor or other caregiver to celebrate their accomplishments, their memory or a milestone occasion such as a birthday or wedding.

Securities

Donating publicly-traded securities, especially if they contain capital gains, may allow you to make a charitable gift and take advantage of special tax-saving provisions.

Will and estate gifts

Plan for a future gift in your will or in some other way, such as life insurance, an RRSP, a RRIF or a trust.

To learn more, contact us:

Mail: 178-1081 Burrard St., Vancouver, BC V6Z 1Y6
Phone: 604-682-8206
E-mail: sphfoundation@providencehealth.bc.ca
Web: *www.helpstpauls.com*

Sight-Saving Lasers

St. Paul's Hospital's Eye Clinic is looking to provide sight-saving care using state-of-the-art laser technology

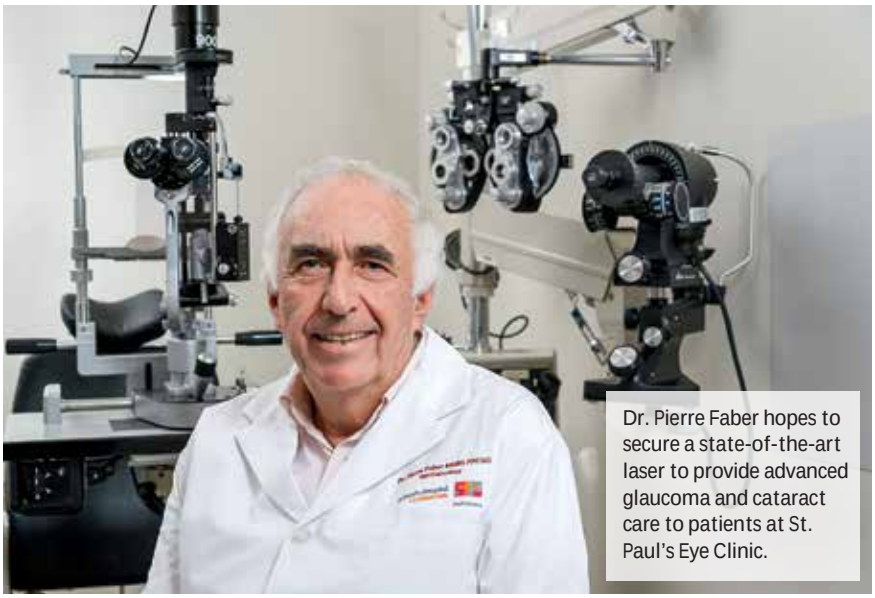
Innovations in surgical laser technology could soon offer patients at St. Paul's Hospital's Eye Clinic new treatment possibilities for some of the most common causes of vision loss in Canada.

The proposed acquisition of a new $100,000 state-of-the-art combined laser system known as Nd:YAG/SLT would give eye specialists at St. Paul's Eye Clinic the technology they need to continue to deliver timely, world-leading care to British Columbians suffering from degenerative eye diseases.

"Nd:YAG and SLT lasers have become essential to basic care," says Dr. Pierre Faber, head of ophthalmology at St. Paul's. "It's vital we bring it to St. Paul's, especially considering our aging population and the number of cataract and glaucoma patients we see."

Millions of Canadians are affected by cataracts – a condition that causes the lens of the eye to become cloudy and block light, interfering with vision – and glaucoma, which is caused by a buildup of pressure inside the eye that can lead to vision loss.

The dual laser system is extremely versatile and will allow doctors to switch between Nd:YAG mode, for the post-operative care of cataract patients, and SLT mode, for the treatment of glaucoma – an option currently unavailable at St. Paul's.



Dr. Pierre Faber hopes to secure a state-of-the-art laser to provide advanced glaucoma and cataract care to patients at St. Paul's Eye Clinic.

"We estimate that within a year of acquiring our own SLT system, we will perform 800 procedures," says Faber. "The need is that great."

SLT surgery, which stands for Selective Laser Trabeculoplasty, employs the laser to alleviate pressure in glaucoma-affected eyes, and is a procedure that can be performed in the time it takes to have a cup of coffee.

"It is not painful, it's non-invasive, and it can be done in about 20 minutes, right in the eye clinic," says Faber. "Then the patient can go home."

The other component of the laser, known as Nd:YAG, serves to perform a procedure called a posterior capsulotomy: the removal of vision-obscuring scar tissue that can form on the membrane behind the implanted lens after cataract surgery.

"Cataract surgery is the most common surgery we perform and pretty much everybody that has had cataract surgery will eventually have to have this procedure done," says Faber. "That represents a lot of patients in need and we're hoping, with this new laser, that we can address some of that need." ■

To learn how to support the acquisition of a new Nd:YAG/SLT laser system, please contact St. Paul's Hospital Foundation at 604-682-8206 or visit www.helpstpauls.com.

WHAT'S IN A LASER?

- Laser is an acronym for **L**ight **A**mpli f cation by **S**timulated **E**mission of **R**adiation.
- In ophthalmology, Nd: YAG and SLT lasers use varying bursts of high intensity light to coagulate, cut, remove, shrink and stretch eye tissues.
- Nd:YAG is short for neodymium doped yttrium aluminium garnet and refers to the lavender-coloured garnet crystal in the centre of the laser.
- SLT refers to a type of laser using minimal heat energy absorption, which is only taken up by selected pigmented tissue in the eye. It is sometimes referred to as a "cold laser."
- Nd:YAG lasers are widely used for other medical purposes, such as the removal of skin cancers, thyroid nodules and malignant liver lesions, as well as being commonly employed in the realms of dentistry and cosmetic surgery.

Photo: Brian Smith

Disease ELIMINATION

Building on 30 years of innovation in HIV/AIDS, the BC-CfE at St. Paul's sets a new course to eliminate hepatitis C and eventually other communicable diseases

BY HELENA BRYAN ▪ PHOTOGRAPHY BRIAN SMITH

It's a typical rainy February day in Vancouver, BC, and Dr. Julio Montaner, director of the British Columbia Centre for Excellence in HIV/AIDS (BC-CfE) at St. Paul's Hospital, is on the phone with the United Nations AIDS program off ce. He's discussing a topic that's anything but typical – the proposed UNAIDS global targets to eliminate the HIV pandemic by 2030.

Montaner is the architect of the made-in-BC Treatment as Prevention (TasP) strategy and continues to work relentlessly to build global support for evidence-based strategies to f ght HIV and AIDS. This July, he is scheduled to serve as the local co-chair of the 2015 International AIDS Society (IAS) Conference on HIV Pathogenesis, Treatment and Prevention coming to Vancouver.

"With the world coming to us this summer, it's a unique opportunity to show stakeholders the real possibility of an AIDS-free generation in the very near future," says Montaner.

Dr. Julio Montaner, shown here in his office at the BC-CfE at St. Paul's, is an internationally recognized leader in HIV/AIDS prevention and care.

WHAT IS THE IAS CONFERENCE?

THE INTERNATIONAL AIDS Society (IAS) Conference on HIV Pathogenesis, Treatment and Prevention is a biennial forum and the world's largest science-focused conference on HIV- and AIDS-related issues.

The 2015 IAS Conference will be held in Vancouver from July 19-22 and is scheduled to be co-chaired by Dr. Julio Montaner. IAS 2015 is expected to bring together over 7,000 delegates from across the world, including scientists, clinicians, public health experts, community leaders and media professionals. Delegates will gather to explore the latest HIV-related research and how it can be applied to HIV treatment and prevention programs. □

Montaner's assertion represents a monumental advance in medical science, especially when you consider that AIDS was a veritable death sentence 30 years ago, when there seemed to be no foreseeable end to the then-expanding epidemic. That was certainly the case when the IAS Conference was last held in Vancouver in 1996.

MILESTONES IN THE GLOBAL FIGHT AGAINST HIV/AIDS

It was at IAS 1996 that Montaner announced his pioneering multi-drug treatment for HIV/AIDS called HAART – highly active antiretroviral therapy.

"In the early 1990s, an HIV diagnosis was equivalent to a short-term death sentence," says Montaner. "Then, [in 1996] we came up with new drug cocktails and lab strategies that could extend lives."

Using data collected from patients on HIV treatment, the BC-CfE continued to refine HAART, which is the international gold standard in HIV therapy. The treatment is now simpler and safer. The life expectancy of a 20-year-old person diagnosed with HIV has improved from 10 years, prior to the development of HAART, to more than 50 years today.

In 2006, Montaner took HAART to yet a higher level, when he unveiled at the Toronto International AIDS Conference his TasP (Treatment as Prevention) strategy, another major game-changer that was eventually adopted by countries around the world. The strategy, pioneered by the BC-CfE, is based on evidence that expanding access to HAART prevents disease progression to AIDS and premature death, and secondarily prevents HIV transmission.

TasP calls for widespread outreach and HIV testing, particularly among hard-to-reach populations, such as intravenous drug users and sex workers, and the immediate offer of treatment and support for those who test positive for HIV. Already, many jurisdictions around the world have adopted TasP to address the spread of HIV, including China, France, Panama, Brazil, Spain, Sierra Leone, Argentina, parts of the United States and Queensland, Australia.

In British Columbia, the development of HAART and the provincial government's investment in implementing TasP have dramatically changed the outlook for HIV-positive individuals throughout BC. Recent statistics show that AIDS-related deaths in the province have decreased by more than 80 per cent from 1994 to 2013.

Montaner's success with TasP is at the heart of the recently proposed UNAIDS global strategy, known as the 90-90-90 target, which sets out to eliminate AIDS globally by 2030 by achieving the following targets by 2020: 90 per cent of all people living with HIV know their HIV status; 90 per cent of those diagnosed with HIV receive sustained antiretroviral therapy; and 90 per cent of people receiving antiretroviral therapy experience full viral suppression.

"In 1996, we came up with a strategy to stop AIDS. In 2006, we shifted our attention towards a strategy that could change the course of the global pandemic," says Montaner. "In 2015, we know we have a strategy that can eliminate the HIV/AIDS pandemic. Indeed, if we meet the UN 90-90-90 target by 2020, we can expect that by 2030 HIV/AIDS will become a sporadic endemic condition."

USING TasP TO STEM THE SPREAD OF HEPATITIS C AND OTHER COMMUNICABLE DISEASES

The success of the BC-CfE's HIV/AIDS research has created opportunities to apply that knowledge and experience to targeting the elimination of other communicable diseases.

BC-CFE: A TIMELINE

1992
The BC Centre for Excellence in HIV/AIDS (BC-CfE) at St. Paul's Hospital opens.

1996
Dr. Julio Montaner introduces HAART at the International AIDS Society (IAS) Conference in Vancouver, BC.

1997
A dedicated HIV/AIDS ward opens at St. Paul's Hospital.

2004
Montaner becomes the director of the BC-CfE.

2006
Montaner introduces the Treatment as Prevention (TasP) strategy at the International AIDS Society Conference in Toronto.

Photo: Courtesy of the BC-CfE

"Our work with HIV/AIDS has shown us that the TasP strategy works and we feel we can export it to other areas of medicine," says Montaner. "As long as we can screen and manage a contagious disease to reduce morbidity, mortality and transmission – the strategy can apply."

BC has achieved unprecedented success with the implementation of the TasP strategy; indeed, it is the only province in Canada demonstrating a consistent decline in new cases of HIV. While there remains work to be done, Montaner and his team are now focused on applying TasP to address the much larger epidemic of hepatitis C, a serious liver disease.

Symptoms of hepatitis C often don't show up for years, and the disease can be transmitted much more readily than HIV. Over time, hepatitis C can lead to serious and even fatal damage to the liver. Some 80,000 British Columbians are carrying the virus (in contrast to 12,000 living with HIV), Montaner says, and as many as half of them are unaware they're carriers.

"To help stop hepatitis C we need to seek out at-risk populations, just like we are doing with HIV/AIDS, and ensure they have prompt access to care to facilitated treatment and transmission-reduction strategies to prevent further infection," says Montaner.

While the stakes are high, Montaner and the BC-CfE are conf dent that, in time, with suff cient resources and backed by the knowledge gained from 30 years of world-leading HIV/AIDS research, care, knowledge translation and advocacy, they will be well prepared to stem the hepatitis C crisis as well as other communicable diseases. ■

To support communicable disease care, research and teaching at St. Paul's Hospital, please contact St. Paul's Hospital Foundation at 604-682-8206 or visit www.helpstpauls.com.

TIKO KERR: ONE PATIENT'S STORY

WHEN VANCOUVER ARTIST Tiko Kerr tested positive for HIV in Sydney, Australia, back in 1985, the outlook was grim. A little understood disease with no known treatments at the time, Kerr's doctors told him to, "Return to Canada and get your a□airs in order."

Within weeks, the then-30-year-old Kerr was in Vancouver and preparing to die: "There was so much fear at that time and so little hope."

But Kerr was one of the lucky ones. He managed to hang on long enough to benefit from HAART, the groundbreaking drug therapy pioneered by Dr. Julio Montaner at the BC Centre for Excellence in HIV/AIDS (BC-CfE) at St. Paul's Hospital.

Those, like Kerr, who survived the wait, went from 80 pills a day and many side-e□ects, to 10 pills a day, a negligible viral load and a comparable life expectancy to non-infected individuals.

Today, the 61-year-old Kerr continues to be a prominent artist in the Vancouver community who rows, goes to the gym and is feeling healthy. He is also "a bit of a poster boy for HIV/AIDS and the BC-CfE," he says.

"It's the least I can do. What Dr. Montaner and the BC-CfE have done for me is nothing less than miraculous." □

2009
TasP is implemented as a pilot project called Seek and Treat for Optimal Prevention of HIV/AIDS (STOP HIV/AIDS), with $48 million from the BC government.

2011
China is the first nation to embrace the made-in-BC TasP strategy.

2012
TasP is implemented across BC with support from the provincial government.

2014
The AIDS ward at St. Paul's is repurposed due to the drastic drop in new AIDS cases in BC.

2014
The United Nations embraces the BC-CfE's TasP strategy, announcing the 90-90-90 target to end the AIDS pandemic by 2030.

2015
Montaner to co-chair the July 19-22, 2015 IAS Conference in Vancouver.

Photo: Brian Smith

»Learn how you can support heart and lung research at St. Paul's Hospital by contacting St. Paul's Hospital Foundation at 604-682-8206 or by visiting *www.helpstpauls.com.*

Heart and Lung Innovation

Some of the world's leading researchers call the Centre for Heart Lung Innovation (HLI) at St. Paul's home. Their work, examples of which are featured here, could potentially transform health care by unlocking the link between our genes, the environment and heart, lung and blood vessel diseases.

Understanding cholesterol

Dr. Gordon Francis, director of the Healthy Heart Program Prevention Clinic at St. Paul's and an associate director of the HLI, and a team of researchers are examining smooth muscle cells from HLI's heart tissue registry to uncover how cholesterol accumulates in arteries. Through this research, they hope to find new ways to treat and prevent heart attacks and stroke.

Dr. Gordon Francis (right) and Dr. Ying Wang, a post-doctoral atherosclerosis research fellow at HLI, PHCRI and UBC's Department of Medicine.

Studying cells with advanced technology

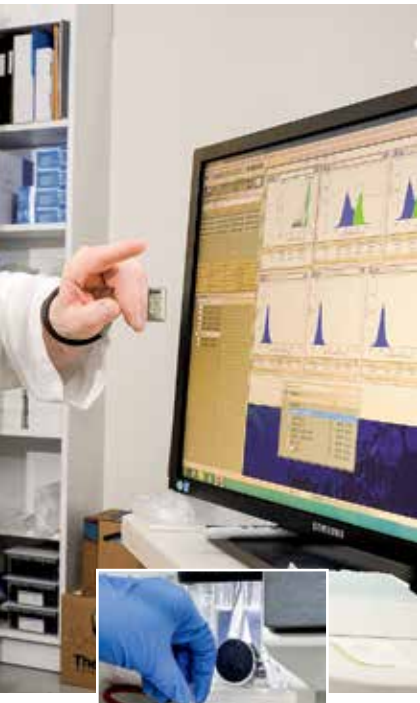
The fluorescence-activated cell sorting machine uses advanced technology to separate and label cells with fluorescent dye. By isolating certain cells, researchers are able to study how the cells behave and interact with other cells in a sample and possibly identify new treatments for diseases such as asthma, COPD and HIV.

Photos: Greg Morton

Analyzing human tissue

The HLI's heart and lung tissue registries are two of the world's largest collections of heart, lung and blood vessel tissues, including more than 50,000 lung specimens and more than 14,000 specimens from heart transplant surgery patients. These tissues, taken at various stages of health, provide valuable insight on the progression of cardiovascular disease.

(left to right) Dr. Michael Seidman, acting director of the heart registry; Dr. Mark Elliot, manager of the lung registry; and Dr. Tillie-Louise Hackett, director of the lung registry and associate director of the HLI.



Dr. Del Dorscheid (opposite right) and Jasemine Yang, PhD candidate in the Experimental Medicine program at UBC.

Diagnosing a deadly lung disease

Dr. Don Sin, head of Respiratory Medicine at St. Paul's Hospital, and colleagues are conducting research to develop a simple blood test that could identify patients at the early stages of the deadly lung disease, chronic obstructive pulmonary disease (COPD), as well as those at risk of "lung attacks."

Dr. Don Sin (left) and Roy Chen, a master's student of Experimental Medicine at UBC.

Rebecca Johnson, a former patient of St. Paul's Hospital's Maternity Centre, shares some quality time with her two girls, Elliott (left) and Avery, at their home in Mission, BC.

Photo: Paul Joseph

Top-Tier MATERNITY CARE

Women facing high-risk pregnancies receive compassionate and high-level care thanks to a team of specialists at St. Paul's Hospital's Maternity Centre

By Gail Johnson

By the time Rebecca Johnson hit the six-week mark of her first pregnancy, she had passed out several times. The weather during the summer of 2012 was hot and humid, and it was initially thought that she was simply dehydrated and experiencing low blood pressure. In fact, the Mission, BC, resident was suffering from complications due to a blood clot in her heart. After being referred to St. Paul's Hospital, Johnson required open-heart surgery when she was eight weeks pregnant.

"It was awful," says Johnson. "I was totally stressed. My obstetrician/gynecologist focused on the fact that there was a 20-percent chance my baby would make it."

Specially trained experts from St. Paul's Maternity Centre team monitored Johnson closely throughout her pregnancy, labour and delivery. Not only did she recover fully from the heart operation, but she went on to deliver a healthy baby girl named Elliott.

Johnson's case is just one example of the unique and vital role that St. Paul's plays as a provider of top-level medical care for higher-risk mothers and babies.

SPECIALIZED MATERNITY CARE

St. Paul's highly specialized level III Maternity Centre, which delivers approximately 1,800 babies every year, supports some of the most complex and high-risk pregnancies in British Columbia. The multidisciplinary team at the Maternity Centre cares for pregnant women with a range of co-existing medical issues, including heart disease, kidney conditions and blood disorders. In fact, St. Paul's is the only hospital in Vancouver to have an adult Intensive Care Unit just steps away from the maternity ward. It also houses the Neonatal Intensive Care Unit, which treats infants up to eight weeks premature with equipment generously donated by Variety - The Children's Charity and other supporters. Patients come from all over BC, including from remote areas and the Downtown Eastside.

(Left to right) Dr. Monica Beaulieu, Dr. Jasmine Grewal and Dr. Elisabet Joa stand beside a fetal heart monitor at St. Paul's Maternity Centre.

"Our goal is a healthy baby and a healthy mom," says Dr. Elisabet Joa, head of the Department of Obstetrics and Gynecology at St. Paul's. "Providing a safe and caring environment is what we work for every day."

When a pregnant woman has a pre-existing medical condition – such as a neurological illness, diabetes, compromised kidney function, respiratory disorder, heart condition, etc. – it can have a signif cant effect on both the pregnancy and childbirth. That's why it's so crucial for the obstetrics team to work in close collaboration with doctors and nurses from a range of medical specialties.

"We share a common goal of providing the best possible care for these women, who often have very complicated histories," says Joa. "It all comes down to the team members respecting each other and working well together. A dedicated team makes all the difference.

"While we provide care in very high-risk situations, we really strive to create an environment for the family that minimizes stress," she adds. "We work to create trust on our unit, so that our patients feel secure knowing that they're getting excellent care."

CARE WITH HEART

That was certainly the case for Johnson. Having initially come to St. Paul's with a heart condition, she says she knew she was in good hands when her cardiologists began working closely with the obstetrics and anesthesiology teams.

"Our doctors spent a lot of time talking to us and answered all of our questions, and they really made sure that my husband understood everything that was going on, too," says Johnson. "He felt very included, and that made it easier for both of us."

Patients like Johnson, with congenital or acquired heart disease, such as rheumatic heart disease or valvular heart disease, can be at risk of developing serious cardiac and obstetrical complications during pregnancy. These include miscarriage, heart failure, arrhythmias, stroke and even sudden death.

"Our aim is to provide comprehensive, individualized care to women through this important time," says Dr. Jasmine Grewal, cardiologist and director of the Cardiac Obstetrics Clinic at St. Paul's. "Close attention through pregnancy, labour and delivery and in the post-partum period is important to avoid cardiac complications or to manage them when they do arise."

The clinic also provides pre-pregnancy assessment and counselling, patient and family education and psychosocial support, as well as reviews from cardiologists, obstetricians, anesthesiologists, maternal-fetal medicine experts and other specialists.

KIDNEY CARE

That same kind of interdisciplinary approach applies to women with kidney disease. Dr. Monica Beaulieu, director of St. Paul's Hospital's Kidney Care Clinic and a scientist with the Centre for Health Evaluation and Outcome Sciences (CHÉOS) at St. Paul's, explains that risks to these patients during pregnancy include pre-eclampsia (pregnancy induced high blood pressure), the need for dialysis and premature, low-birth-weight babies.

"The most common risk is the kidney disease getting worse during pregnancy," says Beaulieu. "The value that the moms f nd in having a team-based approach and having their obstetrician and their nephrologist talk to each other throughout their pregnancy is tremendous.

"We help patients understand all the information in front of them, so they can make informed decisions. Both the mom and baby have to be watched closely."

COMPASSIONATE CARE FOR FAMILIES

Johnson, meanwhile, has since gone on to have a second child – a healthy baby girl named Avery. Throughout her open-heart surgery and both of her pregnancies, Johnson says she had full conf dence in the team at St. Paul's Hospital.

"The doctors and nurses were amazing," she says. "They were professional but never clinical. They were all positive and compassionate, and that makes you feel a lot better when you're in a scary situation. I could tell they really cared." ■

To learn how to support women and babies at St. Paul's Hospital, please contact St.Paul's Hospital Foundation at 604-682-8206 or visit www.helpstpauls.com.

ESSENTIAL EQUIPMENT

FETAL HEART MONITORS are an essential tool for the ongoing assessment of the health and safety of an unborn baby throughout every woman's pregnancy, but especially when the woman is at high risk of complications.

"In labour, for these high-risk pregnancies, we require a way to monitor the status of the fetus and the monitors are how we do this," says Dr. Elisabet Joa, head of the Department of Obstetrics and Gynecology at St. Paul's Hospital.

St. Paul's Hospital Foundation currently has a fundraising goal of $45,000 for replacement fetal heart monitors. As St. Paul's is unique in that it has specialized services and equipment for higher-risk pregnancies, replacing the aging monitors is a top priority for the unit and essential to making sure moms and babies continue to get the best care. □

Photo: Brian Smith

St. Paul's Dr. John Boyd (centre), postdoctoral fellow and researcher Elena Topchiy (right) and scientist Mihai Cirstea (left) are researching new tests and therapies to treat and prevent severe sepsis.

Stopping Sepsis

A new test and treatment for severe sepsis, the leading cause of death from infection globally, is the focus of groundbreaking research taking place at St. Paul's

By Sarah Ripplinger

Doctors at St. Paul's Hospital are developing a test to detect the early stages of severe sepsis, a condition that affects millions of Canadians each year and is a leading cause of death worldwide.

Severe sepsis is a condition in which harmful pathogens, such as bacteria and fungi, overwhelm the body's immune system, causing blood pressure to drop to dangerously low levels and potentially leading to organ failure. The challenge for medical practitioners is to know which patients who enter the hospital's emergency department could go on to develop severe sepsis.

Research conducted by Dr. John Boyd, a critical care physician at St. Paul's and the Centre for Heart Lung Innovation at St. Paul's, and his colleagues, has so far identified 31 key genes, or markers, that can show patients' risk of developing severe sepsis based on the results of a simple blood test taken upon their admission to hospital.

"This blood test could be a game-changer," says Boyd. "We would like to see it being used at hospitals as a way to detect the early stages of sepsis so that we can intervene before a patient's condition becomes critical."

That's why Boyd says the test they are developing would need to have a turnaround time of approximately one hour between the time the blood work is taken and the results are received. Those results would show if a patient is at risk of developing severe sepsis and should be admitted to the intensive care unit – where he or she would receive critical care services – rather than to the general medicine ward. The results would also give staff more information about which medications, such as antibiotics and corticosteroids, to administer.

"It would be a big step forward," says Boyd. "This test could help us match patients with the right departments in the hospital and the right treatments."

Boyd and colleagues at St. Paul's are also researching a medication that could stop sepsis in its tracks.

Harmful particles from dead or alive pathogens are mostly carried in fatty molecules, such as cholesterol, in the bloodstream, and researchers have found that flushing these toxic fatty molecules from the blood also removes a lot of pathogens.

The medication that Boyd and his colleagues are working on would more quickly remove toxic fatty molecules from a patient's bloodstream for a limited amount of time, thus controlling a potentially harmful immune system response and giving the patient a better chance of recovery.

The results of Boyd and his colleagues' initial findings were published in the journal *Science Translational Medicine* online, and a clinical trial into the use of the new medication is set to begin at St. Paul's this year.

"We're going to be looking at the best way to deliver this therapy to patients through the clinical trial," says Boyd. "We hope it can be used to treat patients at St. Paul's and beyond in the near future." ■

To learn how you can support care, research and teaching at St. Paul's Hospital, please contact St. Paul's Hospital Foundation at 604-682-8206 or visit www.helpstpauls.com.

Photo: Greg Morton

(left to right) Dr. T. Laine Bosma, Dr. Adam Peets and Dr. Jeanne MacLeod use simulation mannequins like the one pictured here to teach emergency care skills.

Practice Makes Perfect

A breathing, talking mannequin is being used to provide training for critical patient care at St. Paul's Hospital

By Sarah Ripplinger

Photo: Brian Smith

As a teaching hospital affiliated with the University of British Columbia, Simon Fraser University and other educational institutions, St. Paul's Hospital is always looking for innovative methods to train the health care professionals of tomorrow. Since 2014, one of those methods has involved the use of a new lifelike simulation mannequin (Sim Man) to teach caregivers how to manage challenging clinical emergencies.

UNLIKE PREVIOUS MODELS, THE NEW SIM MAN CAN ALSO BE MOVED TO DIFFERENT PARTS OF THE HOSPITAL, SUCH AS THE OPERATING ROOM AND EMERGENCY DEPARTMENT.

So far, around 120 medical students and residents, along with nurses, fellows and other staff, have learned how to provide emergency care to patients using the new, state-of-the-art Sim Man at St. Paul's. Displaying similar characteristics to a real person, the Sim Man can produce such things as sounds, sweat and a heartbeat. It can simulate any number of conditions, from cardiac arrest to respiratory failure, giving trainees a chance to practise their skills outside of the patient environment.

"For patient safety and continuing professional development, simulation has really become an important means of training staff," says Dr. Adam Peets, site fellowship director for Critical Care Medicine at St. Paul's. "Studies show that trainees gain a level of competency much faster using simulators than they otherwise would."

SAFE LEARNING ENVIRONMENT

The advantage of using the Sim Man is that trainees can practise new and established procedures and protocols in controlled areas of the hospital, such as a part of the emergency department or in the Clinical Simulation Room, a dedicated space where up to 50 trainees can run through simulations under the watchful eye of trainers.

Trainees can run the same simulation several times, and are exposed to a wide variety of cases, ranging from moderately complex to highly complex. A debrief ng, where trainees discuss the simulation and receive feedback from trainers, immediately follows each simulation.

"It creates a safe environment for our learners," says Dr. Jeanne MacLeod, staff emergency physician and director of simulation for the emergency department at St. Paul's. "The key thing is that often these crisis situations don't occur often enough to allow us to practise our skills. By using simulation, it allows us to have more exposure to crisis situations."

AN INTERDISCIPLINARY TEAM EFFORT

According to Dr. T. Laine Bosma, a consultant anesthesiologist at St. Paul's, simulations have the added advantage of enabling multiple team members, such as physicians, nurses and anesthesiologists, to come together to bridge any gaps in understanding and identify everyone's role in a given situation.

"That way, when it comes to putting these skills into practice, everyone can move quickly, the patient's safe and we have a good outcome," he says.

This collaborative environment not only creates an arena for caregivers at St. Paul's and beyond to practise essential skills, it also fosters knowledge-sharing and provides a space where discussions can lead to new and improved approaches to patient care.

Unlike previous models, the new Sim Man can also be moved to different parts of the hospital, such as the operating room and emergency department. In these "in situ" cases, trainees are right in the environment where they will use their skills. Nearby staff, such as nurses and respiratory therapists, can also participate in the simulations, providing further opportunities for collaboration and enhanced learning.

EXPANDING TECHNOLOGY AND TEACHING

The effectiveness of simulations and simulation mannequins as teaching tools could play a key role in enabling St. Paul's to remain at the forefront of teaching and training care providers. In fact, Peets, MacLeod and Bosma are hoping to see the simulation program expanded to other departments at the hospital. Already, St. Paul's is expected to receive a Sim Mom this year, which will be used to train maternity staff in emergency situations, such as emergency Caesarean sections. While similar to the Sim Man in terms of its overall functionality, the Sim Mom also has a uterus and fetus.

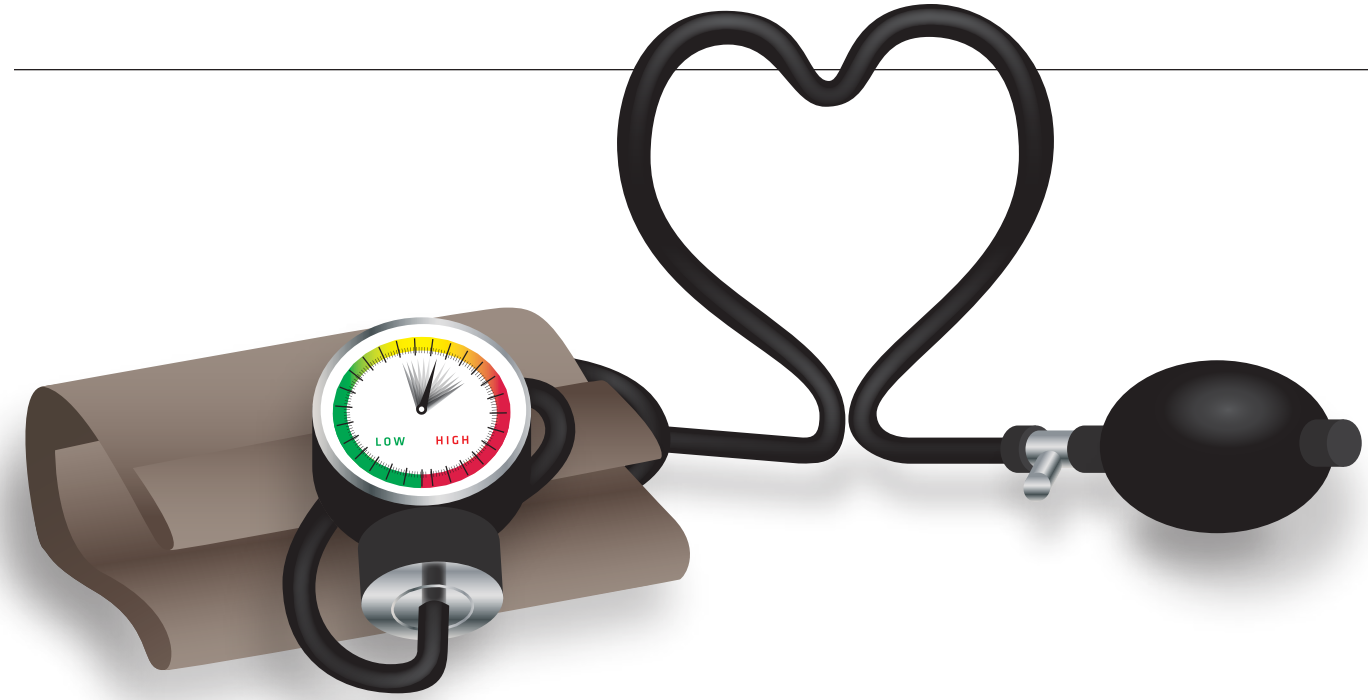
"St. Paul's could be a leader in teaching using simulation," says MacLeod. "It's a bridge between the knowledge our learners gain in medical school and the practical skills they use in the hospital." ■

To learn how to support medical teaching at St. Paul's Hospital, please contact St. Paul's Hospital Foundation at 604-682-8206 or visit www.helpstpauls.com.

GET TO KNOW THE SIMULATION MANNEQUIN

St. Paul's uses a state-of-the-art simulation mannequin (Sim Man) for its clinical simulations. While made mostly of plastic, the Sim Man can exhibit realistic symptoms that seem to make it come to life. Here are a few things the Sim Man can do:

- Bleed
- Blink
- Breathe
- Chest rises and falls
- Heart sounds
- Pulse
- Pupils open and close
- Speak
- Sweat



Regulating Blood Pressure

Patients access innovative care at St. Paul's Hospital's Hypertension Clinic for a leading cause of heart attack, stroke, heart failure and kidney disease

By Michelle Hopkins

Phil Reid's 50th birthday is certainly one he'll never forget. The Vancouverite had plans to celebrate the milestone in Whistler, but instead of hitting the slopes, he ended up in hospital.

"I just wasn't feeling well," remembers Reid. "I was really panicky and short of breath." Little did he realize his blood pressure was through the roof.

Reid was immediately referred to Dr. Jane McKay, a hypertension specialist at St. Paul's Hospital's Hypertension Clinic (HTC), one of the few dedicated clinics of its kind in British Columbia. McKay quickly diagnosed Reid with hypertension (high blood pressure) and high blood cholesterol levels, and he began receiving treatment and lifestyle advice for his condition. Today, thanks in no small measure to both the immediate care and his regular followup visits to the HTC at St. Paul's, Reid is happy, healthy and well.

COLLABORATIVE APPROACH

The HTC is unique in that it provides comprehensive care for the hundreds of British Columbians with hypertension referred there from across the province each year. This includes patients with chronic health conditions, such as diabetes and heart or kidney failure. Thanks to the HTC, patients can receive customized care and referrals in one place, gaining access to a multidisciplinary team of medical experts – cardiologists, dietitians, sleep experts, neurologists and bio-chemists.

"What's also unique about our approach is that we empower our patients using motivational interviewing techniques, so that they have a say in their own health," says McKay. "We provide a personalized approach to care at the Hypertension Clinic: the right treatment for the right patient at the right time."

Illustration: Denise Cymbalist

HELP FOR HYPERTENSION

For Eileen Sallis, the HTC proved to be her lifeline. Prior to being referred there, she says she was on a merry-go-round between doctors' off ces, emergency wards, hospital visits and home.

The 58-year-old's medical problems began in 2002 when she was diagnosed with slightly elevated blood pressure. However, over time, her blood pressure started to go up, exacerbated by her Type 2 diabetes and her admittedly poor diet and lack of exercise. In January 2014, she wound up in hospital suffering from kidney failure.

"They took an ultrasound and found that my left kidney wasn't functioning properly," says Sallis from her home in Gibsons, BC. "I was put on medication, but my blood pressure kept rising."

By April 2014, her blood pressure had reached dangerously high levels, signalling a hypertension crisis and, without proper treatment, the possibility of organ failure. She was tired, lacked energy and her cognitive abilities had started to decline. Sallis was in trouble. Luckily, in May 2014, she was referred to St. Paul's HTC where she met Dr. Laura Kuyper, a hypertension specialist and director of the HTC.

"She [Kuyper] was just amazing," says Sallis. "Not only was she straightforward and open with me about my condition, she was the hub for my total care. Even when I was not at the clinic, she called and checked up on me."

Eileen Sallis credits the care she received at the Hypertension Clinic at St. Paul's with saving her life.

A few months after her f rst visit to the clinic, Sallis had a heart attack. She was f own from Sechelt, BC, to St. Paul's Hospital, where she was admitted to the cardiac critical care unit.

"Dr. Kuyper came in to see me every day," says Sallis. "She made sure I was treated for my hypertension, put me on different medication and sent me to see an endocrinologist. Then, I was sent to a sleep apnea clinic – all under Dr. Kuyper."

The strong collaborative approach at St. Paul's HTC helps ensure that patients' specif c needs are met. For Sallis, it meant that all of her care was coordinated through Kuyper. Whether it was changing her medication or f nding the cause of her hypertension using MRI scans, referrals to endocrinology or sleep specialists, she was provided with access and frequent follow-ups when needed.

"When you are sick and afraid, having all your needs met in one place is so important," says Sallis, who receives ongoing support from the HTC. "I owe the team my life."

The advice patient Phil Reid received from St. Paul's Hypertension Clinic has encouraged him to adopt a healthier lifestyle to control his hypertension.

PERVASIVE HEALTH PROBLEM

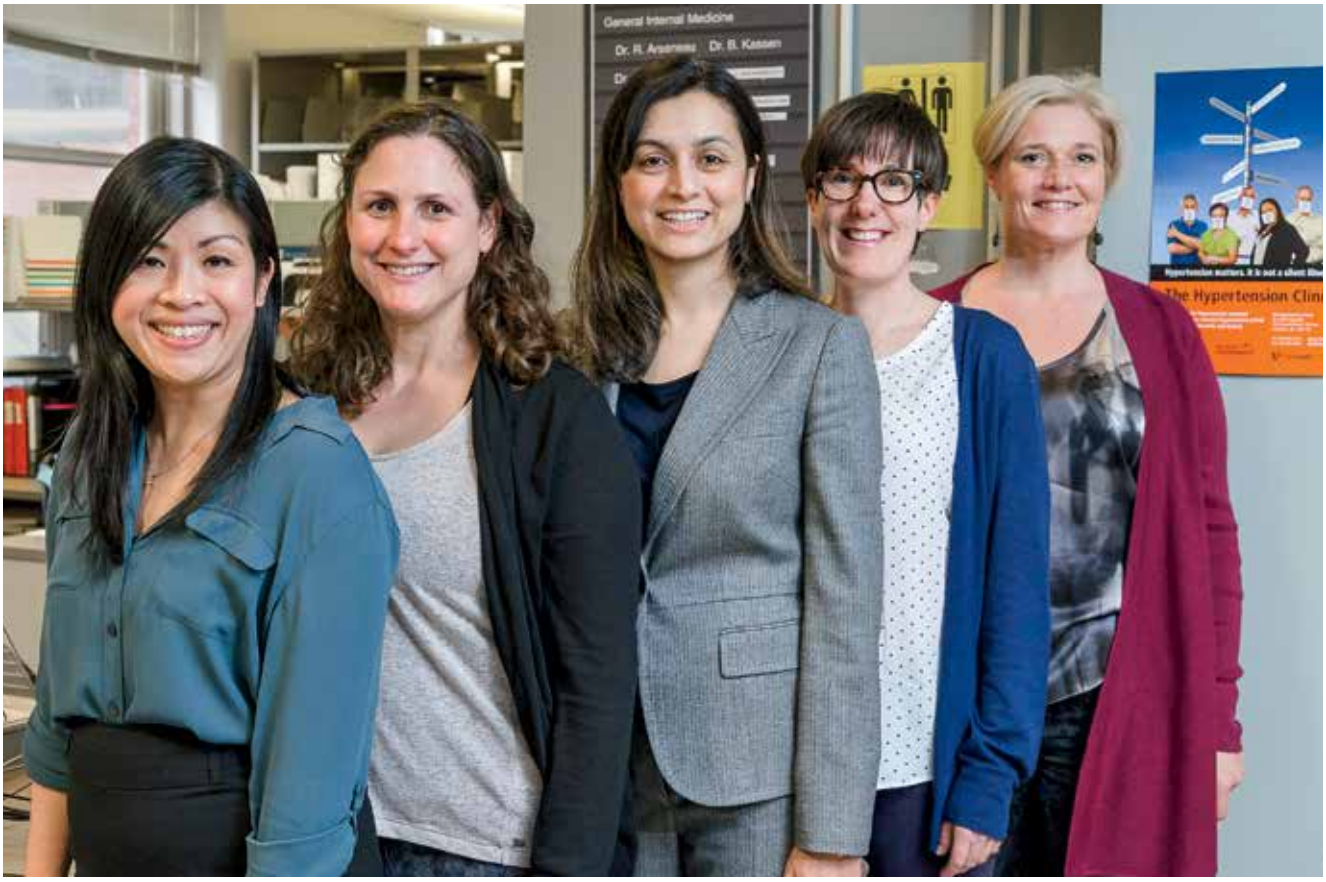
There's no question that the services provided by the HTC are vital to health care in BC. High blood pressure is one of the leading causes of heart attack, stroke, heart failure and kidney disease in Canada, affecting one in f ve British Columbians.

"High blood pressure accounts for 70 per cent of all strokes and 30 per cent of heart attacks," says McKay.

Nearly 95 per cent of cases of hypertension are primary, with no obvious underlying medical cause. Secondary hypertension is caused by another medical condition, such as kidney disease, hormonal disorders and sleep apnea.

Although the exact causes of primary hypertension are unknown, several risk factors increase the chances of developing it, including lack of exercise, obesity, excessive salt and/or alcohol intake, smoking and stress, to name just a few.

Photos: Brian Smith



Members of the innovative Hypertension Clinic at St. Paul's Hospital (l-r): Dr. Karen Tran, Dr. Debbie Rosenbaum, Dr. Nadia Khan, Dr. Laura Kuyper and Dr. Jane McKay.

The warning signs and symptoms of life-threatening hypertension include severe chest pain and/or headache, accompanied by confusion and blurred vision, nausea, vomiting, acute anxiety, shortness of breath, seizures and unresponsiveness.

A LEADING-EDGE TRAINING CENTRE

Kuyper says that in addition to providing comprehensive care to patients, the HTC is also an important centre for learning and training in hypertension care and treatment for medical students, family practice residents or medical residents.

Resident training fellow Dr. Karen Tran observes that the HTC's focus on treating hypertension means staff has the luxury of providing more comprehensive and personalized care to patients at the clinic.

"It's very rare in hospitals that we get to spend as much valuable time with patients, from counselling them, to offering personal care and – more importantly – behaviour modif cation care," says Tran. Each new patient undergoes a battery of tests in order for doctors to complete an assessment, she adds.

The HTC team is also investigating the best evidence-based approaches to detecting and controlling high blood pressure. This includes studying antihypertensive medication-taking behaviors, tracking population trends in severe hypertension across the province and investigating promising new technologies for patients with refractory (persistent) hypertension.

Dr. Nadia Khan, research scientist at the Centre for Health Evaluation and Outcome Sciences (CHÉOS) at St. Paul's, is currently looking at opportunities to introduce ways to better predict hypertension that are not yet available in Canada.

"There are newer ways to measure blood pressure other than using the standard cuff on the arm technique," she says. "These innovative measures, such as looking for hardening of the aorta and other blood vessels by measuring aortic stiffness, will allow us to better treat our patients and personalize their care. This is the future of hypertension care and one aspect we want to bring to the Hypertension Clinic."

Thanks to donors to St. Paul's Hospital Foundation, $30,000 was raised to purchase the key equipment and facility upgrades to help the HTC provide specialized care to patients. Later this year, McKay hopes to have the Virtual Patient Learning Centre up and running: "This will be a web-based learning centre here in the clinic where our patients can access information," she says.

For Reid and Sallis, who are both doing much better thanks to the care they received at St. Paul's, the HTC has more than proven its worth. ■

To f nd out how you can support care, research and teaching at St. Paul's Hospital, please contact St. Paul's Hospital Foundation at 604-682-8206 or visit www.helpstpauls.com.

Photo: Brian Smith

Dr. Brian Westerberg

Dr. Brian Westerberg, head of the Division of Otolaryngology – Head and Neck Surgery at St. Paul's Hospital, is an award-winning physician, researcher and mentor who specializes in the treatment of disorders of the ear. Westerberg is one of a handful of physicians in BC who perform the innovative cochlear implant surgery. This procedure involves implanting an electronic device into the patient's ear that provides a sense of sound to the wearer. Westerberg is also a scientist with the Centre for Health Evaluation and Outcome Sciences (CHÉOS) at St. Paul's and clinical professor in the Department of Surgery at the University of British Columbia.

What motivated you to become an otolaryngologist?

Once I started learning more about the sensory cells in the ear and how they worked, I was fascinated. That led me to do a fellowship in otology and neurotology [the study and treatment of neurological disorders of the ear].

Tell me about the renaming of the Rotary Hearing Clinic to the BC Rotary Hearing and Balance Centre at St. Paul's.

We've always been a centre for both hearing and balance at St. Paul's. The hearing has always been front and centre, but renaming the clinic is representative of the fact that we are really a provincial referral centre for patients with complex disorders related to both the hearing and the balance system of the inner ear.

Why did the Centre recently undergo a renovation and receive new equipment?

Every year for the past five years we've seen about a five-per-cent increase in the volume of patients at the Centre. Our waitlist was up to nine months at one point. The funds that we received [through a $500,000 St. Paul's Hospital Foundation fundraising campaign] supported a third sound booth and additional sta, and additionally allowed us to purchase a state-of-the-art micro-scope for the operating room. Now we can assess more patients per year and our waitlist is down to around five months and dropping.

What are some of the research projects underway at the Centre?

We have a research fellow from the Netherlands who's been working on a way to use magnetized stem cells in the ear to potentially improve the function of cochlear implants. As well, our associate, Dr. Jane Lea, is interested in balance disorders, particularly how anxiety can a ect patients' balance. She is also looking at ways of delivering care closer to home using outreach and telecommunications-based tools.

What plans do you have for the future?

What's exciting is seeing how the technology is moving along and how new tests are enabling us to better diagnose and treat patients. Moving forward, we're still looking for ways to continue to provide exceptional care to patients so that they're more comfortable and have a better quality of life.

Of which of your accomplishments are you the most proud?

Having such a phenomenal team at St. Paul's that is so focused on providing excellent patient care is amazing. It's a great place to work. ■

Photo: Greg Morton

breakthroughs by Nancy Gratham

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