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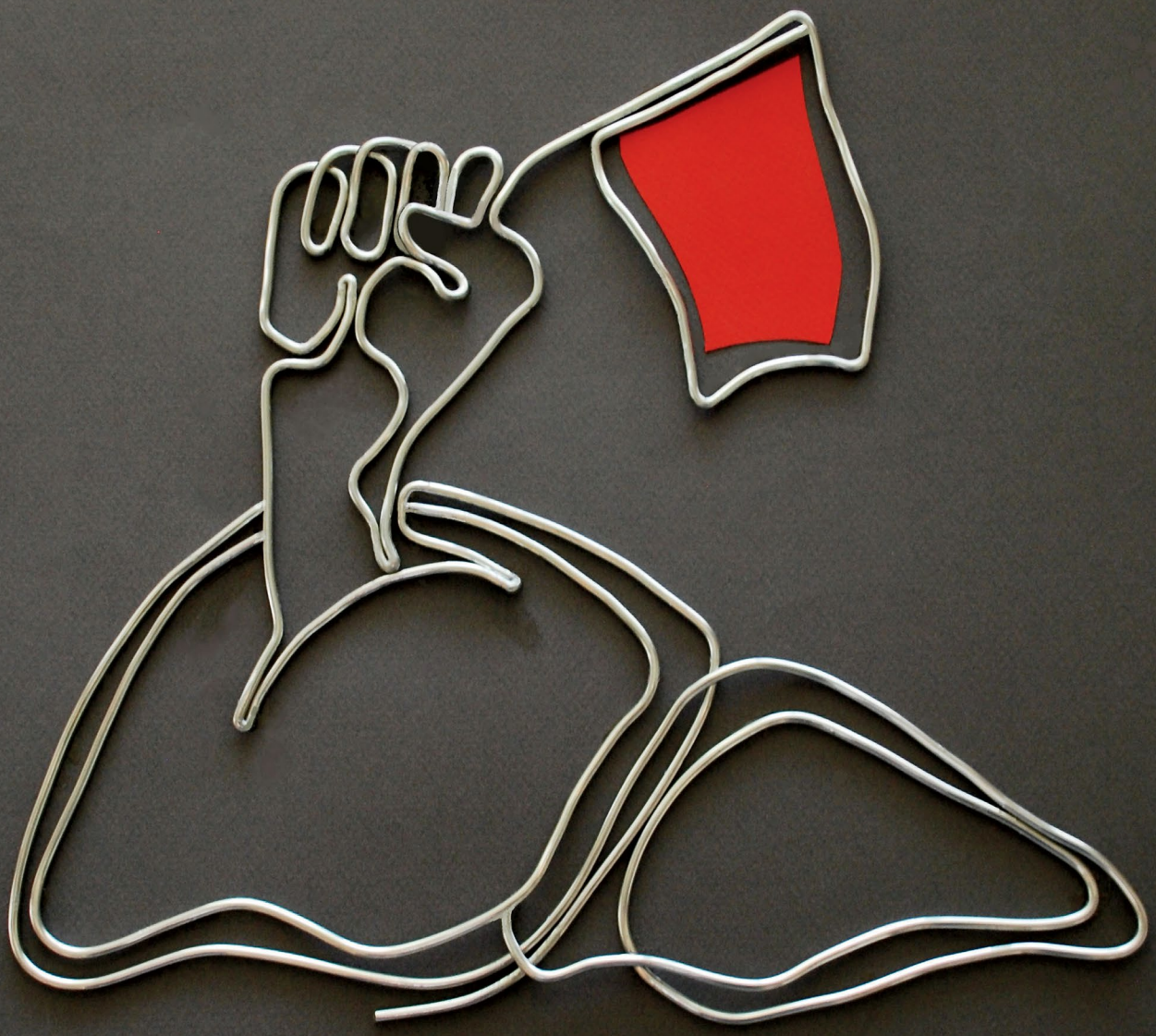
BCMJ
A Doctors of BC Publication

Chronic hepatitis B in British Columbia:

Updates from the 2025 Canadian Association for the Study of the Liver/ Association of Medical Microbiology and Infectious Disease Canada guidelines



IN THIS ISSUE

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Pages 225–264

Cardiac rehabilitation programs in BC face challenges that are resulting in gaps in services and variation in access. Cardiac Services BC conducted an environmental scan to assess current services and identify opportunities for improvement. "The current state of cardiac rehabilitation in British Columbia and Yukon: Mending the gaps" begins on page 240.

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.

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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.
Impact: Striving for healthier patients and communities by amplifying physicians' voices, opinions, research, and news.

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ON THE COVER
Recent guidelines on treating hepatitis B recommend universal one-time screening for adults, reflex hepatitis D virus testing, expanded treatment indications, and updated hepatocellular carcinoma surveillance, which should enable earlier diagnosis and treatment initiation. Article begins on page 246.

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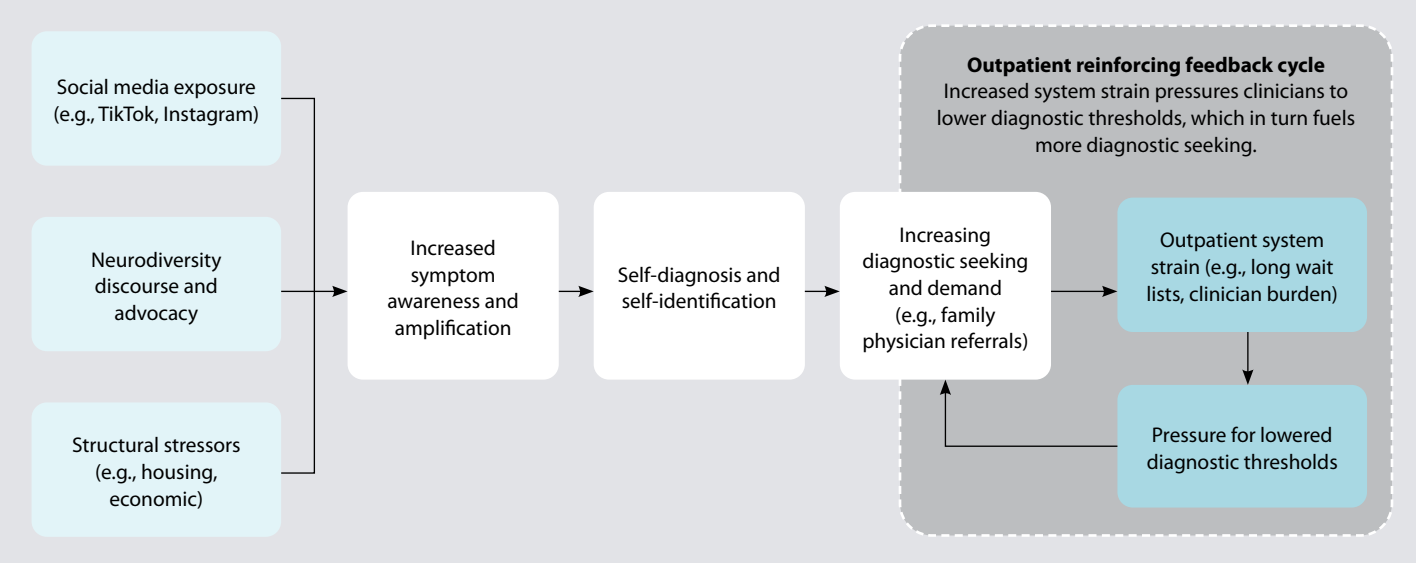

A conceptual model illustrates how converging digital, sociocultural, and economic factors lead to a reinforcing feedback loop that amplifies diagnostic rates in urban outpatient psychiatry and leads to system strain. "Rising demand for psychiatric diagnosis in urban British Columbia: Implications for the BC health care system" begins on page 234.

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Would you support your child being banned from social media?

"Can I have Snapchat? When can I get Snapchat? The only thing I want for my birthday is Snapchat. I will have zero friends without Snapchat. Seriously, Mom. Snapchat is not social media—you just don't understand because all you had was Facebook. This isn't fair. Everybody has Snapchat. I am literally the only one who doesn't."

It's easy to dismiss this as preteen hyperbole. But my son isn't entirely wrong. According to MediaSmarts, 86% of kids aged 9 to 11 years have at least one social media platform, despite nearly all platforms requiring users to be at least 13 years old.[1]

His pleas make me wonder: Am I protecting him or making him a social outlier? Am I preserving his childhood or becoming the gatekeeper of his friendships? I worry about opening the floodgates to a world where children are expected to post, respond, accumulate followers, remain perpetually available, and take the risk of being "blocked" into social exile.

In May 2026, *JAMA Pediatrics* published the largest longitudinal meta-analysis to date on digital media use and childhood development, encompassing nearly 19 000 participants (153 studies, 115 cohorts).[2] The paper looked only at longitudinal studies, meaning that the digital media exposure preceded the outcomes. The authors concluded that digital media use was consistently associated with poorer child and adolescent health and development outcomes, particularly for social media.

Social media was linked to higher rates of depression, self-injurious thoughts and behaviors, internalizing behaviors, externalizing behaviors, poorer self-perception, poorer academic achievement, increased substance use, and problematic Internet use. Importantly, not all digital media was equally harmful. Video games showed a more nuanced picture, with some negative associations but also a small positive association with attention and executive functioning.

The authors suggest that social comparison and the constant feedback inherent in social platforms can make younger adolescents particularly vulnerable. They describe social media as a "low-level transdiagnostic risk factor" with an effect size similar to poor diet and physical inactivity. While this does not prove causation, and it remains possible that vulnerable adolescents are drawn to social media, the accumulating evidence of harm to children should not be ignored.[2]

The lead author, Samantha Teague, is based in Australia, the first country to prohibit children under 16 years of age from holding accounts on major social media platforms. That 2024 legislation sparked international debate and has influenced policy discussions around the world. For example, in July 2026, the Special Panel on Child Safety Online presented its findings to the European Commission president as the European Union considers age-appropriate restrictions to platforms.[3]

Canada is moving in a similar direction with the introduction of the Safe Social Media Act (Bill C-34) on 10 June 2026.[4] Part 1, the Digital Safety Act, proposes new requirements for social media and artificial intelligence services, such as a minimum age requirement of 16 to access social media accounts, regulations on chatbots, and a duty to make specific types of sexual content inaccessible to better protect children. Part 2 would see the establishment of the proposed Digital Safety Commission of Canada to administer the framework. Parliamentary debate is expected to take place in the fall of 2026.

Should physicians support age-based restrictions on social media, or should we instead focus on harm reduction through education about content literacy, sleep hygiene, and online habits?

At this stage of my life, I support stronger government regulation.[5] I've heard the argument that this represents state substitution for parenting, but I see it differently. Public policy has long helped parents raise healthier children by mitigating transdiagnostic risk factors such as tobacco and alcohol.[6] Social media platforms are engineered by some of the world's most sophisticated technology companies to capture attention and maximize engagement. I don't believe parents alone should be expected to compete with that. ■

—Caitlin Dunne, MD, FRCSC

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More than just a beautiful game

As physicians, we spend much of our time helping patients navigate life after something has gone wrong. By the time they arrive in our offices, illness has often begun its quiet work of narrowing a life. Chronic pain can reduce a person's world to the dimensions of what they can carry, lift, or tolerate. Depression can make ordinary tasks feel implausibly heavy. Loneliness, although harder to chart and easier to miss, may be one of the most corrosive conditions of all: a gradual withdrawal from the people and places that once gave shape to joy and purpose.

We are well trained to respond to disease processes. But lately I find myself drawn to a different kind of clinical question: What keeps people connected, active, and tethered to the communities around them?

This summer, the beautiful game offered one answer.

The FIFA World Cup 2026 is easy to dismiss as an overpriced, commercialized sporting spectacle. And yet every few years it performs a social miracle. People gather in restaurants, parks, and city squares with a collective energy and an expectation to socialize with all those around them. In our current day, when so many of us spend copious amounts of time staring at our screens and relying on technology for even simple tasks, witnessing this level of connection and community is becoming uncommon. It seems the answer to our unprecedented levels of loneliness is simple—more community-centred events.

The World Cup gave people around the world a reason for friends to connect and family group chats to endlessly debate referee calls and last-minute goals. For a few weeks, people who may have little in common had shared rituals, conversation, and connection through a common experience. In my clinic, many appointments began not with symptoms but with conversations about the previous day's match. More than once, I ran behind schedule because we found ourselves reliving a dramatic finish or debating a controversial call. Those conversations may not appear in a medical record, but they remind me that strong health care is built not just through ordering medications and procedures but also through our relationships and connections with patients.

It seems the answer to our unprecedented levels of loneliness is simple—more community-centred events.

From a public health perspective, this type of connection matters. Loneliness and social isolation are increasingly recognized as serious threats to our health. Depression, anxiety, cardiovascular disease, cognitive decline, frailty, and premature mortality are all connected to chronic social isolation. We often speak about the importance of exercise and diet when it comes to chronic disease prevention. But our health is shaped by more than just our individual choices and risk factors. People and communities are healthier when they have a sense of belonging and social connection.

The World Cup represents more than just a corporate sporting event. It has demonstrated that what we have quietly forgotten is a core part of our mental well-being—human connection. For all the efficiencies of modern life, human beings still want to sit shoulder to shoulder, share a conversation, argue over a missed call, and feel that they are part of a collective experience, not just an individual behind a screen.

With the tournament now behind us, I hope we remember what it revealed. Healthy communities are not built solely through hospitals and clinics. They are built through parks filled with people of all ages who have access to affordable, inclusive sporting activities, community festivals, and public spaces where people can gather without needing an invitation.

As a physician, I will continue to advocate for movement and exercise, because they prevent disease. But perhaps I should be just as willing to advocate for the community infrastructure that allows people to connect with one another. ■

—Inderveer Mahal, MD, CCFP

Letters to the editor

We welcome original letters of less than 500 words; we may edit them for clarity and length. Email letters to journal@doctorsofbc.ca and include your city or town of residence, telephone number, and email address. Please disclose any competing interests.

Bravo for *BCMJ* cover art

As a longtime reader of the *BC Medical Journal*, I have always appreciated the appropriate and often whimsical artistic representation of the lead articles. With the FIFA tournament afoot, the cover illustration's depiction of the brain, the youth's body language, and the soccer ball by the bed were timely for the June 2026 issue!

Interestingly, the illustration also applies to other content in the issue that concerns brain health: permanent daylight saving time, fetal alcohol spectrum disorder and incarcerated people, young men's health, medication abortion, burnout, environmental history taking, and community health care!

Bravo to the artists and editors who have made these illustrations relevant and educational.

—Kwadwo Ohene Asante, MSM, BSc, MBChB, FRCPC
New Westminster

Re: Appropriate use of diagnostic tests in medical practice

It has been some time since I practised medicine actively, but I think there is some nuance required in the statement "It is not a sufficient justification to order a test solely to satisfy one's curiosity or to alleviate anxiety if the evidence does not support its use" [*BCMJ* 2026;68:141-144].

Stewardship of limited resources is the responsibility of everyone in the health care system. There can be and are different perspectives on what responsible decisions are. Evidence-based decisions are ideal but often lack precision and can be poorly informed. Curiosity is the foundation of clinical care—without it, differential diagnoses are not possible, and an evolving worldview is stymied. Algorithmic care, perhaps in the future mediated by artificial intelligence, may have value, but it will not replace the human side of medicine or substitute the need of physicians to advance their perspectives. Trust and human relationships remain the foundation of clinical care. Managing complexity and uncertainty remain the most challenging aspects of providing care. Therefore, I disagree. Curiosity is the *only* reason to order a diagnostic test; everything else is superfluous, even if alternative considerations are important.

As an example, my father-in-law recently died of metastatic cancer. His ordeal started when he complained of pain and disability in his right hip sufficient to stop working and to interfere with his responsibilities as a caregiver at home. His family doctor attributed his symptoms to trochanteric bursitis. However, despite time and treatment for bursitis, his symptoms worsened. Eventually, a diagnosis of metastatic cancer was made after an emergency admission and a CT scan. He died shortly after.

From my perspective, failed treatment is an indication for timely advanced investigations—curiosity and urgency—especially in a person who is disabled enough to stop working and is the primary caregiver of a wife with dementia. The lack of appropriate investigation in a timely manner is, from my perspective, linked to a dysfunctional health care system and also to promoted behavioral changes that may be inferred from the statement referred to above. I assume it was not the intent to discourage physicians from ordering tests or to inadvertently justify administrative decisions within a dysfunctional health care system, but I also think awareness of the potential unintended consequences of using platforms and words should be carefully considered.

Why would it be reasonable to assume that a physician ordered an investigation solely to satisfy their curiosity, and why would anyone presume that the evidence did not support its use? I think that a better recommendation might be "For the sake of responsible stewardship and in alignment with evidence-based care, medical decisions should include consideration of the entire clinical context and all competing interests."

—Scott A. Lang, MD, FRCPC, FANZCA (retired)
Calgary, Alberta

Re: Switching to permanent daylight saving time

I agree with Drs Schwandt's and Khorasani's editorials about the limitations of the transition to permanent daylight saving time in BC [*BCMJ* 2026;68:122; 2026;68:156-157,159]. Additionally, permanent daylight saving time is a contradiction, as daylight saving time is defined as moving clocks forward by 1 hour in the spring, then "falling back" as winter approaches. The reality is that BC has moved from Pacific Time (either Standard or Daylight) to Mountain Standard Time, defined as Coordinated Universal Time (UTC) – 7 hours. Mountain Time centres on a longitude of 105° W, passing near Regina, Saskatchewan. BC now uses the same clock as Arizona (which does not have daylight saving time). Alberta will switch to permanent Central Standard Time (UTC – 6 hours) so will remain 1 hour ahead. Premier Eby wants to rename

BC Mountain Time as "Pacific Time," but he is wrong: Pacific Standard Time remains UTC – 8 hours.

As Vancouver and Victoria are both farther west than 120° W longitude (corresponding to 8 hours west of the Greenwich meridian), to match geographic time to our circadian rhythm in the most populated areas of BC, we should move our clocks back—or perhaps just adopt permanent Pacific Standard Time, rather than permanent Mountain Standard Time. With the transition made, Dr Khorasani correctly notes that sunrise will be at 9 a.m. in the middle of winter in Victoria and Vancouver. As the BC coastline continues even farther west, going north, by December the sun will rise at around 10 a.m. in Prince Rupert, Stewart, and Haida Gwaii, but at 8 a.m. in Hyder, Alaska.

The time change will be a major disincentive for anyone who needs to get out of bed to go to work or school. And a sunset 1 hour later during the winter is unlikely to promote outdoor evening recreational activities, as it will be dark. I predict that this "experiment" will fail.

—Richard S. Taylor, MB BS, FRCPC
Victoria

Re: Stethoscope technology and use

In his letter about chest auscultation [*BCMJ* 2026;68:159], Dr Murray Trusler poses two questions: Why are doctors not applying stethoscopes to bare skin, and why are they not using electronic stethoscopes?

René-Théophile-Hyacinthe Laennec is said to have placed his ear directly to the bare chest of his patients. Then he transitioned to a tube of rolled paper for the sake of modesty, particularly with female patients (others say he did it to avoid the fleas).

While I occasionally experienced the latter when examining patients, perhaps modesty, medicolegal concerns, speed, and laziness are to be considered as the reasons for the current practice of auscultation through clothing.

As regards electronic stethoscopes, the cost (close to $2000 for some models) is undoubtedly a major prohibiting factor for medical students. That is when most of us make the investment in our first instrument, which we then continue with into office practice.

But Dr Trusler is correct that we seniors need all the help we can get when auscultating. As an intern in 1966, I recall eagerly presenting my findings of a faint diastolic murmur to the patient's older attending physician. When I asked for his opinion about it, he replied, "I tell you, Walter . . . I don't hear so good."

—Anthony Walter, MB BCh
Coldstream

Where do fee codes come from?

For many members of Doctors of BC, checking the box to join their section and society may seem like an unnecessary expense. What is a section's primary role,

anyway? What is the role of the two major societies—BC Family Doctors (previously the Section of General Practice) and Consultant Specialists of BC?

Like many things in life, it helps to follow the money trail. The first and foremost duty for sections is to manage their respective fee codes—amending existing codes and creating new ones. Just like conceiving a baby, the birth of a fee code takes two partners—the section and the Ministry of Health. It starts with a section recognizing when a new fee code is necessary to provide optimal patient care and ensure that its members are remunerated fairly. To fund a new fee code, the section must use money from its own budget, as allocated by the Physician Main Agreement. The section writes a proposal for review by the Ministry of Health. The ministry compares the proposed new fee code to existing fee codes and possibly to fee codes in other provinces and confirms the anticipated cost and use of the code. There is an active dialogue with the section about any issues the ministry foresees. Finally, the fee code is presented to the Doctors of BC Tariff Committee for review, and final approval is provided by the Medical Services Commission.

As you can imagine, coming up with a fee code, writing a proposal, interacting with the Ministry of Health, and possibly presenting to the Tariff Committee consumes time and, for most sections, is unpaid work done off the side of someone's desk. This process is not static. Fee codes must be updated periodically to reflect shifts in practice patterns and to update and modernize language. A large section like BC Family Doctors has staff support and contracted physicians with expertise to complete this crucial work. Consultant Specialists of BC has a single physician undertaking this work. For small sections with only a few executive members, there is no budget for physician stipends or staff. This leaves them isolated doing this work unpaid while putting them at a disadvantage to modernize fee codes and apply for new ones. Membership is a critical means of supporting this work, but more needs to be done.

Even though every couple is unique, the process of having a baby is the same. Similarly, each section and its fee code needs are unique, but the process to create or alter a fee code is similar. Having support to ensure that all physicians in BC have access to adequate economic assistance is essential. This is why BC Family Doctors and Consultant Specialists of BC are advocating for equitable economic support for all BC physicians undertaking Physician Main Agreement–related work, including section leaders.

Please consider becoming a member of your respective group today to support this important work and strengthen the voice of physicians across BC. ■

—Tahmeena Ali, MD
Chair, BC Family Doctors

—Robert Carruthers, MD
President, Consultant Specialists of BC

yaːy̓əstaɬ

As we approach the National Day for Truth and Reconciliation, we want to share more about the work of Doctors of BC's Indigenous Guiding Circle and reflect on what this journey has meant to us as individuals, health care leaders, and physicians committed to improving health care for Indigenous Peoples.

The Indigenous Guiding Circle was established by Doctors of BC's Board in March 2025 to guide the association in its commitment to truth and reconciliation and Indigenous-specific anti-racism. The Guiding Circle brings together five First Nations and Métis physicians, five First Nations and Métis community members from across the province, and the president of Doctors of BC.

The members of this group bring a deep knowledge of Indigenous health and the impacts of both colonization and Indigenous-specific racism in health care contexts. They also offer an understanding of Indigenous cultural safety and humility, as well as First Nations and Métis ways of knowing, cultural traditions, ceremonies, protocols, and traditional wellness practices. Their collective wisdom is helping shape Doctors of BC's Truth and Reconciliation Plan while encouraging thoughtful reflection on the association's history and the medical profession's role in the health care experiences of Indigenous Peoples.

Earlier this summer, the Guiding Circle was gifted the name yaːy̓əstaɬ by xʷməθkʷəy̓əm (Musqueam) Elders and cultural teachers, which means "working together" in the hən̓q̓əmin̓əm (Coast Salish) language. The name reflects both the spirit of the Guiding Circle and our shared commitment to moving this work forward in partnership, grounded in humility, mutual respect, and learning from one another. Guided by yaːy̓əstaɬ, we continue to review publicly available records and Doctors of BC archives as we look to understand the past to develop our Truth and Reconciliation Plan. Looking honestly at our history is not always easy, but it is necessary to help us better understand where we have come from, acknowledge the profession's role in past harms, and identify meaningful opportunities to build a different future together.

The Guiding Circle was gifted the name yaːy̓əstaɬ by xʷməθkʷəy̓əm (Musqueam) Elders and cultural teachers, which means "working together" in the hən̓q̓əmin̓əm (Coast Salish) language.

One of the greatest gifts of the Guiding Circle has been the opportunity to listen. Some of the most meaningful moments have come not from formal presentations or strategic discussions but from shared stories of lived experience, resilience, and hope. Those conversations have challenged assumptions, broadened perspectives, and reminded us that reconciliation is not a destination but an ongoing commitment to listening, learning, and being open to seeing the world through a different lens.

Our conversations have also reinforced that health is far more than the absence of illness. It is rooted in relationships—with family, community, culture, and the land—and in the understanding that the well-being of individuals cannot be separated from the well-being of the communities to which they belong. These teachings have guided Indigenous Peoples for generations and offer valuable lessons as we work to build a more compassionate, culturally safe, and patient-centred health care system. They also invite all of us to think differently about health, not only as clinicians but also as members of communities with shared responsibilities to one another and to future generations.

As physicians, we know that meaningful change happens through relationships. The same holds true for reconciliation. It requires openness, humility, accountability, and a willingness to keep learning, even when the conversations are difficult. While there is still much work ahead, we are grateful to be walking this path together with yaːy̓əstaɬ, in the spirit of *working together*. We remain committed to advancing truth and reconciliation, addressing anti-Indigenous racism, and helping build a health care system where Indigenous Peoples feel respected, safe, heard, and valued. ■

—Adam Thompson, MD
Doctors of BC President

—Kelsey Louie, MD
Doctors of BC Chief Medical Advisor, Indigenous Health Care

Rising demand for psychiatric diagnosis in urban British Columbia: Implications for the BC health care system

This narrative review integrates epidemiologic data, health care systems analysis, and conceptual literature, synthesizing clinical and policy-relevant insights.

Edwin Chete, MBBS, DPM, FRCPsych, FRCPC

ABSTRACT: Over the past decade, outpatient psychiatric services in Vancouver and across British Columbia have experienced a marked increase in referrals focused on diagnostic clarification for depression, anxiety disorders, attention-deficit/hyperactivity disorder, autism spectrum disorder, and broader constructs of neurodivergence. Increased demand appears to reflect multiple converging influences, including greater public awareness, evolving diagnostic frameworks, social media exposure, and structural and policy-related factors. While improved recognition may enhance access to care, increasing demand for diagnostic clarification may affect the distribution of limited specialist resources. A systems-informed stepped-care approach may help balance access to outpatient psychiatric services, diagnostic accuracy, and sustainability. Strengthening primary care capacity and aligning policy frameworks with functional needs may support more equitable and effective mental health care service delivery.

Dr Chete is a clinical associate professor in the Department of Psychiatry at the University of British Columbia and a staff psychiatrist for Vancouver Coastal Health and Providence Health Care. He has over 20 years of experience in psychiatry inpatient and outpatient care.

This article has been peer reviewed.

Over the past decade, outpatient psychiatric clinics in Vancouver and across British Columbia have experienced a notable increase in referrals focused on diagnostic clarification. Referrals increasingly involve concerns about depression, anxiety disorders, attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), and broader constructs of neurodivergence. This shift may reflect both evolving epidemiology and changing societal understandings of mental health, identity, and disability.

National surveys suggest that approximately 1 in 5 Canadians will experience a mental health disorder in any given year, with lifetime prevalence approaching 33%.[1] Mood and anxiety disorders are the most common diagnostic categories, accounting for most mental health care service utilization.[2] More recently, adult ADHD and ASD diagnoses have increased substantially, particularly among women and individuals without childhood documentation.[3,4] In British Columbia, administrative health data show a marked increase in mental health–related outpatient service utilization over the past decade, including rising demand for care associated with neurodevelopmental conditions.[5]

While improved recognition and reduced stigma may account for some of this increase, emerging evidence may suggest that broader sociocultural forces, digital health platforms, and economic incentives are also reshaping diagnostic landscapes.[6,7] The rise of neurodiversity discourse, social media–driven symptom awareness, and evolving disability accommodations may have collectively influenced patient expectations regarding diagnosis and identity.[8,9]

In publicly funded health care systems such as BC's, this increased diagnostic demand may present complex clinical, ethical, and operational challenges. Psychiatrists face growing demand for specialized assessments, often with limited resources, long wait lists, and competing clinical care priorities. Understanding the drivers, consequences, and policy implications of increasing diagnostic demand is, therefore, important for optimizing service delivery and safeguarding clinical standards.

This narrative review aims to examine the epidemiology, diagnostic evolution, sociocultural drivers, and health care systems implications of increasing diagnostic demand for depression, anxiety, ADHD, autism, and neurodivergence in urban outpatient psychiatry, with a particular focus on Vancouver and BC.

This article advances the premise that the increasing demand for psychiatric diagnostic evaluation—particularly for ADHD

and autism presentations—is reshaping outpatient psychiatry in BC. While improved recognition has clear benefits, this shift may also divert limited specialist resources away from longitudinal care for severe mental illness. This rising demand appears to be influenced not only by epidemiologic trends but also by social media exposure, evolving concepts of neurodiversity, and structural and policy-related incentives.

Changing patterns in psychiatric diagnosis

Depression and anxiety disorders

Mood and anxiety disorders are the leading causes of disability worldwide, accounting for more than 40% of years lived with disability attributable to mental illness.[10] Canadian data demonstrate increasing prevalence, particularly among adolescents and young adults, with depression rates nearly doubling between 2000 and 2020.[1,9] In British Columbia, administrative data demonstrate increased mental health service utilization, with notable growth among younger and midlife adults.[5]

Multiple factors likely contribute to these trends, including heightened mental health literacy, reduced stigma, economic precarity, housing instability, and the inadvertent psychological sequelae of digital connectivity.[11,12] The COVID-19 pandemic seems to have further amplified depressive and anxiety symptoms, with prevalence rates increasing by up to 25% globally.[13,14] In Vancouver, pandemic-related disruptions disproportionately affected marginalized populations, which exacerbated pre-existing mental health disparities.[5]

ADHD in adults

ADHD was historically conceptualized as a childhood disorder, yet longitudinal studies confirm persistence into adulthood in up to 60% of cases.[15] Population prevalence of adult ADHD is estimated at 2.5% to 4.4%.[16] However, available data suggest that diagnostic rates have increased sharply over the past decade, particularly among women and professionals.[17]

In British Columbia, psychotropic medication dispensing increased during the past decade, reflecting broader shifts in mental health service utilization.[5] While improved recognition of adult ADHD explains part of this trend, concerns regarding overdiagnosis and inappropriate prescribing have emerged.[18,19]

Autism spectrum presentations and neurodiversity-reported prevalence of autism spectrum presentations have increased over time, reflecting changes in diagnostic criteria, improved recognition, and expanded conceptual frameworks.[20,21] Adult diagnosis has become more common, particularly among individuals whose traits may not have been identified in childhood.

The concept of neurodiversity has contributed to a shift in understanding by framing autism and related conditions as part of natural variation in human cognition.[8,22] For many individuals, this perspective provides validation, identity, and access to supportive communities.

At the same time, these evolving frameworks introduce important considerations for how diagnostic thresholds, service eligibility, and clinical decision making are defined within health care systems.

Epidemiologic trends in BC

Observed diagnostic growth trends in BC are summarized in the **Table**. These estimates illustrate increasing service utilization across major diagnostic categories, particularly ADHD and autism.

The evolution of diagnostic criteria within the *Diagnostic and Statistical Manual of Mental Disorders (DSM)* appears to have influenced psychiatric case mix. Successive *DSM* editions have shown a need to broaden diagnostic thresholds and emphasize symptom dimensionality and functional impairment rather than categorical illness.[23]

For depression and anxiety, lowered symptom thresholds and reduced duration requirements may have expanded the diagnostic capture.[24] While facilitating early intervention, these shifts could conflate normative distress with psychopathology.[25]

In ADHD, expanded adult criteria introduced in the *DSM-5* increased diagnostic sensitivity but reduced specificity, particularly in populations with trauma, mood disorders, or executive dysfunction related to psychosocial adversity.[26] Similarly, the *DSM-5* reconceptualization of autism as a spectrum appears to have widened eligibility while possibly reducing distinctions between subclinical traits and clinically impairing syndromes.[4] However, it is important to recognize that for many individuals, neurodiversity frameworks provide validation, identity, and improved access to supportive environments.

These diagnostic expansions intersect with increasing self-diagnosis driven by online screening tools and social media narratives, which often lack psychometric rigor.[14,26,27] Clinicians increasingly encounter

TABLE. Estimated prevalence and diagnostic growth trends in British Columbia.

Condition	Estimated adult prevalence	10-year diagnostic growth
Depression	8% to 12%	+45%
Anxiety disorders	10% to 15%	+52%
Attention-deficit/hyperactivity disorder (ADHD)	2% to 4%	+110%
Autism spectrum disorder	1% to 3%	+175%

Sources: Statistics Canada; BC Ministry of Health; Canadian Institute for Health Information.[1,5,10]
Note: Growth estimates reflect increases in diagnostic volume and service utilization rather than population-adjusted prevalence rates. In particular, the +110% increase in ADHD represents increased diagnoses rather than a true doubling of prevalence.

patients who request formal diagnoses based on online symptom alignment, which raises ethical and epistemological challenges.[14,26,27]

Sociocultural drivers of diagnostic preoccupation

Platforms such as TikTok, Instagram, and Reddit have become major sources of mental health information, particularly for younger adults.[13] ADHD- and autism-related content appears to have proliferated, often presenting symptom lists that may emphasize common experiences such as distractibility, sensory sensitivity, or social discomfort.[17] While normalizing mental health struggles, these narratives may in some cases risk pathologizing everyday variability.[18]

Individuals exposed to high volumes of mental health content are more likely to self-identify with psychiatric diagnoses and seek formal assessment.[21] This phenomenon has been termed "diagnostic contagion," reflecting social amplification of symptom perception.[14] This is depicted in the **Figure**. Neurodiversity discourse may reframe diagnosis as identity, offering validation, community belonging, and access to accommodations.[8,9] In academic and workplace environments, formal diagnoses appear to have increasingly determined eligibility for educational supports, disability benefits, and workplace adjustments.[22]

While enhancing equity for individuals with genuine impairments, this dynamic may unintentionally incentivize diagnostic pursuit, thereby contributing to increasing demand within publicly funded health care systems.[25]

Vancouver's housing crisis, income inequality, and cost-of-living pressures exert profound psychological effects.[2] Increasing diagnostic demand may partially reflect potential medicalization of social suffering as individuals seek clinical explanations for distress rooted in structural adversity.[18]

Clinical implications in outpatient psychiatry

Urban outpatient psychiatry clinics increasingly devote substantial resources to diagnostic clarification rather than longitudinal treatment of complex illness.[2,5] Increasing outpatient demand in British Columbia has contributed to pressures on psychiatric service capacity, with clinics reporting challenges in meeting rising volumes of referrals.[5] This diagnostic surge may disproportionately affect individuals with severe mental illness, whose access to specialist care may be delayed as clinics manage high volumes of apparent low-risk diagnostic referrals.[5]

High diagnostic demand may amplify the risk of overdiagnosis or misclassification, particularly in borderline presentations overlapping with trauma, personality traits, and situational stress.[25,26] Overdiagnosis may lead to unnecessary pharmacotherapy, stigma, and reduced self-efficacy.[26] Conversely, failure to validate patient concerns risks reducing therapeutic alliance. Balancing diagnostic precision with empathic engagement is a core clinical challenge.[25]

Diagnostic expansion raises fundamental ethical questions regarding medical authority, patient autonomy, and distributive justice. Labeling normative cognitive and emotional variability as disorder risks reinforcing pathologization while diverting limited resources from individuals with apparently more disabling illness.[6]

Clinicians must navigate tensions between validating lived experience and preserving diagnostic integrity, particularly when diagnoses could in some cases confer social and economic benefits.[2]

Health care systems and policy implications in BC

The increasing demand for psychiatric diagnosis has substantial implications for

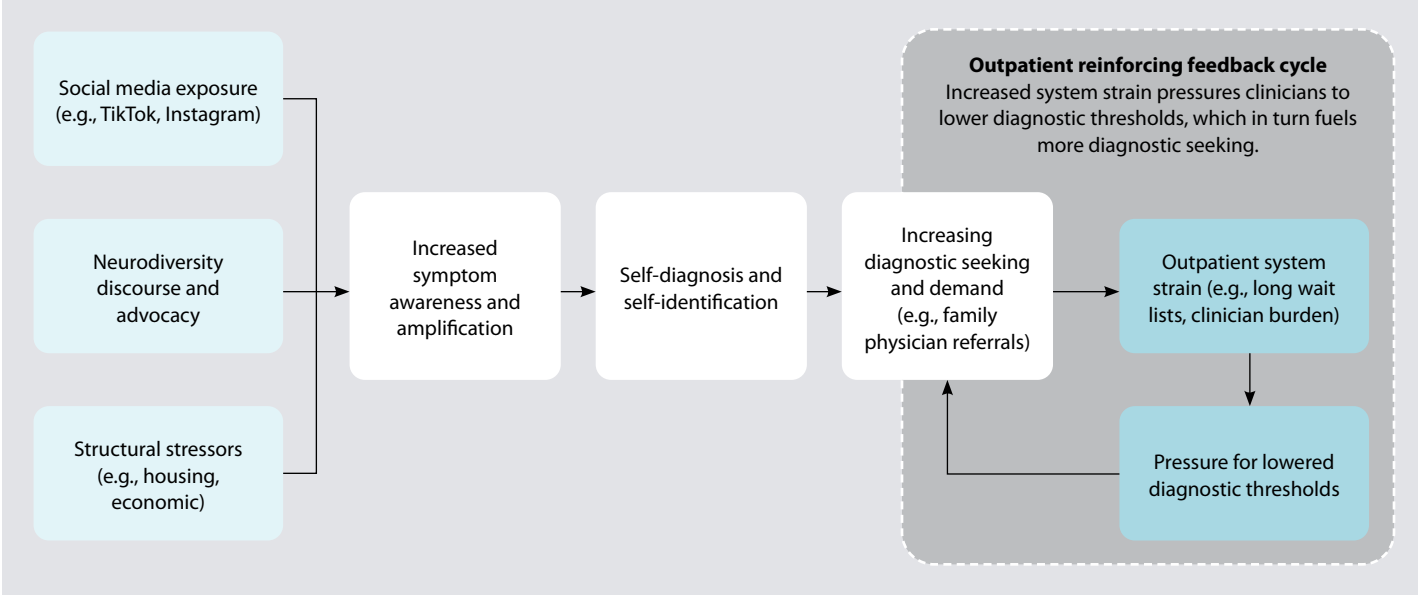

FIGURE. Refined conceptual model of diagnostic amplification in urban outpatient psychiatry. This model illustrates how converging digital, sociocultural, and economic factors lead to a reinforcing feedback loop that amplifies diagnostic rates and system strain.

BC's publicly funded health care system. BC faces ongoing shortages of psychiatrists, particularly in community outpatient settings. Increasing outpatient demand in British Columbia has contributed to pressures on psychiatric service capacity, with clinics reporting challenges in meeting rising volumes of referrals.[5] Shifting appropriate diagnostic assessment to primary care, supported by standardized tools and specialist consultation, could optimize system efficiency.[25]

Collaborative care models that integrate family physicians, psychologists, and psychiatrists demonstrate improved outcomes and reduced wait times.[27] Expanding access to evidence-based psychotherapy and neuropsychological assessment within primary care may reduce unnecessary psychiatric referrals.[22]

Provincial disability benefits and academic accommodations frequently require formal psychiatric diagnoses, which inadvertently incentivizes diagnostic pursuit.[22] Policy reforms that emphasize functional assessment over categorical diagnosis may reduce increased diagnostic demand while preserving equitable access.[22]

Oversight of online mental health content and commercial diagnostic platforms appears to be limited. Developing evidence-informed digital literacy initiatives could mitigate misinformation and unrealistic diagnostic expectations.[27]

Drivers of increased diagnostic demand

Multiple interacting factors contribute to increasing diagnostic demand. Digital platforms and social media have become major sources of mental health information, particularly among younger populations. Exposure to symptom-based content may influence self-identification and help-seeking behavior. Sociocultural shifts increasingly frame diagnosis as identity and a pathway to accessing supports.[8,9,22] Structural stressors—including housing instability and economic pressures—also contribute to distress and may influence diagnostic seeking.[12]

These interacting pathways are summarized in the **Figure**. This conceptual model illustrates how digital exposure, sociocultural factors, and structural pressures may contribute to increasing demand for psychiatric diagnosis. The model is an interpretive synthesis of the literature and is not derived from a single empirical data set.

Collaborative care models that integrate family physicians, psychologists, and psychiatrists demonstrate improved outcomes and reduced wait times.

Discussion

The expanding diagnostic preoccupation observed in outpatient psychiatry necessitates a comprehensive, multidisciplinary research and policy agenda. Several priority domains merit focused investigation.

There is a striking paucity of long-term outcome data for adults newly diagnosed with ADHD or ASD. Most existing longitudinal cohorts focus on childhood-onset cases, which limits applicability to adult-diagnosed populations.[16,21] Prospective studies that examine functional outcomes, quality of life, occupational stability, and health care service utilization following adult diagnosis are urgently needed.

Such research should also examine potential inadvertent effects of diagnosis, including possible identity consolidation around illness narratives, medication dependency, and altered self-expectations.[25,26] Understanding both the benefits and unintended consequences of diagnosis is essential for developing balanced diagnostic frameworks.

Borrowing from antimicrobial stewardship paradigms, the concept of diagnostic stewardship emphasizes appropriate use of diagnostic labels to maximize clinical benefit while minimizing harm.[6,25] This approach could involve standardized referral criteria, stepped assessment protocols, and multidisciplinary triage models.

Randomized implementation trials that compare traditional open-access psychiatric referral pathways with stepped-care diagnostic models could clarify optimal service configurations.[25,27] These studies should measure outcomes, including wait times, diagnostic yield, patient satisfaction, symptom improvement, and system-level cost-effectiveness.

Expanding diagnostic and therapeutic capacity within primary care is an urgent systems lever. Targeted training initiatives in ADHD assessment, autism screening, and mood disorder differentiation may substantially reduce unnecessary psychiatric referrals.[22,25]

Integrating validated screening instruments, clinical decision-support tools, and specialist consultation services within primary care could enhance diagnostic accuracy while preserving access equity. Such models require rigorous evaluation within BC's primary care networks and longitudinal funding commitments.

Given the significant influence of social media on diagnostic awareness, public mental health care strategies should increasingly address digital literacy.[13,14] Evidence-informed public education campaigns could promote nuanced understanding of psychiatric symptoms, diagnostic thresholds, and normal psychological variability.

Partnerships between public health authorities, academic institutions, and digital platforms may facilitate development of high-quality mental health content that balances validation with clinical rigor.[27]

Provincial disability and accommodation frameworks currently emphasize categorical diagnosis.[22] Transitioning toward function-based eligibility models may mitigate increased diagnostic demand while preserving equitable access to supports.

Pilot programs that evaluate functional assessment tools within postsecondary institutions, workplaces, and social assistance programs could generate critical policy evidence. These initiatives must

carefully monitor unintended consequences, including potential exclusion of vulnerable populations.

Administrative data from British Columbia highlight the need for system-level analyses examining how rising service utilization affects access for individuals with severe and persistent mental illness.[5] Modeling studies could quantify the trade-offs between diagnostic expansion and access to care for individuals with severe and persistent mental illness, which would inform system-level prioritization.

Study limitations

Several methodological and conceptual limitations warrant careful consideration.

First, this article is a narrative review rather than a systematic review or meta-analysis. While this approach allows for integrative synthesis across epidemiological, sociocultural, and health care systems domains, it may introduce selection bias in the literature included. Priority was given to high-quality population studies, systematic reviews, and policy-relevant publications; however, important regional data may be unpublished or inaccessible, particularly within health authority quality improvement databases.[1,5]

Second, administrative health data used to infer diagnostic trends are limited by coding practices, billing incentives, and variations in diagnostic documentation.[5] Changes in service utilization may reflect evolving physician billing behaviors, diagnostic labeling practices, or health care system restructuring rather than true changes in prevalence. Furthermore, diagnostic coding lacks granularity, which limits differentiation between provisional, confirmed, and rule-out diagnoses.[23,24]

Third, much of the emerging literature on neurodiversity, digital health, and diagnostic identity is qualitative or theoretical. While these frameworks provide valuable sociocultural context, empirical outcome data are sparse. This limits definitive conclusions regarding the long-term benefits and risks of expanded diagnostic conceptualizations, particularly in adult populations.

Fourth, social media–driven diagnostic awareness is a rapidly evolving phenomenon.[13,14] The digital landscape changes at a pace that outstrips traditional academic publishing, which renders many observations temporally contingent. As platform algorithms, content moderation policies, and user demographics shift, the influence of social media on diagnostic self-concept may evolve in unpredictable ways.

The increasing diagnostic preoccupation with depression, anxiety, ADHD, autism, and neurodivergence arguably represents a consequential paradigm shift in contemporary psychiatry.

Fifth, the Vancouver-centric focus of this analysis may limit generalizability. Although urban psychiatric clinics across Canada report similar trends, local sociodemographic characteristics, housing markets, service availability, and cultural norms uniquely shape help-seeking behaviors in BC.[2,18] Rural and remote communities face distinct access barriers and may exhibit different diagnostic patterns.[5]

Finally, the conceptual critique of diagnostic expansion must be balanced against the legitimate needs of individuals who have historically faced underdiagnosis, particularly women, racialized populations, and neurodivergent adults.[4,17,22] Efforts to recalibrate diagnostic thresholds should avoid reintroducing barriers to care or perpetuating systemic inequities.

Conclusions

The increasing diagnostic preoccupation with depression, anxiety, ADHD, autism, and neurodivergence arguably represents a consequential paradigm shift in contemporary psychiatry. This transformation reflects evolving diagnostic frameworks, expanding neurodiversity discourse, unprecedented digital information dissemination, and intensifying structural stressors within urban environments.

At its best, enhanced diagnostic awareness promotes early identification, destigmatization, and access to supportive interventions. Historically marginalized populations, particularly women, neurodivergent adults, and individuals with complex presentations, stand to benefit from more inclusive diagnostic practices.[4,17] However, when diagnostic expansion proceeds without commensurate system capacity, evidence-based thresholds, and policy alignment, unintended consequences may ensue.

In BC's publicly funded health care system, expanding diagnostic demand strains outpatient psychiatric capacity, prolongs wait times, and risks displacing individuals with severe mental illness from timely access to specialist care.[5] The ethical imperative of distributive justice demands careful stewardship of limited psychiatric resources.[5,6]

Furthermore, excessive medicalization of normative distress could risk narrowing the conceptual space for human variability, resilience, and adaptive coping.[6,7] Psychiatry should resist the conflation of suffering with disorder, particularly in contexts shaped by social inequity, housing instability, and economic precarity.[2,18] A more expansive public mental health care approach that integrates social policy, community supports, and preventive interventions may better address the upstream determinants of psychological distress.

The emerging paradigm of diagnostic stewardship offers a promising framework for balancing accuracy of psychiatric diagnosis, access to related health care services, and equity among those who require care. By embedding stepped-care principles, primary care integration, and functional assessment models within service design, BC can recalibrate its psychiatric care pathways toward sustainability.[22,25]

Ultimately, the challenge confronting contemporary psychiatry is not merely diagnostic precision but epistemological

humility: recognizing the limits of categorical frameworks, respecting lived experience without surrendering clinical rigor, and stewarding finite resources in service of population-level mental health care. Achieving this balance will require sustained collaboration among clinicians, policymakers, educators, and communities.

If successfully navigated, the current diagnostic transformation may represent not a challenge but an opportunity to build a more responsive, humane, and equitable mental health care system for British Columbians. ■

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Artificial intelligence

The **Figure** was created with assistance from Google Gemini based on the author's conceptual framework.

Competing interests

None declared.

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The current state of cardiac rehabilitation in British Columbia and Yukon: Mending the gaps

This province-wide environmental scan found that only 47% of programs offer all six core components of cardiac rehabilitation programs recommended by the Canadian Association of Cardiovascular Prevention and Rehabilitation.

Valerie Barrette, RN, MScN, Kelly Mackay, RN, MA, Darien Grace, MD, Souhaila Hussain, MA, Elizabeth Swiggum, MD, FRCPC, FCCS, Nathaniel Moulson, MD, MHA, FRCPC

ABSTRACT

Background: Cardiac rehabilitation has been shown to decrease cardiovascular mortality by 26% and hospital readmissions by 18%, yet only 34% of eligible Canadian patients studied participated. Cardiac Services BC conducted an environmental scan to assess current cardiac rehabilitation services and identify opportunities for improvement.

Methods: A cross-sectional survey was sent to all cardiac rehabilitation programs in British Columbia and Yukon to understand the availability and quality of cardiac rehabilitation services.

Results: Respondents from all programs completed the survey (35 responses representing 43 programs). Six of the survey respondents represented 14 cardiac rehabilitation programs as affiliated programs under one governing body. Approximately 6100 patients are enrolled in a cardiac rehabilitation program in BC annually. Most (65%) of the programs offered education and exercise. Only 47% offered all core components surveyed. Perceived service delivery barriers included unmet demand, barriers to access, instability of existing services, and limited adoption of virtual health.

Conclusions: Cardiac rehabilitation programs face significant challenges despite proven benefits. Potential opportunities to improve access to these programs include developing comprehensive provincial service delivery models aligned with cardiac rehabilitation guidelines that include evidence-based clinical practice, defined program models, access benchmarks, operational structures and processes, and performance outcome measurements.

Ms Barrette is a provincial clinical nurse specialist at Cardiac Services BC (CSBC). Ms Mackay is a senior director of provincial quality, research, and integrated care at CSBC. Dr Grace is a resident in the Department of Medicine at the University of British Columbia. Ms Hussain is a coordinator of provincial system planning at CSBC. Dr Swiggum is a cardiologist at Island Health, a clinical associate professor at UBC, and a director on the Doctors of BC Board. Dr Moulson is a medical director at the Centre for Cardiovascular Health and Prevention at the Dilawri Cardiovascular Institute, a preventive and sport cardiologist at SportsCardiologyBC, and a clinical assistant professor at UBC.

Corresponding author: Ms Valerie Barrette, valerie.barrette@phsa.ca.

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Background

Cardiac rehabilitation is a multidisciplinary, systematic, yet personalized therapeutic intervention for the provision of evidence-based secondary prevention care in patients with cardiovascular disease.[1] Cardiac rehabilitation is typically delivered as a suite of education sessions and supervised group exercise classes. The Canadian Association of Cardiovascular Prevention and Rehabilitation's clinical practice guidelines recommend that all cardiac rehabilitation programs have the following core components: patient assessment, risk stratification, health behavior interventions, risk factor modification, exercise training, patient education, and continuous assessment of performance measures.[1]

In a study by Anderson and colleagues, cardiac rehabilitation decreased cardiovascular mortality by 26% and hospital readmissions by 18% in patients referred.[2] Other benefits included reducing risk factors for cardiovascular disease[3] and improving overall function, quality of life,[4] psychological well-being, anxiety, and depression.[5] Additionally, participation in cardiac rehabilitation is associated with savings of up to $3000 in annual health care resource utilization per patient.[6] Despite these benefits, cardiac rehabilitation remains largely underutilized: in a study by Grace and colleagues, only 34% of eligible Canadian patients studied participated in a cardiac

rehabilitation program.[7] Furthermore, evidence suggests there is insufficient access to programs and scant strategies to increase equity for underrepresented groups.[7]

In British Columbia, there is no provincial oversight for cardiac rehabilitation services. Cardiac rehabilitation programs are funded using a mixed model: regional health authorities' global budget, not-for-profit organizations' donations, private funding, and revenue from direct costs to patients. Some extended medical benefits reimburse cardiac rehabilitation costs for patients.

In 2017, Cardiac Services BC led a provincial forum to review the state of cardiac rehabilitation and inform the development of a long-term strategy to improve equitable access to care.[8] The Heart and Stroke Foundation also developed the national Heart Failure Resources and Services Inventory to gather data on the hospital-based services available to people with heart failure across Canada, including a focus on cardiac rehabilitation.[9] Clinician leaders established provincial networks to create a services inventory to improve patient and provider knowledge of available cardiac rehabilitation services. Insufficient baseline cardiac rehabilitation services were identified provincially and nationally as a key issue requiring a provincial approach.

The current availability and quality of cardiac rehabilitation services in BC and Yukon were unknown. The primary objective of this environmental scan was to evaluate the state of cardiac rehabilitation services in these regions.

Methods

A cross-sectional survey of all cardiac rehabilitation programs in BC and Yukon was performed between March and June 2023 (see the supplemental material available at bcmj.org). The survey, which was developed by a Cardiac Services BC team and provincial subject matter experts, addressed a wide range of topics, including care delivery models and program core components.

Forty-three cardiac rehabilitation programs were identified using an updated provincial inventory. Thirty-five online surveys were administered; six of the survey results represented 14 cardiac rehabilitation programs as affiliated programs under one governing body (i.e., a hospital-based program and affiliated community programs). The survey results represented all 41 operational cardiac rehabilitation programs and one program temporarily on hold in BC (97.7%) and one operational cardiac rehabilitation program in Yukon (2.3%); together, they represented 10 hospital programs, 31 community programs, and two fully virtual programs. Yukon's only cardiac rehabilitation program was included because its patients are often transferred to BC for cardiac procedures.

Checkbox Survey software was used, and surveys were sent to each cardiac rehabilitation program's medical director or program manager via email. Participation in the survey was voluntary.

Rural and urban cardiac rehabilitation programs were defined based on their geographic location. Multidisciplinary cardiac rehabilitation teams were defined as consisting of health care professionals from three or more disciplines. High-risk patients were defined based on the American Association of Cardiovascular and Pulmonary Rehabilitation's guidelines.[10]

This study was conducted as a quality improvement initiative and did not require formal research ethics approval, as per standard ethical guidelines. Descriptive statistical methods were employed to analyze survey responses. When possible, responses were provided at the individual program level (n = 43); otherwise, aggregate program responses were used (n = 35).

Results

Thirty-five responses were received (100% response rate), representing 43 cardiac rehabilitation programs within BC and Yukon. Ten were from rural programs. Annual reported patient intakes ranged from 5 to 1200, and enrollment in programs that provided an exercise component ranged from 27 to 800 participants.

Access

Seventy-seven percent (33/43) of cardiac rehabilitation programs were in urban centres **[Table 1]**; 23% (10/43) were in rural communities **[Table 2]**.[11] Eighty-eight percent (38/43) of cardiac rehabilitation

TABLE 1. Cardiac rehabilitation core components for urban programs, by region.*

Component	Interior Health	Vancouver Coastal Health/ Providence Health	Fraser Health	Island Health	Northern Health
No. of programs	8	11	7	5	2
Medical assessment/ risk stratification	88%	82%	86%	40%	0%
Interprofessional health care team	50%	82%	100%	60%	0%
Exercise with individualized exercise prescription	100%	100%	100%	80%	100%
Heart disease and risk factor education	63%	82%	86%	60%	100%
Behavioral modification strategies	100%	82%	71%	80%	50%
Nutritional counseling	50%	82%	86%	40%	0%

* Yukon has no urban cardiac rehabilitation programs.
Source: Adapted from a poster presented at the 2024 Canadian Cardiovascular Congress.[11]

TABLE 2. Cardiac rehabilitation core components for rural programs, by region.*

Component	Interior Health	Vancouver Coastal Health/ Providence Health	Island Health	Northern Health	Yukon
No. of programs	4	2	1	2	1
Medical assessment/ risk stratification	0%	100%	100%	50%	0%
Interprofessional health care team	25%	100%	0%	50%	100%
Exercise with individualized exercise prescription	75%	100%	100%	50%	100%
Heart disease and risk factor education	100%	100%	100%	100%	100%
Behavioral modification strategies	100%	100%	100%	50%	100%
Nutritional counseling	25%	0%	0%	100%	100%

* Fraser Health has no rural cardiac rehabilitation programs.
Source: Adapted from a poster presented at the 2024 Canadian Cardiovascular Congress.[11]

TABLE 3. Estimated annual population need for cardiac rehabilitation in BC.

Indications for cardiac rehabilitation	Estimated incidence*
Post-percutaneous coronary intervention	7856
Post-coronary artery bypass grafting (isolated)	1744
Post-valvular heart surgery (isolated)	430
Post-implantable cardioverter-defibrillator/cardiac resynchronization therapy implant	952
Other (e.g., post-ST-segment-elevation myocardial infarction, post-non-ST-segment-elevation myocardial infarction or unstable angina, stable coronary artery disease without recent intervention, stable chronic heart failure with reduced ejection fraction, post-heart failure hospitalization, atrial fibrillation, spontaneous coronary artery dissection, post-heart transplant)	Data unavailable

* Data source: Cardiac Services BC database (fiscal year 2022–23).[12]

programs provided their services solely in English. Sixty-seven percent (29/43) of cardiac rehabilitation programs required patients to pay out-of-pocket expenses, whereas financial assistance was offered in 21% (9/43) of programs.

Based on survey responses from active cardiac rehabilitation programs, 6111 patients (including all indications) are enrolled in a cardiac rehabilitation program in BC annually. However, in fiscal year 2022–23, 10 982 BC patients underwent cardiac procedures that included indications for cardiac rehabilitation **[Table 3]**.[12]

Cardiac rehabilitation enrollment indications

All programs reported accepting standard cardiac rehabilitation indications of post-percutaneous coronary intervention for stable coronary artery disease, post-coronary artery bypass grafting, and post-ST-segment-elevation myocardial infarction **[Figure]**.[11] Nearly all programs reported accepting standard cardiac rehabilitation indications of post-valvular heart surgery (34/35; 97%), post-non-ST-segment-elevation myocardial infarction or unstable angina (34/35; 97%), and stable coronary artery disease without recent intervention (34/35; 97%). Most (30/35; 86%) programs reported accepting high-risk patients, as defined by the American Association of Cardiovascular and Pulmonary Rehabilitation.[10] Sixty-three percent (22/35) of programs reported accepting patients with all surveyed cardiac rehabilitation indications.

Care teams

Multidisciplinary teams were present in 60% (21/35) of programs. Seven percent (3/43) of cardiac rehabilitation programs included one type of health care professional only; 23% (10/43) relied on two types of health care professionals, predominantly a certified exercise physiologist/kinesiologist, an exercise class leader/personal trainer, or a registered nurse. Fifty-three percent (23/43) of programs had a medical director. Cardiac rehabilitation teams consisted of registered nurses (25/35; 71%), certified exercise physiologists/kinesiologists (27/35; 77%), dietitians (21/35; 60%), exercise class leaders/personal trainers (12/35; 34%), psychologists (2/35; 6%), social workers (7/35; 20%), psychiatrists (3/35; 9%), pharmacists (5/35; 14%), physiotherapists (5/35; 14%), occupational therapists (4/35; 11%), physical therapists (1/35; 3%), athletic therapists (1/35; 3%), licensed practical nurses (1/35; 3%), and physiatrists (1/35; 3%).

Program components

Reported baseline participant assessment included depressive symptoms screening; laboratory results; and measurement of blood pressure, heart rate, and waist circumference or body mass index. In addition, 40% (17/43) of programs recommended a pre-enrollment graded exercise stress test for risk stratification and exercise prescription purposes for all patients, 19% (8/43) did so for select patients only, 9% (4/43)

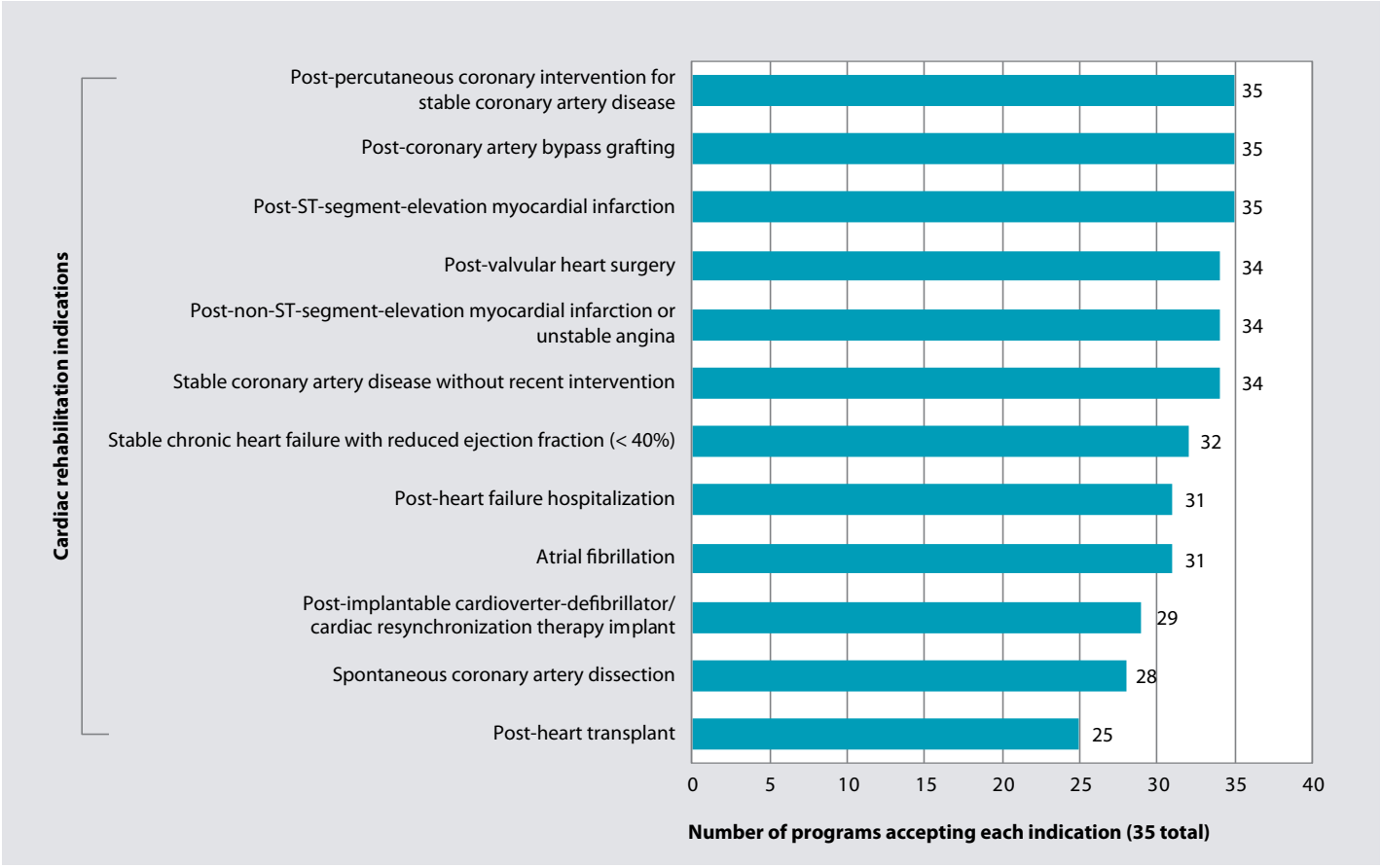

FIGURE. Indications accepted by cardiac rehabilitation programs in BC and Yukon.
Source: Adapted from a poster presented at the 2024 Canadian Cardiovascular Congress.[11]

relied on cardiologist discretion, and 33% (14/43) did not require a stress test prior to enrollment.

Forty-seven percent (20/43) of programs offered all six cardiac rehabilitation program core components surveyed **[Table 1, Table 2]**.[11]

Delivery models

Most (28/43; 65%) cardiac rehabilitation programs offered both exercise and education. Several (12/43; 28%) programs offered an exercise component but did not have their own education component, so they sometimes referred patients to a different program for educational needs. Seven percent (3/43) of cardiac rehabilitation programs offered education only. Exercise and education were offered in person and/or virtually **[Table 4]**. Virtual cardiac rehabilitation care delivery included synchronous ("real-time") virtual exercise sessions and/or individualized self-directed exercises. Finally, 25% (10/40) of cardiac rehabilitation programs that offered an exercise component also offered a remote monitoring/virtual option.

Data collection

Fifty-one percent (22/43) of cardiac rehabilitation programs collected operational site-specific data electronically.

Discussion

This study identified four key findings regarding the current state of cardiac rehabilitation services in BC and Yukon. First, most cardiac rehabilitation programs accept patients who have most or all established guideline indications for participation in cardiac rehabilitation, as well as patients deemed to be at high risk of adverse cardiovascular events with exercise.

Second, slightly less than half of programs offer all six cardiac rehabilitation program core components surveyed. More information is needed to understand the reasons for this variation across programs.

TABLE 4. Education and exercise delivery models.

Education delivery model	No. of programs
In person only	13 (42%)
Both in person and virtual	13 (42%)
Virtual only	5 (16%)
Total	**31**

Exercise delivery model	No. of programs
In person only	24 (60.0%)
Both in person and virtual	15 (37.5%)
Virtual only	1 (2.5%)
Total	**40**

In the current literature, core components of cardiac rehabilitation programs vary slightly. They are used by cardiac rehabilitation programs as a foundation for developing their services, while considering local factors involved.[1,13,14]

Third, cardiac rehabilitation programs in BC are run by various types of health professionals. Multidisciplinary teams are present in most programs and are slightly more common in urban cardiac rehabilitation programs. However, only about half of programs included a medical director. The Canadian Association of Cardiovascular Prevention and Rehabilitation's guidelines[1] identify key roles that should be integrated into all cardiac rehabilitation programs, including a medical director, program manager, administrative assistant, health educator, and exercise therapist. Cardiac rehabilitation program capacity, services offered, complexity of patient population served, and human and program resources impact the number and type of health care professionals within each program.

Last, many cardiac rehabilitation programs reported barriers to access, including inequitable geographic distribution that favors urban centres, limited virtual services, limited availability of languages other than English, and out-of-pocket expenses. The Canadian Association of Cardiovascular Prevention and Rehabilitation's recommendations[1] indicate that cardiac rehabilitation should be equally accessible to all patients after a cardiac event, particularly people from groups that are less likely to access this service (e.g., people from underrepresented groups or who have lower socioeconomic status, older age groups, women, persons from rural communities, those with mental and physical health comorbidities). Based on the survey results, there is insufficient and inequitable access to cardiac rehabilitation in BC.

The results indicate the need for provincial service delivery models and improved information availability to address unmet demand, instability of existing cardiac rehabilitation services, and limited adoption of virtual health.

Unmet demand

Cardiac rehabilitation programs reported that they are unable to meet demand. When considering the complete list of cardiac rehabilitation indications, there are inadequate data at the provincial level to understand that unmet need and the opportunities to build on existing services.

Instability of existing services

Cardiac rehabilitation service delivery lacks continuity. An internal cardiac rehabilitation program inventory update indicated that more than 20 cardiac rehabilitation programs have closed since 2017, mostly programs that depended on limited teams to provide services (unpublished data). The high rate of closure of cardiac rehabilitation programs and the wide variation in services offered across health authorities leads to a constantly changing inventory of operational cardiac rehabilitation programs, which makes it challenging for health care providers to stay up to date. This highlights the need for a more sustainable cardiac rehabilitation model in BC. Contact information for BC cardiac rehabilitation programs is provided in the Pathways Community Service Directory (www.pathwaysbc.ca).

Limited adoption of virtual health

The COVID-19 pandemic had a large impact on all cardiac rehabilitation programs, which resulted in a rapid shift in delivery models from in-person to virtual care. Effective cardiac rehabilitation can be delivered using a virtual approach and can have similar patient outcomes and safety as in-person, centre-based programs.[15] To help address gaps in care and improve cardiac rehabilitation delivery, existing cardiac rehabilitation programs are encouraged to develop sustainable virtual options.[15] This will improve access to this essential service, especially for those in rural communities.

Opportunity for provincial service delivery model

A comprehensive provincial service delivery model, aligned with cardiac rehabilitation guidelines, should include evidence-based clinical practice, defined program models, access benchmarks, operational structures and processes, and performance outcome measurements. Such a model is needed to provide guidance and a road map for regions to standardize existing cardiac rehabilitation programs, develop new cardiac rehabilitation programs, and contribute to the development of a sustainable provincial cardiac rehabilitation model.

Need for improved information

Wait times, volumes, and access measures: The latest Canadian Cardiovascular Society access benchmark recommends that patients access cardiac rehabilitation services within 30 days of discharge.[16] Provincially, accurate numbers of patients who are accessing cardiac rehabilitation services and their wait times are unknown. This makes it impossible to determine if this benchmark is being met and the full extent of service demand and unmet need. In 2021, the Office of the Auditor General of Ontario[17] recommended collecting information on outpatient cardiac rehabilitation services to provide access to appropriate rehabilitation for patients who have cardiac disease and to better understand referral patterns and the reasons for program completion. A similar approach within BC would help in determining wait times, patient volumes, and program completion rates, and would support effective health care system planning.

Performance/outcome measurement: There is a lack of data to measure the effectiveness of cardiac rehabilitation services in BC. In 2013, the Canadian Cardiovascular Society[18] developed a series of cardiac rehabilitation and secondary prevention quality indicators, which included the number of inpatients referred to a cardiac rehabilitation program, the wait time from referral to enrollment, patient self-management education, increase in exercise capacity, and emergency response strategy.

The Canadian Association of Cardiovascular Prevention and Rehabilitation has also published several performance measures for the delivery of cardiac rehabilitation

services. Data on provincial cardiac rehabilitation outcomes, performance, and resource use are required to more accurately determine the current state of cardiac rehabilitation services and to support their future development.[1]

Future considerations

Initial provincial considerations for action include the following:

- Improve awareness of operational cardiac rehabilitation programs by disseminating a current cardiac rehabilitation program directory.
- Integrate the planning and delivery of cardiac rehabilitation services into overall cardiac care services.
- Engage with provincial cardiac rehabilitation experts, including representation from Indigenous partners and people with lived experience, to develop a culturally safe, equitable, and high-quality cardiac rehabilitation service model.
- Address the data void to inform investments, leverage existing services, and integrate hybrid models using expanded virtual options for care delivery.

Study limitations

This study has several limitations that are inherent to a cross-sectional survey design, including the potential for response bias. However, this risk is partially mitigated by the 100% response rate, which enhances the completeness of the results.

Conclusions

Cardiac rehabilitation programs within BC face significant challenges that are resulting in gaps in services and variation in access. Regional health authorities and community programs are working to provide services despite these challenges and limited resources. Our environmental scan identified opportunities to raise awareness of current services; support future engagement; and inspire health care professionals, health system leaders, policymakers, and people with lived experience in BC to take action to improve cardiac rehabilitation services. ■

Competing interests

Dr Moulson serves on the advisory board of and/or has received honoraria from Amgen, GSK (formerly GlaxoSmithKline), HLS Therapeutics, Novartis, Novo Nordisk, and Sanofi. The other authors declared no competing interests.

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Chronic hepatitis B in British Columbia: Updates from the 2025 Canadian Association for the Study of the Liver/Association of Medical Microbiology and Infectious Disease Canada guidelines

Recent guidelines on treating hepatitis B recommend universal one-time screening for adults, reflex hepatitis D virus testing, expanded treatment indications, and updated hepatocellular carcinoma surveillance.

Kai Zhu, MD, Yvette Ysabel Yao, MD, Richard L. Morrow, PhD, Hin Hin Ko, MD, FRCPC, FAASLD, Nancy Fu, MD, MHSc, FRCPC

ABSTRACT: Chronic hepatitis B is a significant cause of liver disease worldwide and an important public health issue in Canada. In British Columbia, hepatitis B virus (HBV) disproportionately affects immigrants and newcomers from endemic regions, which contributes to ongoing disparities in liver-related morbidity and mortality. Despite effective antiviral therapies, gaps remain across the HBV care cascade, including underdiagnosis, limited engagement in care, and undertreatment. The recently released updated 2025 Canadian Association for the Study of the Liver/Association of Medical Microbiology and Infectious Disease Canada guidelines introduce several important changes, including universal one-time screening for adults, reflex hepatitis D virus testing, expanded treatment indications, and updated hepatocellular carcinoma surveillance recommendations. This review summarizes the epidemiology of chronic HBV in BC and highlights key guideline updates relevant to screening, diagnosis, and treatment of chronic hepatitis B.

Dr Zhu is a postgraduate fellow in the Division of Gastroenterology, University of British Columbia. Dr Yao is a postgraduate resident in the Department of Medicine, UBC. Dr Morrow is a postdoctoral research fellow at the BC Centre for Disease Control and a postdoctoral research fellow in the School of Population and Public Health, UBC. Dr Ko is a clinical professor in the Division of Gastroenterology, UBC. Dr Fu is a clinical assistant professor in the Division of Gastroenterology, UBC.

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Hepatitis B virus (HBV) is a DNA virus in the Hepadnaviridae family that can cause a wide spectrum of liver disease, ranging from acute infection to cirrhosis and hepatocellular carcinoma (HCC).[1] Untreated chronic HBV infection is associated with a substantial risk of complications, including liver failure, HCC, extrahepatic manifestations, and premature death.[2,3] Chronic infection is often asymptomatic in its early stages, and many individuals remain undiagnosed until late complications develop.[4]

HBV infection affects an estimated 254 million people worldwide and approximately 262 000 people in Canada.[5,6] Canada has committed to the World Health Organization goal of eliminating HBV as a public health threat by 2030, including targets of a 90% reduction in new cases of chronic HBV infection, diagnosis of 90% of infected individuals, and treatment of 80% of eligible patients.[7,8] Despite these targets, significant gaps remain across the HBV care cascade. It is estimated that in Canada, approximately 29% of individuals with HBV infection remain undiagnosed, about 40% of those diagnosed are not engaged in care, and only 23% of those eligible for treatment receive antiviral therapy.[2,3]

Recently updated Canadian guidelines on the management of chronic hepatitis B were developed jointly by the Canadian Association for the Study of the Liver (CASL) and the Association of Medical Microbiology and Infectious Disease Canada (AMMI).[9] The 2025 guidelines recommend expanded screening, laboratory evaluation, and treatment strategies aimed at improving detection and management of HBV infection. In this article, we highlight key updates in the 2025 guidelines compared with the 2018 Canadian guidelines, with a focus on HBV screening, reflex hepatitis D virus (HDV) testing, laboratory assessment, and antiviral therapy.[9]

Epidemiology

Canada is considered to have low HBV endemicity; however, important regional and population-level variation exists. Immigrants and newcomers account for approximately two-thirds of HBV infections in Canada, and they experience a

disproportionate burden of HBV-related complications, including higher rates of hospitalization and liver cancer mortality.[2,10-13] A population-based study estimated that immigrants with chronic HBV infection lose an average of 4.6 life-years compared with individuals without HBV.[14]

In British Columbia, many HBV infections occur among newcomers from countries where HBV is endemic and routine screening and prophylaxis may be limited.[15] Approximately 15% of the population in BC was born in regions with intermediate to high HBV endemicity, defined as hepatitis B surface antigen (HBsAg) prevalence higher than 2%.[2,16-19] Ethnicity has been shown to be associated with HBV infection in the province. South and East Asian individuals are disproportionately affected by chronic HBV infection, and risk is further increased among those with lower socioeconomic status.[11] As of 2023, the highest rate of reported HBV cases in BC occurred in Richmond, where approximately 60% of the population is first-generation immigrants and most recent immigrants are of Chinese origin.[20,21]

Several populations are underserved or disproportionately affected by HBV infection, including individuals who were born in or have lived in HBV-endemic regions, Indigenous people, people living with HIV, individuals with a history of incarceration, people who use unregulated drugs, and individuals with a family history of HBV or HCC.[22] Notably, the disproportionate impact of hepatitis B on Indigenous people reflects historical and ongoing inequities stemming from systemic racism and settler colonialism. HBV risk factors include sexual exposure to an infected partner, sharing personal care items with someone with HBV infection, tattoos or body piercings performed with inadequate infection control practices, occupational exposure such as needlestick injury, and chronic kidney disease requiring hemodialysis.[10,22,23]

Despite the higher burden of disease in some populations, disparities in HBV outcomes are also influenced by important social determinants of health that affect access to screening, longitudinal care, and antiviral treatment **[Table 1]**.[24-30] A survey on awareness and knowledge of HBV in Asian communities in BC reported that 79% of respondents had a general awareness of HBV, although many had misconceptions about the natural history, transmission,

Clinical pearls: What to know about hepatitis B care

- Chronic hepatitis B virus (HBV) infection is often asymptomatic until advanced liver disease develops.
- All adults aged 18 years or older should undergo one-time HBV screening with hepatitis B surface antigen (HBsAg), hepatitis B surface antibody, and hepatitis B core antibody.
- Patients who are HBsAg-positive should undergo reflex hepatitis D virus (HDV) testing.
- Initial evaluation for patients who are HBsAg-positive should include HBV DNA, alanine aminotransferase (ALT) levels, hepatitis B e antigen status, and fibrosis assessment.
- Antiviral treatment should be initiated in patients with HBV cirrhosis, HBV-related hepatocellular carcinoma (HCC), HBV extrahepatic manifestations, planned initiation of potent immunosuppression, elevated ALT above the upper limit of normal with HBV DNA higher than 2000 IU/mL, or significant fibrosis (F2 or higher).
- Antiviral treatment should be considered in those gray-zone patients who have normal ALT, high HBV DNA (higher than 2000 IU/mL), and high risk factors for progression of cirrhosis or HCC. Treatment decisions should involve shared decision making with the patient.
- First-line therapies include entecavir, tenofovir disoproxil fumarate, and tenofovir alafenamide.
- HCC surveillance with abdominal ultrasound and alpha-fetoprotein testing every 6 months is recommended for high-risk groups, including individuals with cirrhosis, men aged 40 years or older, women aged 50 years or older, individuals of African ancestry aged 30 years or older, those with a first-degree family history of HCC, and patients with HIV or HDV co-infection.

TABLE 1. Social determinants of health influencing hepatitis B virus (HBV) screening, access to care, and treatment outcomes.

Social determinant or barrier	Potential impact on HBV care
Language barriers[24]	Reduced understanding of HBV transmission, screening, and treatment
Limited health literacy[25]	Delayed diagnosis and reduced engagement in longitudinal care
Lack of access to primary care[26]	Reduced screening and delayed specialist referral
Immigration and newcomer status[27]	Difficulty navigating the health care system and accessing culturally appropriate care
Stigma related to HBV infection[28]	Reduced disclosure, testing, and treatment uptake
Low socioeconomic status[27]	Difficulty affording transportation, child care, or time away from work for appointments
Lack of extended medication coverage[29]	Reduced access to antiviral therapy
Cultural barriers and mistrust of health systems[25]	Reduced engagement in preventive care and follow-up
Rural or remote residence[30]	Limited access to laboratory testing and specialist care

and health consequences of HBV.[31] Barriers to HBV screening and care include language barriers, lack of familiarity with the health care system, difficulty finding a family physician, and stigma associated with HBV diagnosis.[32-35] Among individuals who are aware of their HBV diagnosis, additional socioeconomic barriers may include lack of extended health care benefits for medication coverage, travel and child care costs, and time taken off work to attend medical appointments or laboratory testing.[36] Given persistent gaps in the HBV care cascade and ongoing inequities in HBV prevalence and outcomes, chronic HBV infection remains an important public health challenge in BC.

HBV screening

Early identification of chronic hepatitis B infection is essential for preventing long-term complications, including cirrhosis and HCC. Screening also allows timely vaccination of individuals who lack immunity.

The 2025 CASL/AMMI guidelines represent a major shift from the earlier 2018 recommendations regarding HBV screening and monitoring. The 2018 guidelines emphasized a risk-based approach that targeted screening toward individuals in higher-risk groups.[37] In contrast, the 2025 update recommends universal one-time screening for all adults aged 18 years or older using a triple serologic panel consisting of hepatitis B surface antigen (HBsAg), antibody to HBsAg, and antibody to hepatitis B core antigen.[9] Reflex testing for HDV infection is also recommended for individuals who test positive for HBsAg. Individuals who remain nonimmune or who have ongoing risk factors should undergo periodic repeat testing. This universal screening approach aims to improve case detection among asymptomatic individuals and eliminates the need for complex individual risk assessments. The updates in the CASL/AMMI guidelines from 2018 to 2025 are summarized in **Table 2**.

Screening recommendations during pregnancy remain particularly important, because most chronic HBV infections worldwide are acquired through perinatal transmission.[38] All pregnant people should undergo HBsAg testing in the first trimester of every pregnancy.[9] Despite these recommendations, screening remains imperfect. A population-based study from Ontario reported prenatal HBV screening rates of approximately 92.7%, with suboptimal follow-up laboratory assessment among patients who tested positive for HBsAg.[39]

HBV diagnosis and initial evaluation

Diagnosis of chronic HBV infection is established by the presence of HBsAg for longer than 6 months. Once infection is identified, further laboratory assessment is required to determine the phase of disease, level of viral replication, and degree of liver injury. Initial evaluation typically includes hepatitis B e antigen (HBeAg), antibody to HBeAg (anti-HBeAg), quantitative HBV DNA, and alanine aminotransferase (ALT) levels. Assessment of liver fibrosis using noninvasive tests such as transient elastography may also help guide treatment decisions.

Testing for HDV infection has also evolved in recent guidelines. HDV requires HBV for replication and causes the most severe form of viral hepatitis. Because HDV shares similar transmission routes with HBV, co-infection may occur through simultaneous exposure.[40] Earlier guidelines recommended HDV testing only in higher-risk groups, including individuals from endemic regions, people who inject drugs, those with unexplained ALT elevation despite antiviral therapy, and patients with advanced liver disease. The 2025 guidelines now recommend universal reflex anti-HDV testing for all individuals who are HBsAg-positive, with repeat testing if ongoing risk factors or suggestive clinical features persist.[9]

Recent updates have also addressed the management of patients in the so-called gray zone, whose serum HBV DNA and ALT levels cannot be readily categorized into a defined phase of chronic HBV infection.[41] The natural history and optimal management of these patients remain areas of ongoing study. Under the 2018 guidelines, treatment was generally recommended when HBV DNA levels exceeded 2000 IU/mL and ALT levels were persistently above the upper limit of normal for approximately 6 months, or when significant fibrosis was

TABLE 2. Summary of updates in the Canadian Association for the Study of the Liver/Association of Medical Microbiology and Infectious Disease Canada hepatitis B virus (HBV) guidelines from 2018 to 2025.[9,37]

	2018 guidelines	2025 guidelines
Screening population	Risk-based screening for high-risk groups	Universal one-time screening for adults ≥ 18 years of age, using a triple serologic panel (HBsAg, anti-HBs, anti-HBc)
HDV testing	Testing in high-risk HBV patients	Universal reflex anti-HDV testing for all HBsAg-positive individuals
HCC surveillance	Ultrasound every 6 months in defined high-risk groups	Ultrasound plus AFP every 6 months in high-risk groups
Treatment eligibility	HBV DNA > 2000 IU/mL with ALT > ULN or significant fibrosis	Expanded indications, including select patients with normal ALT
Treatment endpoint	Treatment cessation mainly after HBsAg loss or HBeAg seroconversion with consolidation therapy	Additional criteria for stopping therapy in non-cirrhotic HBeAg-negative patients using quantitative HBsAg thresholds
Role of quantitative HBsAg	Limited clinical role	Used to guide treatment cessation and risk stratification in selected patients

AFP = alpha fetoprotein; ALT = alanine aminotransferase; anti-HBc = hepatitis B core antibody; anti-HBs = hepatitis B surface antibody; HBeAg = hepatitis B e antigen; HBsAg = hepatitis B surface; HCC = hepatocellular carcinoma; HDV = hepatitis D virus; ULN = upper limit of normal.

present.[37] The 2025 guidelines adopt a broader treatment approach that includes selected populations with normal ALT levels. In particular, treatment is recommended for individuals older than 40 years of age with HBV DNA levels higher than 2000 IU/mL, regardless of HBeAg status, as a strategy to reduce the risk of HCC.[9]

Together, these changes reflect a broader and more proactive approach to HBV detection and management that emphasizes earlier diagnosis, more comprehensive risk stratification, and expanded treatment strategies aimed at reducing long-term complications.

Chronic hepatitis B treatment

The main treatment goals for chronic hepatitis B are to reduce disease-related morbidity and mortality.[42] Functional cure is defined as sustained loss of HBsAg with undetectable HBV DNA after completion of treatment. This outcome demonstrates good durability after treatment cessation and is associated with improved clinical outcomes. However, functional cure is achieved in only 1% to 12% of patients who receive nucleos(t)ide analogue therapy.[23] For most patients, a more practical treatment goal is sustained virologic suppression with undetectable HBV DNA and normalization of ALT levels.

Chronic hepatitis B treatment indications

The 2025 CASL/AMMI guidelines emphasize increasing awareness and treatment of patients in the gray zone. These patients do not fit within the traditional phases of HBV infection and account for approximately 30% to 50% of individuals with chronic hepatitis B.[42] The most common gray-zone subgroup includes patients who are HBeAg-negative and have normal ALT levels and HBV DNA higher than 2000 IU/mL **[Table 3]**. Increasing evidence demonstrates that gray-zone patients are at increased risk of progressive liver disease and that antiviral treatment is associated with reduced rates of progression to cirrhosis, hepatic decompensation, and HCC.[43-45] As a result, the updated 2025 CASL/AMMI guidelines have expanded treatment criteria and support earlier treatment initiation in selected patients with normal ALT levels.[9] These indications are summarized in the **Figure**.

In BC, PharmaCare Special Authority provides indefinite coverage for lamivudine, tenofovir disoproxil fumarate (TDF), tenofovir alafenamide (TAF), and entecavir in patients with HBV DNA higher than 2000 IU/mL and ALT levels above the upper limit of normal. Coverage is also available for patients with evidence of fibrosis stage F2 or higher, as assessed by liver biopsy, transient elastography (FibroScan), or the aspartate-aminotransferase-to-platelet ratio index. PharmaCare Special Authority criteria have not yet been updated to reflect the new guideline recommendations. During this interim period, clinicians may discuss self-funded antiviral therapy with patients or closely monitor those who do not meet coverage criteria and initiate treatment once eligibility is reached. In selected circumstances where antiviral therapy is clinically indicated but falls outside the listed criteria, such as hepatitis B prophylaxis in the setting of potent immunosuppression, additional clinical information may be submitted with the Special Authority application for review by the BC Hepatitis Drug Benefit Adjudication Advisory Committee.

Chronic hepatitis B antivirals

The first-line antiviral agents recommended for the treatment of chronic hepatitis B are entecavir, TDF, and TAF. These nucleos(t)ide analogues are preferred because of their high antiviral potency, favorable safety profiles, and very low rates of antiviral resistance.[46] TDF or TAF is preferred over entecavir in patients with prior exposure to lamivudine because lamivudine resistance compromises the efficacy of entecavir. In patients with renal impairment or risk factors for

TABLE 3. Clinical phases in chronic hepatitis B.[9,37]

Clinical phase	HBeAg-positive chronic infection	HBeAg-positive chronic hepatitis	HBeAg-negative chronic infection	HBeAg-negative chronic hepatitis	Gray zone	HBsAg-negative
Synonymous terminology	Immune tolerant, high replication	Immune active, high replication	Inactive carrier, low replication	Immune active, high replication	Indeterminate phase	Functional cure, resolved/occult
HBsAg	+					–
HBeAg	+		–		+/–	–
Anti-HBc	+					
Anti-HBe	–		+		+/–	+
Anti-HBs	–					+/–
ALT	Normal	Elevated or fluctuating	Normal	Elevated or fluctuating	Normal or mildly elevated	Normal
HBV DNA (IU/mL)	$> 10^7$	10^4–10^7	Often < 2000	10^3–10^7	Often > 2000	Undetectable

ALT = alanine aminotransferase; anti-HBc = hepatitis B core antibody; anti-HBe = hepatitis B e-antibody; anti-HBs = hepatitis B surface antibody; HBeAg = hepatitis B e antigen; HBsAg = hepatitis B surface antigen; HBV = hepatitis B virus.

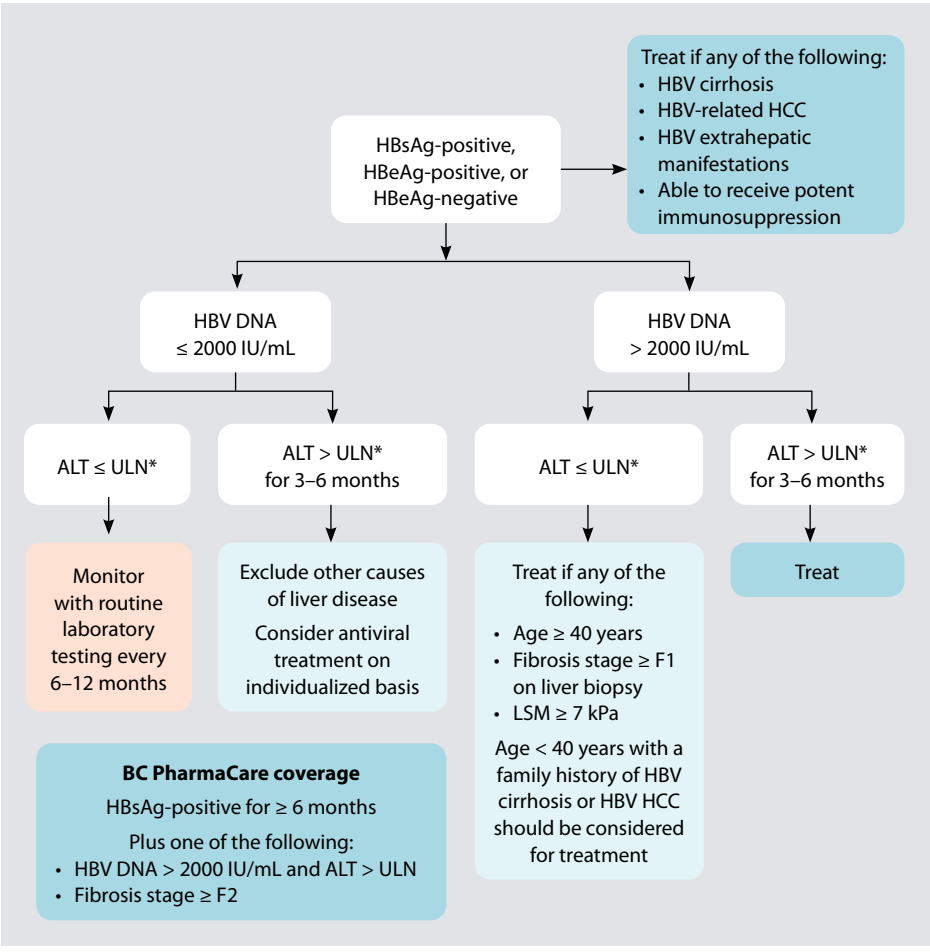

FIGURE. Canadian Association for the Study of the Liver/Association of Medical Microbiology and Infectious Disease Canada treatment recommendations for chronic hepatitis B.[9]

ALT = alanine aminotransferase; HBeAg = hepatitis B e antigen; HBsAg = hepatitis B surface antigen; HBV = hepatitis B virus; HCC = hepatocellular carcinoma; LSM = liver stiffness measurement; ULN = upper limit of normal.
* ULN = 25 U/L for females and 35 U/L for males.

osteoporosis, entecavir or TAF is preferred over TDF because long-term use of TDF has been associated with reductions in bone mineral density and renal tubular injury.

Pegylated interferon alfa offers a finite treatment course of 48 weeks and may be appealing for selected patients—for example, young adults who prefer a finite course of treatment. However, treatment requires subcutaneous injections and is associated with significant adverse effects, including flu-like symptoms, neutropenia, thrombocytopenia, depression, and exacerbation of autoimmune disease. Pegylated interferon alfa is also contraindicated in pregnancy, decompensated cirrhosis, autoimmune disease, uncontrolled psychiatric disorders, and cytopenias.[42] Older nucleos(t)ide analogues, including lamivudine, adefovir, and telbivudine, are no longer recommended because of lower antiviral potency and high rates of resistance; lamivudine resistance is reported in up to 70% of patients at 5 years of age.[46]

Treatment endpoints

The ideal endpoint of HBV therapy is functional cure, defined as sustained HBsAg loss with undetectable HBV DNA. This outcome is associated with improved clinical outcomes and durable viral suppression after treatment discontinuation.[47] Treatment endpoints vary according to HBeAg status because it reflects different phases of infection with distinct treatment responses.

In noncirrhotic HBeAg-negative patients, treatment cessation may be considered after loss of HBsAg or when quantitative HBsAg levels are lower than 100 IU/mL in Asian patients or lower than 1000 IU/mL in White patients, followed by an additional 12 months of consolidation therapy. The ethnicity-specific thresholds were derived from cohorts that were overwhelmingly Asian or White, with minimal representation of other ethnic groups. Therefore, there are currently no recommendations in the guidelines for other groups. Although not included in current guideline recommendations, an anti-HBs level higher than 100 mIU/mL at the time of HBsAg loss has been associated with improved clinical outcomes and a lower risk of reverse HBV seroconversion.[48] In contrast, HBeAg-positive patients without cirrhosis may be considered for treatment cessation after HBeAg seroconversion, followed by an additional 12 months of consolidation therapy. Patients should be monitored closely after treatment discontinuation for evidence of virologic relapse. Patients with HBV-related cirrhosis are generally recommended to continue antiviral therapy indefinitely until loss of HBsAg, regardless of HBeAg status. Decisions regarding treatment discontinuation should be made in consultation with a gastroenterologist or hepatologist, an infectious diseases specialist, or another clinician experienced in the management of chronic hepatitis B.

Local centres of excellence include the Digestive Health Centre of BC/Pacific Gastroenterology Associates and the Vancouver General Hospital BC Hepatitis Program. There are also other clinicians and clinics throughout BC with experience in the management of hepatitis B.

Hepatitis B in pregnancy

Perinatal transmission accounts for up to 50% of HBV infections worldwide, but there is substantial variability across geographic regions.[49] Vertical transmission is clinically significant because approximately 90% of neonates infected perinatally develop chronic infection, compared with only about 5% of immunocompetent adults. As a result, all pregnant people should be

screened for HBsAg during the first trimester. If positive, further evaluation should include testing for HBeAg, anti-HBe, HBV DNA, and ALT. Pregnant people who meet standard indications for antiviral therapy should begin treatment promptly. In addition, pregnant people with HBV DNA levels higher than 200 000 IU/mL should initiate antiviral therapy between 28 and 32 weeks of gestation to reduce parent-to-child transmission.[9] TDF is the preferred antiviral during pregnancy based on well-established safety and efficacy data. However, TAF is increasingly recognized as a safe and effective alternative.[50] For patients who are receiving treatment solely to reduce the risk of parent-to-child transmission, antiviral therapy can be continued until 3 months postpartum to reduce the risk of postpartum flares. Breastfeeding is not contraindicated in HBV infection or while receiving TDF or TAF.

All infants born to parents who are positive for HBsAg should receive hepatitis B vaccination and hepatitis B immunoglobulin as soon as possible after birth, followed by completion of the second and third vaccine doses by 6 months of age. The combination of passive and active immunization is approximately 95% effective in preventing parent-to-child transmission.[48] However, the risk of transmission increases in infants born to parents with high HBV viral loads, which is why pregnant people with HBV DNA levels higher than 200 000 IU/mL are recommended to receive antiviral therapy during pregnancy.

Hepatocellular carcinoma surveillance

HCC surveillance is recommended in patients with chronic hepatitis B, because HCC can develop even in the absence of cirrhosis. HBV DNA can integrate into the host genome and disrupt tumor suppressor genes or activate oncogenes, leading to carcinogenesis independent of cirrhosis. The estimated annual incidence of HCC in noncirrhotic patients with chronic hepatitis B ranges from 0.3% to 0.5%.[51] Additional host, viral, liver-related, and environmental factors further increase the risk of HCC and influence the recommended age at which surveillance should begin. Accordingly, the CASL/AMMI guidelines recommend surveillance in high-risk patients with chronic hepatitis B, including those with cirrhosis, men aged 40 years or older, women aged 50 years or older, individuals of African ancestry aged 30 years or older, those with a first-degree family history of HCC, and patients with HIV or HDV co-infection. The recommended surveillance strategy is abdominal ultrasound with alpha-fetoprotein measurement every 6 months, which is cost-effective, noninvasive, free of radiation exposure, and more sensitive than imaging alone.[52]

Future directions in HBV management

Future directions in HBV management focus on achieving functional cure, defined as sustained loss of HBsAg with undetectable HBV DNA after a finite course of therapy. Several novel agents, including siRNA therapies and capsid assembly modulators, are currently in advanced clinical development. Emerging biomarkers, such as quantitative HBsAg, HBV RNA, and hepatitis B core-related antigen, hold promise for more precise disease monitoring and personalized treatment stratification, although only quantitative HBsAg is available in clinical practice. The recent CASL/AMMI guidelines advocate for broader HBV screening and expanded treatment indications, which should enable earlier diagnosis and treatment initiation. However, successful implementation will require public health studies to assess cost-effectiveness, alongside updates to provincial health coverage policies. Functional cure is more likely to be achieved with these potential new drugs, as early phase trials of siRNA-based regimens and related agents have demonstrated substantially higher rates of sustained HBsAg loss compared with current standard therapies. In the long term, the ultimate goal remains complete cure through eradication of covalently closed circular DNA and integrated viral DNA, although this remains unattainable with existing or foreseeable therapies. ■

Competing interests

Dr Ko has received honoraria and consulting fees from Gilead and GSK (formerly GlaxoSmithKline). The other authors declared no competing interests.

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Digital health as a health promotion tool in primary care

Primary care is where prevention, chronic disease management, and patient relationships live, and where the cracks in the system show up first. Digital health can close some of the gaps and can be a powerful health promotion tool, but only if it is built on interoperable foundations and keeps patients at the centre.[1]

In family practice, a disconnected system is the reason clinicians chase labs and consult notes, duplicate tests, and ask patients to retell the same story at every touchpoint.[2] When medication changes, imaging results, and referral updates do not reliably follow a patient, delays and duplications occur, resulting in more administrative work and less time for relationship-based care.[1,3]

BC's eReferral system and the pan-Canadian Health Application Lightweight Protocol (HALO) framework show what a better approach can look like. OceanMD's eReferral platform is built so referrals can launch from within the electronic medical records (EMR) system rather than requiring re-entry into a separate portal.[4-6] HALO adds to this model by creating a standardized way for approved applications such as eReferrals or care dashboards to plug into EMR and other clinical systems.[7,8] For patients, this means clearer communication, improved referral visibility, and reduced uncertainty about what happens next.[2,4]

A more connected system can also change patients' roles in their own care. Digital tools can inform patients about their conditions, support self-monitoring and behavior changes, and improve communication with care teams.[9] Canadian survey data show that when patients have electronic access to their health information, most feel better equipped to manage their health, and some report avoiding unnecessary visits, including emergency department use, because they can act on the information they have.[10]

But digital health is not inherently equitable. Access to electronic health information and positive experiences using digital tools still vary by income, education, geography, disability, and digital literacy.[11,12] Equity has to be built in from the start through accessible design, multilingual options, non-digital pathways, and consideration for who is not being reached.[1,11]

Family medicine sits at the intersection of all of this. Digital health, built on interoperable standards and implemented with equity in mind, can extend the reach of primary care beyond the brief office visit. The role of primary care is not only to adopt these tools but also to help shape them so they reduce friction, support continuity, and make the system easier for patients to navigate.[1,9] ■

—Birinder Narang, MBBS, CCFP
Co-Chair, Joint Executive Table (previously Digital Referrals and Orders Steering Committee), Doctors of BC

—Jennifer Phillips, MD, CCFP
Council on Health Promotion Member

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Recommending the appropriate naloxone formulation for the patient

Both nasal and intramuscular (injectable) formulations of naloxone are now available through the BC Centre for Disease Control's Take Home Naloxone (THN) program, which provides naloxone and overdose response training at no cost to anyone likely to witness or respond to an overdose event. Between January 2019 and April 2025, naloxone distributed through the program is estimated to have prevented 37 200 death events due to opioid toxicity.[1]

The THN program initially offered only intramuscular naloxone. Following a nasal THN pilot launched at select sites in 2024, the program received 2 years of additional funding in 2026 to expand access to nasal naloxone across all THN sites, in alignment with national guidance recommending the availability of both formulations.[2]

Both intramuscular and nasal naloxone contain the same medication, are safe to give to anyone experiencing an opioid poisoning, and are effective at reversing opioid overdoses. Determining which formulation is most appropriate will depend on factors relating to administration, the characteristics of the person experiencing the overdose event, and the situational context.

Administration

Injectable naloxone requires the capacity to open a glass ampoule, draw naloxone into a syringe, and inject it into a muscle. These steps may be a barrier to people with dexterity, vision, or cognitive limitations and those with limited experience responding to overdose events. Conversely, nasal naloxone is administered as a single-dose nasal spray that typically requires less preparation, making it an easier and quicker option in some situations.

Both intramuscular and nasal naloxone contain the same medication, are safe to give to anyone experiencing an opioid poisoning, and are effective at reversing opioid overdoses.

Characteristics of the person experiencing overdose

Giving one dose of nasal naloxone is the equivalent of giving approximately five doses of the intramuscular formulation. One dose of nasal naloxone is 4 mg, while one dose of intramuscular naloxone is 0.4 mg. The bioavailability of nasal naloxone is lower, approximately 50%, while that of intramuscular naloxone is approximately 100%.[3]

Further, while intramuscular naloxone has a predictable onset to action of 2 to 5 minutes and reaches peak action within 15 minutes of administration, nasal naloxone typically onsets at 3 to 4 minutes but may take up to 17 minutes to reach onset and up to 30 minutes to reach peak action.[4] Nasal naloxone can be absorbed particularly slowly by people with nasal congestion or other nasal issues.

Because intramuscular naloxone is administered in smaller doses and has a more predictable absorption rate, it can be more easily titrated to reduce the risk of precipitated withdrawal in individuals with a physical opioid dependence. Precipitated withdrawal is intensely uncomfortable, may increase the risk of aggression after resuscitation, can interfere with subsequent medical care, and may impact future health care–seeking behaviors. In rare cases, precipitated withdrawal can cause respiratory and cardiac issues.[5,6]

The nasal formulation is well suited for use with opioid-naive individuals. It may also be preferred for responding to an overdose in someone with a higher body mass index, which may make injecting into a muscle more difficult.

Situational context

Environmental and situational factors may also influence formulation choice. Nasal naloxone is often preferred in cold-weather conditions where injecting through multiple layers of clothing may be difficult or when reduced hand dexterity from cold temperatures can make injection more challenging. However, nasal naloxone has a freezing point of –15 °C, and nasal congestion is more common in colder climates. People in areas of the province that reach colder temperatures may wish to carry both formulations.

Because intramuscular naloxone has a more predictable absorption and onset, in rural and remote settings where emergency health services' response times may be prolonged, responders and individuals should have and be trained to use injectable naloxone as well as nasal naloxone, where indicated.

Supporting a comprehensive overdose response

Regardless of formulation, a comprehensive

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overdose response prioritizes early recognition, naloxone administration, rescue breathing, and calling 9-1-1.

Physicians can help prevent drug poisoning deaths by educating their patients and staff on how to recognize and respond to drug poisonings with naloxone and rescue breaths, distributing naloxone or supporting patients in finding a distribution site on Toward the Heart (https://towardtheheart.com/site-finder), and helping patients determine which naloxone formulation best meets their needs [**Figure**].

Reviewing the advantages and limitations of each formulation can help patients identify the option that best meets their needs. For some individuals, having access to both formulations may be beneficial. Ultimately, the best naloxone is the one that will be used. ■

—Christie Wall, MPH
Policy Lead, Harm Reduction and Substance Use Services, BCCDC

—Dylan Griffith
Professionals for Ethical Engagement of Peers

—Sierra Williams, MPH
Public Health Manager, Harm Reduction and Substance Use Services, BCCDC

—Sammy Iammarino, RN, MN
Senior Practice Lead, Harm Reduction and Substance Use Services, BCCDC

—Alexis Crabtree, MD, MPH, PhD, CCFP, FRCPC
Public Health Physician, BCCDC

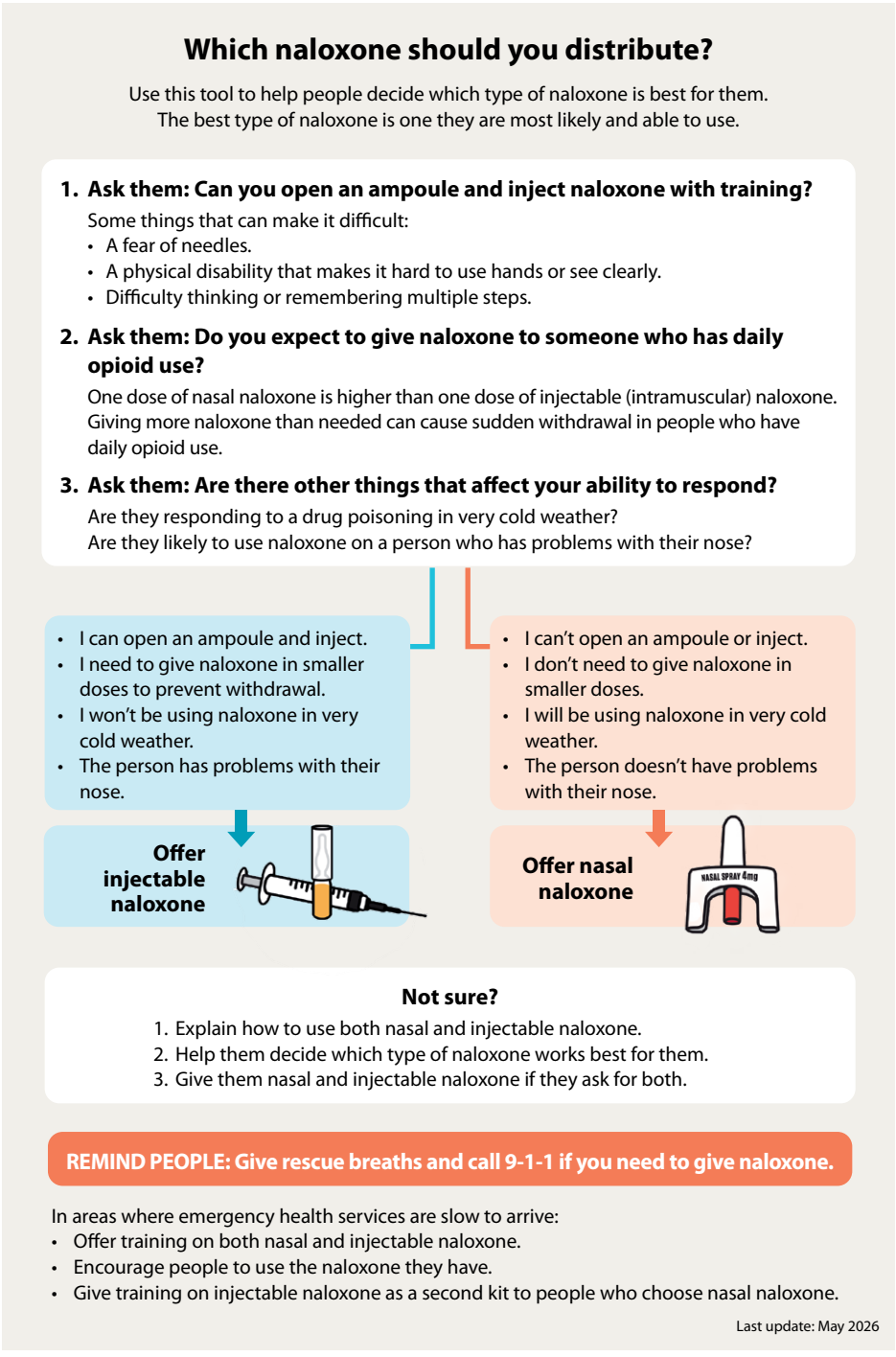

FIGURE. A guide for service providers to help people decide which type of naloxone is right for them.
Source: https://towardtheheart.com/thn-sites.

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From gatekeeper to navigator: The physician's role in a digital health care system

In an era of abundant information and increasingly complex care processes, the physician's value lies less in holding knowledge than in helping patients interpret information, move through the system, and decide what to do next.

Susan Lee, MD, MEd, CCFP, FCFP

In family practice, it is now common for a patient to arrive with a phone in hand, along with a list of symptoms, search results, and questions prepared before the visit. Before I can even ask my first question, the patient has often reviewed possible diagnoses and may request a referral to a specific specialist. As we speak, I open the patient's electronic medical record, review results, and consult an online clinical guidance resource. Between us sit two screens and layers of digital information. The clinical encounter is no longer simply a conversation between physician and patient; it is increasingly mediated by technology.

As a family physician, I see this shift regularly. Medicine now often involves helping patients and clinicians work through an expanding landscape of information, guidelines, and health system processes.

Medicine has moved from an era of information scarcity to one of information saturation. In the past, physicians were valued largely for what they knew. Medical knowledge was difficult to access, and physicians served as its primary interpreters. Today, information is everywhere. Patients can search guidelines, read summaries of medical research, and consult online communities long before seeing a clinician. Artificial intelligence tools can synthesize evidence in seconds.

Medicine once depended on physicians who knew the answers. Today it increasingly depends on physicians who can help patients interpret them.

More information, however, does not necessarily produce greater clarity. Often, it produces the opposite. Patients frequently arrive not *lacking* information but struggling to *interpret* it. Multiple diagnoses may appear plausible. Recommendations vary between sources. Risks and probabilities are difficult to weigh. What should feel empowering can instead feel disorienting, even overwhelming.

Medicine once depended on physicians who knew the answers. Today it increasingly depends on physicians who can help patients interpret them. This is not a lesser role. If anything, it returns physicians to an enduring task in medicine: bringing clinical judgment, context, and steadiness when certainty is in short supply.

The physician's role is shifting—physicians place information in context. They help distinguish what is likely from what is merely possible and what requires action from what can safely continue to be observed.

The health care system has also become more complex. Diagnostic pathways, referral processes, and specialty access often involve multiple steps and evolving criteria. Navigating this landscape can be challenging for patients and clinicians alike.

Digital tools have emerged partly in response to this complexity. Digital guidance resources and decision-support tools aim to organize knowledge and clarify next steps. When designed well, they do not replace clinical judgment. They make care processes easier to follow, allowing physicians to spend less time searching for information and more time focusing on the patient in front of them.

Of course, technology can also intrude on the clinical encounter. Electronic medical records require documentation, and computers increasingly occupy space in the consultation. Telehealth platforms also change how physicians and patients are present with one another. Anyone practising medicine today recognizes how easily attention can drift from the patient to the screen.

This tension reflects an important reality: technology in medicine is never neutral. Its impact depends on how it is designed and how it integrates into clinical practice. Systems that increase administrative burden risk distancing physicians from patients. Systems that reduce complexity and clarify decisions can do the opposite.

In many ways, the physician's role is

Continued on page 258

Dr Lee is a family physician and co-chair of Pathways BC.

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Spotlight: Canadian Association of Physicians with Disabilities

The Canadian Association of Physicians with Disabilities (CAPD) is a not-for-profit social networking and support organization for physicians, residents, and medical students. Founded in 2000 by the late Dr Ashok Muzumdar, a physiatrist who lived with a visual impairment, the CAPD supports physicians with disabilities, provides a national forum for discussing related issues, influences clinical education and research, and more.

The CAPD strives to ensure that doctors and medical learners are not forced out of the medical profession due to disability. CAPD vice-president Dr Quinten Clarke says its organizational mandate has evolved since its establishment. At that time, the organization largely focused on supporting physicians in practice who were not permitted to continue working due to disability, medical reasons, or discriminatory policies. As the organization has evolved and the contemporary understanding of disability has changed, the CAPD has shifted its focus to removing barriers in medical training and practice that prevent individuals with disabilities from working or continuing their studies.

While the conversation around disability has transformed in recent years, Dr Clarke says there is still much work to do to make medicine an accessible career for people with disabilities, including prioritizing the active removal of accessibility barriers and implementing universal design principles. The CAPD is advocating for the needs of doctors with disabilities to be front and centre—not an afterthought.

In alignment with this work, the CAPD is developing a curriculum on disability in health care with patient partners and medical learners with disabilities from across Canada. This series of modules will establish a basic understanding of disability and accessibility that can help improve the competency of medical learners and physicians in working with and caring for people with disabilities, improving access to care, and creating a more inclusive medical culture.

The CAPD works closely with national and international organizations, including the Canadian Medical Association, the Canadian Federation of Medical Students, Resident Doctors of Canada, and the Docs with Disabilities Initiative. The CAPD Trainee Group has been highly engaged at the medical student and resident levels with organizations to ensure that decisions about medical learners with disabilities incorporate their input and lived experience.

To support physicians, residents, and students, the CAPD has created guides to help them access accommodations at various stages of medical training and hosts periodic support sessions for learners with disabilities. The CAPD Trainee Group offers a mentorship program that connects medical students with near-peer mentors—other students or residents who have navigated the same accommodation processes, faculty hurdles, and clinical challenges.

Visit the CAPD website (www.capd.ca) to learn about its work and how to get involved. ■

—Ellen Tannam
Communications Specialist,
Communications and Public Affairs,
Doctors of BC

Support for physicians providing care under ICBC's Enhanced Care model

Throughout 2026, ICBC and Doctors of BC delivered a series of educational webinars for family physicians and specialists who provide care to patients injured in a motor vehicle accident. The sessions focused on billing, reporting, consent, and care pathways under ICBC's Enhanced Care model to help physicians navigate administrative processes while supporting timely patient care.

Enhanced Care, introduced on 1 May 2021, provides care and recovery benefits to British Columbians injured in a crash, regardless of who is at fault. Patients can access early rehabilitation services, including physiotherapy and other initial treatments, without prior approval during the first 12 weeks after injury. Treatment beyond this period requires ICBC approval. ICBC recovery specialists also provide patients with information about available benefits, including coverage for medications, mobility devices, and other medically necessary supports.

Family physicians

Webinars for family physicians focused on updates to billing, patient consent, and communication with ICBC.

As of February 2026, family physicians can bill motor vehicle accident–related care through the Longitudinal Family Physician (LFP) Payment Model, simplifying billing by aligning motor vehicle accident care with other Medical Services Plan (MSP)–insured services. Physicians practising under both LFP and fee-for-service models continue to bill ICBC directly for physician reports, while care related to work-related

motor vehicle accidents should be billed through WorkSafeBC.

After completing ICBC's physician forms (Family Physician Standard Medical Report, CL489; Family Physician Extended Medical Report, CL489A; or Family Physician Reassessment Medical Report, CL489B), physicians are encouraged to submit reports promptly once patient consent has been obtained. Consent is not required when ICBC requests information under Section 28(1) of the Insurance (Vehicle) Act. Doctors of BC also offers a consent-to-sharing-information form to support documentation (www.doctorsofbc.ca/sites/default/files/icbcconsentsharinginformation.pdf).

Specialists

Webinars for specialists focused on reporting requirements and billing under Enhanced Care.

Specialists may complete the Physician Specialized Services Report (CL489S) after seeing a patient referred by a physician or nurse practitioner. The report may be submitted proactively following the initial consultation (with patient consent), when requested by ICBC, or when significant new clinical information becomes available. Follow-up reports are generally required only when there has been a material change in the patient's condition or treatment plan. Residents may also complete reports under physician supervision.

The CL489S functions as both the clinical report and invoice. Specialists are compensated $275 per report, billed directly to ICBC, while clinical visits continue to be billed separately through MSP.

Billing and communication

For both family physicians and specialists, the physician conference fee (A94569) applies to interactive discussions with ICBC or other care providers regarding patient care planning or barriers to recovery. The fee does not apply to administrative tasks and requires prior ICBC approval and submission of an itemized invoice.

Physicians can contact ICBC's Health Care Inquiry Unit for claim information and contact details for recovery specialists. ICBC communicates funding decisions directly to patients and, when applicable, to physicians providing physician-administered services. Patients seeking a review of a benefits decision should first speak with their recovery specialist before escalating concerns through ICBC's review process.

Recordings of both webinars, along with additional billing resources, are available on the Doctors of BC website. Physician groups or clinics interested in a customized presentation on ICBC Enhanced Care billing can contact icbc@doctorsofbc.ca.

—Rheanna Corpuz
Senior Coordinator, Physician Advocacy, Doctors of BC

ICBC resources

- **Enhanced Care**
  https://icbc.com/claims/enhanced-care
- **Health Care Inquiry Unit**
  https://partners.icbc.com/health-services/contact-health-services
- **Resources for physicians**
  https://partners.icbc.com/health-services/physicians

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evolving from gatekeeper to navigator. Algorithms may organize knowledge, and digital systems may streamline referrals, but they cannot replace the human work of a trusted clinician: listening carefully, understanding context, and helping patients navigate uncertainty and decide what to do next.

The future of medicine will bring more technology, more data, and more interconnected systems. For BC physicians, the real promise of digital medicine is not more data, but better navigation—for patients, for clinicians, and for the system itself. ■

Generative artificial intelligence use

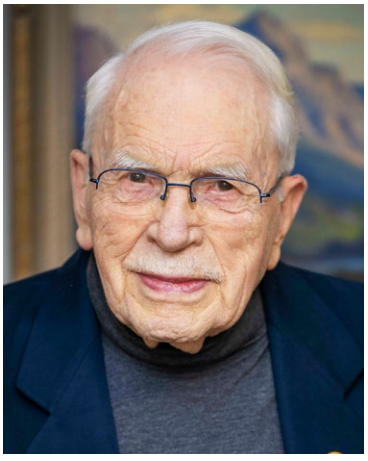
The author used ChatGPT during manuscript preparation for editorial feedback and language refinement. The author reviewed and revised all content and takes responsibility for the final article.

Competing interests

Dr Lee serves as co-chair of Pathways BC. No financial competing interests have been declared.

Obituaries

We welcome original tributes of less than 700 words; we may edit them for clarity and length. Email obituaries 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 Vernon Withold Krause

1925–2026

Vernon Withold Krause, MD, FRCPC, passed away peacefully on 20 May 2026, in Halifax, Nova Scotia, at the age of 101, surrounded by his loving family. Born on 2 March 1925 in Bruderheim, Alberta, to Withold and Alice Krause, Vern lived a life marked by curiosity, empathy, and generosity.

Vern earned his medical degree from the University of Alberta in 1948. His career began in Mayerthorpe, Alberta, where he practised family medicine. In 1950, he married Isabel Merriman, an OR nurse he met at the Royal Alexandra Hospital in Edmonton.

Driven by a desire to keep learning, Vern moved to Ontario in 1955 to specialize in pathology at Queen's University and the University of Toronto's Banting Institute, later working in pediatric pathology at Toronto's Hospital for Sick Children. After settling in Halifax in 1961, he served as director of laboratory services at the then IWK Hospital for Children and the adjacent Grace Maternity Hospital and as an assistant professor at Dalhousie University. His publications, leadership, and contributions to his field were recognized nationally when he was elected president of the Canadian Association of Pathologists in 1981.

In 1983, Vern and Isabel returned west, to British Columbia, where he continued his career in general pathology with Dr C.J. Coady Associates, serving as chief pathologist at the then MSA Hospital in Abbotsford. Following his retirement, he remained engaged, taking on pathology locums in communities across the country.

Vern maintained an active lifestyle, playing tennis, cycling, fishing, skiing, sailing, and white-water rafting, in addition to his keen interest in the stock market, current affairs, and sports, especially when an Edmonton team was in the mix. He often crisscrossed the country to visit and support family. He traveled to six continents to fulfill his interest in history, art, and culture, accompanied by family, friends, and his longtime friend Dr Lynn Kobierski.

At age 90, he returned to Halifax, where he became a valued member of the Parkland at the Gardens retirement community. He participated with enthusiasm in activities like book club, painting, writing, and exercise classes. He enjoyed sharing medical news and insights at the weekly discussion group meetings. With his sharp memory, he delighted many with stories of his life experiences. His saying "Trying to stay in the game" captured his enduring spirit.

Vern is survived by his children, Shauna (Payson) Hunter of Halifax, Donald (Lois) of Mississauga, David of Ottawa, and Margaret (Monty Clemens) of Whistler; seven grandchildren; five great-grandchildren; his sister Barbara (Jim) Moscovich; and Alberta-based nephew and nieces. He was predeceased by his beloved wife, Isabel; his brother, Gilbert; and his parents.

Memorial donations may be made to the IWK Foundation in Halifax.

—Margaret Krause
Whistler

Dr Michael C. Klein

1938–2026

Dr Michael C. Klein died on 10 June 2026, 1 week shy of his 88th birthday.

Michael was a pioneering family physician and medical researcher who had a lasting impact on maternity care in Canada and beyond. He was head of a McGill University teaching centre and the Department of Family Medicine at the Jewish General Hospital in Montreal for 17 years and head of the Department of Family Practice at BC Children's and Women's Hospitals in Vancouver for 10 years. He was professor emeritus of family practice at the University of British Columbia and senior scientist emeritus at the BC Children's Hospital Research Institute in Vancouver. For his work in placing maternity care at the heart of family medicine, he was appointed a

member of the Order of Canada.

Michael was born in Los Angeles, California, the son of Anne and Phil Klein, who raised him in a socialist, secular Jewish home, surrounded by art and activism. His father was a cartoonist and among a small group who started the union at the Walt Disney Company and led a long strike there just prior to the US joining World War II. One of Michael's earliest memories was sitting on a motorcycle outside the gates of the Walt Disney Studios in Burbank, California, at 3 years of age and shouting "Scab!" at everyone who attempted to enter. After the strike, his family returned to the East Coast, and Michael grew up mainly in Newark, New Jersey.

Michael and his wife, Bonnie, to whom he was married for 59 years, immigrated to Canada twice. The first time was under duress in 1967 as Vietnam War resisters, when Michael refused to serve as an officer in the United States Army Medical Corps. The second time was by choice in 1975, this time drawn by Michael's desire to work in Canada's public health care system and by the National Film Board of Canada, where Bonnie spent many years as a documentary filmmaker. In both cases, Canada beckoned because of public policy choices that distinguished this country from our southern neighbors.

Michael did his undergraduate degree in political science at Oberlin College in Ohio and then attended medical school at Stanford University in California. While still in medical school, he lived and practised medicine for many months in both Chiapas, Mexico, and Ethiopia. His early experience working with midwives in Ethiopia—delivering babies using techniques for natural pain relief and without routine episiotomy—were formative, leading him to question many standard but unjustified procedures in Western maternity care.

Michael made many unconventional decisions as a result of this insight, transitioning from a specialization in pediatrics and newborn care to become a family physician with a lifelong focus on low-tech birth. Michael delighted in being an accomplice to the miracle of new life. He delivered—or, as he always said, "caught"—thousands of babies. Deeply concerned about the overmedicalization of birth, he was driven to transform the medical profession's approach to bringing new humans into the world so that it reflected the joy, strength, and health that are at the heart of pregnancy. He played a key role in the legalization of midwifery in BC and other provinces (much to the dismay of many other doctors) and championed the role of birth doulas. He loved bumping into the babies he helped deliver as adults. It happened all the time.

Over his career, he conducted groundbreaking research, mainly on the overuse of medical interventions during childbirth (particularly cesarean sections and episiotomies). Dr Vania Jimenez, a longtime colleague, observed that "Dr Klein chose to follow the path of science and research to investigate the validity of his insights about birth, leading to profound changes in how we practise." Michael believed deeply in mentorship and spent his last energies co-writing papers with younger researchers. He published until the very end, with a paper appearing only a month before his death and another posthumously.

Michael suffered from an assortment of neurological conditions over his last years, causing considerable pain, loss of balance, and ultimately great difficulty speaking and moving. As a doctor and researcher, he had spent much of his career solving medical mysteries in others, much like a detective. Yet in a cruel paradox, neither he nor any of his devoted doctors could solve his own. He died at home, surrounded by family and friends.

Those interested in learning more about Michael's purpose-driven life can do so by reading his 2018 memoir, *Dissident Doctor: Catching Babies and Challenging the Medical Status Quo*.

Michael leaves behind his wife, Bonnie; his children, Seth, Naomi, and Misha; his daughter-in-law, Christine Boyle, and son-in-law, Avi Lewis; and his grandchildren, Zoe, Toma, Aaron, and Theo.

—Naomi Klein
Vancouver

—Seth Klein, MA
Vancouver

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MISCELLANEOUS

ACROSS BC (RURAL AND REMOTE)—SUPPORT FOR RURAL SPECIALIST OUTREACH CLINIC

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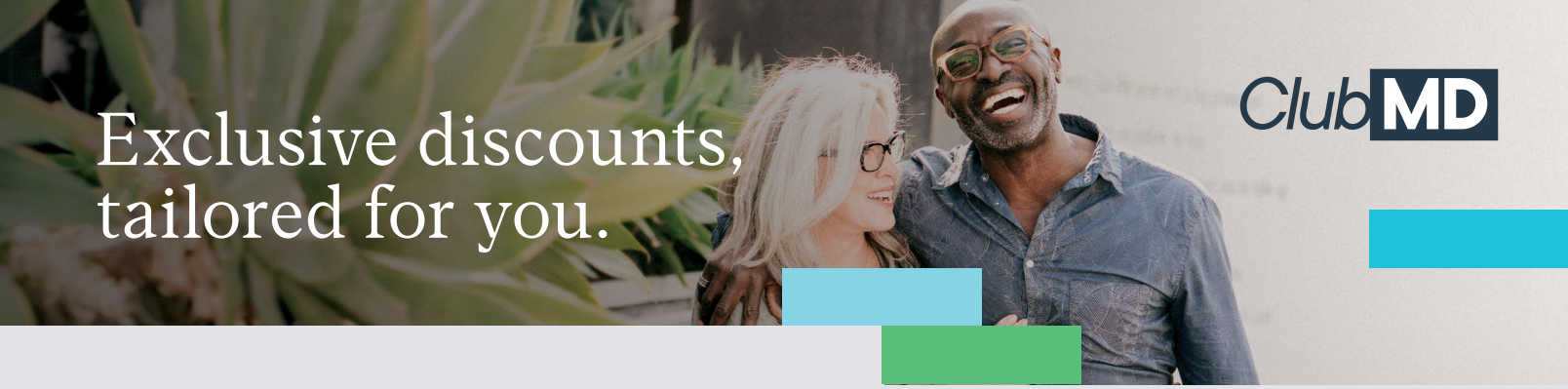

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Male Infertility: Workup and Diagnosis for the Community Physician
DR. KEN POON

Artificial Intelligence and Fertility Care
DR. SARA ILNITSKY

Menopause in the Era of Virtual Care
DR. LINDSAY SHIRREFF

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DR. PAUL YONG

Obesity and Infertility
DR. SARAH HALLERAN

Fertility Preservation, to Freeze or Not to Freeze?
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