

**CASES ARE TICKING UP.
SO ARE THE QUESTIONS**

Why some children develop persistent
Lyme arthritis and how to improve care

THE POWER OF CHOICE

Dr. Jennifer Johnston is reimagining
reproductive health

**PROTECTING EVERY
HEARTBEAT**

How two Dalhousie alum are
helping transform cardiac rhythm
care around the world

**RE
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MAGAZINE

SPECIAL FEATURE

**At the heart
of discovery:**

Cardiovascular research
at Dalhousie

FALL/WINTER 2026



DALHOUSIE
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FACULTY OF MEDICINE

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FOR HEALTH RESEARCH

RE ME DY

M A G A Z I N E

FALL/WINTER 2026

Dalhousie University is located
in Mi'kma'ki, the ancestral and
unceded territory of the Mi'kmaq.
We are all Treaty people.

We recognize that African Nova Scotians
are a distinct people whose histories,
legacies and contributions have
enriched that part of Mi'kma'ki known
as Nova Scotia for over 400 years.

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A MESSAGE FROM THE DEAN

As I begin my tenure as Dean of Medicine, I am inspired by the extraordinary community that makes the Faculty of Medicine such a remarkable place.

Across our campuses and throughout the Maritimes, researchers, learners, clinicians, donors, and partners share the common purpose of improving the health and wellbeing of the communities we serve. This issue of REMEDY highlights just a few examples of that commitment in action, showcasing innovative research that is advancing knowledge, improving care, and helping shape a healthier future.

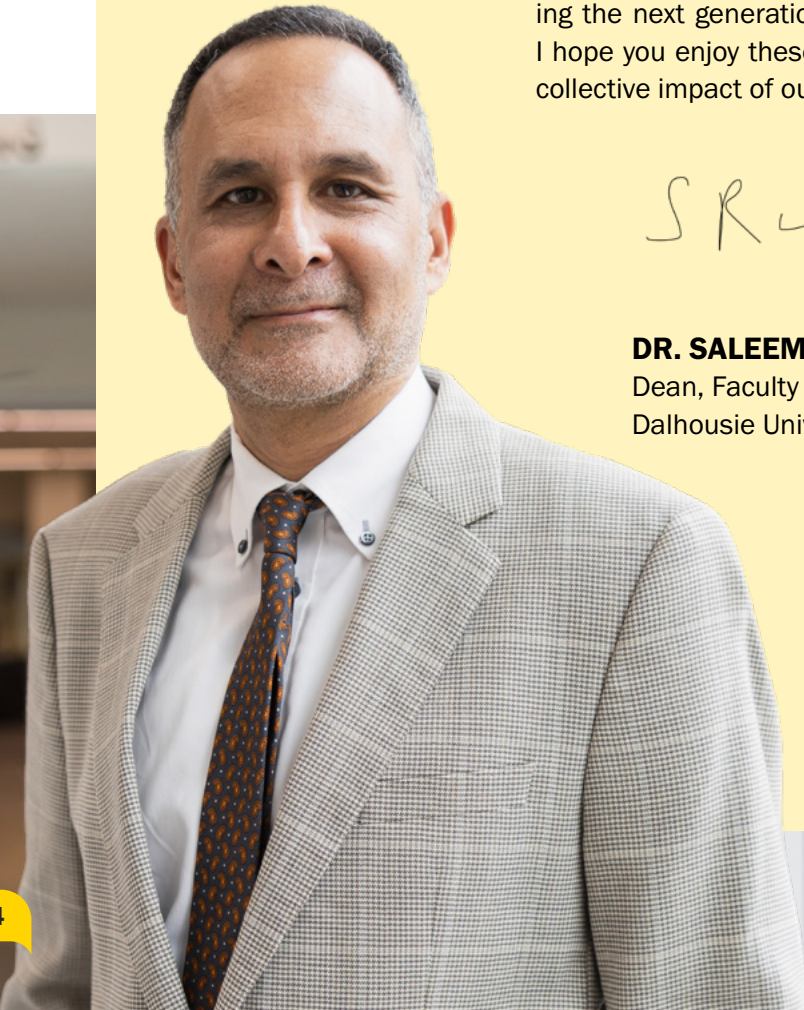
I believe strongly that research, education, patient care, and community are deeply interconnected. Together, they create opportunities to better understand society's evolving health needs and to develop solutions that make a meaningful difference in people's lives.

As a Faculty, we have both the privilege and responsibility of listening to the communities we serve and ensuring our work reflects their priorities.

To our donors and supporters, thank you. Your generosity helps make this work possible through fostering innovation and supporting the next generation of health professionals and researchers. I hope you enjoy these stories and feel as inspired as I do by the collective impact of our Faculty of Medicine community.



DR. SALEEM RAZACK
Dean, Faculty of Medicine
Dalhousie University



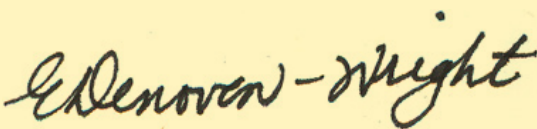
MESSAGE FROM THE ASSOCIATE DEAN OF RESEARCH

Cardiovascular disease remains one of the most significant health challenges facing Canadians. Every day at Dalhousie, researchers, clinicians, learners, and partners are working to change that reality through groundbreaking discoveries, innovative approaches to prevention and treatment, and a shared commitment to improving health outcomes.

In this issue of REMEDY, we shine a spotlight on just some of the remarkable cardiovascular research taking place throughout the Faculty of Medicine and our affiliated health and research institutions. From pioneering work in heart rhythm disorders and precision prevention strategies to advances in cardiac metabolism, the stories featured on these pages demonstrate the depth and breadth of expertise that exists within our research community.

To our donors, alumni, partners, and friends, thank you for your continued support. Your investment in research helps create opportunities for discovery, fuels innovation, and ultimately contributes to healthier futures for individuals and communities across Atlantic Canada and beyond.

I hope you enjoy reading these stories and learning more about the people whose passion and perseverance are helping shape the future of cardiovascular health.



DR. EILEEN DENOVAN-WRIGHT
Associate Dean, Research, Faculty of Medicine
Dalhousie University



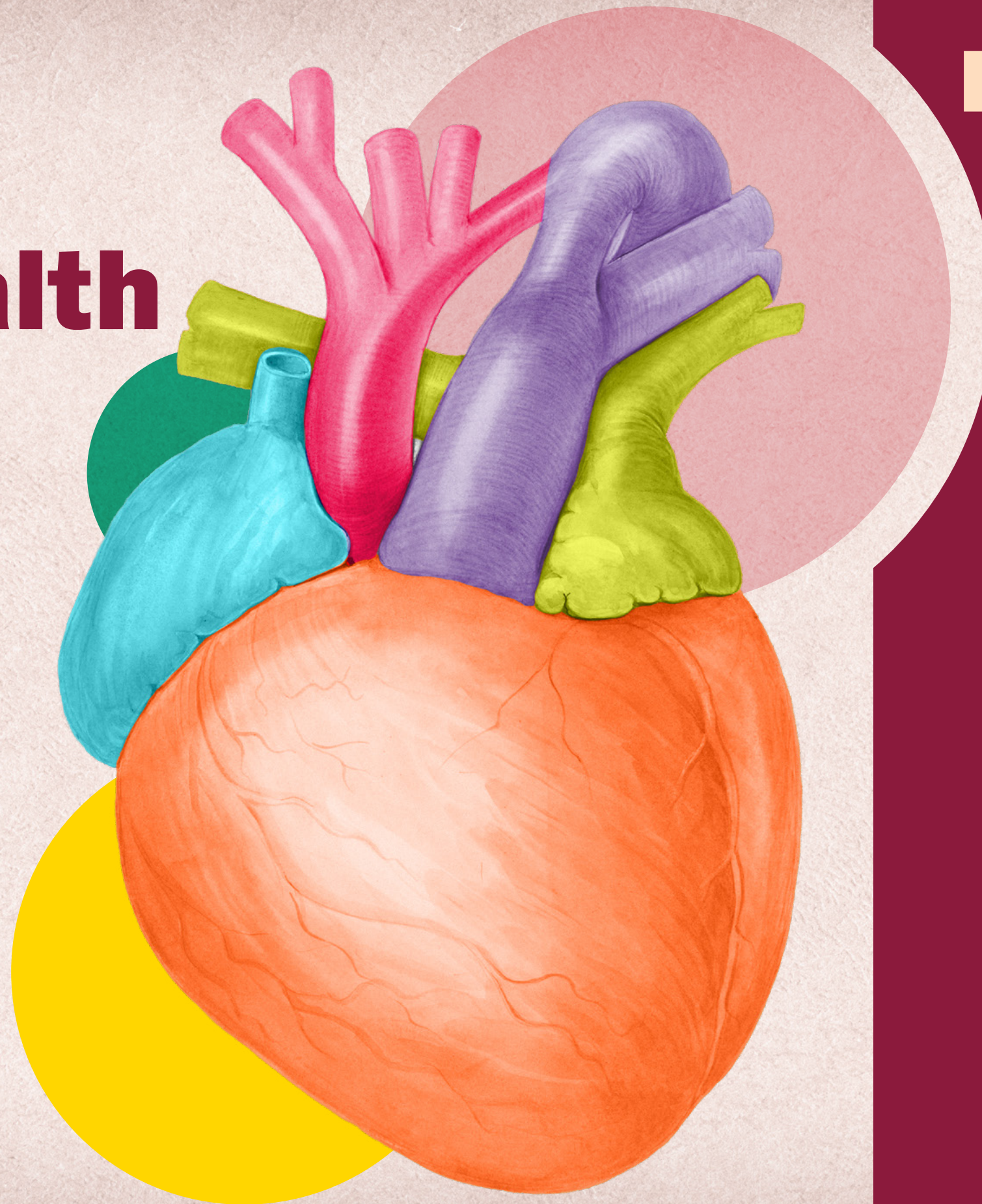
Research transforming the future of heart health

Heart disease remains one of Canada's most significant health challenges, claiming more than 55,000 lives each year and affecting more than one in 12 adults nationwide. But there is cause for optimism. Over the last two decades, rates of heart attack have steadily declined, thanks in part to advances in prevention, diagnosis, treatment, and care. Across Atlantic Canada, researchers at Dalhousie and our partner institutions are helping drive that progress, advancing discoveries that are improving cardiovascular health today while shaping the future of heart care for generations to come.

In the pages that follow, you'll meet researchers whose work is driving progress across the cardiovascular spectrum. From internationally recognized leaders in cardiac rhythm management to scientists investigating how nutrition, metabolism, and aging influence heart health, these teams are tackling some of the most complex challenges in medicine.

You'll also see how research discoveries move from the laboratory to the bedside, improving diagnoses, informing treatment decisions, and creating new opportunities for prevention. Behind every breakthrough is a network of supporters, partners, trainees, patients, and donors whose belief in research helps turn promising ideas into real-world impact.

Together, these stories demonstrate how Dalhousie's talented and dedicated research community is advancing cardiovascular science, transforming patient care, and helping shape the future of heart health in Atlantic Canada and beyond.



HEART HEALTH by the numbers

Heart disease is the second leading cause of death in Canada, claiming more than

55,000

lives each year.

More than **8%** of Canadian adults live with heart disease.

ONE in FOUR

Atlantic Canadians have high blood pressure, the highest rates of hypertension in the country, a major risk factor for cardiovascular disease.

63,000+

Canadians experienced a heart attack in 2023-24.

Heart attack rates have declined by more than

40%

over the past 20 years, reflecting advances in prevention, diagnosis, treatment, and care.

SOURCE: PUBLIC HEALTH AGENCY OF CANADA, CANADIAN CHRONIC DISEASE SURVEILLANCE SYSTEM (CCDSS), 2023-24 DATA.



PROTECTING EVERY HEARTBEAT

HOW TWO DALHOUSIE
ALUM ARE HELPING
TRANSFORM CARDIAC
RHYTHM CARE
AROUND THE WORLD

By Dayna Park

DR. JOHN SAPP

Both Dr. Ratika Parkash (MD '96) and Dr. John Sapp (MD' 94) are drawn to solving puzzles.

For Dr. Parkash, that fascination began with electrocardiograms and the math behind the heart's electrical system. For Dr. Sapp, it was a desire to understand how things work, first in a Dalhousie research lab and later while training with world leaders in cardiac rhythm medicine.

Today, the two cardiologists and researchers are helping answer some of the most important questions in cardiac electrophysiology, the branch of medicine that studies the heart's electrical system. Their discoveries are influencing how patients are treated not only here in Atlantic Canada, but around the world.

UNDERSTANDING THE HEART'S ELECTRICAL SYSTEM

Every heartbeat depends on a carefully coordinated electrical signal. Most of us never think about it until something goes wrong. For people living with cardiac rhythm disorders, a split-second disruption can increase the risk of heart failure, stroke, sudden cardiac arrest, and death. Preventing those outcomes is the focus of internationally recognized research being led in Halifax.

Drs. Parkash and Sapp's research focuses on different aspects of cardiac rhythm disorders, but both are driven to understand the heart's electrical system and use that knowledge to improve patient care.

"This research can improve patients' quality of life, reduce issues like heart failure, and save lives," says Dr. Parkash.

As professor and clinical researcher in Dalhousie's Division of Cardiology, cardiologist with QEII Health Sciences Centre, and the Heart and Stroke Foundation of Nova Scotia Endowed Chair in Cardiovascular Outcomes Research, Dr. Parkash focuses much of her work on atrial fibrillation, the most common heart rhythm disorder. She is leading studies examining whether more aggressive rhythm-control strategies can prevent heart failure and reduce deaths.

At the same time, Dr. Parkash is helping pioneer new approaches to digital health. Recent national clinical trials examined the use of a digital platform for patients with pacemakers and defibrillators, allowing them to access their health information in an easy-to-understand way and receive high-quality care while reducing travel and healthcare costs. She recently presented her findings at the European Society of Cardiology Congress in Munich, Germany.

RESEARCH CHANGING CARE

While Dr. Parkash focuses on atrial fibrillation and heart failure prevention, Dr. Sapp's work addresses a different but equally life-threatening challenge: ventricular tachycardia (VT), a dangerous heart rhythm and a leading cause of sudden cardiac arrest, that can occur years after damage from a heart attack. VT can cause the heart to beat so rapidly that it can no longer effectively pump blood.

Throughout his career, Dr. Sapp, a practicing cardiologist with Nova Scotia Health, researcher, and assistant dean of clinical research at Dalhousie, has worked to improve treatments for patients at risk of these deadly arrhythmias.

His internationally influential VANISH and VANISH 2 studies have helped shape treatment decisions for patients around the world. The findings demonstrated that catheter ablation, a procedure that targets and eliminates the abnormal electrical pathways causing dangerous rhythms, is often more effective than relying solely on medication therapy.

FROM HALIFAX TO THE WORLD

One of the most rewarding aspects of research is seeing local discoveries create global impact.

"Somewhere in a country I've never visited, a cardiologist I don't know is meeting a patient I've never seen and giving them better treatment because of work that we did here in Halifax," Dr. Sapp says.

Dr. Parkash sees that same global potential in research.

"As a physician, I can make a difference on a daily basis to that patient sitting in front of me," she says. "But as a researcher, I can make a difference to people globally."



“As a physician, I can make a difference on a daily basis to that patient sitting in front of me. But as a researcher, I can make a difference to people globally.”

— DR. RATIKA PARKASH

A WORLD-CLASS RESEARCH HUB

Despite their differing areas of focus, both researchers emphasize that those advances would not be possible without collaboration.

Today, Halifax is recognized as a leading centre for cardiac rhythm research. Researchers at Dalhousie University and Nova Scotia Health have led international clinical trials and pioneered new approaches to treating dangerous arrhythmias.

“We have advantages here,” says Sapp. “We’re big enough to practice big-city medicine and do all the procedures you would get in downtown Toronto, but small enough that our cardiovascular group is very collegial.”

Dr. Parkash echoes that sentiment, noting the importance of Faculty support, dedicated research infrastructure, and the foundations built by earlier generations of cardiovascular researchers who helped establish Halifax as a hub for innovation in cardiac rhythm care.

Looking ahead, both researchers remain focused on the next unanswered questions.

Whether preventing dangerous arrhythmias, reducing hospitalizations, making care more accessible through technology, or helping patients live longer lives, these cardiac rhythm researchers are ensuring that more people can count on something most of us rarely think about until it goes wrong: every heartbeat. ■

BREAKTHROUGH BREAKFAST: Advancing Heart Health

Join us for the next Breakthrough Breakfast, which will showcase the groundbreaking cardiovascular research being led by four Dalhousie researchers, highlighting how their work is helping us better understand the heart, prevent disease, and improve treatment for dangerous heart conditions.

Hosted by Associate Dean of Research, Dr. Eileen Denovan-Wright, this engaging morning event will take place on Tuesday, November 24, 2026.



Featured Speakers:



Dr. Leah Cahill

Preventing heart disease before it happens.



Dr. Ratika Parkash

Finding better ways to keep hearts in rhythm.



Dr. Alex Quinn

Understanding what causes dangerous heart rhythms.



Dr. John Sapp

Changing how dangerous heart rhythms are treated.



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\$40/person or \$400/table

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Canadian Museum of Immigration at Pier 21

November 24, 2026

7:30–9:00 a.m.

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DALHOUSIE UNIVERSITY

Department of Medicine

DR. LEAH CAHILL AND
DR. HELEN WONG

HELPING OLDER CANADIANS MAKE HEART-HEALTHY FOOD CHOICES

UNDERSTANDING HOW NUTRITION CAN
SUPPORT CARDIOVASCULAR HEALTH
AS WE AGE

By Dayna Park

For Dr. Leah Cahill, heart disease is not an inevitable part of growing older. A registered dietitian and the Howard Webster Department of Medicine Research Chair at Dalhousie University, Dr. Cahill studies how nutrition shapes cardiovascular health across the lifespan, with a focus on preventing disease before it starts.

“The biggest myth is that heart disease is an unavoidable consequence of aging,” she says. “Aging increases risk, but it does not guarantee heart disease. The choices we make throughout life, including what we eat, can have a meaningful impact on how healthy we remain as we grow older.”

Many factors associated with heart disease, including blood pressure, cholesterol, physical activity, smoking, diet, and diabetes management, remain modifiable later in life. Prevention can help people remain healthy, active, and independent for longer, while reducing the personal and financial burdens of heart attacks, strokes, and other cardiovascular conditions.

But knowing what supports heart health and being able to put that knowledge into practice are not the same thing.

“Most people don’t wake up wanting to make unhealthy food choices,” says Dr. Cahill, who is also an associate professor in Dal’s Department of Community Health and Epidemiology. “In many cases, they face practical barriers that make healthy eating difficult.”

Planning, purchasing, and preparing nutritious meals requires time and resources. Effective nutrition recommendations, she says, must fit into people’s real lives and recognize that food is closely



connected to culture, family, enjoyment, independence, and quality of life.

This idea is central to a growing area of research known as precision prevention, which aims to tailor disease prevention strategies to an individual's unique circumstances. While personalized medicine is often associated with genetics, Dr. Cahill says effective prevention also requires understanding the social and environmental factors that influence everyday decisions.

"Healthy eating looks different for different people," she explains. "A recommendation that is realistic for one person may be difficult or impossible for another because of caregiving responsibilities, limited resources, or cultural preferences."

To support healthy aging and reduce heart disease risk, researchers and healthcare providers must consider both biological factors and the social determinants of health. By meeting people where they are and adapting strategies to their health status, region, life stage, and environment, precision prevention has the potential to make cardiovascular disease prevention more effective, equitable, and sustainable.

That gap between knowing what to do and being able to do it is at the heart of research by Dr. Helen Wong, a postdoctoral fellow with Dr. Cahill's Nourish research team.

Dr. Wong studies "household foodwork," the many physical and mental tasks required to feed ourselves and others. It includes everything from planning meals, grocery shopping, and cooking to remembering what is in the refrigerator and accommodating family members' preferences or special diets.

These seemingly ordinary tasks could have important implications for healthy aging. Previous studies suggest that meal planning and cooking at home may support healthier eating, but foodwork tasks

have rarely been examined together, in depth, or in relation to the barriers people face. Dr. Wong's work aims to change that.

Using a questionnaire developed by Dr. Cahill alongside analyzing food intake, blood pressure, blood test results, and quality of life, she is exploring how foodwork shapes cardiovascular risk among older adults. The findings could help identify practical strategies and supports that make heart-healthy eating more accessible and achievable.

"Many older adults face challenges such as changing health conditions, limited mobility, caregiving responsibilities, or loss of social support," says Dr. Wong. "By understanding these barriers, we can develop interventions that better meet people's needs and support healthy aging."

Ultimately, the goal is not just to tell people what they should eat. It is to create evidence-based approaches that help people make healthy choices in ways that fit their daily lives. By combining nutritional science with a deeper understanding of the social and practical realities that shape food choices, researchers hope to help more Canadians maintain their heart health as they age.

"Every meal is an opportunity to support heart health," says Dr. Cahill, "and over time those small choices can add up to meaningful improvements in health, independence, and quality of life." ■

NEW SCHOLARSHIP ENCOURAGES EXCELLENCE IN CARDIOVASCULAR RESEARCH

FOSTERING THE NEXT GENERATION

By Elizabeth Conrad

A new scholarship in the Faculty of Medicine will help foster the next generation of clinician-researchers while celebrating the remarkable career and generosity of distinguished alum Dr. Anne M. Gillis (MD '79).

The Dr. Anne M. Gillis Scholarship for Cardiovascular Research will be awarded annually to a third- or fourth-year medical student in Dalhousie's undergraduate MD program who demonstrates strong academic achievement and a significant interest in cardiovascular research.

The scholarship recognizes the essential role that research plays in medical education and aims to encourage students to pursue the integration of scientific discovery with clinical practice.

A graduate of Dalhousie's Faculty of Medicine, Dr. Gillis has built an internationally renowned career as a clinician-scientist, educator, and leader in cardiac electrophysiology.

Her research has advanced our understanding of the mechanisms underlying cardiac arrhythmias and contributed to innovations that have improved the diagnoses and treatment of heart rhythm disorders. Throughout her career, she has championed the value of rigorous scientific inquiry alongside exceptional patient care, demonstrating the profound impact clinician-researchers can have on health outcomes.



DR. ANNE M. GILLIS

Beyond her scientific achievements, Dr. Gillis is widely respected for her commitment to mentorship and leadership. She has inspired generations of cardiologists and cardiovascular researchers through her guidance, collaboration, and dedication to excellence, and continues to impact the profession as Professor Emerita in the Department of Cardiac Sciences at the University of Calgary.

This new scholarship reflects the values that have defined Dr. Gillis's career: curiosity, scholarship, innovation, and a commitment to improving the lives of patients. By supporting medical students who are excelling academically and exploring cardiovascular research, the award will help cultivate future physicians who are equipped not only to deliver outstanding care, but also to generate new knowledge that advances medicine.

The establishment of the Dr. Anne M. Gillis Scholarship for Cardiovascular Research is also a meaningful example of alumni-driven philanthropy. Through her generosity, Dr. Gillis is creating opportunities for future generations of Dalhousie medical students and strengthening the Faculty's tradition of research excellence. Her gift is an investment in the future of cardiovascular discovery and in the talented clinician-researchers who will help shape it. ■

PREVENTING HEART FAILURE BEFORE IT STARTS

HOW DALHOUSIE
RESEARCHERS ARE
UNCOVERING THE
HIDDEN LINKS BETWEEN
METABOLISM, OBESITY,
AND HEART DISEASE

By Dayna Park



DRS. PETRA KIENESBERGER AND THOMAS PULINILKUNNIL

The human heart beats more than 100,000 times a day, pumping blood through the body without pause. To keep that relentless pace, it requires a constant supply of energy. Under normal conditions, the heart gets most of its energy from fats, continuously converting fuel into the power needed to keep us alive.

“The heart is a fat-loving organ,” says Dr. Thomas Pulinilkunnil, professor in the Department of Biochemistry and Molecular Biology at Dalhousie Medicine New Brunswick (DMNB).

At the Saint John campus, Dr. Pulinilkunnil and his colleague, Dr. Petra Kienesberger, are uncovering how obesity—the excess accumulation of body fat—and diabetes can quietly reshape the heart years before symptoms appear.

“Obesity is not simply a weight issue,” says Dr. Kienesberger. “It’s a complex metabolic disease.”

While Dr. Pulinilkunnil investigates how heart cells manage stress and dispose of damaged cellular material, Dr. Kienesberger studies how fats act as chemical messengers between organs.

Excess fat tissue does more than store energy. It releases molecules into the bloodstream that communicate with organs throughout the body, including the heart. Over time, those signals can trigger inflammation, disrupt energy production, and contribute to harmful changes inside heart muscle cells. The process is often silent.

“This continues for 15 or 20 years of our lives, and we don’t know it,” says Dr. Pulinilkunnil. “People are carrying on with their daily activities while important changes are happening inside the heart.”

A GROWING CHALLENGE IN HEART FAILURE

Understanding those early changes has become increasingly urgent because of a growing and poorly understood form of heart failure known as heart failure with preserved ejection fraction, or HFpEF.

Unlike other forms of heart failure, people with HFpEF can experience fatigue, shortness of breath, and exercise intolerance even though standard tests show their hearts are pumping normally. Women are particularly affected, yet effective treatments remain limited.

“HFpEF is the greatest unmet need in cardiology at the moment,” says Dr. Kienesberger.

In 2024, that challenge inspired the creation of RESOLVE, a \$7.3-million program funded by Canada Foundation for Innovation, Research Nova Scotia, Research NB, HSF-NB, and Dalhousie University, that is bringing together researchers from Dalhousie University, Dalhousie Medicine New Brunswick, and partner institutions across the region to better understand how HFpEF develops and how it can be prevented.

A FOCUS ON PREVENTION

Two years after launching, RESOLVE is already transforming cardiovascular research capacity in the region. Laboratories in Halifax and Saint John have undergone major upgrades, and the new infrastructure allows researchers to study heart disease at the genetic, molecular, and metabolic levels.

“These are state-of-the-art technologies,” says Kienesberger. “They also dramatically enhance our training environment, and the skill sets that trainees and staff can acquire.”

Ultimately, the researchers hope RESOLVE will create a roadmap of how HFpEF develops, helping identify earlier warning signs and more personalized treatment approaches.

As rates of obesity, diabetes, and metabolic disease continue to rise, the need for answers has never been greater. Researchers at Dalhousie are working to ensure that the future of heart care includes preventing heart disease altogether. ■





The power of choice

Dr. Jennifer Johnston is reimagining reproductive health

By Kate Rogers

Dr. Jennifer Johnston's work began with a deeply personal experience.

A family physician in the Annapolis Valley and assistant professor in the Department of Family Medicine, Dr. Johnston (MD'10) is the founder of Elle, MD, a biotechnology company that is reimagining women's reproductive health.

After experiencing her own health challenges in 2021, she immersed herself in research on hormones and reproductive health. What she found was a lack of support for people seeking evidence-based hormone care, and a shortage of effective non-hormonal contraceptive options for those who could not or did not want to use hormones.

The mother of four was determined to find a solution.

"Hormonal contraception works very well for many people and remains a great option, but for those who don't want hormones, the alternatives are limited," she says. "I thought, *someone has developed new contraceptives before*, so why can't I? It takes a certain amount of naïve optimism to begin something like this."

That optimism and determination became the inspiration behind Elle, MD and a new once-monthly, non-hormonal vaginal ring contraceptive designed to work locally within the reproductive tract.

FROM IDEA TO CLINICAL STUDY

The development process has been rigorous. To date, the team has completed eight pre-clinical studies, including research examining the device's ability to prevent pregnancy in sheep, which are considered an appropriate model for vaginal ring research.

Results from one study found that none of the animals using the ring became pregnant, while all of those in the control group did, providing an encouraging milestone for the technology.

Dr. Johnston and her team have now submitted an Investigational Testing Authorization application to Health Canada and are preparing for their first human study at The Ottawa Hospital. Recent funding will support that work and help lay the groundwork for a second human trial that she hopes will begin next year.

Several important steps remain. Following the initial human studies, the team will need to conduct larger pivotal trials and complete the Health Canada approval process. If development proceeds as hoped, Dr. Johnston estimates that the device could be available in Canada by 2029 or 2030 at the earliest.

The ring would initially be available by prescription, offering the most direct regulatory pathway and increasing the likelihood that it could be covered by Pharmacare. In the longer term, Dr. Johnston hopes evidence gathered through clinical trials and post-market use could support making it available over the counter.

"Ultimately, accessibility is the goal," she says. "There are many people who don't have a family physician or who face barriers to accessing care. If someone could safely order this product online or obtain it easily, that would make a meaningful difference."

INVESTING IN WOMEN'S HEALTH INNOVATION

Reaching this stage has required more than scientific expertise. With support and direction from the Nova Scotia Health Innovation Hub, Dr. Johnston was connected to opportunities, programming, and funding to help bring her idea to life.

Support from National Research Council of Canada Industrial Research Assistance Program (NRC IRAP), Atlantic Canada Opportunities Agency (ACOA), and other funding sources has been critical in getting the project off the ground and continues to be important moving forward. Philanthropic support has also provided an important boost at key stages of development.

The company recently raised approximately \$1.1 million in pre-seed financing and will soon be seeking approximately \$3.5 million for its seed round. That funding would allow the team to complete its next phase of studies and prepare for a pivotal clinical trial. Dr. Johnston expects it will require a combination of private investment, grants, and philanthropic partnerships.

For Dr. Johnston, that investment is about more than advancing a single product. Historically, women were often underrepresented in research studies, leaving significant gaps in the evidence used to guide care. While progress has been made, she believes there is still a need for greater investment in women's health research and innovation, from contraception and reproductive health to conditions such as endometriosis, perimenopause, and menopause.

"There's tremendous potential in philanthropy," says Dr. Johnston. "Philanthropic funding can help to not only bring a technology to market but also ensure it reaches the people who could benefit from it most."

GLOBAL IMPACT

"My dream is to see it freely available in sexual health clinics around the world so women have another practical, non-hormonal option they can access easily," she says.

While continuing to care for patients in rural Nova Scotia, Dr. Johnston sees innovation as a way to extend the impact of her medical training far beyond her own practice.

"A family doctor helps people one at a time, which is incredibly meaningful, but with something like this, my hope is that it could eventually help women all over the world. That's an impact I could never achieve in my rural Nova Scotia practice alone."

At the centre of that vision is her belief that women should feel supported, heard, and empowered to participate actively in decisions about their health.

"I want women to know that they have more agency over their health than they may realize," she says. "I want women to feel informed, engaged, and confident in making decisions about their care. That's ultimately what this work is about." ■

An Emerging Leader

Dr. Bahaa Abu-Raya receives 2026 Gairdner Early Career Investigator Award

By Kate Rogers

As a pediatric infectious diseases physician, Dr. Bahaa Abu-Raya has cared for infants hospitalized with vaccine-preventable illnesses. As a researcher, he has dedicated his career to understanding how to better protect them.

That commitment to translating clinical questions into real-world vaccine solutions has earned Dr. Abu-Raya the 2026 Gairdner Early Career Investigator Award, a prestigious international honour recognizing exceptional emerging leaders in biomedical research.

Dr. Abu-Raya was selected by the Gairdner Scientific Committee and then hand-picked by Gairdner laureates Drs. John D. Clemens and Jan Holmgren, who transformed global cholera control through the development of oral cholera vaccines. He is recognized for research that is helping reshape how vaccines are used to protect some of the world's most vulnerable populations. His research focuses on maternal and infant immunization, vaccine development, and the immune responses that protect against infectious disease.

As a clinician-scientist and researcher at the Canadian Center for Vaccinology (CCfV) in Halifax, for Dr. Abu-Raya, the honour reflects years of work at the intersection of patient



care and laboratory science. More importantly, it signals that the answers his team is uncovering are helping to shape how vaccines are developed, delivered, and used to protect people around the world.

“This recognition confirms that the work we are doing at the CCfV is important and has the potential to transform vaccinology research. It also reinforces that the work I plan to do in the coming years is meaningful, which gives me additional motivation to pursue it with passion and enthusiasm.”

PROTECTING INFANTS BEFORE BIRTH

Dr. Abu-Raya and his colleagues have helped demonstrate that administering the pertussis—more commonly known as whooping cough—vaccine early in the third trimester produces a stronger immune response and greater antibody transfer than the previously recommended timing. Their findings, later confirmed by research groups in the United States and Australia, helped establish early third-trimester immunization as the optimal approach and continue to inform vaccination policies worldwide.

Building on that work, Dr. Abu-Raya is now applying the same approach to another major threat to infant health: respiratory syncytial virus or RSV, the leading cause of respiratory-related hospitalizations among Canadian infants. Through a recently announced Canadian Institutes of Health Research (CIHR) grant, he is leading a multicentre clinical trial to determine whether RSV and pertussis vaccines administered during the same prenatal visit are as safe and effective as when they are given separately.

“As a clinician, again and again I saw babies suffering from whooping cough, and today, I still see babies suffering from RSV disease,” he says. “If we have vaccines available, we need to understand how to use them most effectively to provide the greatest protection.”

While pertussis vaccination during pregnancy has been recommended in Canada since 2018, maternal RSV vaccination was only introduced in 2024, creating new opportunities to protect

infants against two serious respiratory infections before birth. Administering both vaccines during a single visit could simplify care, improve uptake, and reduce health system costs, but researchers do not yet know whether giving them together affects their efficacy.

Through a CIHR-funded multi-centre clinical trial, Dr. Abu-Raya and his team will assess antibody responses in pregnant individuals and their infants to determine whether concurrent vaccination provides comparable protection. The findings are expected to inform vaccination guidelines in Canada and internationally.

“We now recommend more vaccines than ever before, but we still do not fully understand how these vaccines interact with one another when given during pregnancy,” says Dr. Abu-Raya. “This new project will help us answer some of those questions.”

COLLABORATION AND GLOBAL IMPACT

Dr. Abu-Raya is quick to emphasize that the advances he has made are the result of collaboration. Success, he says, is not only about individual effort, but also about being in the right place at the right time and working with the right people.

“I feel that is happening now at the CCfV here in Halifax. I am fortunate to work with leaders in vaccinology, including Scott Halperin, Joanne Langley, and Tobias Kollmann, who have helped shape my career and continue to guide and refine my goals and career path.”

At the heart of Dr. Abu-Raya's work is a simple goal: to make a meaningful difference in people's lives through research.

“That is one of the most rewarding aspects of science,” he says. “You can conduct research in Halifax, but people across the world can benefit from the knowledge and discoveries that result from it.”

This fall, Dr. Abu-Raya will join fellow Early Career Investigator Award recipients and 2026 Gairdner laureates at Gairdner Science Week, an opportunity to learn from and collaborate with some of the world's most influential scientists. ■

The Missing Link

How Dr. Christopher McMaster is helping bridge the gap between scientific discovery and patient care

By Dayna Park

One in every 15 children is born with an inherited disease. For most, there is no treatment.

For families facing that reality, scientific breakthroughs alone are not enough. A promising discovery in the lab only matters if it can become a therapy that reaches the children who need it.

WHEN DISCOVERY ISN'T ENOUGH

"It's not a science problem," says Dr. Christopher McMaster, professor in Dalhousie's Department of Pharmacology. "It's a translation problem."

By translation, he means the process of moving a scientific discovery from the laboratory into the real world. That journey requires expertise in therapy development, manufacturing, clinical trials, regulatory approvals, and financing.

Dr. McMaster has spent his career studying inherited diseases and the genes that cause them. His work focuses largely on rare childhood conditions, many of which are caused by a single faulty gene.

"For 95 per cent of those one in 15 children born with an inherited disease, there's currently nothing we can do," he says.

While advances in gene therapy have opened new possibilities for treating conditions once thought untreatable, many rare diseases affect too few patients to attract significant investment from large

pharmaceutical companies. As a result, potentially life-changing therapies can remain out of reach for the children and families who need them most.

Rather than accepting those limitations, Dr. McMaster and a growing network of researchers, clinicians, philanthropic partners, and patient advocates are working to build a different model.

A NEW MODEL FOR RARE DISEASES

That model is already taking shape around a rare inherited form of muscular dystrophy.

In laboratory studies, Dr. McMaster's team has successfully used gene therapy to restore normal muscle function in animal models by replacing a faulty gene with a functioning copy.

"It's pretty incredible technology," he says. "You treat the patient once and they should be good for life."

But proving a treatment works in the laboratory is only the first step. Before a therapy can reach patients, it must undergo safety testing, manufacturing development, regulatory review, and clinical trials. For rare diseases, where patient populations are small and potential returns on investment are limited, securing the resources to complete that journey can be one of the biggest obstacles.

That's why Dr. McMaster and his collaborators are working to build a treatment platform that can be repurposed for affected genes, helping to move them more efficiently to patient care.

"If everything's identical other than the gene that's different, the process gets faster and cheaper each time," he says.

MAKING TREATMENT ACCESSIBLE

The promise of this gene therapy is enormous. If they were to be developed through traditional pharmaceutical models, they could cost millions of dollars per patient. Dr. McMaster believes these therapies must be accessible and affordable.

What comes next, manufacturing, testing, regulatory approvals, and clinical development, is the fiscal hurdle now. Dr. McMaster and his team hope to bring therapies to the clinic and ultimately lower barriers for patients and families.

"If we're successful, we want these treatments reaching the families who need them for little to no cost to them," he says.

INVESTING IN WHAT COMES NEXT

That is where philanthropy can make a transformative difference. For donors, this represents an opportunity to invest not only in bringing a single breakthrough to market, but in the infrastructure and expertise needed to advance many future therapies. It is a platform for the treatment of many rare diseases—not a single disease being targeted.

The benefits extend beyond patient care. Dr. McMaster believes continued growth in the sector could create even more opportunities for young scientists to build careers in Nova Scotia rather than leaving the region to find work elsewhere.

"We've got the people, we've got the expertise, and we've got a model that the team used before," he says. "Now it's about doing it again."

For families waiting for answers, success won't be measured in regulatory milestones or commercialization strategies. It will be measured in something far more meaningful: a chance for a child to receive a treatment that is not only life-changing, but accessible and affordable. ■



"If we're successful, we want these treatments reaching the families who need them for little to no cost to them."

— DR. CHRISTOPHER MCMASTER

Dal researchers help identify new Ebola variant and potential treatment

An international effort to combat a deadly outbreak in Africa

By Dayna Park

When the World Health Organization declared an Ebola outbreak in Uganda and the Democratic Republic of the Congo (DRC) a Public Health Emergency of International Concern in May 2026, scientists around the world mobilized to help. Among them were researchers at Dalhousie University.

Working alongside scientists and public health teams in Uganda and the DRC, researchers in Dalhousie's Department of Microbiology and Immunology helped identify a new variant of Bundibugyo ebolavirus (BDBV), a rare and contagious form of Ebola for which there are currently no approved treatments or vaccines specifically designed for the disease.

For Dr. Anuj Kumar, a Moderna Global Fellow and researcher in Dr. David Kelvin's Laboratory of Emerging Infectious Diseases at Dalhousie, helping respond to the outbreak meant tackling two urgent challenges at once: understanding the virus and identifying potential ways to stop it.

Within weeks of the public health emergency declaration, Dr. Kumar and his international collaborators published two significant studies in leading

infectious disease journals. One, published in *The Lancet*, identified the virus driving the outbreak as a genetically distinct variant of Bundibugyo ebolavirus. A second study, published in the *Journal of Infection*, pointed to a potential treatment option that is now being evaluated through a clinical trial in Africa.

The rapid publication of both studies gave researchers and public health officials access to critical information while the outbreak response was still unfolding.

"This is a novel variant of the virus circulating in the DRC," says Dr. Kumar. "From the genomic side, we can build a mutation map, see what changes have occurred, and better understand what those changes in the virus might mean."

The work was a collaborative effort involving scientists, clinicians, and public health teams across three countries. Researchers in Uganda and the DRC performed the virus sequencing, while the Dalhousie team analyzed the genetic data and helped map how the virus has changed over time.



"The key is to build research that allows us to rapidly respond. We know that through computer modelling, we can do that."

— DR. DAVID KELVIN



"From the genomic side, we can build a mutation map, see what changes have occurred, and better understand what those changes in the virus might mean."

— DR. ANUJ KUMAR

Those answers matter because understanding how a virus evolves can help researchers identify drug targets, inform future vaccine development, and support public health efforts to control the disease.

SEARCHING FOR SOLUTIONS

Understanding the virus was only half the challenge. Researchers also wanted to find out how the new variant could be treated, a particularly important question because BDBV remains difficult to diagnose in its early stages.

“When somebody is infected with Ebola, the initial symptoms mimic the flu or simply feeling unwell,” says Dr. David Kelvin, professor and Canada Research Chair in Translational Vaccinology and Inflammation. “There are currently no good diagnostic tools available to catch cases in the early stages.”

Without approved therapies specifically developed for BDBV, the team turned its attention to a promising alternative: repurposing an existing drug.

Using advanced computer modelling, researchers examined whether remdesivir triphosphate, the active form of a drug used during the COVID-19 pandemic, might also be effective against the new Ebola variant.

Their analysis suggested the drug targets a critical part of the virus responsible for replication, a region that remained unchanged despite the emergence of the new variant. That finding generated enough interest that the drug is now being evaluated through an ongoing clinical trial in Africa.

Dr. Kumar says the study demonstrates how modern computational tools can help accelerate responses during public health emergencies. Rather than starting from scratch to develop a brand-new drug, researchers can use genomic analysis and computer

modelling to quickly evaluate whether existing treatments might help combat emerging diseases.

INVESTMENT, PARTNERSHIP, AND IMPACT

For Dr. Kelvin, the team’s ability to respond quickly to the outbreak is the result of years of investment in research infrastructure, expertise, and international partnerships.

The tools used to analyze the virus were not built overnight. About four years ago, Research Nova Scotia invested in Dr. Kelvin’s laboratory to strengthen its capacity in viral modelling, genomic analysis, and drug discovery. Those same tools, originally developed and refined during the COVID-19 pandemic, are now being used to support outbreak response efforts thousands of kilometres away.

“It was based on that investment that we were able to rapidly respond to the outbreak today,” says Kelvin.

Support from organizations including Research Nova Scotia, the Li Ka Shing Foundation, the Canada Research Chairs Program, and other research funders has helped build the expertise and infrastructure needed to answer urgent global health questions when they arise.

“The key is to build research that allows us to rapidly respond,” Dr. Kelvin says. “We know that through computer modelling, we can do that.”

For Dr. Kumar, the project highlights the power of international scientific collaboration.

“We’re working closely with our collaborators in Africa and providing support,” he says. “We’re optimistic that the information we’re generating will be useful for researchers and public health teams working to control this outbreak.” ■

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DR. SUDEEP SHIVAKUMAR

Simple solution, large-scale impact

Canadian study published in NEJM could change care after joint replacement surgery

By Dayna Park

A medication found in medicine cabinets around the world may be all many patients need to prevent dangerous blood clots after hip and knee replacement surgery.

That is the finding of a landmark Canadian study administered by Nova Scotia Health (NSH) and led by Dr. Sudeep Shivakumar, associate professor and head of the Division of Hematology at Dalhousie University's Faculty of Medicine.

The study was recently published in the New England Journal of Medicine (NEJM), widely considered the world's leading medical journal. It found that aspirin alone was as safe and effective as a more complex regimen involving the blood thinner rivaroxaban followed by aspirin for preventing potentially life-threatening blood clots after total hip and knee replacement surgery.

"After a total hip or total knee replacement, there is an increased risk of blood clots," explains Dr. Shivakumar. "What we wanted to do with this study is to look at whether aspirin, which is commonly known and inexpensive, can be as good as blood thinners in this situation."

ANSWERING AN IMPORTANT CLINICAL QUESTION

Joint replacement surgeries are among the most common surgical procedures performed worldwide. While blood-thinning medications have dramatically reduced the risk of post-surgical blood clots, they can also increase the risk of bleeding complications. Clinicians have long wondered whether aspirin alone could provide the same protection without the added complexity of stronger anticoagulants.

To find out, researchers launched a large randomized, double-blind clinical trial comparing aspirin alone with a commonly used treatment strategy that begins with rivaroxaban before transitioning to aspirin.

While the research team was based at Dalhousie, the clinical trial funding was administered through NSH, which played a key role in supporting the study's delivery through 5,300 patients at 15 university-affiliated health centres across Canada. Neither the participants nor the investigators knew which treatment individual patients received during the study, helping eliminate potential bias.

"We were able to show that aspirin alone is as safe and as effective as a strategy using a blood thinner followed by aspirin," says Dr. Shivakumar.

BENEFITS FOR PATIENTS AND HEALTH SYSTEMS

For patients, the findings could help simplify recovery after surgery.

The alternative treatment strategy requires patients to take rivaroxaban for five days before switching to aspirin, a process that can create confusion during an already challenging recovery period. Aspirin, by contrast, offers a simpler, one-drug approach.

"It gives us some evidence so that we can present options to patients so they can make decisions with their healthcare provider," says Dr. Shivakumar. "Now we have a big study that shows that this option of using aspirin alone is a good one."

The findings may also have broader implications for healthcare systems. While the study did not include

a formal economic analysis, aspirin is widely available and inexpensive compared with many newer blood thinners.

“Hopefully it would save patients and the healthcare system some money,” says Dr. Shivakumar.

A CANADIAN COLLABORATION YEARS IN THE MAKING

The publication marks the culmination of nearly eight years of work.

Planning for the study began in 2018, with funding awarded in 2019 through the Canadian Institutes of Health Research (CIHR). Researchers had hoped to begin recruitment in 2020, but the arrival of the COVID-19 pandemic threatened to derail the project before it started.

Because the study focused on elective hip and knee replacement surgeries, the widespread cancellation of elective procedures created major uncertainty about whether researchers would be able to recruit enough participants to complete the trial.

“We didn’t know when the world would return to normal, or sort of normal,” recalls Dr. Shivakumar. “We didn’t know that we’d get the number of patients in a reasonable amount of time.”

Recruitment eventually accelerated as surgical programs resumed across the country, allowing the study to move forward. The trial was completed in early 2026 and was published only months later.

The project was supported entirely through public funding, something Dr. Shivakumar views as particularly significant.

“There was no pharmaceutical or private funding,” he says. “It was all through the Canadian Institutes of Health Research.”

FROM HALIFAX TO THE WORLD

Beyond the scientific findings themselves, Dr. Shivakumar hopes the study demonstrates the impact Canadian researchers can have on global healthcare.

“This is really proof that practice-changing research can happen in Canada,” he says. “We can contribute with a high-quality study that will give information to people around the world.”

He credits the success of the project to an extensive network of collaborators across the country, including surgeons, research staff, study coordinators, patients, and families who contributed their time and effort over many years. More than 250 research personnel helped support the study across participating sites.

Most importantly, he says, patients made the research possible.

“This study wouldn’t have happened without them.”

A MILESTONE PUBLICATION

Seeing the results published in the New England Journal of Medicine was both professionally rewarding and encouraging.

“The NEMJ is the premier medical journal,” says Dr. Shivakumar. “To have our work there shows that they also thought that it was a well-run study that has the potential to change practice.”

The achievement also highlights the calibre of research being conducted at Nova Scotia Health and Dalhousie University.

“I think we really are an amazing institution with the ability to do world-class research,” he says. “We can affect people in all corners of the world.”

As the research team looks ahead, its focus is no longer on collecting data, but on ensuring the findings reach the clinicians and patients who stand to benefit from them.

“The bottom line is that we now have evidence that an aspirin-alone strategy is as good and as safe as one involving a blood thinner,” says Dr. Shivakumar. “Patients have options, and we now have evidence that can help inform their decisions.” ■

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Cases are ticking up. So are the questions.

Why some children develop persistent Lyme arthritis and how to improve care

By Kate Rogers



Twenty years ago, when Dr. Elizabeth Stringer started practicing in Halifax, she saw one or two patients a year present with Lyme arthritis, a painful joint inflammation that can develop months after a Lyme disease infection.

Today, the paediatric rheumatologist is one of a team of four who sees so many cases that the IWK has a dedicated Lyme arthritis clinic, drawing referrals from across the Maritimes and serving as a resource for physicians nationwide.

That change reflects the rapid rise of Lyme disease in Canada. According to government data, in 2024,

the country reported 5,809 cases of Lyme disease, the highest annual total on record. Roughly 40 per cent—2,350—of those cases were reported in Nova Scotia.

As Lyme disease has become increasingly common, Nova Scotia has emerged as an unexpected centre of expertise in one of its most common childhood manifestations. At Dalhousie University and IWK Health, Dr. Stringer is leading research aimed at understanding why some children develop persistent symptoms of Lyme arthritis and how those insights could improve care for patients across Canada.

SEARCHING FOR ANSWERS

Lyme arthritis occurs when the bacteria that causes Lyme disease settles in the joints, most often the knee, triggering inflammation and swelling. Most children recover after a course of antibiotics, though some require additional treatment. Even after two courses of antibiotics, about one in six children continue to experience symptoms, a condition known as post-infectious Lyme arthritis.

“The good news is that, with the combination of treatments we can offer, most of our patients do have resolution of their arthritis,” says Dr. Stringer. “I have had some patients with lingering symptoms, but overall, most make a full recovery.”

While physicians have become increasingly adept at diagnosing and treating Lyme arthritis, many questions remain unanswered.

One of the most pressing focuses on the small group of patients whose arthritis persists after antibiotic treatment. Researchers still do not fully understand why some children recover quickly while others continue to experience inflammation after the infection is believed to have been cleared.

Dr. Stringer and co-investigator Dr. Beata Derfalvi, along with other collaborators, are following children with Lyme arthritis over time and studying how their immune systems respond to infection. By examining blood samples and, when possible, joint fluid, the team hopes to identify biological signals that distinguish children whose arthritis resolves from those who develop persistent symptoms.

“We want to understand whether the immune systems of patients with persistent arthritis after antibiotics behave differently from those of children whose arthritis resolves,” says Dr. Stringer. “We believe this could help to provide insight on how best to treat these children.”

The work is among the first of its kind in children and is poised to make a big impact.



“The good news is that, with the combination of treatments we can offer, most of our patients do have resolution of their arthritis.”

— DR. ELIZABETH STRINGER

AN UNEXPECTED DIAGNOSIS

For many families, a Lyme arthritis diagnosis comes as a surprise. Most children seen in Dr. Stringer’s clinic never developed the telltale rash commonly associated with Lyme disease, and many families never knew a tick bite had occurred.

When Vale Dobbelsteyn began complaining of a sore neck and hips, her parents, Julia and Matt, figured she must have slept funny or was experiencing growing pains. When she awoke two days later with an extremely swollen knee and had difficulty walking, they went directly to the Emergency Department at the IWK where she was quickly diagnosed with Lyme disease.

“We had no idea Vale had been bitten by a tick,” recalls Julia. “We had never found a tick on her, and she never had the bull’s-eye rash we typically associate with Lyme disease, so the diagnosis was very unexpected.”

Vale was given a 28-day course of antibiotics and improved remarkably quickly, with swelling significantly improved within days. The harder part for her parents was the feeling of uncertainty—had they missed something, and would she have lasting effects?

Dr. Stringer quickly dispelled those fears.

“She explained it was very unlikely Vale would experience long-term effects and helped us understand that a tick bite or bull’s-eye rash isn’t always noticed,” says Julia. “She also reassured us that we shouldn’t stop doing the things we enjoy because of this experience.”

Despite the diagnosis, the family’s relationship with the outdoors has not changed.

“We still want Vale to go to camp, play sports, explore outside, and do all of the things she loves,” Julia

says. “We just approach those activities with more awareness, using tick spray, dressing appropriately, doing regular tick checks, and teaching our children to be aware of their own bodies. For our family, it’s about being prepared rather than being afraid.”

Vale is now thriving and has fully resumed all the activities she loves, including dancing, soccer, running, and golf.

BEYOND THE CLINIC

Working closely with children and families has shaped another aspect of Dr. Stringer’s research. Her team has learned that many families struggle to find information specific to paediatric Lyme arthritis and can encounter confusing or alarming messages online.

“There is a lot of fear associated with a Lyme disease diagnosis, and families receive a lot of comfort and reassurance from talking this through with us,” she says.

In response, Dr. Stringer is working with patient partners and communication specialists to develop educational resources that will help families better understand the condition and know what to expect.

AWARENESS WITHOUT FEAR

As Lyme disease continues to spread, Dr. Stringer and her colleagues at the Lyme arthritis clinic remain the centre of expertise in Canada, caring for a growing number of children and families navigating Lyme arthritis. While important questions remain about why some children develop persistent symptoms and how the disease can be diagnosed more effectively, she is optimistic about the progress being made.

“There is a real tension for families,” she says. “We want children to play outside, explore and enjoy nature, but there are now more things to be aware of. The goal isn’t to create fear. It’s to help families recognize Lyme disease when it occurs, know what to watch for, and feel confident that effective treatment is available.” ■



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