# the heart of a woman

Females comprise **51 per cent of the population**, but cardiovascular research aimed at them is almost non-existent. One researcher is changing that

**TEN YEARS AGO, AS PART OF A QUALITATIVE STUDY** she was conducting, nursing professor, associate dean of research and Carvazan Chair in Mature Women's Health **Colleen Norris**, '78 Dip(Nu), '82 BScN, '92 MN, '02 PhD, asked women what it felt like to be given a cardiovascular diagnosis by a health-care professional. The answer was not what she was expecting, and it was an a-ha moment for her.

"'It's embarrassing. It's all my fault.' This is what one woman told me," Norris says.

"I thought to myself, 'Of course this is not your fault,'" she says. "But this is how women see it. We blame ourselves and then we hide it. This is how we fall into our gender roles."

Ever since then, Norris' research agenda has been clear — to raise awareness of women's heart health. She says it's easy to understand why cardiovascular health isn't front of mind for many women.

"It's not because we don't care about our health; it's because we don't make ourselves a priority," says Norris, who is a member of the Women and Children's Health Research Institute (WCHRI). "Instead of talking to someone about it, we keep it to ourselves. Rather than focusing on ourselves for a few hours, we'll be doing everything for everybody else."

The statistics speak for themselves. Women comprise 51 per cent of the Canadian population, yet evidence-based cardiovascular research aimed at just females is almost non-existent, explains Norris. And treatment and therapies designed specifically for women are missing from the health-care system.

Symptoms are overlooked in emergency departments, too. In fact, 78 per cent of cardiovascular symptoms are missed in women because they present with at least three additional symptoms over and above chest pain and discomfort compared

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to men. Of the women who are sent home from emergency departments annually in Alberta, 300 of them will return within 30 days having suffered a heart attack.

Part of the problem, Norris explains, is that historically, cardiovascular research studies are composed of male subjects. "We don't even have the clinical evidence to support what treatments work for women. We're still working on diagnosing women's heart health," she says. "We're still working on being able to identify the symptoms."

Her most recent research study (published by master of nursing student Nicole Tegg) paints a dim picture of women's heart health. An environmental scan of 450 emergency departments across Canada revealed that only one has a female-specific protocol for women presenting with cardiovascular symptoms.

"But having found this, there is a movement to start saying 'We need some answers here. And the answer is nursing research," she says, which will lead to better care by staff at the front line.

"We are getting away from the concept that nurses just go in and take care of their patients until their shift is over. The nurses of today have learned about research-based evidence. They are learning about the people, sex and gender, intersectionality. So, we are looking at every person regardless of their setting, using a biopsychosocial lens," she says.

While recognizing that nursing-focused clinical research is still in its infancy, Norris is one of the researchers behind changing the landscape of the nursing profession.

And she's doing this one research project at a time, while passing the torch to the next generation.

"The light of a candle does not diminish by lighting another," says Norris, a philosophy she credits to her own mentor and supervisor, William Ghali, vice-president of research at the University of Calgary. "To me, mentorship is collegiality, so the first thing I tell my students is that we are here to do research and we are going to do it together."

## Fatigues to Scrubs

Christopher Picard crossed paths with Norris while taking her statistics course. As with many of her graduate students, that one course ignited a spark that quickly turned into a master's-level research project.

Picard, an emergency room nurse and clinical nurse educator at the Royal Alexandra Hospital, is using triage narratives to collect data and investigate how cardiology care is delivered in emergency rooms to female patients. His route to emergency department research nurse wasn't straightforward.

Picard was an army medic, stationed at a patrol base in Afghanistan. Having joined the army at a young age, he was looking for a career change. A friend suggested nursing, so he enrolled in the University of British Columbia's accelerated program, and graduated in 2012.

While working in the emergency department and simultaneously pursuing his master's at the U of A, Picard noticed something disturbing

at the hospital where he worked. "Men go to cardiology and women go to internal medicine for the exact same complaints, and there is something wrong with that," he told Norris "This is not fair."

That conversation was the genesis of Picard's research interests, and he is now a part of Norris's team, helping her change the way the health-care system treats cardiovascular female patients.

"Christopher's data showed us what was happening when women were entering the emergency room," says Norris. "Triage narratives and data showed us that women were saying, 'Something is wrong with my heart,' but were being sent home. It showed us part of the issue is clinician awareness." A pilot study conducted by both researchers further validated what Picard was seeing. The study showed that women who complained of the same symptoms as men were being treated differently.

"It drives my research now," says Picard. "We've set women up for failure for decades. We've taught this failed paradigm to our clinicians. Women get substandard treatment and die." And this is where Picard's research hopes to make a difference.

The majority of people admitted to the hospital come through the emergency department, where the treatment path is often set. The patient's symptoms and complaints are recorded by the triage nurse, who then assigns a reason for the visit and acuity score treatment. A miscategorization at this step can contribute to a misdiagnosis of symptoms — and most often that happens to women, says Picard.

"These visits are typically recorded in 70 words or less, no longer than a tweet," says Picard. "This is the very first documentation and assessment the patient receives and it's as close as it can get to the patient's own words."

Picard is looking to identify the key markers that demonstrate this disconnect using structured (visit categories) and unstructured (clinical narrative) data gathered when patients are in triage.

"This involves systemic barriers that need to be fixed," he says. "The women who eventually end up in cardiology have had huge delays."

His next steps build impact right where it matters. After publishing his review, he will begin to analyze triage narratives in the Edmonton zone, a dataset that includes almost two million emergency room visits.

"It will be the first study to actually examine what a triage narrative looks like and will offer insight into what a prototypical narrative is," says Picard. "For the U of A, this dataset is a unique opportunity. Being global leaders in artificial intelligence and qualitative methods, in addition to having access to rapidly growing volumes of clinical data, we have an opportunity to work with existing infrastructure and expertise. All the pieces are just waiting to be put together."

## Back to the Clinic

Norris says a major part of advocating for women's heart health is bringing questions back to the clinical setting.

"We've done all this stuff clinically as nurses, just because we've always

New data showed what was happening when women went to the emergency department.

One patient, a new mom five days post-partum, had spontaneous coronary artery dissection — a tear in the wall of the heart.

done it that way. Now we are raising the question, 'why?' We are building research to support our questions," says Norris. "When I'm assigned a grad student, the first thing I say is, 'Let's see how we can apply this to women's health.'"

A perfect example of real-time research and impact in nursing is Natasha Yarrow's work.

Yarrow had been on the job for just two years, working as a registered nurse primarily in cardiology ICU. Little did Yarrow know at the time, the patient she was about to treat was going to change the way she practiced nursing.

Her patient — a new mom only five days postpartum — had spontaneous coronary artery dissection (SCAD), a tear in the artery wall in her heart.

What causes SCAD is unknown. But 90 per cent of SCAD patients are women between the ages of 30 and 60. Until the past few decades, SCAD went mostly undiagnosed and was often fatal.

This was Yarrow's first encounter with SCAD. She quickly realized she knew very little about the disease and that there was very little information available in terms of how to manage it after a patient leaves hospital.

"A big part of nursing is explaining to families what is going on and helping them understand the disease process," says Yarrow, as well as providing the tools they need. "With this patient, I didn't know what to say to her husband. I didn't know how to explain the disease, and I couldn't find management strategies or even provide any basic knowledge or resources." This pushed her to find answers not just for herself but for her profession.

Yarrow moved to Edmonton and enrolled in the master of nursing nurse practitioner program with Norris. Here she published her scoping review, "Discharge Recommendations for Females Diagnosed With Spontaneous Coronary Artery Dissection."

Yarrow's scoping review identified a small number of cohort-based studies that showed followup care after SCAD should include patient-centred exercise training; social, emotional and mental health support; and lifestyle change management, similar to other cardiac rehabilitation programs.

"Colleen was able to connect me with the right people, set up a network, and she was consistently there to make sure I was on the right path," says Yarrow, who was conducting research for the first time. "She provided the nursing lens to make my research even more fitting."

At Norris's suggestion, Yarrow followed up her scoping review by embarking on a literature review to find out how well the information about how followup care was being translated to patients.

Next, Yarrow hopes to secure funding for a randomized controlled study. In the end, she says, "It would be nice to discharge a patient with a long-term plan in hand."

## Crucial Connections

Just as SCAD research is evolving, so is the understanding of the connection between intimate partner violence and cardiovascular disease in women later in life.

Jamie Mann's crusade began during a research course led by Norris, whom Mann counts as personally inspiring.

Mann's research — which focuses on intimate partner violence and its long-term impact on women developing cardiovascular disease later in life — was inspired by an encounter with a patient who disclosed she was experiencing intimate partner violence.

Mann, the physician, residents and a social worker scrambled for hours to get the patient help; no shelters had space or were willing to accommodate the woman despite all of the interdisciplinary team's efforts.

"It felt like she was screaming for help, but we couldn't help her. When intimate partner violence is disclosed, we should have sufficient resources available to help women," says Mann, now a master of nursing student in the family and all ages nurse practitioner stream.

In her current research, she is looking at improving cardiovascular health in women by addressing intimate partner violence as a unique and gendered risk factor for the development of cardiovascular disease.

In Canada, heart disease is the No. 1 cause of death in women over the age of 55. While factors such as high blood pressure, menopause, diabetes, tobacco use and physical activity are counted as major contributors, mental health and trauma are now being documented to play a role as well.

"Long-term trauma and abuse not only affects mental and emotional health, but has a stark impact on physical health," says Mann, who like Picard and Yarrow took a course of Norris's and undertook research to move the needle on women's heart-health care. "Trauma and abuse can directly lead to systemic inflammation and over-stimulation of the body's compensatory stress-response mechanisms, resulting in cardiovascular damage."

Mann hopes her research will equip nurses with the tools and resources to promote routine screening for intimate partner violence, particularly for women who enter primary health care.

"Literature in this realm is evolving. Especially research connecting intimate partner violence with cardiovascular disease risk in women," says Mann. Diagnosing something like knee pain is routine, Mann says, but identifying mental health and social concerns are more difficult but necessary. "Nurses are here to provide holistic care. But if someone is in an abusive relationship, they may be unsupported when asking for help. We need to provide the tools and resources to identify these patients, to prevent further health concerns later in life."

This is another opportunity to figure out a way to move the science along to solve a serious clinical problem, says Norris.

"We know that if you're living in a stressful environment, your cortisol is flowing all the time. And if you're in fight-or-flight mode all the time it affects your heart," says Norris.

"We need to start paying attention to women's health, especially when they come into the emergency department. More importantly we need to recognize our knowledge gaps, knowing that women's health is an intricate balance of sex and gendered factors, which we're looking at with a nurse's lens and nursing research."

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