

BCM J

A Doctors of BC Publication

Dr Charlene Lui

Doctors of BC president, 2025

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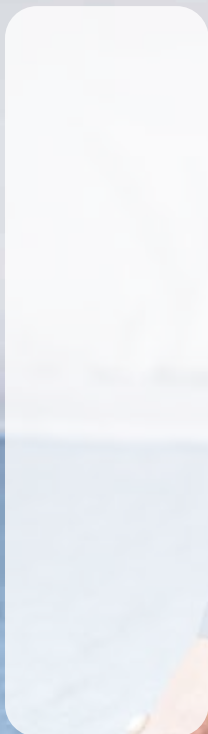
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Mission: The *BCMJ* is a general medical journal that shares knowledge while building connections among BC physicians.

Vision: The *BCMJ* is an independent and inclusive forum to communicate ideas, inspiring excellent health care in British Columbia.

Values

Quality: Publishing content that is useful, current, and reliable.

Connections: Sharing diversity of thought and experiences from across the province and promoting communication between BC doctors.

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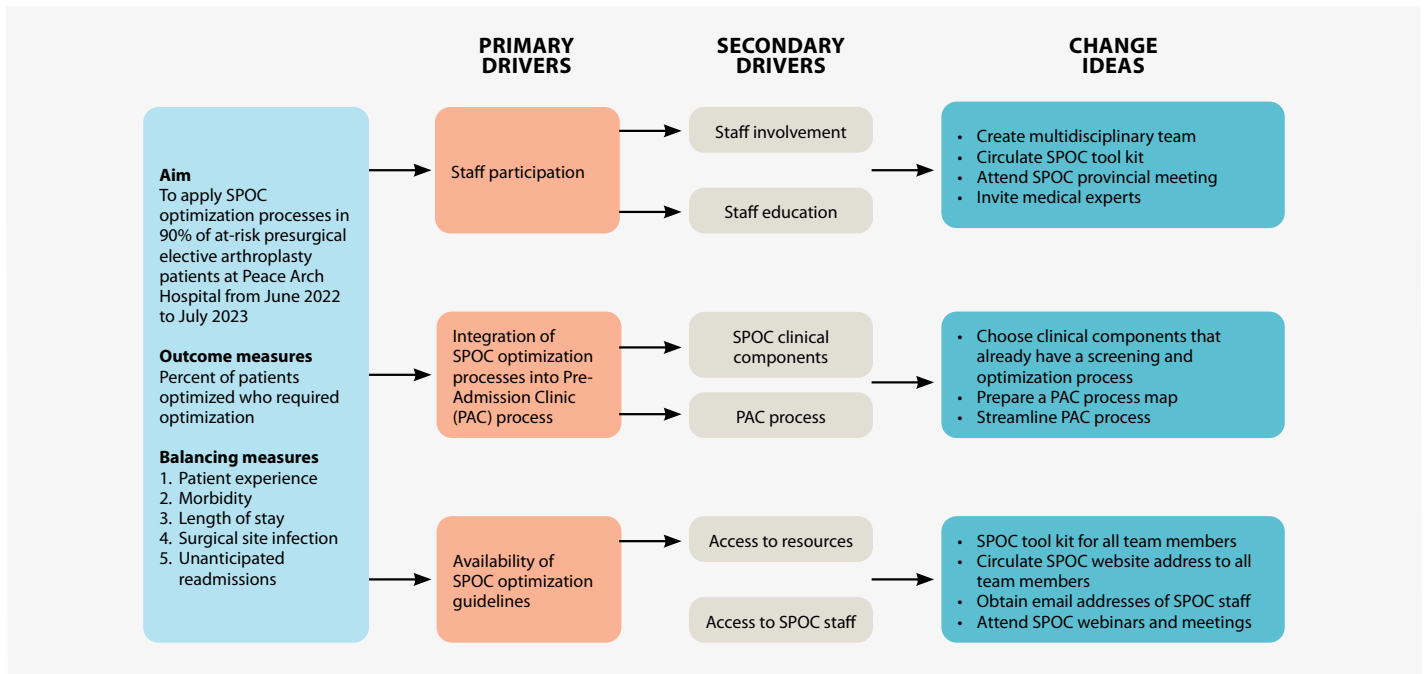
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Consistency beats intensity

As we step into 2025, the start of a new year offers a natural moment to revisit our health and fitness goals. Although change is possible at any time, there's something about turning the calendar that inspires fresh aspiration. However, overly ambitious resolutions often backfire. More than half of adults abandon their resolutions,¹ with 23% giving up before the end of January.² If you're looking to build strength and improve fitness, consistency beats intensity every time.

Health and fitness are long games, not quick fixes. As physicians, we routinely recommend healthier habits to our patients—quit smoking, reduce alcohol consumption, cut back on sugar, and move more. Yet even for us, sometimes the advice is easier to prescribe than to follow. Change is hard. On average, it takes 66 days to solidify a new behavior into a habit.^{3,4} SMART goals (specific, measurable, achievable, relevant, and time bound) provide a helpful framework, but achieving them demands perseverance.

Intensity can be the enemy of sustainability. If a workout is too demanding, it can be harder to maintain and can increase the risk of injury. In studies on distance running, for example, the 80/20 rule suggests that the optimal balance is 80% low intensity and 20% high intensity.^{5,6} Elite athletes understand this, and so should we. There's no need to push your limits every single day.

My 2024 resolution was to complete an Instagram-purchased daily hip-stretching course (a goal that may not have been smart *or* SMART). With 18 days down and 348 to go, its efficacy remains to be seen. But stay tuned: 2025 is going to be much more flexible.

If you have resolved to move more, remember, every bit counts! Research shows that the benefits of moderate to vigorous physical activity apply whether it happens sporadically or in sustained bouts.⁷ Reflecting this, the Canadian 24-hour movement

guidelines removed the 10-minute minimum bout requirement to achieve the recommended 150 minutes per week of moderate to vigorous physical activity.^{8,9} This change acknowledges that short, frequent bursts of activity make health goals more accessible and achievable for more people.¹⁰

If you have resolved to move more, remember, every bit counts! Research shows that the benefits of moderate to vigorous physical activity apply whether it happens sporadically or in sustained bouts.

Setbacks are inevitable, but perfection isn't required. James Clear, the author of *Atomic Habits*, reassures us that “building better habits is not an all-or-nothing process.”⁴ Progress comes from small, consistent actions. Focus on manageable behaviors that create momentum and, over time, lead to meaningful, sustainable change.

The most enduring resolutions are internally driven—“I want to run with my dog”—versus externally motivated—“Everyone in my office is doing the Sun Run.”¹¹ Internal motivation fosters a sense of ownership and accomplishment, increasing the likelihood of long-term success.

Even smaller pursuits, like a lunchtime stroll or taking the stairs while doing rounds, can contribute to wellness. If we choose activities that bring us joy and fit seamlessly into our lives, we'll create sustainable routines, proving that consistency, not intensity, is the key to exercise results. ■

—Caitlin Dunne, MD, FRCSC

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Youth social media use: Like and subscribe to healthy approaches

In November 2024, Australia passed a new law banning social media use by youth under 16 years of age. The Social Media Minimum Age bill will require social media companies to take “reasonable steps” to prevent the use of their platforms by youth.¹ This legislation aims to protect youth mental health and will be backed by fines of up to C\$45 million for failure to comply. Meanwhile, critics have suggested that this approach may be ineffective or even harmful. Is an outright ban necessary amid other available measures? Is it sufficient to prevent harms to youth in a complex social media universe? And what role do health care practitioners have in this area? In short, it’s complicated.

The impacts of social media on youth mental health and well-being are increasingly widely studied; findings show a litany of negative effects linked to social media use, including addiction-like experiences such as uncontrolled use, neglect of other activities, and withdrawal during pauses in engagement.² A growing body of research describes dose–response relationships between social media use and symptoms of anxiety and depression, as well as inattention and distractibility.³ These effects are familiar to many: the experience of negative cognitive impacts flowing from social media use has become so pervasive that a term describing the experience—*brain rot*—was named Oxford’s word of the year for 2024. Many social media platforms and features are addictive by design. It has been demonstrated that compulsive social media use engages similar reward pathways as other addictive behaviors. Users may be particularly vulnerable to these effects during adolescence, a crucial period of neurological development.

Weighing the mounting evidence and identifying a need for action, the US

surgeon general issued an advisory noting “growing evidence that social media is associated with harm to young people’s mental health” and recommending protective action by policymakers, technology companies,

In primary care, pediatric, and psychiatric contexts, screening and counseling for harmful social media use may become as fundamental as discussions on drug use.

parents, and youth themselves.⁴ In BC, the provincial government passed a law restricting students’ use of digital devices in the classroom, with stated aims including support for mental health, social connection, and distraction-free learning.⁵

On the other hand, evidence suggests that youth may also experience benefits from social media, including feelings of acceptance and connection.⁴ Potentially isolated young people can find others who share interests and experiences, either across town or around the world. Discussing life challenges with online connections distant from family and local friends may be less awkward for some, and in some cases it may indeed be safer. The positive and negative effects of social media play out in the context of identity and environment, and evidence suggests that supportive aspects of social media may be particularly positive for racialized, disabled, and transgender people. Experiences of social media are as varied as the myriad platforms and diverse populations of users.

Health care practitioners can anticipate and respond to the rapid evolution of social

media use among youth. In primary care, pediatric, and psychiatric contexts, screening and counseling for harmful social media use may become as fundamental as discussions on drug use. Public health authorities should use emerging evidence to inform policymakers, with attention to potential restrictions on use by youth, more nuanced interventions in the online environment, investment in early childhood development, prevention of traumatic adverse childhood events, and promotion of healthy social connections.

No single law, digital feature, or offline program will be protective against all potential harms of social media among youth. Instead, a variety of complementary options will be necessary. We may not be able to delete all negative aspects of youth social media use, but as a society, we can block many harmful impacts by applying health-promoting policy and practice. ■

—Michael Schwandt, MD, MPH, FRCPC

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Together is our superpower

I want to start my first President's Comment by thanking each of you for the extreme privilege of serving as president of Doctors of BC. I am humbled by the passion, dedication, and skill of the physician leaders I have met during my year as president-elect. As I step into the role of president, I vow to listen, learn, amplify, and act on the issues that impact our ability to deliver high-quality care for our patients.

During my presidency, I will focus on fostering a stronger and more unified profession to increase the influence of the physician voice and highlight the unique and important perspective doctors can bring when it comes to creating positive and sustainable change. Physicians bring an experienced viewpoint informed by their direct day-to-day interactions with patients and their deep understanding of the complexities of delivering patient care. Amplifying these voices and empowering physician leaders to take an active role in decision making are critical to shaping policies that are both practical and patient centred.

I am committed to leading with transparency and authenticity, listening to understand, and taking meaningful action that is informed by our conversations. I am also dedicated to engaging with you to better understand the diverse challenges and successes experienced by physicians across the province. We can always learn from each other's successes, but we can also find

opportunities in working collaboratively to turn our challenges into positive change for doctors, patients, and the future of medicine. It's not just about addressing the immediate pressures on the system, but also about fostering long-term solutions that prioritize the health and dignity of every individual.

I want to express my deepest gratitude to the physicians working tirelessly on the ground to care for patients under challenging circumstances. Your unwavering dedication does not go unnoticed. Additionally, I commend those who have stepped into leadership roles to guide us through this critical time. Your contributions are invaluable to the resilience and evolution of our health care system.

The positive change we want and need to see in British Columbia's health care system requires strong, unified leadership. Doctors of BC is a catalyst for change, uniting medical professionals, advocating for systemic improvements, and fostering innovation. As president, I will build on this legacy by prioritizing collaboration, championing physician wellness, and uplifting and amplifying the physician voice to drive meaningful change. I hope to build trust across the profession so that all doctors—specialists and family physicians, rural and urban—feel supported and united in their goal to improve the health care system.

Together, we can create a health care system that is resilient and responsive to

the needs of all British Columbians and reflects our shared commitment to excellence, equity, and innovation. Together, we can transform challenges into opportunities and ensure a healthier future for everyone in our province. Together is our superpower. ■

—Charlene Lui, MD
Doctors of BC President

The positive change we want and need to see in British Columbia's health care system requires strong, unified leadership.



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Dr Lui: Putting the principles of transformation and improvement into everything she does

Dr Charlene Lui started her 1-year term as president of Doctors of BC on 1 January 2025. She spoke with *BCMJ* editor-in-chief Dr Caitlin Dunne in December.

Congratulations on being elected the next president of Doctors of BC. It's a great honor to be recognized by your peers in that way. I'd like to start by giving you a chance to introduce yourself in your own words.

I'm a family physician in Burnaby. I was born and raised and work and play in the Burnaby community, so I'm very tied to it. I love the rest of the province as well. I love to travel. I love to explore the many beautiful regions in our province, and I'm looking forward to getting out to meet people where they're at so I can hear and listen and learn, and hopefully help in any way I can.

I'm married—my husband is a family doctor in longitudinal care—and I have three lovely children who are grown and dispersed around the globe. One lives in Australia, one lives in Toronto, and one lives in Victoria.

I love medicine. I also love to learn new things, so I'm always looking for something new to try. I like to sing—I sing in a choir—I do yoga, and I like to go for walks. If anybody is ever interested in having a walk and a chat with me, please give me a call.

I think raising three children and successfully launching them into the world while both you and your partner have busy careers deserves a huge congratulations as well. That's an even bigger accomplishment than the Doctors of BC presidency.

Thank you. Yes, I'm very proud of them. I am especially proud that they are launched, they're happy, and they're working in their fields. That's all a parent can ask for.

On the subject of family, how would your kids describe you?

They would say I'm driven, goal oriented, and always busy. I don't do well when I've got nothing to do. I always like to have something on the go to feel like I'm being productive and learning and connecting with people. That's important to me. I value connection. I try to volunteer. I try to be involved.

I can see from your background that community connections, either with the hospital or the various ways you connect with the community, are important to you, and judging by the number of committees and initiatives you've served on, I'm estimating that

you started this kind of work early in your career. How did you first get involved in committee work or quality improvement work?

Since the beginning of my career in medicine, I've wanted to get involved. I believe that if you don't put time and energy into improving something, then you don't really get a say in complaining. I began to do work with the hospital, for example, and as department head for obstetrics and gynecology. I became more involved when the Divisions of Family Practice initiative began because I felt that family physicians were very siloed and experiencing burnout, and it was important for me to lean into this initiative to bring family physicians back together again.

I miss the days when in-hospital family physicians would come and see their patients; we would see each other in the doctors' lounge, and all of that. In our community hospital, hospitalists came in, and pretty much all family doctors dropped out of rounding on their own patients. I wanted that connection again. So, six of us family docs in Burnaby got together and decided to incorporate our own Burnaby Division of Family Practice, and it was through that initiative that I found my love of health care transformation. I'm very proud of the various important and valuable things we did through the division, and I think that's what led to my stepping into the presidency.

What is a committee initiative or a piece of quality improvement that you're especially proud of, where you feel you made a difference?

One of the things I'm most proud of is the evolution of primary care networks (PCNs). Burnaby was one of the first five PCNs to go forward for the province, and our networks were built out of extensive engagement with the entire community. I think that's what made ours unique and special. We felt that a collaboration between only family physicians and the health authority wasn't good enough; we needed to involve the whole community in the work. We did it to make sure we were genuinely making a difference, that we weren't duplicating work others had done, and that we were building a more seamless connection to the resources our patients needed. We formed our PCN out of a tripartite stool, if you will, of the Burnaby Division of Family Practice, the Fraser Health Authority, and the resources and agencies in our community. We

Things can be improved in many areas. And they're not going to improve without some commitment and effort.



engaged with everyone—parks and rec, the school board, firefighters, police, MOSAIC [settlement and employment services for newcomers], SUCCESS [social services], and the Society to End Homelessness in Burnaby. Anyone who wanted to be involved was invited to participate and help form what our PCN would be like. And of course, the acute care hospital, the specialists, etc. We've built a PCN that involves everybody. And by doing that, and building relationships in advance, we were poised and ready when COVID-19 hit. Where other communities were struggling to figure out how to manage COVID and how to keep everybody safe, our PCN was ready. We were ready to work together and quite quickly and easily launched our COVID response with our drive-through COVID testing and treatment areas, and being able to step in to help homeless people, who were really struggling and didn't have a place to be safe. The way we formed our PCN has helped us accomplish many important things for our community.

I imagine it's both rewarding and challenging to take time away from clinical responsibilities to do this kind of work, which in some ways is never-ending, to make the community better. And it sounds like you've been dedicated to that for quite a while now. I really love it. It makes me feel like I'm making a difference, which is important to me. I don't want to take up space and warm a seat. I want to be involved in transformation and improvement. Those are principles I try to put forward in everything I do.

You have talked about connecting and representing both family doctors and specialists, and there are many ways that could happen, but in your vision as president of Doctors of BC, how do you think doctors can better connect? And how do you think they can be better represented by the association?

That's an important question. Of course, there are already organized opportunities for in-person connection and Zoom connection via Doctors of BC, and I think they are important, but I believe we need to do better. I hope to get out to communities and meet with people. I find in-person gatherings to be the most helpful to build relationships and offer a chance to hear about the challenges and the good things happening in communities, and for us to learn from each other.

I think we also need a better way for groups to reach in and express their concerns and to invite further dialogue about whatever is worrying them. I hope people will reach out to me through my president's email or my personal email to let me know they want to talk. I think that virtual connection will be even more important in rural communities, where I know it's very difficult for so many reasons.

I would also like to emphasize how important I think it is for specialists and family physicians to unite and gain a better understanding of each other, and to be able to speak in one voice. The more united we are as a profession, the more we can use our collective voice. In the coming year, with the new health minister and the new deputy



I always like to have something on the go to feel like I'm being productive and learning and connecting with people. That's important to me. I value connection.

minister and cabinet, we need to be united, connected. We need to use our collective voice to amplify what we feel strongly about.

How do you approach balancing your clinical care and your clinical responsibilities with getting involved? What is your advice to somebody who wants to use their voice and get involved but feels too busy and overwhelmed with their clinical load?

It's always a difficult balance. I started to prioritize this kind of committee and transformational change work because I know that, in the end, it's going to help our patients more. We all recognize that things can be improved in many areas. And they're not going to improve without some commitment and effort. Thinking about it that way helps. Also, the fact that committee work is now paid time helps a lot. One thing I struggled with when I moved into this kind of committee and board work was when my patients would say "Oh, you're not here on Wednesday afternoon again. You know I need to see you." That's always hard. Now my response is "I'm sorry that I'm not here. Taking care of you is very important to me, and helping you is very important to me, and by working to improve the health care system, I'm helping you and everybody following you." Things are challenging *now*, and if we don't fix them, they're going to be even more challenging for future generations of physicians. Improving things now helps us recruit and retain the individuals who will step into medicine in the future.

That's very true. Something else that stood out for me is your work with new immigrants. Tell me about that.

When I was in longitudinal family medicine, I saw a lot of people new to Canada in my practice, partly due to the demographics of the area in which I work—the Metrotown area. I developed a sincere appreciation of what they were going through. We also see a lot of new immigrants in the maternity clinic, partly because they don't have a family physician, and partly because when they seek help in the community, if they don't speak the language well, they can sometimes feel a little rushed or not as comfortable. In the maternity clinic, we can get translators in. We can help them navigate the health care system a little easier. We would take care of them in the maternity clinic, and when they were finished having

their baby, and after we saw them for the first 6 weeks, we'd have to send them out into the community, and they wouldn't know what to do. They have language barriers, a lesser understanding of the health care system, and no family physician. It felt wrong to say "You're done with my services; have a nice life."

I tried to think of how we could help these people who need a place to feel safe, to have some cultural sensitivity, to have help addressing some of the nonpregnancy-related concerns they have. How do you take a bus? How do you contact the government to tell them you have a new address? With my involvement with the Burnaby Division of Family Practice, when the nurse practitioner infrastructure funding came out, there was an opportunity to apply for funding to help whatever population we wanted to help. I wrote a business case and worked with the division to open a new-immigrant clinic. We called it the Global Family Care Clinic, and it was designed especially to serve immigrants within the first 5 years of their arrival in Canada. It was all-encompassing, with a nurse practitioner and physician support.

I admire your dedication to individual patients as well as to the systems that support them. It sounds like communication will be a cornerstone of your presidency. Can you tell us what success would look like for you, a year from now? What would you like to have accomplished?

There are so many things I want to accomplish. At this moment, it would be a huge success for me to see a more unified profession, where specialists and family physicians feel understood by each other, valued by each other, and united. Right now, there's a divide that is harmful to everybody. Another success would be if physicians from all areas of the province felt that Doctors of BC understood and represented them and the needs they have to care for their patients, and that they trusted Doctors of BC to meet the needs they express. A third win would be to have helped establish Doctors of BC as an important and necessary partner with the ministry so that the ministry understands physicians' needs and that our main concern is to care for our patients. By building a *strong* relationship, I think we can get the health care system to where we need it to be. ■

Postpartum cardiovascular health: Why enhanced screening and longitudinal care are essential

The postpartum period, described as a critical yet underserved phase in maternal health care, presents unique challenges and opportunities for screening and treating women at risk of premature cardiovascular disease (CVD). Research has increasingly highlighted the connection between complications during pregnancy—such as gestational diabetes, preeclampsia, preterm birth, intrauterine growth restriction, low birth weight, placental abruption, and hypertensive disorders of pregnancy—and elevated cardiovascular risk. Despite these risks, significant gaps in postpartum screening persist, exacerbated by limited access to longitudinal primary care.

One study showed that only 29% of women with gestational diabetes received the recommended blood glucose screening. Similarly, 90% of women with gestational hypertension had their blood pressure checked postpartum, but comprehensive follow-up, including lifestyle counseling and specialist referrals, was often lacking. Many women don't have a longitudinal primary care provider, leading to a shortened window of opportunity to receive preventive CVD care. These care gaps underscore the need for more robust postpartum screening and interventions to mitigate future risks.¹

Socioeconomic disadvantage compounds these challenges. Women from

lower socioeconomic backgrounds face heightened stress, decreased access to providers, and adverse living conditions, all of which increase the likelihood of pregnancy complications. These conditions, in turn, elevate lifetime risk of CVD. Addressing these disparities requires systemic interventions, including policies aimed at reducing socioeconomic inequalities and enhancing access to comprehensive postpartum care.²

Family physicians are pivotal in bridging the care gap during the postpartum period. Pregnancy serves as a cardiovascular stress test that can reveal latent risk factors. Family physicians are uniquely positioned to conduct comprehensive risk assessments and provide ongoing care, including lifestyle counseling and therapeutic interventions. For women without access to primary care, the lack of follow-up increases the risk of missed diagnoses and delayed interventions.³ For instance, women who experience hypertensive disorders of pregnancy are four times more likely to have or develop hypertension after pregnancy and have double the risk of developing CVD. Placental abruption is associated with double the risk of future CVD, and those with gestational diabetes have seven times the risk of developing type 2 diabetes.⁴ Given that approximately 20% of women will have one or more pregnancy complications, intervention could result in substantial downstream benefits.⁵

A provincial strategy focusing on CVD prevention is imperative. Routine screening in the first 3 to 6 months postpartum, particularly for women with a history of hypertensive disorders of pregnancy or gestational diabetes, should be standardized and can enable timely interventions. We

must strive to implement integrated care pathways that facilitate coordination among health care providers and ensure continuity of care beyond the typical postpartum period for unattached patients.⁶

Due to the shortage of family physicians, there appears to be a sudden decline in health care support after childbirth, highlighting the need for systemic reforms. Addressing cardiovascular risks in the postpartum period requires a multifaceted approach that includes enhanced screening, comprehensive follow-up care, and targeted interventions for high-risk populations. Bridging the care gaps through improved coordination among health care providers, addressing socioeconomic disparities, and implementing provincial strategies can significantly reduce the burden of premature CVD among postpartum women. Recognizing the postpartum period as an integral phase of women's cardiovascular health trajectory is essential to improving long-term outcomes for mothers and their families. I encourage you to check out <https://pathwaysbc.ca>, which houses great clinical tools to enhance your practice if you have postpartum patients. ■

—Alex Kilpatrick, MD, MPH, CCFP
Member, Council on Health Promotion

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Angela Hu, MD, FRCPC, Barbara Blumenauer, MD, FRCPC, May Kazem, MD, FRCPC, MHA, Corisande Baldwin, MD, FRCPC, MSc, Raheem B. Kherani, MD, FRCPC, MPHE, Shahin Jamal, MD, FRCPC, Heather Day, MD, FRCPC, Jacqueline Stewart, MD, FRCPC, Grace Wright, MD, PhD, Gwenesta Melton, MD, Kam Shojania, MD, FRCPC, Diane Lacaille, MDCM, FRCPC, MHSc, Mollie Carruthers, MD, FRCPC

Explaining the gender pay gap: Lessons from rheumatology

Remuneration models should provide equitable payment based on the different ways female and male physicians practise medicine.

Dr Hu is a clinical instructor in the Division of Rheumatology, Faculty of Medicine, University of British Columbia. Dr Blumenauer is a rheumatologist in Kamloops. Dr Kazem is a clinical instructor in the Division of Rheumatology, Faculty of Medicine, UBC. Dr Baldwin is a clinical assistant professor in the Division of Rheumatology, Faculty of Medicine, UBC. Dr Kherani is a clinical associate professor and residency program director in the Division of Rheumatology, Faculty of Medicine, UBC. Dr Jamal is a clinical professor in the Division of Rheumatology, Faculty of Medicine, UBC. Dr Day is a rheumatologist in West Vancouver. Dr Stewart is a clinical assistant professor in the Division of Rheumatology, Faculty of Medicine, UBC. Dr Wright is president of the Association of Women in Rheumatology. Dr Melton is vice-president of the Association of Women in Rheumatology. Dr Shojania is head of rheumatology at Vancouver General Hospital and a clinical professor in the Division of Rheumatology, Faculty of Medicine, UBC. Dr Lacaille is scientific director of Arthritis Research Canada and a professor in the Division of Rheumatology, Faculty of Medicine, UBC. Dr Carruthers is a clinical associate professor in the Division of Rheumatology, Faculty of Medicine, UBC.

Corresponding author: Dr Angela Hu, angela.hu@medportal.ca.

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ABSTRACT

Background: In British Columbia, based on Medical Services Commission reports, male rheumatologists earn on average 31.2% more than female rheumatologists. The reasons for this disparity are not completely understood.

Methods: The Department of Medicine Rheumatology Equity Committee at the University of British Columbia developed a survey that the BC Society of Rheumatologists (BCSR) distributed to its members. Survey questions included domains such as demographics, career stage, remuneration, time allocation, work hours, duration of consult and follow-up appointments, hours spent on indirect care, and patient population.

Results: Forty-nine rheumatologists (67% of BCSR members) responded. Women and men worked the same number of hours per week (42.5 and 42.6 hours, respectively). However, 71% of women earned less than \$400 000 annually, compared with 33.5% of men. Women spent longer on an initial consult (50.4 minutes versus 40.8 minutes for men) and had more patients with complex connective tissue disease and fewer with mechanical concerns than did men.

Conclusions: There are significant differences in the way that female and male rheumatologists practise. Changing time-based billing codes for complex initial consultations may be one way to address these disparities.

Background

In Canada, many physicians work under a fee-for-service model, in which a physician is remunerated a predetermined amount for a rendered medical service.¹ It would, therefore, be presumed that this payment model entails equitable payment, given the fee codes are irrespective of a physician's gender, race, or years in practice. With the same medical training and qualifications, physicians identifying as women or men would be expected to provide the same number and quality of medical visits. However, in Canada, gender pay gaps persist universally across all specialties,² despite a shift in gender distribution of the medical workforce with increasing numbers of female physicians, a phenomenon termed as "feminization" of the workforce.³ This is no exception in rheumatology. The number of women accounted for less than one-third of rheumatologists in Canada in 1995 but reached parity in 2015, and their numbers have been increasing since.²

In Ontario, the gender income gap for rheumatologists equated to a 35% difference in favor of men for gross fee-for-service payments in 2016.² In British Columbia, the Medical Services Commission of the Ministry of Health publishes a public online financial statement that summarizes the fee-for-service payments made to all physicians. Between 2018 and 2022, female rheumatologists earned \$348 406 on average, whereas male rheumatologists

earned \$506 238 on average [Figure 1; Figure 2]. This equates to a gender income gap of 31.2% in favor of men for gross fee-for-service payments. There was also a 40.6% difference in the average gross billings of the highest-earning woman (average \$799 811) compared with the highest-earning man (average \$1 347 055) from 2018 to 2022.⁴

Women with young children and those early in their career are more likely to work part-time,^{5,6} though after age 38, the number of hours female practitioners work increases to prior levels (before bearing children).⁷ Various other factors also contribute to pay disparities, including systemic bias in medical school,^{8,9} hiring practices,¹⁰ promotions,¹¹ clinical care arrangements, and fee schedules;² however, none of them are completely understood or have been fully examined, particularly in our local setting. The Department of Medicine Rheumatology Equity Committee at the University of British Columbia was created as a subcommittee within the BC Society of Rheumatologists (BCSR) to examine these factors.

Methods

We conducted a cross-sectional survey of rheumatologists across BC. The survey questions included domains such as demographics, career stage, remuneration, time allocation, work hours, working with trainees, duration of consult and follow-up appointments, hours spent on indirect care, patient population, and physician roles outside of medicine (e.g., caregiver for children). The questions were created and voted on by the Department of Medicine Rheumatology Equity Committee. For the purposes of this study, gender was referenced in a binary fashion, though we acknowledge that further studies need to include nonbinary gender identification among physicians.

We sent out an electronic survey using the University of British Columbia Qualtrics website as a survey and data storage platform. The BCSR distributed the survey to its mailing list of rheumatologists,

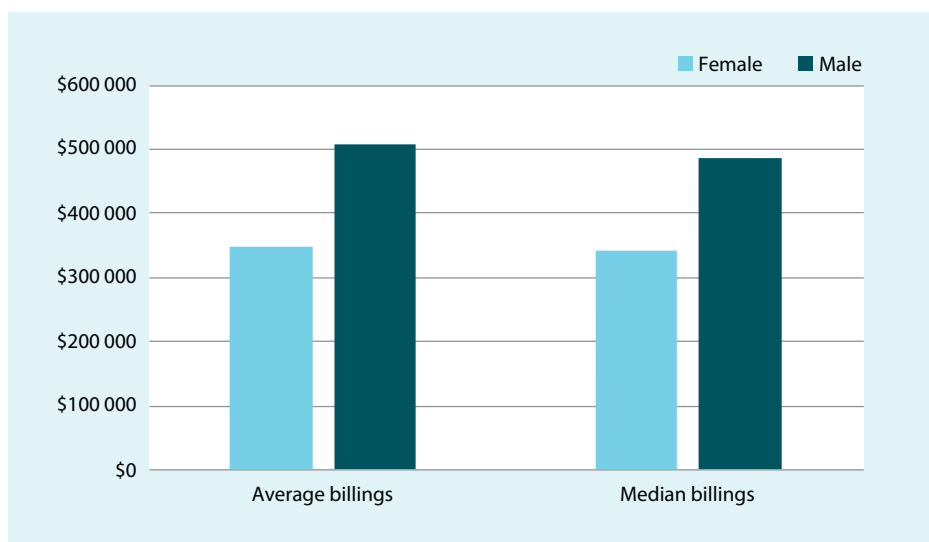


FIGURE 1. Summary of Medical Services Commission financial reports, 2018–2022.³

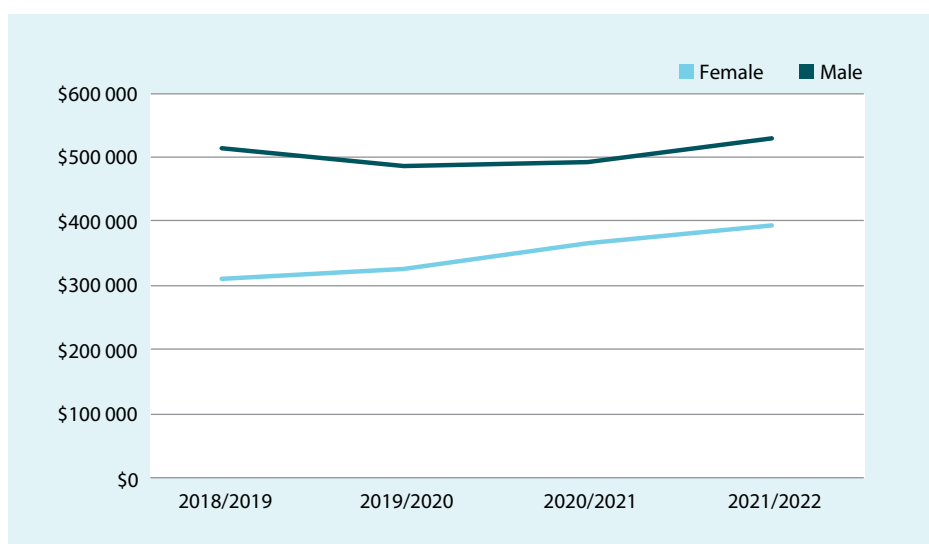


FIGURE 2. Average annual billings, 2018–2022.³

approximately 73 members who were registered and actively practising in 2022. The survey was available for 1 month, from July to August 2023. All responses were anonymized. The results were analyzed using descriptive statistics with examination of means, proportions, frequencies, and standard deviations. Unpaired *t* tests and linear regression models on *R* were conducted, using an alpha significance level of < 0.05. Ethics approval was obtained from the University of British Columbia Research Ethics Board.

We focused on adult rheumatologists because they are compensated via the fee-for-service model in BC. We did not survey academic pediatric rheumatologists because their remuneration models are different.

Results

Forty-nine rheumatologists (67% of active BCSR members) responded to the survey: 22 men (59% of male BCSR members) and 27 women (75% of female BCSR members). Overall, a greater proportion of male

rheumatologists had been in practice for more than 20 years (43%) compared with female rheumatologists (25%).

Self-reported annual remuneration indicated that in 2023, 42.0% of female rheumatologists earned less than \$300 000 annually, 29.0% earned \$301 000 to \$400 000, 17.0% earned \$401 000 to \$500 000, and 12.5% earned \$501 000 to \$800 000 [Figure 3]. In comparison, 29.0% of male rheumatologists earned less than \$300 000 annually, 4.5% earned \$301 000 to \$400 000, 32.0% earned \$401 000 to \$500 000, and 32.0% earned \$501 000 to \$800 000 [Figure 3].

Mean number of hours worked per week by female rheumatologists was similar to that of male rheumatologists: 42.5 hours versus 42.6 hours, respectively ($P = .48$). Allocation of time for clinical care and other responsibilities (e.g., research, administration, teaching) was relatively equal between women and men [Figure 4]. The overall number of hours female and male rheumatologists spent per week reviewing results and reports (3.5 hours versus 3.9 hours, respectively; $P = .28$) and reviewing CareConnect for external investigations (2.5 hours for both women and men) was not significantly different. The average time female rheumatologists spent on an initial consultation was 50.4 minutes, whereas male rheumatologists spent on average 40.8 minutes ($P = .0032$). Increased consult time for female rheumatologists was correlated with a reduction in salary ($P = .002$), whereas there was no statistically significant correlation between consult time and salary for male rheumatologists ($P = .084$).

Female and male rheumatologists reported the following patient presentations in their practice, respectively: mechanical concerns, 16.7% versus 28.0% ($P = .08$); autoimmune inflammatory arthritis, 52.0% versus 47.7% (not significant); crystal arthritis, 9.9% versus 10.9% (not significant); and complex connective tissue diseases, 25.2% versus 16.3% ($P = .038$) [Figure 5]. Compared with male rheumatologists, female rheumatologists had a numerically greater proportion of patients with complex additional needs

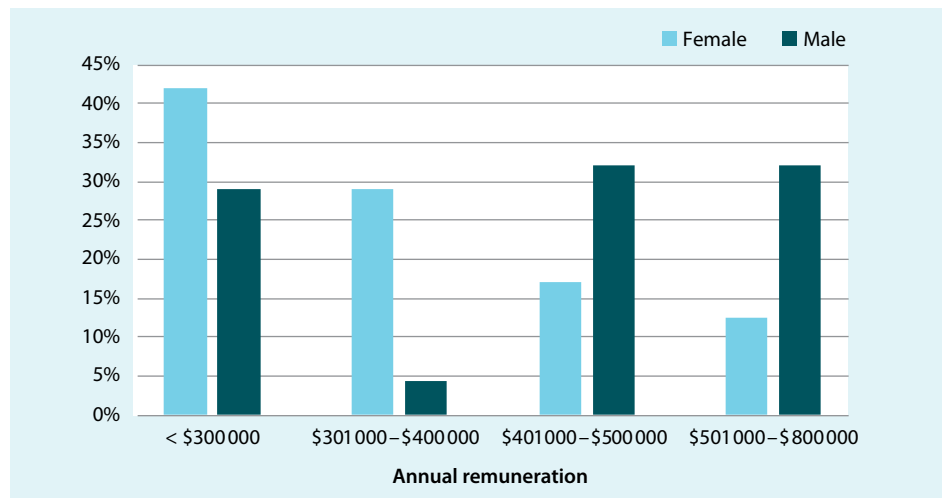


FIGURE 3. Annual remuneration reported by self-survey of rheumatologists, 2022–2023.

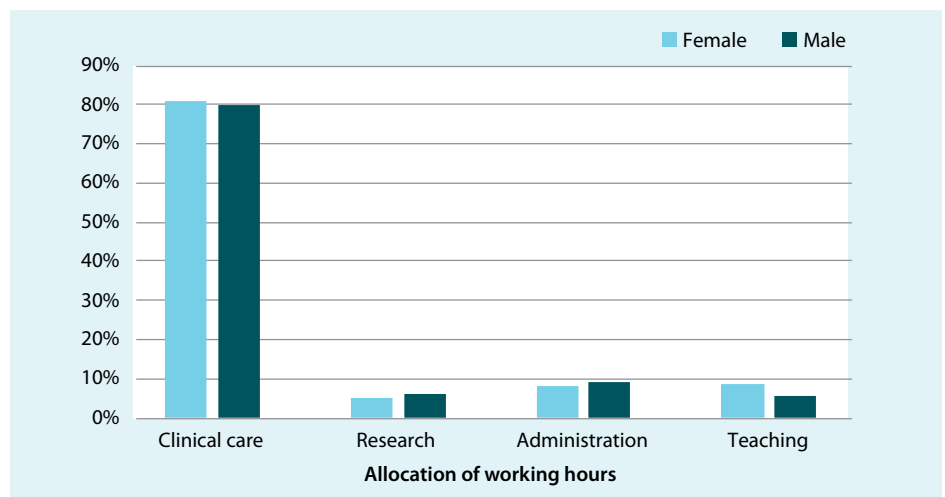


FIGURE 4. Allocation of working hours reported by self-survey of rheumatologists, 2022–2023.

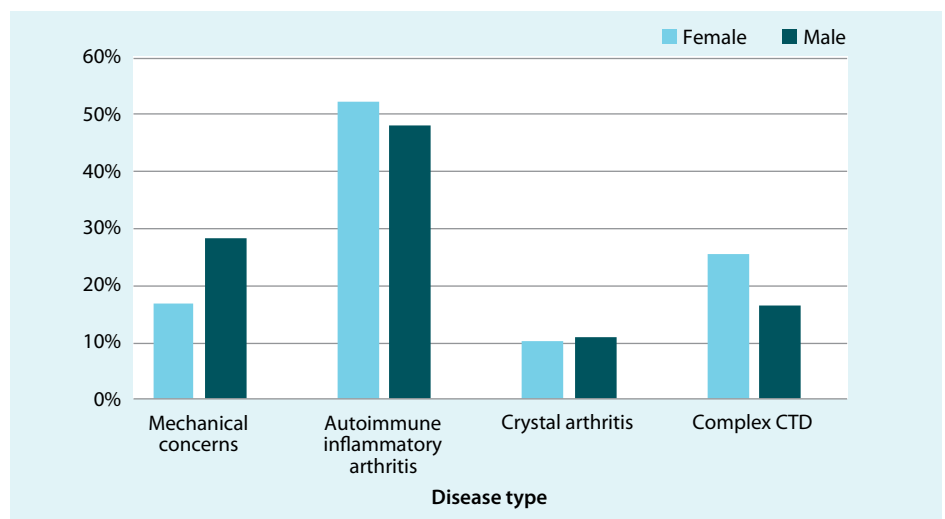


FIGURE 5. Prevalence of diseases in patient population reported by self-survey of rheumatologists, 2022–2023. CTD = complex connective tissue disease.

across all domains (hearing loss, dementia, mobility issues, depression, anxiety, history of trauma, refugees, homelessness) except English as a second language, though all results were not statistically significant [Figure 6].

Discussion

In our study, female and male rheumatologists worked on average the same number of hours per week, but 71.0% of women earned less than \$400 000 annually compared with only 33.5% of men.

We compared self-reported annual remuneration to MSP billings. The average self-reported remuneration for 2022–2023 was \$384 830 for women and \$454 460 for men; MSP billings between 2018 and 2022 showed an average of \$348 406 for women and \$506 238 for men. These results equate to a pay gap of 15.3% and 31.2%, respectively, in favor of men. This difference is likely because our survey did not capture all rheumatologists practising in BC. Furthermore, because our survey was anonymized, it was not possible to directly compare individual self-reported billings to MSP data.

In addition, the Blue Book billings reported by MSP capture only fee-for-service payments, not other remuneration from, for example, clinical teaching, on-call stipends (Medical On-Call Availability Program), administrative roles, clinical trial funding, and pharmaceutical company honoraria. However, the overall allocation of time among women and men was similar, with about 80% of time spent by both groups on clinical care; thus, most rheumatologist remuneration was from fee-for-service billings.

Compared with male rheumatologists, female rheumatologists more frequently had patients with complex chronic connective tissue disease. Although the results

Patients have different expectations of female and male physicians: patients speak more and disclose more biomedical and psychosocial information with female physicians than with male physicians.

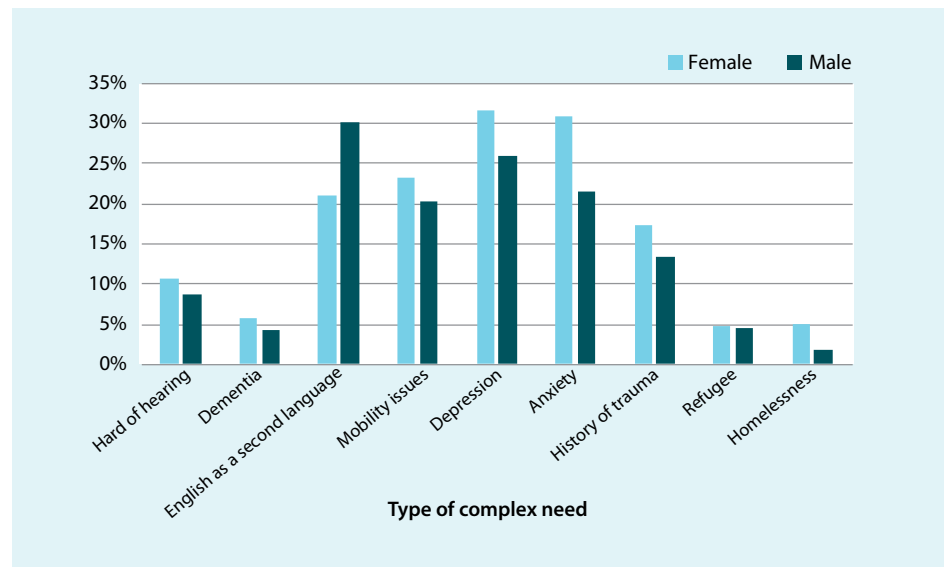


FIGURE 6. Prevalence of patients with complex needs reported by self-survey of rheumatologists, 2022–2023.

were not statistically significant, male rheumatologists more frequently had patients with mechanical concerns than did female rheumatologists. This was not well captured in our data, but mechanical concerns are frequently accompanied by procedural billing codes (e.g., injections) that increase remuneration, and often less consultation time is required to manage mechanical concerns than complex connective tissue diseases. In addition, female rheumatologists more frequently had patients with complex additional needs across the majority of domains, which may contribute to increased consult length.

In our study, female rheumatologists spent on average 50.4 minutes on an initial consult compared with 40.8 minutes by male rheumatologists. In an average 8-hour working day consisting of only new consults, this equates to 2.3 more new patients seen in a day by male rheumatologists than by female rheumatologists, which is equivalent to a billing difference of \$551 daily. In 1 year with an average

of 250 working days, this amounts to an annual difference of \$137 750. Increased consult time for female rheumatologists was correlated with a reduction in salary. Although more male rheumatologists than female rheumatologists had been in practice for more than 20 years, this was not associated with a difference in billings.

Our study confirms findings from other research studies. In Canada, between 2000 and 2015, male rheumatologists saw 606 more new rheumatology patients per year than did female rheumatologists and had 1059 more follow-up visits.² A 2018 survey of Canadian rheumatologists indicated that, overall, there was no statistically significant difference in median hours worked per week by female and male rheumatologists (48 hours and 50 hours, respectively), but women under 50 years of age worked fewer hours than men under 50 years of age (45 hours versus 50 hours, respectively; $P = .02$).¹²

Based on our study and other published research, it appears that female rheumatologists spend more time with their patients than do male rheumatologists, which results in fewer patients being seen. There may also be a referral bias in favor of women in terms of caring for more psychosocially complex and vulnerable

populations. Moreover, patients have different expectations of female and male physicians: patients speak more and disclose more biomedical and psychosocial information with female physicians than with male physicians.¹³ Therefore, it seems that both physician and patient factors, along with gendered societal expectations, play a role in lengthier visits with female physicians. Improved outcomes in hospitalized patients¹⁴ and surgical patients¹⁵ have been demonstrated among female physicians and surgeons. These differences in outcomes are multifactorial: female physicians are more likely to adhere to clinical guidelines,¹⁵ provide preventive care more often,¹⁶ use more patient-centred communication,¹⁷ and provide more psychosocial counseling compared with their male colleagues.¹⁸ It remains to be studied whether spending more time with patients leads to improved patient outcomes in rheumatology.

A potential solution to addressing the disparity in consultation times between female and male rheumatologists may be to increase the billing code for complex initial consultations that last more than 53 minutes. This would, in theory, allow for some equalization of earnings. Another possibility is using alternative payment structures, such as a blended model similar to the Longitudinal Family Physician Payment Model that was implemented by the BC Ministry of Health in 2023. It was part of an overhaul of family physicians' remuneration to acknowledge the increasing complexity of longitudinal care and to provide valuation of time spent with patients.¹⁹ Alternative payments funding may be preferable to fee-for-service in some circumstances because it offers a more predictable rate of income for physicians and provides more reasonable remuneration for certain time-consuming services. ■

Conclusions

It is important to acknowledge that female and male rheumatologists, and female and male physicians more broadly, may practise medicine differently. However, rather than changing individual practices, we should

focus efforts on valuing these different contributions and formulating models that equalize remuneration.

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Competing interests

None declared.

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Marshall Cheng, MD, FRCPC, Susan Lee, MD, FRCPC, Angela Tecson, RN, BSN, MStat, Parmjeet Panesar, RN, BSN

Surgical Patient Optimization Collaborative: A community hospital quality improvement perspective

Implementation of optimization processes in the surgical pre-admission process improved patient outcomes and surgical experiences.

ABSTRACT

Background: The surgical program at Peace Arch Hospital in White Rock, British Columbia, is committed to quality improvement and safety. To improve surgical outcomes, a multidisciplinary team enrolled in the Specialist Services Committee's Surgical Patient Optimization Collaborative (SPOC) from January 2022 to July 2023. SPOC offers presurgical patient optimization processes to target comorbidities prior to surgery, which can lead to better patient outcomes.

Methods: We conducted a quality improvement project to provide optimization processes to 85% of presurgical patients who required them by focusing on smoking cessation, preoperative anemia investigation and treatment, social prescribing, and obstructive sleep apnea screening.

Results: SPOC optimization processes provided optimization to 90% of patients who required it and were associated with improved patient unplanned readmission rates, length of stay, and surgical site infection rates.

Conclusions: Overall, patients found the optimization processes improved their surgical experience.

Background

Patient comorbidities can contribute to surgical complications, but medical optimization can lead to better patient outcomes.¹ The terms *preoperative optimization* and *prehabilitation* describe optimization processes prior to surgery that are used to reduce the risk of complications such as myocardial events, pulmonary infection, wound infection, and impaired tissue healing.^{2,3}

Peace Arch Hospital is a 201-bed community hospital in White Rock, British Columbia. Our surgical pre-admission

process has been successful in identifying patient risks for poor surgical outcomes. However, prior to collaboration in the Specialist Services Committee's Surgical Patient Optimization Collaborative (SPOC), we had limited formal standardized optimization processes to address these risk factors before surgery.

We conducted a quality improvement project with SPOC and our regional National Surgical Quality Improvement Program to test and implement standardized optimization processes in our surgical pre-admission process. Our aim was to successfully implement optimization processes to enable the optimization of 85% of presurgical patients who required it and to evaluate the effect on outcomes in patients who underwent elective arthroplasty procedures at our hospital from January 2022 to July 2023.

Methods

Setting

SPOC involves multiple hospital-based surgical programs within BC. It identifies several clinical areas for presurgical optimization and offers multiple ideas for screening and optimization for each area. Each hospital in the collaborative identified areas of optimization and customized its screening

Dr Cheng is an assistant professor of anesthesiology at the University of British Columbia and a staff anesthesiologist and physician quality lead at Peace Arch Hospital. Dr Lee is an assistant professor of anesthesiology at UBC and teaching faculty with the Fraser Health Authority Physician Quality Improvement training program. Ms Tecson is a director for the Fraser Health Authority Surgical Safety Program and Physician Partnerships. Ms Panesar is a leader for the Fraser Health Authority National Surgical Quality Improvement Program.

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and optimization process accordingly. The provincial SPOC team designed 13 optimization processes to target drivers of perioperative complications and improve patient satisfaction: optimization of preoperative nutrition, social supports, anxiety, anemia, cardiac risk assessment, physical therapy, obesity, smoking cessation, substance abuse, frailty, pain management, obstructive sleep apnea, and glycemic control.

We conducted our project in the Surgery Pre-Admission Clinic at Peace Arch Hospital. We limited our project to elective arthroplasty patients. Peace Arch Hospital performs approximately 580 elective joint arthroplasties per year. Our project team included anesthesiologists, surgeons, Surgery Pre-Admission Clinic staff, hospital administrators, nurses, a patient partner, a sleep specialist, a project leader, and a family physician. Team meetings were held monthly to review testing of change ideas and implementation compliance and to plan

adjustments to implementation strategies. Our team met with the provincial SPOC group every 3 months to receive instruction and reports from other hospitals in the collaborative.

Design

In keeping with the requirements of quality improvement, we used an analytic study because of the temporal nature of improvement. We relied on Shewhart charts and interpretation of common and special cause variation to assess our performance rather than statistical methods typically used with enumerative studies, such as hypothesis testing and confidence intervals.

We used the Model for Improvement methodology to implement SPOC screening and optimization processes within the surgical pre-admission process. Our team developed a diagram to identify the primary drivers of implementing SPOC optimization processes and achieving successful

optimization: staff participation, integration of SPOC processes into the Surgery Pre-Admission Clinic process, and availability of SPOC resources [Figure 1]. We used plan-do-study-act cycles to test change ideas that addressed the primary drivers of implementing optimization processes into our surgical pre-admission process.

Staff involvement

To promote staff engagement with the project, the SPOC optimization processes were presented in different ways to our staff. A SPOC tool kit was presented that outlined the guidelines of implementation and the rationale for the optimization processes. SPOC held several provincial meetings throughout the year to share different hospitals' experiences in implementing the optimization processes. We invited several experts in the optimization processes to our monthly staff meetings to provide insight.

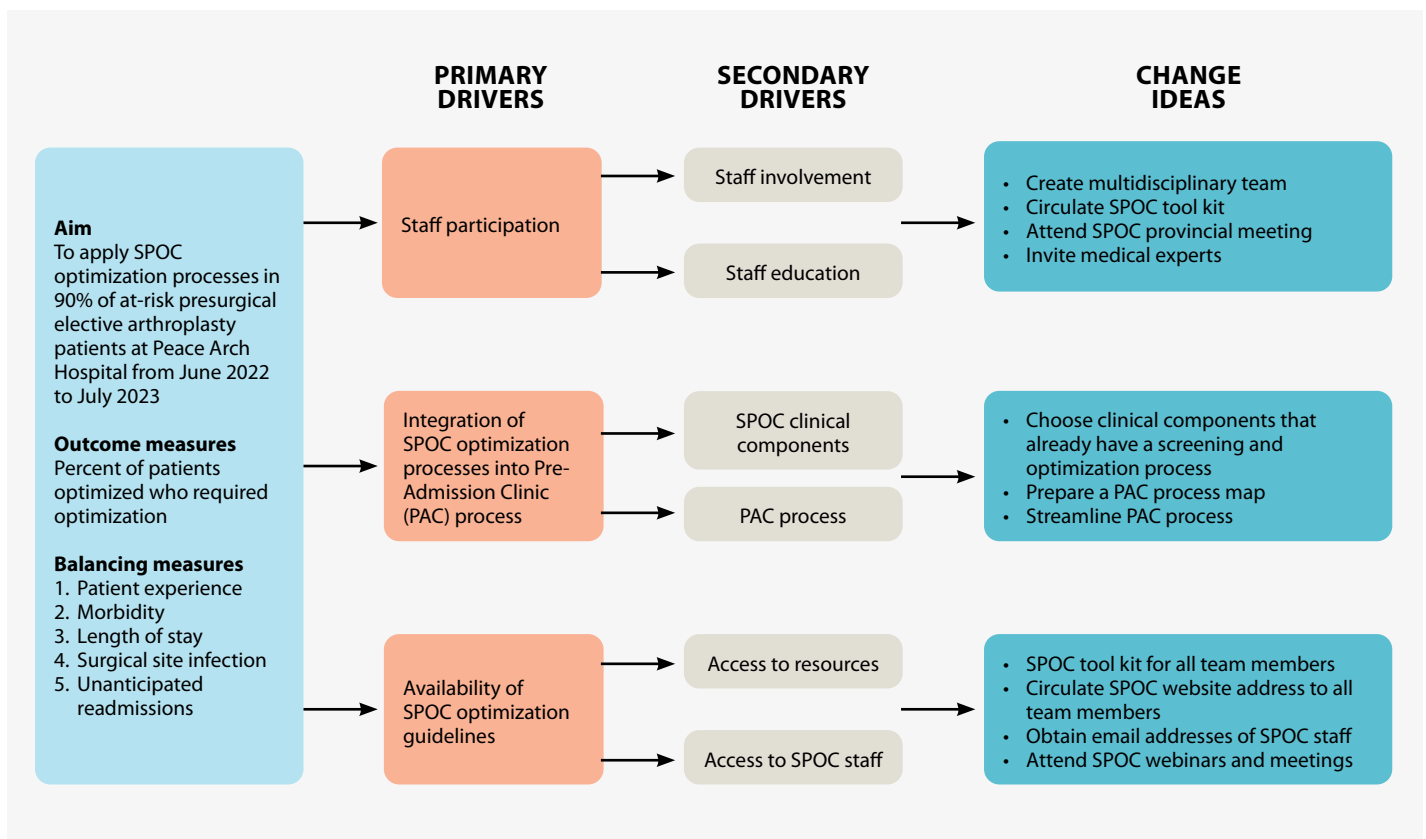


FIGURE 1. Drivers for implementation of the Surgical Patient Optimization Collaborative (SPOC) optimization process.

Integration of SPOC optimization processes into the clinic process

Our Surgery Pre-Admission Clinic staff were concerned about potential increased workloads with the integration of SPOC optimization processes into our clinical processes. To address this, we started by completing a process map for our surgical patient flow through our clinic. We eliminated redundant steps in this process to allow more time for screening and optimization. With key parties, we determined which optimization processes could be integrated without significant added workload and changes to the clinic process.

To increase compliance among clinic staff in delivering SPOC optimization processes, we implemented only four that had minimal impact on our pre-existing clinic process. Our pre-admission staff felt that these optimization processes were easy to accommodate into their workload and did not require significant additional time or staff. In addition, these optimization processes had clear endpoints for optimization, which allowed for easy follow-up by staff. The optimization processes were:

- Smoking cessation.
- Preoperative anemia investigation and treatment.
- Social prescription.
- Obstructive sleep apnea screening.

Smoking is associated with a significant increase in postoperative morbidity and mortality.⁴ Many reviews and meta-analyses have demonstrated that preoperative smoking cessation improves outcomes.⁵⁻⁷ Our intervention involved identifying smokers preoperatively using the preoperative patient questionnaire and our pre-existing preoperative baseline risk screen. Our clinic nurses informed these patients of the detrimental effects of continued smoking and the benefits of smoking cessation. The nurses also offered patients a referral to the QuitNow program if they wished to stop smoking preoperatively.

Preoperative anemia is an independent risk factor for worse outcomes in noncardiac surgery, including worse postoperative morbidity and infection rates and increased

length of stay.⁸ Anemic patients also have increased rates of perioperative acute kidney injury and transfusions. Evaluation and treatment of preoperative anemia are recommended to improve patient outcomes.⁹ Our intervention involved defining preoperative anemia as hemoglobin less than 116 g/L. Our anesthesiologists collaborated with the patient's family physician to evaluate and treat the anemia using recent national guidelines on the management of preoperative anemia.⁹

Our primary outcome measure was to determine the effectiveness of implementing the SPOC optimization process by measuring the percentage of patients who required optimization and received it.

A patient's social support is defined as those resources in a patient's environment that enable the patient to cope with physical and psychological stresses.¹⁰ Reliable patient social support networks at home are associated with improved recovery¹¹ and shorter length of stay in hospital.^{12,13} The Fraser Health Authority Social Prescribing Program provides volunteers who help with transportation to medical appointments and with home errands. Our clinic nurses screened patients for lack of home support using discharge planning questions from the preoperative baseline screen. The nurses referred patients to the program if they concluded the patient would benefit from it.

Obstructive sleep apnea in surgical patients is associated with an increase in respiratory complications and length of stay in hospital.^{14,15} It is also associated with other serious perioperative complications, including cardiac arrhythmia, myocardial injury, and sudden death.^{16,17} To identify patients at high risk for obstructive sleep apnea prior to elective surgery, the STOP-Bang questionnaire is used as a validated screening tool.^{18,19}

Screening for undiagnosed obstructive sleep apnea is recommended prior to surgery.²⁰ We used the STOP-Bang score within our preoperative patient questionnaire to screen for the risk of having severe obstructive sleep apnea. We used a STOP-Bang score of 3 or greater as an initial screen for obstructive sleep apnea. Our clinic nurse interviewed high-risk patients and gave them information about the effects of obstructive sleep apnea on surgical outcomes. Patients were referred to an anesthesiologist if they had symptoms of nighttime apnea, gasping, snoring, hypertension, or daytime somnolence. Subsequently, these patients were interviewed and sent for a home sleep apnea test or were referred to a sleep specialist using the BC Obstructive Sleep Apnea: Assessment and Management guidelines.²¹ Continuous positive airway pressure (CPAP) was recommended if the patient was diagnosed with obstructive sleep apnea, because it has been shown to reduce complications in surgical patients with this condition.^{15,22} Patient follow-up was coordinated with the patient's family physician.

Availability of the optimization tool kit

Availability of the SPOC tool kit was essential to help staff in referencing optimization materials. We distributed booklets containing the SPOC optimization tool kit to all members of our team. The SPOC website, which contains the tool kit, was accessible online and through a QR code. Names of the care providers involved in creating the tool kit were made accessible to our staff.

Measures

Outcome measures

Our primary outcome measure was to determine the effectiveness of implementing the SPOC optimization process by measuring the percentage of patients who required optimization and received it. We defined a patient who required optimization as someone who had a history of one or more of the following: inadequate social support, preoperative anemia, current smoking, or high risk of obstructive sleep apnea.

We defined *optimized* as any patient who received at least one optimization process. SPOC provided a pre-existing tool to measure this outcome in June 2022.

Balancing measures

Our balancing measures for patient outcomes included arthroplasty patients' experience with the optimization process, morbidity rates, surgical site infection rates, unplanned readmission rates, and length of stay. We measured patients' satisfaction by telephoning them 1 month after their surgical procedure and asking them two questions about their experience: (1) Was your surgical experience improved as a result of information/care pre-op? (2) Was your overall health improved as a result of the information/care pre-op? Baseline data for surgical site infection rates, morbidity rates, readmission rates, and length of stay were obtained from the National Surgical Quality Improvement Program. We continued using this program to collect data throughout the study period.

Process measures

We obtained process measures through chart reviews. They included the percentage of eligible patients who started on CPAP, the percentage of patients who quit smoking preoperatively, the percentage of anemic patients with improved hemoglobin levels, and the percentage of patients who accepted social supports.

Results

We screened 260 patients for prehabilitation; 137 needed one or more optimization processes offered through our Surgery Pre-Admission Clinic.

Outcome measures

SPOC provided a process to collect data on the percentage of patients who required optimization and received it. We achieved 100% optimization from June to October [Figure 2]. However, these results were not sustainable, because our optimization processes resulted in a high nursing workload. The screening process for optimization contributed to the increase in workload. This resulted

in a decline in optimization from October to December. From December to April, we conducted several plan-do-study-act cycles to streamline our optimization and screening process to reduce the impact on nursing. The largest improvement occurred in April, when we introduced a nurse navigator to screen patients and used email to disseminate educational information. As a result, our optimization rates improved from April to October. The percentage decline in August was due to common cause variation (i.e., normal variation in the process) since it was not sustained and did not show a trend.

Balancing measures

We conducted 118 patient interviews to evaluate the patient experience with the optimization process; 70% of those patients felt their overall health had improved as a result of the information and care provided by the surgical preoperative team, and 93% reported that their surgical experience had improved.

The baseline mean rate for morbidity was 5.8% [Figure 3]. Our rates did not reveal any special cause variation after starting SPOC processes; however, the upper control limits narrowed during the study.

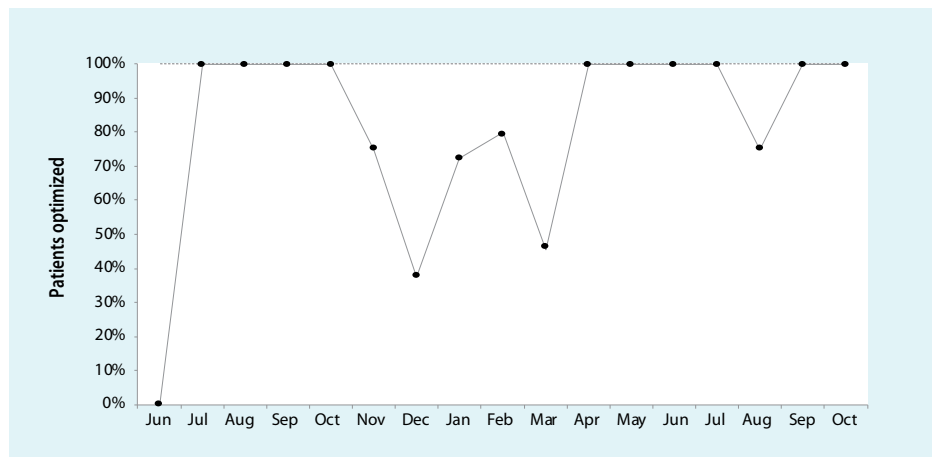


FIGURE 2. Percentage of patients who required and received optimization in 2022 and 2023.

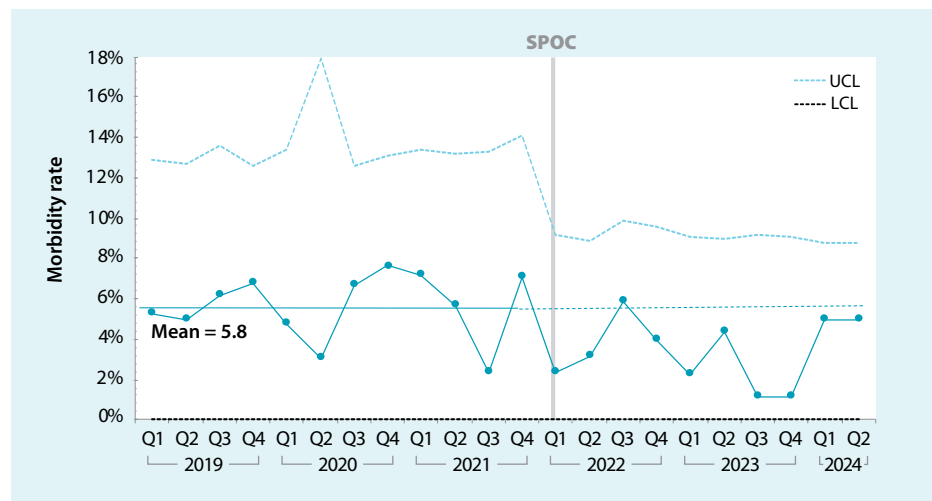


FIGURE 3. Morbidity rates for arthroplasties.

SPOC = Surgical Patient Optimization Collaborative; UCL = upper control limit; LCL = lower control limit.

Additional note for Figures 3, 5, and 6: The solid line represents the baseline data used to calculate the mean baseline performance. The transition from solid line to dotted line marks the point where data collection shifted to reflect the action period. This distinction also enables detection of special cause variation more rapidly, as the new data do not influence the mean baseline calculation.

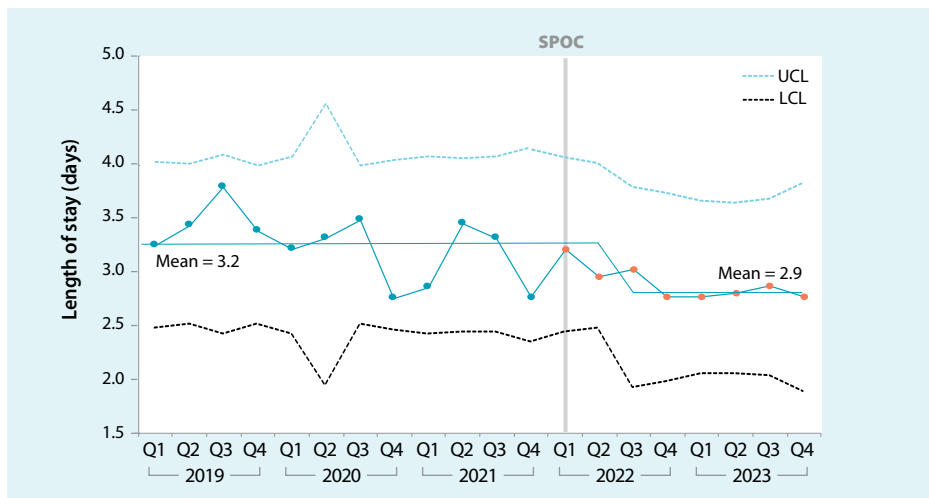


FIGURE 4. Length of stay for arthroplasties.
SPOC = Surgical Patient Optimization Collaborative; UCL = upper control limit; LCL = lower control limit.

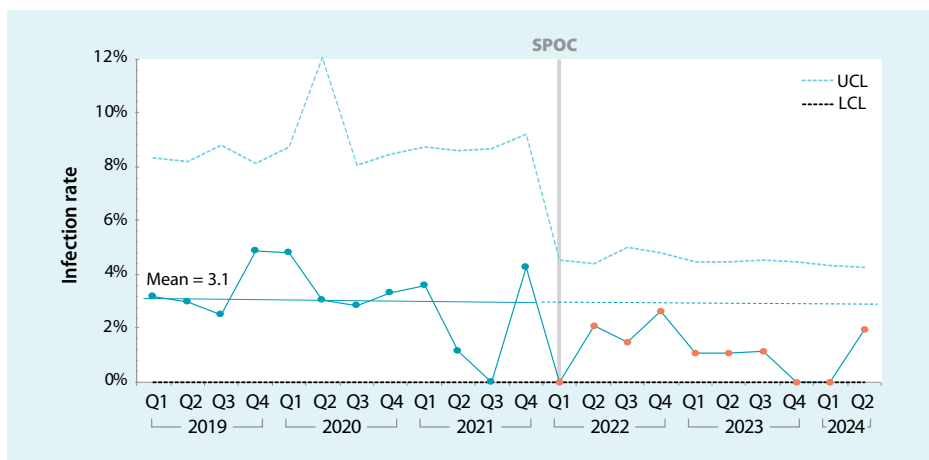


FIGURE 5. Surgical site infection rate for arthroplasties.
SPOC = Surgical Patient Optimization Collaborative; UCL = upper control limit; LCL = lower control limit. See the additional note under Figure 3.

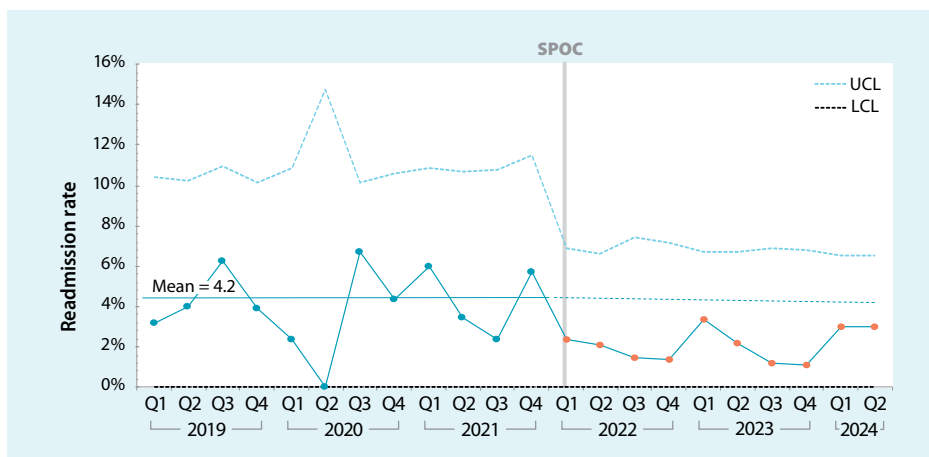


FIGURE 6. Readmission rates for arthroplasties.
SPOC = Surgical Patient Optimization Collaborative; UCL = upper control limit; LCL = lower control limit. See the additional note under Figure 3.

The baseline mean for arthroplasty length of stay was 3.2 days [Figure 4]. There was a special cause variation shift to below our baseline mean (to 2.9 days) after initiating SPOC processes, and the upper control limits narrowed.

The baseline mean surgical site infection rate was 3.1% [Figure 5]. A special cause variation shift to improvement occurred after SPOC processes were initiated (the mean declined to 1.1%), and the upper control limits narrowed.

The baseline mean readmission rate for arthroplasties was 4.2% [Figure 6]. There was a special cause shift to below the baseline mean (to 2.2%) after SPOC processes were initiated, and the upper control limits narrowed.

Process measures

Thirty-two patients were at high risk for obstructive sleep apnea; 27 (84.4%) completed obstructive sleep apnea testing before surgery, and 17 (63.0%) tested patients started CPAP before surgery. Of 23 smokers, 19 (82.6%) who were offered prehabilitation quit or reduced their smoking before surgery. We did not follow their smoking history after surgery. Eleven patients were identified as anemic; eight (72.7%) who required optimization had improved hemoglobin preoperatively. Sixty patients were referred to the Social Prescribing Program; 19 (31.7%) did not require social supports postoperatively. Forty-eight of the referred patients answered our postoperative survey questions; 25 (52.1%) agreed that social support was helpful to their postoperative recovery.

Conclusions

Preoperative optimization of patients' comorbidities is important. Before our involvement with SPOC, our optimization of medical risk factors in presurgical patients was inconsistent and nonstandardized. This presented an opportunity to use quality improvement methodology to implement standardized optimization processes and to assess effects on patient outcomes. We successfully implemented optimization processes in our surgical

pre-admission process for providing social supports, preoperative management of anemia and obstructive sleep apnea risk, and smoking cessation. We were able to customize SPOC processes to allow them to be integrated into our existing workflow with minimal disruption. This led to a high compliance rate for optimization processes among Surgery Pre-Admission Clinic staff. A nurse navigator proved useful in screening patients for optimization.

Overall, patients found the optimization processes improved their surgical experience. Patients were motivated to pursue actions to improve their surgical outcomes. High-risk obstructive sleep apnea patients were willing to undergo testing to confirm their condition. Smokers were willing to stop or reduce smoking prior to surgery. Anemic patients were willing to undergo investigations and take supplemental iron if necessary. We felt that we were successful in providing social supports for patients with inadequate support at home. Our screening for the Social Prescribing Program did not have standardized criteria for referral. Referrals were made at the discretion of the screening nurse, but 31.7% of patients referred to the program did not require support at home. We believe this result can be improved by implementing formalized criteria for referrals.

After implementing standardized approaches to optimization in our clinic process, length of stay, unplanned readmissions, and surgical site infection rates improved. The initiation of SPOC processes was not associated with any special cause variation in morbidity rates; therefore, we plan to explore other approaches to reduce those rates. In all patient outcomes, upper control limits narrowed after initiating SPOC processes. We believe this represents a decrease in system variability, which is attributed to greater standardization of the optimization process. These results highlight the importance of having a structured, embedded optimization process within the surgical pre-admission process.

We believe the high workload on the nurse navigator for screening and

optimization activities limited the ability to expand the program to other elective surgeries or other sites without large increases in human resources within our clinic.

It may be possible to improve capacity for optimization in the future without adding more human resources by increasing the use of digital tools for screening and identifying optimizable opportunities. Since a substantial amount of our clinic

**Standardized
preoperative
optimization not only
improved surgical
outcomes but also
empowered patients
to actively participate
in their care.**

nursing resources are devoted to screening for medical history and making decisions about preoperative testing, leveraging a digital tool to algorithmically assist in those tasks may free capacity for clinic nurses to perform nurse navigator duties. In one study, switching to a digital questionnaire reduced nurse assessment times by more than 50%.²³ With more of our clinic nurses engaging with patients in optimization, there would be increased potential for widespread uptake of health improvements preoperatively. Several reports have described the potential for technology to enhance preoperative screening and medical optimization.²⁴⁻²⁷ Self-administered detailed screening questionnaires have been found to be acceptable to patients and reliable in eliciting a medical history.²⁸ A review of digital technologies for promoting positive preoperative behavior changes found that technology should provide motivation and support, enable patient engagement, facilitate peer networking, and meet individualized patient needs.²⁹ The provincial Perioperative Care Alignment and Digital Screening committee, consisting of anesthesiologists, surgeons, internists, family

doctors, Surgery Pre-Admission Clinic personnel, and patients, has been working on a digital tool that might assist with preoperative optimization in BC. The aim is to provide every presurgical patient with digitally supported, individually tailored, evidence-based advice, referrals, and recommendations before surgery. Until a digital solution is widely adopted, Peace Arch Hospital will maintain the optimization pathways that were successfully developed during the SPOC project period and will continue to find ways to expand using current resources. ■

Competing interests

None declared.

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Denise Werry, ACPR, PharmD, Panteha Eshtiaghi, MD, Leah D. Trippell, MD, Shazia Masud, MD, FRCPC, Inna Sekirov, MD, PhD, FRCPC, Yazdan Mirzanejad, MD, DTMH, FRCP, FACP, MRCP, Patrick H.P. Wong, MD, FRCPC

Mycobacterium heckeshornense tenosynovitis: Case report and literature review

Mycobacterium heckeshornense should be considered in all patients who present with atypical joint infections, because most infections occur in immunocompetent patients and patients rarely report specific exposures.

Dr Werry is a clinical pharmacy specialist, infectious diseases, at Surrey Memorial Hospital and a clinical instructor in the Faculty of Pharmaceutical Sciences at the University of British Columbia. Dr Eshtiaghi is a resident physician in the Division of Dermatology in the Department of Medicine at the University of Toronto. Dr Trippell is a resident physician in the Department of Family Practice at UBC. Dr Masud is a medical microbiologist at Surrey Memorial Hospital and a clinical assistant professor in the Department of Pathology and Laboratory Medicine at UBC. Dr Sekirov is a medical microbiologist at the BC Centre for Disease Control Public Health Laboratory and a clinical assistant professor in the Department of Pathology and Laboratory Medicine at UBC. Dr Mirzanejad is a consultant, infectious diseases and tropical medicine, at Surrey Memorial Hospital and a clinical professor in the Division of Infectious Diseases in the Department of Medicine at UBC. Dr Wong is head of the Department of Medicine at Surrey Memorial Hospital and a clinical associate professor in the Division of Infectious Diseases in the Department of Medicine at UBC.

Corresponding author: Dr Patrick H.P. Wong, patrick@mail.ubc.ca.

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ABSTRACT: *Mycobacterium heckeshornense* is not a commonly isolated organism in British Columbia. We present the first known case of *M. heckeshornense* tenosynovitis in BC, in the hand of an immunocompetent patient. *M. heckeshornense* was identified using *hsp65* gene sequencing, and treatment consisted of surgery and multidrug antimycobacterial therapy. Nontuberculous mycobacteria should be considered as a potential cause of culture-negative tenosynovitis. Because the number of cases implicating *M. heckeshornense* continues to rise, it is important to correctly identify the organism and differentiate it from the phylogenetically related *M. xenopi*. More research and treatment experience are needed before a management guideline for *M. heckeshornense* can be developed.

Case data

A 91-year-old man was assessed by the infectious diseases service at Surrey Memorial Hospital after 3 months of swelling and erythema in the third digit of his left hand. He reported spontaneous development of a small papule that developed into an ulcerating lesion in the volar aspect of the finger around the distal interphalangeal and metacarpophalangeal joints. There was associated dactylitis. He was systemically well with no fevers or chills. He reported no trauma, animal bites or scratches, freshwater

or saltwater exposure, or travel outside of Canada. His medical history included gout, diabetes, hypothyroidism, dyslipidemia, chronic kidney disease, congestive heart failure, benign prostatic hypertrophy, and right temporal stroke. His regular medications included insulin, atorvastatin, ferrous fumarate, levothyroxine, carvedilol, aspirin, and hydralazine. He had no known drug allergies.

The patient received courses of oral cloxacillin, intravenous cefazolin, and ceftriaxone for cellulitis and suspected septic arthritis. Joint aspiration revealed minimal fluid. Crystal analysis and cell count and differential could not be performed. Bacterial culture was negative. He was treated with steroids for a possible gout flare and seemed to have partial response.

The joint was re-aspirated 1 month later, which showed $278\,000 \times 10^6/L$ total nucleated cells with 92% neutrophils. Crystal analysis and bacterial cultures were negative. Given the subacute clinical presentation, fungal and mycobacterial cultures were obtained. They revealed 1+ acid-fast bacilli on auramine-rhodamine staining. Molecular testing for *M. tuberculosis* and *M. avium* complex were negative. The sample was inoculated on liquid and solid media for mycobacterial culture. Throughout the patient's presentation, his white cell count

and differential remained normal, and his C-reactive protein was only mildly elevated, with a peak of 22.7 mg/L.

The patient developed worsening seropurulent discharge from the affected finger and underwent incision and drainage. Operative cultures were positive for a few colonies of methicillin-resistant *Staphylococcus aureus*. The postoperative wound is shown in **Figure 1**. Histopathology showed granulation tissue and fibrinopurulent exudate, with negative periodic acid-Schiff and acid-fast bacilli stains. A deep wound swab was negative for acid-fast bacilli and had no growth in mycobacterial culture at 8 weeks of incubation. The patient received vancomycin, then subsequent daptomycin therapy for possible methicillin-resistant *S. aureus* tenosynovitis.

Despite 5 weeks of daptomycin therapy, the patient developed a new ulcerating lesion in the volar aspect of his finger, with surrounding hypergranulating tissue and serous drainage. Daptomycin was discontinued because there was no evidence of improvement, and repeat tissue cultures were obtained. Bacterial culture, acid-fast bacilli smear, and mycobacterial culture were negative.

The mycobacterial liquid culture (BACTEC MGIT 960 system) of the original acid-fast bacilli smear-positive aspirate flagged as positive at 5 weeks of incubation. Further incubation at 6 weeks demonstrated small yellow colonies on Löwenstein-Jensen solid medium, with short to medium acid-fast bacilli observed on smear. The organism was identified as *M. heckeshornense* using *hsp65* gene sequencing. Susceptibility testing results were obtained from the National Microbiology Laboratory in Winnipeg [Table].

The patient underwent further debridement and left third-finger tenolysis for chronic flexor tenosynovitis. Operative samples were negative for mycobacteria at 6 weeks of incubation. Pathological review showed granulation tissue with abscess formation. Periodic acid-Schiff and acid-fast bacilli stains were negative, and the sample was negative for malignancy. The patient



FIGURE 1. Post-debridement and tenolysis of left third finger.

TABLE. Antimicrobial susceptibility testing results of *Mycobacterium heckeshornense* isolated using broth microdilution minimum inhibitory concentration (MIC) panel.

Drug	MIC (µg/mL)	Interpretation
Amikacin	4.00	Susceptible
Clarithromycin	≤ 0.06	Susceptible
Linezolid	4.00	Susceptible
Moxifloxacin	1.00	Susceptible
Rifabutin	1.00	Susceptible
Trimethoprim/sulfamethoxazole	0.25/4.75	Susceptible
Doxycycline	4.00	No interpretation available
Ethionamide	1.20	No interpretation available
Isoniazid	0.50	No interpretation available
Streptomycin	16.00	No interpretation available
Ciprofloxacin	4.00	Resistant
Ethambutol	16.00	Resistant
Rifampin	2.00	Resistant



FIGURE 2. Left hand and third finger during follow-up after 3 months of antimycobacterial therapy.

was started on treatment with clarithromycin, moxifloxacin, and isoniazid based on susceptibility results.

The patient was reassessed in the outpatient infectious diseases clinic approximately 3 months after starting antimycobacterial therapy. The swelling had decreased, and there had been no recurrent ulcers since the last tenolysis [Figure 2]. The plan was to continue combination therapy for 9 to 12 months if there was ongoing improvement. If the patient had poor clinical response, further consideration would be given to digit amputation by plastic surgery. However, the patient presented to hospital the following month with an unrelated issue of subdural hematoma and died.

Discussion

Hands and wrists are common sites of nontuberculous mycobacterial infections due to a higher likelihood of penetrating injuries.¹ The most common species implicated are *M. marinum*, *M. chelonae*, *M. kansasii*, and *M. intracellulare*. Fifty-three percent of nontuberculous mycobacterial infections of the hand are initially misdiagnosed, leading to delayed treatment and potentially advanced infection by the time they are recognized.¹ Notably, serum inflammatory markers are usually normal, as described in our case. It is not known how our patient was exposed to *M. heckeshornense*.

M. heckeshornense is a rare nontuberculous mycobacterium that is phylogenetically related to *M. xenopi*.² It was first identified in 2000 at the Heckeshorn Lung Clinic in Berlin in respiratory mycobacterial cultures of an immunocompetent woman with chronic cavitary lung lesions.² Pulmonary and extrapulmonary infections by this organism have been described around the world, with varied clinical outcomes.²⁻¹⁹ Extrapulmonary manifestations include peritonitis,³ lumbar spondylodiscitis/osteomyelitis,⁴⁻⁶ axillary lymphadenitis,⁷ bacteremia,⁸ and synovitis.⁹ In the one published case of *M. heckeshornense* tenosynovitis, surgical treatment alone with flexor tenosynovectomy was effective.¹⁰

Most *M. heckeshornense* infections occur in immunocompetent patients. For this reason, *M. heckeshornense* and other nontuberculous mycobacterial infections should be considered in all patients who present with atypical joint infections. Patients rarely report specific exposures, which supports the theory that *M. heckeshornense* is widely distributed.

As with other mycobacteria, microbiological confirmation of *M. heckeshornense* infection may be challenging, because the organisms may not be found in all parts of the affected tissues (as evidenced by recovery of this organism in only one of the multiple specimens collected from our patient).

Tissue or fluid, rather than swabs, are the appropriate sample types for mycobacterial smear and culture. *M. heckeshornense* is a slow-growing scotochromogen that is able to grow in temperatures ranging from 37 °C to 45 °C, but not at 30 °C.² Sequencing of both 16S rRNA and *hsp65* regions can be used to identify *M. heckeshornense*.¹⁰ Granulomata, giant cells, rice bodies, and central necrosis are supportive histopathological clues. In our case, *M. heckeshornense* was ultimately recovered in the aspiration sample obtained after the patient had received a course of steroid therapy. Therefore, it is possible that initial treatment with steroids suppressed the patient's immune system sufficiently to create an environment suitable for this nontuberculous mycobacterium to flourish.

There are no established guidelines for the treatment of *M. heckeshornense*. The literature supports management with surgical source control and the use of combination antimicrobials.³ It is important to consider in vitro susceptibilities, because *M. heckeshornense* has been found to have reduced susceptibilities to isoniazid and may acquire resistance to rifampicin with long-term treatment.² However, in vitro susceptibility results for nontuberculous mycobacteria do not have optimal correlation with clinical response. In many cases, despite the use of combination antimicrobials, definitive

adjunctive treatment with surgical source control is required for the resolution of symptoms. There is no consensus on the choice and duration of antimicrobial treatment for nontuberculous mycobacterial hand infections, which often ranges from 6 to 12 months but can sometimes be more prolonged.¹

M. heckeshornense is not a commonly isolated organism in BC. Over the last decade, it has been confirmed in less than five cases per year, with most identified in respiratory specimens. The clinical significance of *M. heckeshornense* in these patients is unknown. Among clinically significant cases in BC that we know about, *M. heckeshornense* was described as a source of peritoneal dialysis-associated peritonitis in 2011, where source control with peritoneal catheter removal and fluid drainage alone was adequate for disease resolution,³ and an unpublished case of a *M. heckeshornense* bacteremia in an immunocompromised patient was diagnosed in 2020.

Summary

We present a case of *M. heckeshornense* tenosynovitis in an immunocompetent patient. As the number of cases implicating *M. heckeshornense* continues to rise, it is important to correctly identify this mycobacterium and differentiate it from the phylogenetically related *M. xenopi*. More research and treatment experience are needed before a management guideline for *M. heckeshornense* can be developed. ■

Competing interests

None declared.

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The unsubstantiated preference for outpatient IV antibiotics

There is growing concern that IV antibiotics are overused. Numerous recent randomized controlled trials have demonstrated that oral therapies are just as effective as their IV counterparts for treating many complex infections.

Davie Wong, MD, FRCPC

ABSTRACT

IV antibiotic therapy is a critical component in the management of infectious diseases. However, there is growing concern that IV antibiotics are overused without improving patient outcomes. In recent years, numerous randomized controlled trials have demonstrated that oral therapies are just as effective as their IV counterparts for treating many complex infections, such as infective endocarditis, osteoarticular infections, and bacteremia. A critical review of the appropriateness of outpatient IV antibiotic prescriptions could aid in improving patient outcomes, maximizing cost-effective care, and minimizing the waste of health care resources.

Established in 2005, the outpatient parenteral antibiotic therapy (OPAT) clinic at Royal Columbian Hospital (RCH) is an integral service that provides care for patients who require IV antibiotics for their infections. OPAT clinics are infusion centres that exist in many hospitals, either as an extension of the emergency department or as a self-sufficient unit

that administers IV medications, most commonly antibiotics, to outpatients. Historically, patients who needed IV antimicrobials were admitted to hospital for the entire duration of their treatment course. OPAT clinics are vital in preventing unnecessary hospital admissions and facilitating early discharge.

At RCH, the OPAT clinic is located in the ambulatory care department, separate from the emergency department, and is staffed by a team of skilled nurses and infectious diseases physicians who oversee the care of patients on IV therapy. The most common route of referral is through the emergency department, where patients are assessed by an ER physician who diagnoses them with a bacterial infection that is judged to require IV antibiotics. These patients are subsequently referred to the OPAT clinic and are evaluated by an infectious diseases physician to ensure the infection diagnosis is correct and to devise an appropriate treatment plan. Patients generally come to the clinic once a day to receive their IV treatment.

This model of antimicrobial delivery has been the standard of care for over 2 decades in BC and has generated massive cost savings by avoiding unnecessary hospitalizations and minimizing nosocomial complications.¹ However, with a growing body of literature that has consistently demonstrated the noninferiority of oral antibiotics to their IV counterparts in treating complex bacterial infections, the value of OPAT needs to be re-evaluated.² Moreover,

IV administration can be associated with increased patient harm and unnecessary resource expenditure. OPAT has clearly established itself as an essential resource in mainstream medicine, but perhaps it is being overused or misused in light of modern evidence.³

In this article, we review a simple set of criteria to guide clinicians in their decision making regarding IV prescriptions, present the data from a recent audit conducted at the RCH OPAT clinic, objectively compare the advantages and disadvantages of IV and oral administration, examine the history of the IV superiority myth, and critically assess our cognitive biases when opting for parenteral therapy.

Criteria to determine the appropriateness of IV administration

Criteria for determining whether IV or oral treatment should be prescribed are often lacking and controversial; therefore, the decision to offer parenteral therapy is frequently arbitrary and based on personal practice habits and cultural norms. If we adopt the published criteria proposed for treating osteomyelitis and infective endocarditis, it becomes clear that most outpatients would qualify for oral therapy from the beginning. In my practice, I follow the same set of principles: (1) there is a safe and effective oral option, (2) the patient is able to swallow and absorb oral medication, (3) the patient is clinically stable, (4) there is no source control problem, and

Dr Wong is a clinical assistant professor in the Division of Infectious Diseases, Department of Medicine, University of British Columbia, and an infectious diseases consultant at Royal Columbian Hospital and Eagle Ridge Hospital.

Corresponding author: Dr Davie Wong, davie.wong@fraserhealth.ca.

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(5) there is no psychosocial reason to prefer IV therapy.^{4,5} By encouraging clinicians to follow the same criteria, we can establish a proper standard of care and ensure IV treatments are rationalized.

In one study, 41% of adult patients who received IV antibiotics did not require them (30% could have been switched to oral treatment; 11% did not need antibiotics). Even for patients who were prescribed IV therapy by an infectious diseases physician, it was judged that IV treatment was potentially avoidable in 22% of cases, raising concerns that infectious diseases specialists might also be overprescribing IV antimicrobials and underscoring a potential area for quality improvement.³

Audit at the RCH OPAT clinic

As an infectious diseases physician, I performed an audit of 100 randomly selected patients referred by the emergency department to the RCH OPAT clinic (whom I assessed and treated between March and May 2024) to determine the appropriateness of IV antibiotic prescriptions. Eighty-two patients were confirmed to have a bacterial infection. Skin and soft-tissue infections (50%) and urinary tract infections (13%) were the most common diagnoses for these patients. Ceftriaxone (46%) and cefazolin (40%) were the most commonly prescribed IV agents, while 16 patients (16%) also received a companion oral agent, metronidazole, in combination with ceftriaxone. Patients were transitioned from IV to oral antibiotics after a median of 2 days and an average of 3 days following my assessment. Commonly prescribed oral antimicrobials were cephalexin (31%) and amoxicillin/clavulanate (22%). The median and average durations of oral therapy were 4 and 6 days, respectively. Total durations of therapy were 7 days (median) and 9 days (average). Less than half (48%) of patients with a confirmed bacterial infection met the criteria for IV treatment. The other patients could have been started or continued on oral antibiotics from the beginning. The most common reason to prescribe IV treatment was hemodynamic instability

(21%), of which tachycardia accounted for all cases, followed by inability to tolerate oral medications (9%). No patient had sustained hypotension. Overall, IV antibiotics could have been avoided in 59% of cases.

These eye-opening figures should provoke dialogue about how we use IV medications and spark quality improvement measures to curtail unnecessary consumption of health care resources. In the absence of standardized criteria at our institution, the decision to prescribe oral or IV therapy is somewhat subjective and sometimes a matter of patient or clinician preference.

Practicality of outpatient IV antibiotics

For practical reasons, antimicrobial selection is usually limited to medications that are dosed every 24 hours in the OPAT clinic. Such drugs include cefazolin plus probenecid, ceftriaxone, daptomycin, and ertapenem. This makes it difficult to fine-tune the antibiotic prescription to an agent with the narrowest spectrum of activity, in the spirit of antimicrobial stewardship. Additionally, IV administration is more resource intensive than the oral route, because it requires a nurse to establish and maintain vascular access and administer the medication, and pharmacy support is needed to prepare the medication bag. Patients must secure daily transportation to the clinic, find and pay for parking if applicable, and adhere to instructions on caring for their peripheral IV catheter at home (see RCH's OPAT brochure: <https://patienteduc.fraserhealth.ca/file/opat-rch-outpatient-clinic-intravenous-antibiotic-228563.pdf>). Patients with limited mobility often face challenges attending daily visits and sometimes require friends or family members to assist with transportation.

Compared with oral treatment, IV therapy results in overmedicalization of patients and can profoundly reduce their quality of life without improving infection outcomes. In fact, IV administration can be associated with more adverse effects, mostly related to vascular catheter complications (e.g., superficial thrombophlebitis, infection, drug

extravasation, contact dermatitis from adhesives). Having more patients on IV therapy also means increased traffic and congestion in the hospital environment, which increases staff workload. With informed decision making, most patients prefer oral therapy for treatment of many conditions, including infections, malignancies, and autoimmune diseases.^{6,7}

Advantages and disadvantages of IV and oral antibiotics

When comparing oral and IV antibiotics, the advantages of each mode of delivery become apparent [Table]. Oral treatment offers higher convenience and mobility for patients, avoids the need for vascular access and its associated complications, minimizes medical contact, generates a smaller carbon footprint, and offers higher cost-effectiveness compared with its IV counterpart. Although IV administration causes fewer gastrointestinal side effects and leads to almost instantaneous and 100% drug bioavailability, these advantages are insignificant and mostly irrelevant for the vast majority of patients treated in the outpatient setting. It is not necessary to achieve excessively high peak drug levels for most uncomplicated nonsevere infections. Immediate drug delivery to the site of infection is critical for patients with sepsis or septic shock but is unlikely to be important in other scenarios.

TABLE. The advantages of oral versus IV antibiotics.

	Advantage
Oral	Higher convenience
	Higher patient mobility
	Less contact with health services
	No need for access to IV
	Earlier hospital discharge
	Lower carbon footprint
	Higher cost-effectiveness
IV	Instantaneous and higher bioavailability
	Lower gastrointestinal side effects

PREMISE

Uncertainty is normal in infectious diseases practice

In the field of infectious diseases, it is sometimes difficult to differentiate a bacterial infection from a noninfectious condition. In practice, many clinicians might shoot first and ask questions later when working through the diagnostic process. It is common practice to prescribe antibiotics in the face of diagnostic uncertainty before all clinical information becomes available. This leads to overprescribing of antimicrobials, exposes the patient to unnecessary harms, increases resource use, and can affect patient expectations about the role and utility of IV antibiotics. Instead, it may be prudent to withhold antibiotics for stable outpatients until better diagnostic clarity has been achieved.

History of the IV superiority myth

For decades, clinicians have assumed that IV antimicrobials are superior to oral agents for the treatment of infections based on poor evidence, expert opinion, and established cultural standards.⁸ In fact, there are no controlled trials that have shown IV antibiotics are better than oral. On the contrary, there are many studies that have proven the noninferiority of oral to IV antibiotics in the treatment of bacteremia, osteoarticular infections, complicated urinary tract infections, skin and soft-tissue infections, and even infective endocarditis.⁹ The prevailing myth that IV antibiotics are better than oral continues to be perpetuated in medical practice today, underscoring a widespread oversimplified and misconstrued understanding of a complex topic rooted in infectious disease management principles.

The preference for IV therapy may stem from the introduction of commercially available penicillin in the 1940s when stories of miracle cures following parenteral administration of the antibiotic became commonplace. Years later, the release of primitive oral antimicrobials with low bioavailability was seemingly less effective and made less of an impression on the medical community. Influential physicians at that time concluded that IV therapy was

superior to oral agents, inadvertently leading clinicians and patients to believe that aggressive infections require dramatic and intrusive interventions.⁸ This strongly held belief was left unchallenged and dominated the therapeutic paradigms of infection management for many decades, until 20 to 30 years ago, when randomized controlled trials emerged, finally dispelling the myth of IV superiority.⁹

The route of drug delivery is overemphasized

Other more important factors besides the mode of administration affect the overall efficacy of a drug and warrant careful consideration. These include penetration into the site of infection, antimicrobial spectrum of activity, anti-inflammatory properties, drug–drug interactions, side-effect profile, and published clinical experience. By placing too much emphasis on the route of drug delivery, it is easy to overlook other critical elements that might have a greater impact on outcomes in the management of certain infections. It is a dangerous fixation for both patients and clinicians that distracts us from recognizing the bigger picture.

Cognitive biases impact IV prescriptions

The language we use can subconsciously bias our perception of the effectiveness of antimicrobial therapies, either over- or underestimating their benefits. For example, in my experience, a commonly used justification to escalate to IV treatment is the patient having failed oral antibiotics. After dissecting this phrase, we realize that it is factually incorrect and misleading, because it is nearly impossible for a patient to fail oral antibiotics unless every oral agent has been tried. We also need to be careful to not diagnose treatment failure too early in the course of the infection, because symptoms and signs of inflammation might get worse before they get better, and it can take up to 3 days to achieve a good clinical response.¹⁰ Furthermore, blaming the treatment failure on the oral route of delivery is a gross misunderstanding of antimicrobial therapeutics.

If a patient is truly not responding to treatment, then it is important to consider these factors before reflexively switching to IV therapy:

1. Do you have the correct diagnosis? Sometimes, noninfectious conditions can mimic infections (e.g., venous stasis dermatitis).
2. Are you covering the right pathogen(s)? It does not matter whether the patient is receiving IV or oral antibiotics when the culprit pathogen is not being targeted. For example, escalating from oral cephalexin to IV cefazolin, a commonly observed practice in my experience, makes no microbiological sense, as both agents cover similar bacteria.
3. Are you using the right drug? This relates to correct dosing, adequate penetration into the site of infection, and effective activity against the pathogen.
4. Is there a source control problem? For example, perhaps there is an abscess that needs to be drained. Changing from oral to IV administration does not solve this problem.

Barriers to change

Unfortunately, evidence is not always enough to drive a change in practice. Barriers to change are encountered at the patient, clinician, and system levels. In my experience, some patients firmly believe that oral therapy is ineffective based on their past experiences and misunderstandings. Physicians may resort to inappropriate IV prescriptions because of cognitive biases, being out of date with current evidence, and fear of litigation. Systemic obstacles include a remuneration model that encourages physicians to prescribe more IV antimicrobials, a lack of supportive infrastructure and institutional policies to standardize oral antibiotics as first-line treatments, and hospital programs that pay for IV but not oral antibiotics for patients.⁸ For a positive change to be successfully implemented, barriers at all levels must be addressed by involving key parties and firmly establishing institutional evidence-based practice standards.

Conclusions

We need to reassess our proclivity for IV antimicrobials in an era when oral therapy has been proven to be just as effective and carries less burden for patients, health care staff, and the medical system. By encouraging the use of oral treatment and abandoning our biases regarding IV therapy, we can improve the patient experience, minimize resource use, achieve greater cost savings, and maintain sustainable health care for all. In the face of unequivocal evidence, it is time to shift the model of care once again to adopt the position that oral antimicrobial therapy should be the default route of administration unless there is a compelling indication to prescribe IV treatment. We owe it to our patients, ourselves, our colleagues, and our health care system to embrace and promote the best evidence-based practices to optimize patient outcomes at all stages in the delivery of care. ■

Competing interests

None declared.

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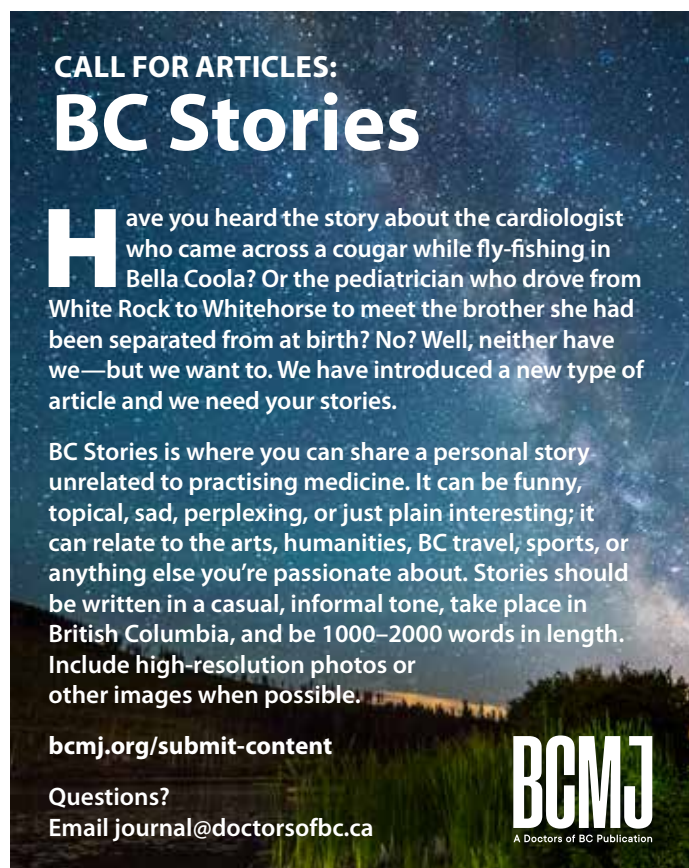
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The role of prosthetists and orthotists for patients with work-related injuries

As a primary care physician, you may be presented with patients who require prostheses (artificial limbs) or orthoses (braces)—including patients with work-related injuries. You may refer these patients to a prosthetist or orthotist, who will contact WorkSafeBC to initiate a treatment plan or notify the patient's claim owner at WorkSafeBC. WorkSafeBC does not directly refer to prosthetists or orthotists but will provide a list of certified prosthetists or orthotists close to the patient's home.

Conditions treated by prosthetists and orthotists

A certified prosthetist can manage your patients who have a limb loss. Referrals to a certified orthotist are made when patients are experiencing biomechanical or pathomechanical issues, including ligamentous instability and skeletal deformities caused by osteoarthritis or neuromuscular conditions.

Certified prosthetists and orthotists work with other health care providers to offer unique solutions to improve the mobility, functional abilities, and health of your patients. They are trained in anatomy, physiology, and pathology, as well as materials science, biomechanics, and engineering. Prosthetists and orthotists are certified by Orthotics Prosthetics Canada. Certification takes 8 years, including a 2-year residency, and 2 additional years are required to be certified as both a prosthetist and an orthotist.

This article is the opinion of WorkSafeBC and has not been peer reviewed by the BCMJ Editorial Board.

Treatment types

Prosthetic

Prosthetic treatments can be cosmetic, passive, body powered, microprocessor controlled, externally powered, or myoelectric. Microprocessor knees and feet can prevent stumbles and falls, help negotiate stairs and slopes, and provide real-time adjustments while walking. Externally powered feet and knees can propel the user like the sound limb.

Myoelectric prostheses are for the upper extremity and use sensors to detect and use nerve impulses to operate fingers, hands, wrists, elbows, and shoulders. Multiarticulate hands have individual motors in each finger to accomplish different kinds of grasps. Some prosthetic hands have gesture control, which interprets a specific motion. For example, a rapid extension of the arm automatically moves the prosthetic hand to grasp a door handle or shake a hand.

Targeted innervation, the surgical rerouting of severed nerves to muscles for myoelectric control, allows for more intuitive control of the prosthesis. Pattern-recognition myoelectric controls use advanced machine learning to create even more natural use of the prosthesis.

Orthotic

Orthotic treatments include custom or off-the-shelf orthotics for feet and knees and orthopaedic footwear. Other treatments include wrist, elbow, spine, and hip orthoses, as well as compression stockings. Custom foot orthoses are used to treat diabetic foot ulcers, and offloading footwear aids in healing these ulcers.

Advances include digital scanning and 3D printing of orthoses. Microprocessor-controlled knee-ankle-foot orthoses have sensors that lock the knee from heel strike through toe off, then allow for free motion

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Key terms

In British Columbia, PharmaCare and WorkSafeBC contract with certified prosthetists and orthotists.

- Certified prosthetists provide prostheses.
- Certified orthotists provide orthoses.
- Prostheses replace any segment of the upper or lower extremities, including fingers, toes, and all levels of the arms and legs. Prostheses are typically custom-made.
- Orthotics (also called orthoses) support, align, and prevent further injuries or promote healing to the upper and lower extremities and the spine. They may be used for patients with fractures and spinal cord, ligamentous, and musculoskeletal injuries. Orthoses are typically custom-made.

Additional resources

Orthotics Prosthetics Canada: <https://opcanada.ca>.

Prosthetic and Orthotics Association of British Columbia: <https://poabc.ca>.

Sooty bark disease in BC: A cause of a rare form of hypersensitivity pneumonitis

Sooty bark disease is a rare form of hypersensitivity pneumonitis that is caused by exposure to spores of *Cryptostroma corticale*. *C. corticale* is a fungus endemic to eastern North America but invasive in parts of western and central Europe, where it infects certain broadleaf trees, specifically maples. The fungus colonizes trees via airborne spores and can lead to wasting of the bark in a disease state known as sooty bark disease.^{1,2} The descriptor “sooty” refers to the mats of fungal spores that can lead to a blackened appearance and friable texture of infected trees’ bark.

In the summer of 2022, staff from the Canadian Forest Service (part of Natural Resources Canada) and the British Columbia Ministry of Forests, Lands and Natural Resource Operations discovered five cases of sooty bark disease in urban trees in the Victoria and greater Vancouver areas and positively identified *C. corticale*. While known to be present in Washington state since 1969,³ sooty bark disease had not been previously reported in BC.

Sooty bark disease

Hypersensitivity pneumonitis is a form of interstitial lung disease, characterized by inflammation and fibrosis of the lung interstitium, driven by an immune response to an inhaled antigen.⁴ In sooty bark disease, these antigens are *C. corticale* spores and/or mycelia.⁵ Acute symptoms of sooty bark disease, which may appear after hours or days of exposure, include coughing, wheezing, fatigue, diarrhea, nausea, and vomiting.

This article is the opinion of the BC Centre for Disease Control and has not been peer reviewed by the BCMJ Editorial Board.

Continued exposure to fungal spores can cause immune-mediated lung remodeling with cough, shortness of breath, and systemic signs such as weight loss and fever.^{5,6}

Hypersensitivity pneumonitis is rare, with an annual incidence of one to two per 100 000.⁴ Sooty bark disease is even more rare—we found five relevant case reports but no descriptions or estimates of incidence.^{6–10} All reports involved prolonged proximity to wood or bark contaminated with *C. corticale*. Three described cases in loggers,^{6–8} one described a case in a horticulturist,¹⁰ and one described a case in an orchid grower who cultivated over 1000 orchids with bark chips.⁹ We did not find documented cases of sooty bark disease due to inhalation of windblown spores or from casual exposure, and we found no description or report of risk to the public.

Risk of sooty bark disease in BC

At present, with only a small number of cases of sooty bark disease detected in BC, the risk to BC residents is low. However, the prevalence of trees affected by sooty bark disease is likely to increase. Sooty bark disease was detected in Seattle in 2020.¹¹ It has since been detected multiple times and is an emerging concern for ornamental tree health.¹² This is likely due in part to recent heat and drought affecting the Pacific Northwest. Heat- and drought-stressed trees are more susceptible to *C. corticale*, and warmer and especially drier weather may lead to an increased incidence of sooty bark disease.^{5,13}

Over time, if sooty bark disease becomes more prevalent in BC, there may be some risk to occupational groups such as foresters, arborists, and carpenters who work extensively with wood. In addition, infected trees will need to be detected, disposed of, and

diverted from chipping or use as mulch. The risk to the public would likely remain very low except for those who engage in activities that bring them into prolonged and frequent contact with wood or bark.

To manage and understand this risk, the Canadian Forest Service is developing a surveillance program based on a network of provincial, municipal, and private stakeholders to monitor for trees infected with *C. corticale*. They will share results of this surveillance with the BC Centre for Disease Control and WorkSafeBC to disseminate to the public and employers, along with appropriate risk and mitigation information. ■

—Ali Okhowat, MD, MPH, CCFP

Clinical Instructor and Co-Lead, R3 Enhanced Skills in Global Health Program, Faculty of Medicine, UBC

—Christopher Carlsen, MD, MPH
Professor of Medicine, UBC

—Joey Tanney, PhD

Research Scientist, Pacific Forestry Centre, Canadian Forest Service, Natural Resources Canada

—Nicolas Feau, PhD

Research Scientist, Pacific Forestry Centre, Canadian Forest Service, Natural Resources Canada

—David McVea, MD, PhD

Public Health Physician, Environmental Health Services, BCCDC

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Letters to the editor

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Specialists filling gaps in care

With the dearth of primary care providers, some specialists are filling the gap somewhat, taking on unrecognized tasks and extra work such as ordering “routine” tests (e.g., bloodwork, appropriate imaging). This unrecognized work, done because it is the right thing to do, not because it is part of specialists’ responsibilities, should be recognized and appropriately compensated. Kudos to these already overburdened practitioners for these extra time-consuming efforts, which are done because it is ethically the right thing to do with our massive gaps in care provision.

—Peter Meyer, MD
Victoria

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during the swing phase of gait, making them safe and efficient.

Considerations for work-related injuries

The goal is to return patients with work-related injuries to as close to their pre-injury condition as possible. To help achieve this, the patient’s WorkSafeBC claim owner may approve and arrange an additional referral to a physiatrist, the WorkSafeBC Visiting Specialist Clinic in Richmond, and/or, in the case of an amputation, the Amputee Multidisciplinary Program at Lifemark Health Centre in Langley. This referral depends on the complexity of the injury and where in the province the patient lives, and it is often made on the recommendation of a prosthetist or physician involved in the patient’s care.

Reach out to a medical advisor

To speak with a WorkSafeBC medical advisor about a patient with a work-related injury, including one who may require a prosthesis or orthosis, submit a RACE request (www.raceconnect.ca). ■

—David Broman, CPO(c)FCBC
Prosthetic and Orthotic Consultant,
WorkSafeBC
Member, Expert Advisory Committee on
Prosthetics and Orthotics, PharmaCare,
Ministry of Health, Province of British
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Obituaries We welcome original tributes of less than 700 words; we may edit them for clarity and length. Obituaries may be emailed to journal@doctorsofbc.ca. Include birth and death dates, full name and name deceased was best known by, key hospital and professional affiliations, relevant biographical data, and a high-resolution head-and-shoulders photo.



Dr Moira Mowa Yeung
1939–2024

Dr Moira Mowa Yeung passed away on 6 September 2024 in Vancouver. She was born in 1939 in Hong Kong and entered the medical faculty of the University of Hong Kong in 1957 with a King Edward VII Scholarship, graduating in 1962 with no less than seven gold medals. Following an internship, she obtained a Commonwealth Scholarship to study in the UK, qualifying as a specialist in internal medicine and respiratory. During that time, she worked at the Royal Brompton Hospital with the great Dr Jack Pepys, arguably the father of clinical immunology in England. It was there that she married her husband, David.

Political unrest in Hong Kong prompted Moira's passage to Vancouver in 1968, where she set about relicensing and eventually joined the Division of Respiratory Medicine at Vancouver General Hospital. There, she began to pursue her academic research interests, eventually establishing the Occupational and Environmental Disease unit at VGH, which bears her name today. She was one of only two female respirologists in BC at the time.

Perhaps influenced by Dr Pepys, her research focused on occupational asthma, specifically western red cedar asthma, which was a common disease among sawmill workers in BC. She went on to discover that plicatic acid was the chemical compound responsible, that patients remain symptomatic even after stopping working with the wood, and that this could lead to permanent respiratory disability. She worked tirelessly on behalf of her patients to have occupational asthma recognized as a compensable disease and to have permanent disability benefits available to those who failed to recover despite removal from the triggering agent. She achieved this first in Canada and later throughout North America, a monumental accomplishment. Moira's work led to international recognition, with the Alice Hamilton Award for Major and Lasting Contribution in Occupational Health from the American Industrial Hygiene Association in 2000 and the prestigious Distinguished Achievement Award from the American Thoracic Society in 2008. She published no less than 400 peer-reviewed scientific journal articles and chapters in several books.

The later years of her career, from 1999 to 2019, were spent between Vancouver and Hong Kong, where she was appointed honorary professor at the University of Hong Kong. During her time there, she wrote a four-volume medical history of Hong Kong and went on to write biographies of several prominent Hong Kong residents who contributed to the scientific and cultural life of her birthplace.

I met Moira in 1978, when I arrived in Vancouver for a fellowship in respiratory medicine. She became my mentor, colleague, friend, and, laterally, my patient. Her later years were very challenging for

her medically, but it by no means slowed her down. Several weeks before she passed away, she circulated a detailed description of how and where her memorial service would be conducted, including the passages to be read, musical accompaniments, her requested speakers, and the order in which they would give their contributions. This, I should add, was managed despite being in the throes of terminal metastatic lung cancer. At no time did I hear her rail against the many slings and arrows that fate had sent her way. On the contrary, several times she expressed gratitude for the life she had led, which she considered privileged and blessed.

Anyone who met Moira would be instantly aware of her calm presence, her air of dignity, and the quiet confidence that emanated from her. Her accompanying photo shows her wonderful smile, which was never far from the surface, as was her easily triggered laughter. The flags on the University of British Columbia campus were lowered to half-mast to honor her, a fitting tribute to this gifted physician.

She is survived by her husband of 53 years, David, and her children, Jennifer and Mark. The motto of my school was *et velle et perficere*, "both to aim and to achieve." This remarkable woman did just that, and then some.

Requiescat in pace.

—Kevin Elwood, MD
Vancouver



Dr Gerald Kenefick
1944–2024

Dr Gerald (Gerry) Kenefick is survived by wife, Sandy; daughters, Victoria, Lisa (Serge), and Alexandra; grandchildren, Grace, Rory, Sophia, and Oliver; sisters, Jackie (Simon) and Anne (Frank); and many nieces and nephews. He was predeceased by his brother, Finbar.

Gerry immigrated to Canada from Cork, Ireland, in 1969 and landed in Victoria for a year of internal medicine. He then moved to Vancouver to take up a residency in obstetrics/gynecology and spent 2 years at BC Women’s Hospital and Health Centre (then Grace Hospital) and St. Paul’s Hospital. Looking for work–life balance, he stayed in general practice for the remainder of his medical career.

Gerry obtained his certification in family practice and was awarded a fellowship by the College of Family Physicians of Canada in 1989.

He held positions on many of the executive boards of Royal Columbian and St. Mary’s Hospitals in New Westminster, including chief of general practice at both hospitals.

In 1980, Gerry was hired at Telus as its medical officer and remained there for 4 years. When he left Telus, he went back into family practice and obtained his certification in occupational medicine, practising in Burnaby, with an added office for occupational medicine, along with three travel vaccination clinics in the Lower

Mainland, which he worked at in tandem with his colleague Dr G. Parhar.

Throughout his life, his passions were sailing and sailboat racing, along with building model ships and aircraft, which he especially loved during retirement. Gerry joined the Royal Cork Yacht Club in Ireland at age 12 and kept his overseas membership until his passing. He was their longest-standing member (67 years).

—Gurdeep Parhar, MD
Vancouver



Dr John Whelan
1943–2024

The psychiatry community in Vancouver lost one of its treasures with the passing of Dr John Whelan in April 2024. John succumbed to ALS in hospice care, surrounded by the love of his life, Dell, and his beloved daughters, Ciara and Julie.

John was born in Galway, Ireland, and came to Vancouver in 1969 for his residency in psychiatry at the University of British Columbia. He had a private practice in Vancouver and established the psychiatric day hospital at the old St. Vincent’s Hospital. He is best known, though, as a pillar of the psychiatry consultation service at Vancouver General Hospital.

Consultation psychiatry brings the psychiatrist into the busy medical and surgical wards of our hospitals. It brings mental health expertise to the challenges staff and patients face in those settings.

John was a unique human being. He was calm, soft-spoken, and a superb listener. His advice to residents was always “Sit down with the patient. Don’t be in a hurry. If you listen very carefully to their story, you will get your diagnosis.”

John’s gentle approach was also powerfully therapeutic, a balm for patients and staff alike. Modern medicine tends to operate on the notion that medical treatment means pharmaceutical or surgical intervention. John taught us that a physician’s very personhood can be a potent force for healing.

John will be missed, but his legacy continues in the work being done by the trainees who were exposed to his remarkable example of humanity.

I feel very blessed to have known John.
—Bruce Patterson, MD
Vancouver

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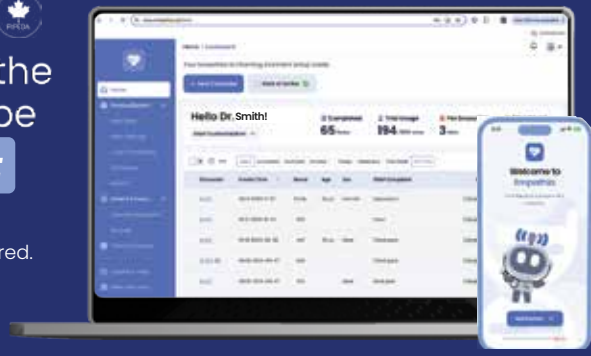
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